2001 NSEI (CHATHAM) SABLEFISH

LONGLINE SURVEY REPORT

August 8 – August 13, 2001

by
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INTRODUCTION

The Alaska Department of Fish and Game (ADF&G) conducted the 14th in a series of annual longline surveys within the Northern Southeast Inside (NSEI) subdistrict of the Southeast District of the Gulf of Alaska from August 7 through August 20, 2001 (Figure 1). The NSEI longline survey is conducted annually to aid in the management of the NSEI sablefish fishery by providing catch per unit of effort (CPUE) and biological data to assess the abundance and general condition of the sablefish (*Anoplopoma fimbria*) resource in Chatham Strait (Carlile et al. 2002).

The specific objectives of the 2001 survey were:

1. Calculate CPUE for sablefish in the Chatham Strait portion of the NSEI subdistrict.
2. Enumerate, by species, all groundfish.
3. Collect a random sample of biological data including otoliths (aging structures), length, weight, sex, and stage of gonad maturity from a minimum of 415 sablefish.
4. Collect biological data including otoliths (aging structures), length, weight, sex, and stage of gonad maturity from all rockfishes.
5. Collect lengths from all shortspine thornyheads (*Sebastolobus alascanus).*

METHODS

Station locations were randomly selected from areas of potential sablefish habitat at depths greater than 200 fathoms (fm). The methods and geographic coverage of these annual surveys have evolved over time (Table 1). Several major changes in survey design were instituted in 1997. Since that time most variables of the survey have remained constant with a further standardization of the fishing gear in 2000 when ADF&G began using longline gear built to National Marine Fisheries Service (NMFS) survey specifications.

The longline surveys are scheduled to fish during periods of minimal tidal fluctuation to minimize problems associated with setting and retrieving gear and to minimize any potential affects on the catchability of sablefish that might be associated with the large tidal currents experienced in Chatham Strait, especially south of Point Gardner.

Survey Area

The survey is designed to set longline gear at the same station locations each August in Chatham Strait; since 1997 the same 45 stations have been set annually. These stations are located in the four statistical areas in Chatham Strait where the major proportion of the commercial fishery occurs. The survey area extends from the northernmost station (57°55.84' N. latitude x 134°47.65' W. longitude) located west of Point Hepburn on Admiralty Island southward down Chatham Strait to the southernmost station (56°05.2'

N. latitude x 134°30.4' W. longitude) several miles southeast of Cape Ommaney on Baranof Island (Figure 2).

Gear

This was the second year the department provided the chartered vessels with standardized skates of gear for use in the NSEI longline survey. In 2000, in an effort to minimize variables associated with using commercial vessel gear, ADF&G contracted Lummi Fishery in Seattle to build skates of conventional longline gear. These skates were built to replicate the gear used by NMFS in their longline surveys in the Gulf of Alaska in order to allow the department to compare sablefish catch and effort data in surveys conducted in internal state waters with those conducted by NMFS in the outside waters of the Gulf of Alaska. To eliminate bias introduced by new (unfished) gear all new gear was soaked (fished) prior to being used in the survey.

A string of gear consisted of a flag pole, an array of buoys, buoy line (the length of which is dependent upon the depth of the set), a 60-pound longline anchor, 150 fm of running line, and 25 skates of 45 #13/0 Mustad[2] circle hooks, and second 150 fm of running line, a second buoy line (again the length is dependent on depth), a second 60-pound longline anchor, a second array of buoys and a second flagpole. Beginning in 2000 a seven-pound, lead ball was snapped to the end of each skate. Hooks were front threaded to gangions secured to beckets tied into the groundline at 6.5 foot (2 m) intervals (Figure 3). The distance of the hook from the groundline (the length of the gangion and the becket when tied together and attached to groundline) was 15 inches (38 cm). Sixteen feet (5 m) of groundline were left bare at each skate end. Gangions were medium lay #60 nylon round braided twine, beckets were medium lay #72 nylon becket twine, and the groundline was medium lay 3/8 inch nylon American Line SSR 100. The vessel crew attached new hooks purchased by the department on all skates prior to each survey.

All ADF&G survey vessels used a sea bird deterrent device (Figure 4).

Vessels

ADF&G awards annual short-term (14-day) charter agreements to three commercial longline vessels to fish 15 stations each during the same time period, splitting the survey area into three distinct areas and allowing all stations to be fished within a single five-day period.

The 2001 request for bids specified a maximum bid of $25,000 for each portion of the survey (due to budget constraints) and that a vessel could not fish more than one portion and that each portion was to be bid separately.

The *F/V Ida June* was awarded an annual contract to conduct the longline survey in the northern portion (Trip #3) (Figure 5). This was the fifth year that the *F/V Ida June* has participated in the survey. It fished

[2] Product names used in this publication are included for scientific completeness but do not constitute product endorsement.

the northern portion in each of those years; in addition, in 1999 it fished half the stations in the central portion. The *F/V Ida June* was built in 1974 and is a 52-foot keel length, Hoquium fiberglass vessel. It was owned and skippered by Greg Beam.

The *F/V Charles T* was awarded an annual contract to conduct the longline survey in the central portion (Trip #2) (Figure 6). This was the sixth year that the *F/V Charles T* has participated in the survey. It fished the entire survey area in 1992 and fished the central portion in 1997, 1998, 2000, and 2001: in addition, in 1999 it fished the southern portion and half the stations in the central portion. The *F/V Charles T* was built in 1919, with a major renovation in 1999 and is a 59.6 foot-over-all (FOA), wooden vessel. It was owned and skippered by Jim Eastwood.

The *F/V Sylvia* was awarded an annual contract to conduct the longline survey in the southern portion (Trip #1) (Figure 7). This was the first year that the *F/V Sylvia* has participated in the survey. The F*/V Sylvia* was built in 1927 and is 62.5 FOA. It was owned and skippered by Bill Lewis.

Vessel Crews

Each vessel was required to provide 3 experienced crewmembers in addition to the skipper. The vessel crew operated the fishing vessel and baited, set, retrieved, and repaired all longline gear (Figure 8 and 9). ADF&G provided two scientific personnel on each vessel who were responsible for gathering the scientific data including the hook accounting and biological data. The fishing crew and scientific personnel for each vessel are listed in Table 2.

Schedule

The *F/V Charles T* departed Petersburg 0700 hours on August 7, 2001 and the *F/V Sylvia* departed Petersburg at 1230 hours the same day. The *F/V Ida June* departed Sitka on August 8, 2001. Each vessel fished 15 stations; no test sets were made in 2001. Each vessel completed their portion of the survey in seven days port to port. The list of stations assigned to each vessel is shown in Table 3.

Tides

The 2001 survey was scheduled to fish during the first period of minimal tides in August in order to complete the survey prior to the opening of the commercial fishery on September 1 (Appendix A). Only in 1989 and again in 1997 was the survey conducted during the first set of minimal tides in August (Table 1).

Bid to Purchase ADF&G Fish

The department solicited bids from area processors to purchase the fish caught during the survey. The Request for Quotes was based upon a total expected landed 2001 catch similar to the 2000 survey catch which was approximately 89,000 round pounds of sablefish plus an additional 2,000 round pounds of rockfish bycatch (Appendix B). The successful bidder was required to have a facility in Kake or provide tender service in Chatham Strait. They had to be available seven-days a week, capable of handling up to 50,000 pounds of round sablefish, and provide sufficient high-quality ice for each vessel including those departing other ports. The quoted price for the fish was to include the cost of the required tender service and ice.

Sitka Sound Seafood (SSS) in Sitka won the bid and contracted with the *F/V Traci C* to provide tender service and with the Port Alexander buying scow the *Alaskan Queen*. SSS arranged for the Petersburg vessels to get ice at Petersburg Fisheries (PFI).

SSS requested that all fish be in Sitka by day four. On the evening of August 10 the *F/V Traci C* picked up fish from the F*/V Charles T* at Warm Springs (day three) and the *F/V Ida June* at Sitkoh Bay (day two). The *F/V Sylvia* unloaded to the PA scow *Alaska Queen* late on August 10 (day three). At the end of the survey the *F/V Charles T* and *F/V Sylvia* unloaded to the F/ V *Traci C* in the very early morning of August 13 (day two) in Warm Springs and the *F/V Ida June* unloaded their last load to the F/V *Traci C* early in the evening on August 14 (day three) near Catherine Island.

Except for the sampled sablefish, which were eastern cut, the sablefish were delivered in the round. Rockfishes were delivered head on with the belly split. The iced boats (*F/V Sylvia and F/V Ida June*) were requested to ice dress sablefish and all rockfish separate from sablefish in the round. RSW and the slush boats (*F/V Charles T*) were requested to ice dress fish in a separate hold or in totes and to put round rockfish in brailer bags if they were put into the RSW or slush tank (to protect the sablefish from the rockfish spines).

The day prior to departure SSS requested that all round sablefish be bled. The Petersburg RSW/slush boats do not customarily bleed their fish and since this request was made at a late date SSS agreed for this year's survey to accept un-bled round RSW/slush fish with the stipulation that in the future they would require in their bid that all fish were to be bled.

Bait

International Marine Industries in Rhode Island won the 2001 NSEI bid to provide 8,281 pounds of Argentina *Illex*, 100–200 gm squid for this survey. The winning bid was $0.41 a pound ($3,382.50 total) with shipping costs of $833.25 to Petersburg for two thirds of the bait and $476.28 to Sitka for one third of the bait. This provided each vessel 2,768 pounds of squid (123 cases x 22.5 lb./case). Each vessel had from 10 to 20 boxes remaining at the completion of the survey.

In 2001 both the head and the tentacles of the squid were discarded, using only the body of the squid as bait. This was done to replicate NMFS bait use and to eliminate variables that might exist should the

heads or tentacles fish differently from the remainder of the squid body. Not using the heads was a departure from years prior to 2000 when we discarded only the tentacles. Hooks were hand–baited with squid cut into 1.5-2 inch pieces. The rate of use averaged 12.5 pounds per 100 hooks and is the same rate of use specified by NMFS. The bait was not thawed more than 24 hours prior to use.

Set Information

A master list based on the 1997 stations was provided to each vessel. This master list included the start and end latitudes and longitudes (to nearest hundredth of a minute), and the start and end depths (in fathoms) for each station. Each vessel was provided a hard copy of the completed 1997 survey set information forms and the 2000 set summary should addition information be needed. Sets were to be made in the same direction as the tidal current between the two points on the master list. Haul-back direction was dependent on the tide, wind direction, and currents. If it was necessary to set differently from the master list 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.

The beginning and ending latitude and longitude, the time the second anchor went overboard, the wind direction and speed at time of setting, the bottom type, and the start and end depth was recorded by the skipper and/or one of the ADF&G crew on the Sablefish Survey Set Form (Appendix C; Figure 10). The bottom depth was recorded as each skate went out and an average depth per station was calculated by averaging these fathometer depths. Comments, particularly those possibly affecting CPUE, were recorded on this form for each station.

A total of 25 skates were set at each station with the exception of station 1 and 2. In 1997 we increased the number of hooks per station from 500 to the current 1,125, and the ends of station 1 and 2 overlapped. To prevent problems associated setting over the same ground, these two stations were set as one continuous set with double the number of skates (and hooks) and were called station 1. As a result station 2 data does not exists in the database for 1997–2001.

Soak Time

Each vessel was expected, within time and weather constraints, to set three stations a day. Occasionally a vessel would set four stations a day. Measured from the time the second anchor went overboard to the time the first anchor was onboard, soak times between three and 11 hours were to be maintained. The three to 11 hour soak time was specified to replicate NMFS soak times. NMFS choose a three-hour minimum soak time as 80–90% (approximately 85%) of fish are hooked in the first three hours of soak time (Sigler 2000). The maximum 11 hours is based on the time it takes NMFS to haul a station (8–10 hours).

A typical pattern of setting gear is to set the first set, wait to minimize soak time on the second set and set the second leaving time to return and haul the first after three hours. The third set of the day is then set and then the second and third set are hauled in sequence. This sequence minimized soak times to reduce

flea problems as well as minimized the number of sets in the water at any one time to avoid exceeding the 11 hours maximum should problems arise in retrieving gear. At times it was not practical to set using the above method and other patterns were followed.

Hook Accounting

The status of each hook was recorded on the Hook Accounting Form (Appendix D).

As each hook broke the surface its status was noted. A hook without a fish on it was recorded as "bare," "bait," or "invalid" (bent, broken, missing, snarled). Fish that broke the surface attached to a hook were identified and recorded by species or species grouping. Sablefish that broke the surface on a hook but which were not landed were noted as "lost." Sablefish less than 15 inches (38 cm) were noted as "small" and immediately returned to the water (unless they were a biological sample). Sablefish that were not marketable were noted as 'discard" and discarded.

The catch and effort data was tallied separately for each skate to allow exclusion of invalid skates and allow for a CPUE comparison both among the sets and between the skates on a set. A skate was considered invalid if greater than 25% of the skate was missing, in a snarl, or stripped of hooks.

All bycatch species except rockfish were returned to the water immediately with minimal damage.

On the *F/V Charles T* and the *F/V Sylvia* one ADF&G staff sat near the roller at a location that provided a good view of the hooks as they came out of the water to note and record the catch and effort data (Figure 11). On the *F/V Ida June* the skipper, situated at the roller, called out the condition of the hook or species of fish on each hook and a vessel crew nearby recorded the data.

A CPUE of sablefish-per-hook (fish-per-hook) for an individual station was calculated using only valid subsets by dividing the number of valid sablefish (includes the lost and released sablefish but not those caught in a large snarl) by the total number of hooks retrieved at that station.

$$cpue_i = \frac{f_i}{h_i}, \tag{1}$$

where $cpue_i$ = the catch per unit of effort for Station i,
f_i = the total number of valid sablefish caught at Station i on valid subsets,
h_i = the total number of hooks fished at Station i on valid subsets.

The overall fish-per-hook for the survey is calculated dividing the total valid sablefish captured by the total hooks retrieved using only valid subsets.

$$CPUE = \frac{\sum_i f_i}{\sum_i h_i}, \tag{2}$$

where $CPUE$ = the overall catch per unit of effort (fish-per-hook) for all stations.

A CPUE of kilograms-per-hook for an individual station is calculated by multiplying the fish-per-hook for a station by the average weight in kilograms from the fish sampled on that station.

$$cpue_{i:wt} = cpue_i \cdot w_i , \quad (3)$$

where $cpue_{i:wt}$ = the catch per unit of effort for Station *i* in kilograms-per-hook.
$cpue_i$ = the catch per unit of effort for Station *i* in fish-per-hook.
w_i = the mean weight of sablefish sampled at Station *i* in kilograms.

The kilograms-per-hook for the survey is calculated by multiplying the overall fish-per-hook by the overall average kilogram for sampled sablefish.

$$CPUE_{wt} = CPUE \cdot W , \quad (4)$$

where $CPUE_{wt}$ = the overall catch per unit of effort (kilograms-per-hook) for all stations
$CPUE$ = the overall catch per unit of effort (fish-per-hook) for all stations
W = the mean weight of sablefish sampled at all stations in kilograms.

Biological Sampling

One ADF&G crew was present on deck during the retrieval of the longline gear and took biological samples from the subsample of fish. A sampling site was set up on the hatch cover of each vessel and a Salter Heavy-Duty Hanging (#235-10S) metric (20 kg) scale was hung nearby (Figure 12 and Figure 13). Fish were sampled for biological data and the data was recorded on the Survey Biological Data Form (Appendix E; Figure 14). The ADF&G crew cleaned and dressed the fish to industry standards and the vessel crew iced the sampled fish.

Sablefish: length, weight, sex, stage of gonad maturity, and age

The sampling goal for sablefish for the survey was 415+ samples. This sample goal for sablefish was based on recommendations in an in-house memo (D. Carlile personal communication 1997). In 2001 biological data including length (to nearest 10 mm), weight (to nearest 0.1 kg), sex, stage of gonad maturity, and otoliths were taken on the first and every tenth sablefish for the first 11 skates hauled at each station. Prior to leaving port this sampling schedule was calculated based on the survey catches in 2000 and the expectation that the 2001 survey catches would be close to the 2000 catches. This sampling rate was continued throughout the survey to assure that each station was sampled at the same rate. The stage of gonad maturity was determined based on the Sablefish Maturity Codes and with the aid of a NMFS gonad maturity photo sheet (Appendix F). Otoliths were extracted and processed according to the Instructions for Labeling and Shipping Otoliths and sent to the ADF&G Otolith Processing Lab in Juneau for aging (Figure 15; Appendix G).

Sablefish Tags

No sablefish tagging was done on the longline survey this year. All previously ADF&G tagged sablefish captured were sacrificed and the recovery data was recorded. This change (from the previous year's protocol to record and release) was implemented to minimize affects on the 2001 mark-recapture project (Richardson 2001). Other agencies' tagged sablefish that were captured were handled according to Protocol for Previously Tagged Sablefish (Appendix H).

Rockfishes: length, weight, sex, stage of gonad maturity, and age

The sampling goal for rockfishes for the survey was 400 samples for each species (Figure 16). In 2001 biological data including length (to nearest 10 mm), weight (to nearest 0.1 kg), sex, stage of gonad maturity and otoliths were taken on all rockfish. The stage of gonad maturity was determined based on the Gonad Condition Criteria Applied to *Sebastes* from Alaska Landings Used in 1988 (Appendix I). Otoliths were extracted, processed according the 2001 Survey SOP, and sent to ADF&G otolith processing lab in Juneau for aging.

Shortspine Thornyheads: length only

The sampling goal for shortspine thornyheads for the survey was 400 samples. Shortspine thornyheads do not have swim bladders and are expected to survive after being released; therefore, lengths (to nearest 10 mm) were to be taken from all thornyheads and the fish were immediately returned to the water.

Other Species

Bycatch species other than those listed above were identified, enumerated, and released at the roller. If dead, Pacific sleeper sharks were examined for stomach contents. No other biological samples were collected from these fish.

Data Entry/Management

All survey data (with the exception of the age data) from the *F/V Sylvia* was entered while at sea for the first time using the prototype of the portable version of the regional integrated database Alexander (Alex) and later uploaded in Sitka to the main Region 1, Alex database (Figure 17). The data collected on the other two vessels was entered into Alex in Sitka and Petersburg after the vessels reached port. After the otoliths were aged the age data was entered in Sitka.

RESULTS

Tides

The survey commenced early in the cycle of minimum tides and on the first couple of days two vessels experienced problems (especially gear and anchor snarls) retrieving gear due to the strong tidal currents in areas below Point Gardner. The confluence of Frederick Sound and Chatham Strait creates strong tidal currents from Point Gardner south. Currents at depth often may not correspond to the tide book or surface currents.

Set Information

Set information was collected from all 45 stations. The set latitude and longitude for each station are listed in Table 4. Several stations were not set as described on the master list. Station 6, (set 2) was moved to the south end of Station 7 to avoid setting over station 6. Station 5, (set 4) was set as it had been set in 1999 by the *F/V Charles T* because if set as listed on the master list it would have been on land. Station 1 had 3 extra skates attached in error; these extra skates were not used to calculate CPUE. In addition several sets, especially in the central portion (Trip 2), had drifted substantially prior to pickup. Pick up locations are not available for this survey but will be recorded in future surveys.

The depths at the locations where the anchors went overboard ranged from a minimum of 207 fathoms at station 13 to 406 fathoms at station 27. The mean of the average depths calculated at each station was 316 fathoms (Table 4).

The winds during the survey were primarily calm, with maximum winds of 5 to 15 knots recorded on a few occasions (Figure 18).

Soak Time

The soak time for a set, measured from the second anchor overboard to the first anchor onboard, ranged from 3 hours 14 minutes to 8 hours 16 minutes; the average soak time was 5 hours 20 minutes and the median was 5 hours 10 minutes (Table 5). The *F/V Ida June* (northern portion-Trip 3) average soak time was 5 hours 53 minutes. The *F/V Charles T* (central portion-Trip 2) average soak time was 4 hours 20 minutes. The *F/V Sylvia* (southern portion-Trip 1) average soak time was 5 hours 35 minutes.

Except in cases where retrieval problems were encountered it took each vessel approximately 1 hour 30 minutes (from anchor to anchor) to pull a set (Table 5). Each vessel recorded parting the line and picking up the remainder of the line at the opposite end twice. The *F/V Sylvia* parted line at station 6 (set 2) and station 4 (set 5), the *F/V Charles T* parted line at station 23 (set 10) and station 27 (set 15) and, the *F/V Ida June* parted gear at station 47 (set 3) and station 41 (set 9). The causes of line parting were noted as due to sharks or hang-ups. The *F/V Sylvia* lost 4 skates of gear at station 6 (set 2) and retrieved a skate of stripped gear at station 4 (set 5); no other gear was lost and all anchors were retrieved.

Hook Accounting

Set information and CPUE data were collected from all 45 stations. Of the 1,112 skates (subsets) set, 1,068 skates were valid and used to calculate CPUEs. Of the total 47,870 hooks set on valid subsets 12,314 (26%) still had bait on them, 13,660 (28) were bare, and 1,191 (2%) were invalid; i.e. broken, bent, snarled or otherwise. Either sablefish or bycatch species occupied the remaining hooks (43%) (Table 6 and Table 7).

On valid subsets, a total of 17,361 sablefish were caught on a total of 47,870 hooks set (Table 6). The overall fish-per-hook was 0.33 and ranged from 0.13 at station 54 to 0.62 at station 45 (Table 8; Figure 19 and Figure 20). The per station fish-per-hook varied throughout the survey area and the overall fish-per-hook per survey portion ranged from a low of 0.28 for stations in the southern portion to 0.35 for stations in the central portion to a high of 0.46 for those stations in the northern portion (Table 9). The fish-per-hook also varied widely within each of these portions (Figure 20).

Using the overall average weight of 2001 survey samples of 3.04 kg (6.6 lbs) the overall kilograms-per-hook was 1.10 (2.42 pounds-per-hook) and ranged from a minimum kilograms-per-hook of 0.39 (0.86 pounds-per-hook) at station 54 to a maximum kilograms-per-hook of 1.96 (4.32 pounds-per-hook) at station 51 (Table 8; Figure 19).

Bycatch

Bycatch included 1,704 shortspine thornyheads, 817 skates, 245 shortraker rockfish, 104 halibut, 121 arrowtooth flounder, 77 rougheye rockfish, 22 redbanded rockfish (Table 6 and Table 7). Additionally there were 237 other fishes and invertebrates captured that were not identified to species in the Alex database output.

The catch of shortspine thornyheads varies substantially by set (Table 6) and is summarized by statistical area in Table 10.

Biological Sampling

Sablefish Biological Sampling: length, weight, sex, stage of maturity, and age.

Lengths were taken on 746 sablefish. The mean length recorded was 64 cm and the sablefish ranged in length from 44 to 103 cm (Figure 21). The mean length recorded in the southern portion was 67 cm and these sablefish ranged from 47 to 103 cm, the mean length recorded in the central portion showed a modest decrease to 65 cm with a range of 44 to 98 cm and the mean length recorded in the northern portion showed an additional modest decrease to 61 cm with a range of 45 to 91 cm (Table 11). To compare lengths with past years data the length frequency was adjusted by the fish-per-hook (Figure 22).

The mean length for male sablefish (n=397) was 62 cm and they ranged in length from 44 to 80 cm. The mean length for female sablefish (n=348) was 67 cm and they ranged in length from 47 to 103 cm (Figure 23).

Weights were recorded for 745 sablefish. The mean weight of the sampled sablefish was 3.0 kg (6.6 round pounds). The mean weight per station ranged from 1.3 to 5.3 kg (2.9 to 11.7 lbs) and the weights of individual fish ranged from 0.7 kg to 11.3 kg (1.5 to 24.9 lbs).

Sex was noted on 746 sablefish. Fifty-three percent of the fish were male and sex ratio varied by station (Table 12). The percent male ranged from 22% at station 49 (n=18) to 100% at station 28 (n=10) with the percent male per station fairly well distributed throughout this range.

Sixteen percent of the males and 7% of the females were immature (maturity code 1) (Table 13). There were no ripe (maturity code 4) males and there were 2 female sablefish that had large clear loose eggs in their ovaries.

The age lab returned estimated ages for 719 samples. These sablefish ranged in age from 2 to 53 years with a mean age at 12 years. The age frequency has a bimodal distribution with the first mode at 6 years of age (Figure 24).

Sablefish Tags

Eighty-eight sablefish that were previously tagged by ADF&G were recovered during the survey. All ADF&G tags recovered were green tags from the 1997–2001 Chatham releases: 6 were from the 1997 longline release, 3 from the 1998 longline release, 5 from the 1999 longline release, 27 from the 2000 pot release, and 47 from the 2001 pot release.

Rockfishes Biological Sampling: length, weight, sex, stage of maturity, and age.

Shortraker, rougheye, and redbanded rockfish were sampled for length, weight, sex, and maturity (Appendix I). Aging structures were taken from rockfishes, however ages are not available at this time.

Of a total of 245 shortraker rockfish caught, 225 were measured for length and weight. The mean length was 64 cm and the fish ranged in length from 44 to 95 cm. The mean weight was 4.6 kg (10.4 lb) and ranged from 1.0 to 11.8 kg (2.2 to 26.6 lb). The sex ratio, noted on 223 of the shortraker rockfish was roughly equal at 49% male. Sexual maturities were noted on 178 shortraker and showed 1% "immature" plus 17% "maturing" shortrakers (Table 14).

Of a total of 77 rougheye rockfish caught, 77 were measured for length and weight. The mean length was 45 cm and the fish ranged in length from 31 to 79 cm. The mean weight was 1.5 kg (3.3 lb) and ranged from 0.6 to 7.9 kg (1.3 to 17.4 lb). The sex and sexual maturity were noted on all 77 of the rougheye rockfish resulting in 35% males and 42% percent of the samples were "immature" and 35% "maturing" (Table 15).

Of a total of 22 redbanded rockfish caught, 21 were measured for length and weight. The mean length was 45 cm and the fish ranged in length from 36 to 53 cm. The mean weight was 1.8 kg (4.0 lb) and ranged from 0.8 to 2.9 kg (1.8 to 6.4 lb). The sex and sexual maturities were noted on 20 of the redbanded rockfish resulting in 60% males and 15% of the samples were "immature" and 10% "maturing" (Table 16).

Shortspine Thornyhead Biological Sampling: lengths only

Of the 1,704 Shortspine thornyheads captured in 2001, lengths were taken on 718 fish. The mean length was 40 cm and lengths ranged from 28 to 67 cm. (Table 17; Figure 25).

COMPARISON WITH RECENT YEARS DATA

The 2001 overall fish-per-hook (0.33) increased 45% from the 2000 survey (0.25 fish-per-hook) and is up 35% from the 1997 survey (0.27 fish-per-hook). In the northern portion the fish-per-hook was up 33% over last year, in the central portion it was up 60% over last year, and in the southern portion it was up 49%. The 1997-2000 overall fish-per-hook was relatively flat and ranged from 0.27 in 1997 and 1998 to 0.26 in 1999 to 0.25 in 2000. The sablefish fish-per-hook per station from 1997–2001 varies widely and independently of the overall survey CPUE.

The 2001 overall kilogram-per-hook of 1.10 (2.42 pounds-per-hook) increased 33% over the 2000 overall kilograms-per-hook of 0.83 (1.8 pounds-per-hook). Both the 2001 per station maximum kilograms-per-hook of 1.96 (0.86 pounds-per-hook) and minimum kilogram-per-hook of 0.39 (4.32 pounds-per-hook) showed an increase over 2000, which showed a maximum kilograms-per-hook of 1.5 (3.3 pounds-per-hook) and a minimum kilograms-per-hook of 0.27 (0.59 pounds-per-hook). A comparison of the 2000 and 2001 kilogram-per-hook with the 1997–1999 kilogram-per-hook should be considered approximate since in 1997–1999 weights were not taken on approximately 20 of the 45 sets and therefore the kilograms-per-

hook for those years is calculated using an average survey weight derived from a subset of survey stations.

Bycatch

The number of shortspine thornyheads varies annually with the 1,704 captured in 2001 down from the 2,491 captured in 2000 and the 1,909 captured in 1998 and up from the 1,541 captured in 1999 and 1,381 captured in 1997. This fluctuation appears to be independent of the overall sablefish CPUE.

Biological Sampling

A direct comparison of 2000 and 2001 biological data with the 1997–1999 data is not possible. In 1997–1999 we tagged and released sablefish on almost half of the survey stations. Standard random sampling was not conducted at these stations for these years. At these stations, lengths were recorded either for all tagged sablefish or only sporadically and no other biological data was collected.

The average, minimum and maximum lengths for 2001 were similar to those in 2000. This is also true when looking at the survey by portion as both the average and minimum length varied only 1 to 2 centimeters between 2000 and 2001 in each of the three portions of the NSEI survey area. In 2001 21 stations showed an increase in mean length and 23 stations showed a decrease in mean length when compared with 2000 data.

Multiplying the 2000 and 2001 percent length frequencies by the overall survey fish-per-hook for that year allows for a comparison based on a change in CPUE. This shows an increase in 2001 over 2000 of sablefish in the 49–69 cm range.

The 2001 mean weight of 3.0 kg was down from the 2000 mean weight of 3.3 kg. Fourteen stations showed an increase in mean sablefish weight over last year and 29 stations showed a decrease (no weights were available for one station in 2000).

The percent immature males (16%) in 2001 was similar to the 15% immature males noted in 2000. The percent immature females in 2001 (7%) showed an increase over the 2% immature females noted in 2000. Both 2001 and 2000 data showed no ripe males and only 2 females with fully formed eggs. This supports the idea that NSEI sablefish do not spawn in August.

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Table 1. NSEI longline survey specifications, 1998–2001.

Year	Start	End	Vessels		Hooks Per Set	Hook Spacing	Hook Size	Gangion Length	Bait	Soak Time	Skate Wts	Fish tagged[a]	Sets Made
1988	8/14	8/26	*F/V Betty*		1000	3 m	13 C	NA	Herring	1 hr	No	1298 t	24
1989	8/7	8/25	*F/V Carrie*		500	3 m	13 C	NA	Herring	1 hr	No	None	44
1990	8/26	9/10	*F/V Isis*		500	3 m	13 C	NA	Herring	1 hr	No	None	40
1991	8/13	8/30	*R/V Stellar*		500	3 m	13 C	0.375 m	Herring	1 hr	2.3 kg	None	40
1992	8/17	8/31	*F/V Charles T*		500	3 m	13 C	0.375 m	Herring	1 hr	2.3 kg	None	40
1993	8/23	9/8	*R/V Medeia*		500	3 m	13 C	0.375 m	Herring	1 hr	2.3 kg	None	38
1994	8/23	9/5	*R/V Medeia*		500	3 m	13 C	0.375 m	Herring	1 hr	2.3 kg	None	38
1995[b]	8/23	9/8	*R/V Medeia*		500	3 m	13 C	0.375 m	Herring Squid Squid	1 hr 3 hr 3 hr	2.3 kg	None	30 6 24
1996	8/17 8/19	8/31 8/23	*R/V Medeia* *F/V Ida June*		500 750	3 m 1 m	13 C 13C	0.375 m 0.2 m	Herring Squid	1 hr 3-7 hr	2.3 kg 1.0 kg	None None	38 16
1997	8/7	8/13	*F/V Ida June* *F/V Charles T* *F/V Kruzof*		923-1217	2 m	13 C	0.2-0.3 m	Squid	3-11 hr	1-3.2 kg	5579 tu	45
1998	8/13	8/19	*F/V Ida June* *F/V Charles T* *F/V Ocean Cape*		831-1267	2 m	13 C	0.2-0.3 m	Squid	3-11 hr	1-3.2 kg	4998 tl	45
1999	8/15	8/23	*F/V Ida June* *F/V Charles T*		1002-1129	2 m	13 C	0.2-0.3 m	Squid	3-11 hr	1.4 kg	3568 t	45
2000	8/16	8/23	*F/V Ida June* *F/V Charles T* *F/V Spirit*		1125	2 m	13 C	0.375 m	Squid	3-11 hr	3.2 kg	none	45
2001	8/08	8/13	*F/V Ida June* *F/V Charles T* *F/V Sylvia*		1125	2 m	13 C	0.375 m	Squid	3-11 hr	3.2 kg	none	45

[a] Notation on tags: t=t-bar tag, u=upper fin clip, l=lower fin clip.

[b] In 1995 30 sets were made side-by-side to compare 1 hour and 3 hours soaks; 6 of these were conventional gear but due to operational problems the rest of the comparison sets were snap-on gear.

Table 2. NSEI longline survey vessel and scientific crew, 2001.

F/V Charles T	F/V Sylvia	F/V Ida June
Skipper: Jim Eastwood	Skipper: Bill Lewis	Skipper: Greg Beam
Crew: Pete Thynes	Crew: Jeremy Schouweiler	Crew: Audrey Beam
Crew: Mike Stainbrook	Crew: John Olsen	Crew: Kevin Beam
Crew: Uriah Strong	Crew: Carl Wood	Crew: Canaan Beam
ADFG: Deidra Holumn	ADFG: Beverly Richardson	ADFG: Tory O'Connell
ADFG Mike Vaughn	ADFG Kamala Carroll	

Table 3. NSEI longline survey station assignments and station numbers for portions of the survey area, 2001.

F/V Sylvia Southern Portion Trip 1 Station Number	F/V Charles T Central Portion Trip 2 Station Number	F/V Ida June Northern Portion Trip 3 Station Number
1	9	30
2	10	32
3	13	33
4	15	35
5	16	37
6	18	39
7	19	41
8	21	42
52	22	43
53	23	44
54	24	45
55	25	46
56	27	47
57	28	49
58	29	51

Table 4. NSEI longline survey set locations and time set, 2001.

YEAR	TRIP NO	SET NO	STATISTICAL AREA	STATION NO	START LATITUDE		START LONGITUDE		END LATITUDE		END LONGITUTUDE	TIME/DATE SET	START FM	END FM	AVG FM
2001	1	7	345631	1	56 34.27	X	134 34.56		56 30.83	X	134 34.60	8/9/2001 13:45	304	285	295
2001	1	6	345631	3	56 33.39	X	134 31.07		56 34.98	X	134 31.29	8/10/2001 6:30	357	355	356
2001	1	5	345631	4	56 41.50	X	134 34.82		56 39.83	X	134 34.83	8/9/2001 9:48	372	362	367
2001	1	4	345631	5	56 42.30	X	134 33.09		56 40.67	X	134 33.10	8/9/2001 6:57	381	372	376
2001	1	2	345631	6	56 41.22	X	134 25.49		56 39.59	X	134 25.48	8/8/2001 7:53	247	290	269
2001	1	1	345631	7	56 43.24	X	134 26.47		56 41.76	X	134 26.11	8/8/2001 5:40	271	240	255
2001	1	3	345631	8	56 43.00	X	134 33.20		56 44.55	X	134 33.22	8/8/2001 12:23	385	399	392
2001	1	11	345603	52	56 15.43	X	134 27.29		56 13.73	X	134 27.32	8/11/2001 10:10	392	394	395
2001	1	14	345603	53	56 25.25	X	134 29.69		56 26.80	X	134 29.91	8/12/2001 14:40	388	382	385
2001	1	13	345603	54	56 20.38	X	134 33.88		56 18.60	X	134 34.92	8/11/2001 9:03	217	353	285
2001	1	10	345603	55	56 06.76	X	134 30.54		56 05.14	X	134 30.49	8/11/2001 7:58	292	282	285
2001	1	8	345603	56	56 26.14	X	134 36.32		56 24.37	X	134 36.00	8/10/2001 9:28	312	320	316
2001	1	12	345603	57	56 15.05	X	134 24.73		56 16.50	X	134 24.73	8/12/2001 6:27	365	388	377
2001	1	9	345603	58	56 08.13	X	134 34.78		56 06.55	X	134 34.91	8/11/2001 7:04	307	285	296
2001	2	3	345631	9	56 43.80	X	134 28.45		56 45.06	X	134 29.12	8/8/2001 11:48	354	361	358
2001	2	2	345631	10	56 48.81	X	134 31.80		56 47.52	X	134 31.79	8/8/2001 8:00	363	386	376
2001	2	1	345631	13	56 50.56	X	134 30.69		56 49.18	X	134 30.74	8/8/2001 5:31	207	225	214
2001	2	5	345631	15	56 54.43	X	134 38.40		56 52.99	X	134 38.40	8/9/2001 7:46	359	366	362
2001	2	4	345631	16	56 54.21	X	134 33.74		56 52.86	X	134 33.75	8/9/2001 5:05	352	365	358
2001	2	6	345701	18	57 00.64	X	134 42.66		57 01.99	X	134 42.64	8/9/2001 11:38	336	352	342
2001	2	7	345701	19	57 01.30	X	134 43.90		57 02.59	X	134 43.90	8/10/2001 5:02	340	356	346
2001	2	9	345701	21	57 07.39	X	134 42.08		57 06.04	X	134 42.08	8/10/2001 11:31	340	355	344
2001	2	8	345701	22	57 11.36	X	134 48.36		57 10.08	X	134 47.44	8/10/2001 6:45	318	327	320
2001	2	10	345701	23	57 11.34	X	134 40.92		57 12.72	X	134 40.91	8/11/2001 6:00	290	354	364
2001	2	11	345701	24	57 15.46	X	134 40.49		57 14.05	X	134 40.75	8/11/2001 8:24	247	282	226
2001	2	12	345701	25	57 18.05	X	134 40.12		57 16.85	X	134 39.11	8/11/2001 12:19	278	242	270
2001	2	15	345701	27	57 20.24	X	134 44.79		57 18.82	X	134 44.79	8/12/2001 10:17	373	406	382
2001	2	14	345701	28	57 18.70	X	134 42.72		57 19.97	X	134 42.71	8/12/2001 6:46	263	352	292
2001	2	13	345701	29	57 19.42	X	134 37.02		57 20.68	X	134 37.00	8/12/2001 4:38	279	288	294
2001	3	13	345701	30	57 19.84	X	134 39.44		57 21.29	X	134 39.24	8/13/2001 7:55	328	367	348
2001	3	14	345701	32	57 22.50	X	134 46.06		57 23.81	X	134 45.93	8/13/2001 8:45	367	366	366
2001	3	15	345701	33	57 26.90	X	134 41.54		57 25.45	X	134 41.54	8/13/2001 9:40	310	291	300
2001	3	11	345731	35	57 32.91	X	134 42.13		57 31.54	X	134 42.13	8/12/2001 7:50	241	328	285
2001	3	12	345731	37	57 33.76	X	134 45.14		57 32.21	X	134 45.14	8/12/2001 8:51	312	342	327
2001	3	10	345731	39	57 35.92	X	134 43.63		57 34.75	X	134 42.39	8/12/2001 7:20	255	245	250
2001	3	9	345731	41	57 41.62	X	134 52.61		57 41.41	X	134 50.06	8/11/2001 8:10	311	259	285
2001	3	8	345731	42	57 43.88	X	134 53.14		57 42.36	X	134 52.81	8/11/2001 7:58	292	321	300
2001	3	6	345731	43	57 45.88	X	134 45.99		57 44.44	X	134 45.80	8/10/2001 8:05	245	288	286
2001	3	7	345731	44	57 46.23	X	134 48.75		57 44.89	X	134 48.75	8/11/2001 7:21	278	279	279
2001	3	5	345731	45	57 47.07	X	134 50.10		57 45.63	X	134 50.25	8/10/2001 7:25	295	285	289
2001	3	4	345731	46	57 49.88	X	134 48.88		57 48.48	X	134 48.62	8/10/2001 7:00	240	266	258
2001	3	3	345731	47	57 52.18	X	134 46.22		57 50.82	X	134 46.01	8/9/2001 8:25	266	255	253
2001	3	2	345731	49	57 52.89	X	134 46.87		57 51.56	X	134 47.12	8/9/2001 7:37	275	277	274
2001	3	1	345731	51	57 56.55	X	134 48.15		57 55.07	X	134 47.76	8/9/2001 7:12	233	302	290

Table 5. NSEI longline survey soak times by set and by vessel, 2001.

Trip	Set	Statistical Area	Station	TIME SECOND ANCHOR OVERBOARD	TIME FIRST ANCHOR ONBOARD	TIME SECOND ANCHOR ONBOARD	Soak time 2nd to 1st anchor in hours	Soak time 2nd to 2nd anchor in hours	Haulback order	Pull time 1st to 2nd anchor in hours
1	1	345631	7	8/8/2001 5:40	8/8/2001 9:37	8/8/2001 11:45	3:57	6:05	Same	2:08
1	2	345631	6	8/8/2001 7:53	8/8/2001 13:50	8/8/2001 16:30	5:57	8:37	Opp	2:40
1	3	345631	8	8/8/2001 12:23	8/8/2001 18:05	8/8/2001 19:40	5:42	7:17	Opp	1:35
1	4	345631	5	8/9/2001 6:57	8/9/2001 10:37	8/9/2001 12:05	3:40	5:08	Opp	1:28
1	5	345631	4	8/9/2001 9:48	8/9/2001 16:10	8/9/2001 17:50	6:22	8:02	Same	1:40
1	6	345631	3	8/9/2001 13:45	8/9/2001 19:10	8/9/2001 20:35	5:25	6:50	Opp	1:25
1	7	345631	1&2[1]	8/10/2001 6:30	8/10/2001 11:07	8/10/2001 14:35	4:37	8:05	Opp	3:28
1	8	345603	56	8/10/2001 9:28	8/10/2001 16:34	8/10/2001 18:13	7:06	8:45	Opp	1:39
1	9	345603	58	8/11/2001 7:04	8/11/2001 11:35	8/11/2001 13:12	4:31	6:08	Same	1:37
1	10	345603	55	8/11/2001 7:58	8/11/2001 14:30	8/11/2001 15:47	6:32	7:49	Opp	1:17
1	11	345603	52	8/11/2001 10:10	8/11/2001 17:33	8/11/2001 19:05	7:23	8:55	Opp	1:32
1	12	345603	57	8/12/2001 6:27	8/12/2001 10:52	8/12/2001 12:22	4:25	5:55	Opp	1:30
1	13	345603	54	8/11/2001 9:03	8/11/2001 16:30	8/11/2001 18:17	7:27	9:14	Opp	1:47
1	14	345603	53	8/12/2001 14:40	8/12/2001 19:49	8/12/2001 21:15	5:09	6:35	Opp	1:26
2	1	345631	13	8/8/2001 5:31	8/8/2001 8:52	8/8/2001 10:36	3:21	5:05	Same	1:44
2	2	345631	10	8/8/2001 8:00	8/8/2001 12:58	8/8/2001 14:42	4:58	6:42	Opp	1:44
2	3	345631	9	8/8/2001 11:48	8/8/2001 15:58	8/8/2001 18:02	4:10	6:14	Opp	2:04
2	4	345631	16	8/9/2001 5:05	8/9/2001 8:40	8/9/2001 10:05	3:35	5:00	Same	1:25
2	5	345631	15	8/9/2001 7:46	8/9/2001 13:14	8/9/2001 15:04	5:28	7:18	Opp	1:50
2	6	345701	18	8/9/2001 11:38	8/9/2001 16:43	8/9/2001 18:21	5:05	6:43	Opp	1:38
2	7	345701	19	8/10/2001 5:02	8/10/2001 8:19	8/10/2001 10:07	3:17	5:05	Opp	1:48
2	8	345701	22	8/10/2001 6:45	8/10/2001 12:39	8/10/2001 14:21	5:54	7:36	Opp	1:42
2	9	345701	21	8/10/2001 11:31	8/10/2001 15:39	8/10/2001 17:15	4:08	5:44	Opp	1:36
2	10	345701	23	8/11/2001 6:00	8/11/2001 9:18	8/11/2001 11:05	3:18	5:05	Opp	1:47
2	11	345701	24	8/11/2001 8:24	8/11/2001 15:57	8/11/2001 17:20	7:33	8:56	Opp	1:23
2	12	345701	25	8/11/2001 12:19	8/11/2001 15:57	8/11/2001 17:20	3:38	5:01	Unk	1:23
2	13	345701	29	8/12/2001 4:38	8/12/2001 7:52	8/12/2001 9:13	3:14	4:35	Opp	1:21
2	14	345701	28	8/12/2001 6:46	8/12/2001 10:55	8/12/2001 12:31	4:09	5:45	Opp	1:36
2	15	345701	27	8/12/2001 10:17	8/12/2001 13:40	8/12/2001 15:43	3:23	5:26	Opp	2:03
3	1	345731	51	8/9/2001 7:12	8/9/2001 11:11	8/9/2001 13:35	3:59	6:23	Unk	2:24
3	2	345731	49	8/9/2001 7:37	8/9/2001 14:26	8/9/2001 16:00	6:49	8:23	Unk	1:34
3	3	345731	47	8/9/2001 8:25	8/9/2001 16:41	8/9/2001 18:45	8:16	10:02	Same	2:04
3	4	345731	46	8/10/2001 7:00	8/10/2001 10:55	8/10/2001 12:15	3:55	5:15	Same	1:20
3	5	345731	45	8/10/2001 7:25	8/10/2001 13:20	8/10/2001 14:45	5:55	7:20	Same	1:25
3	6	345731	43	8/10/2001 8:05	8/10/2001 15:52	8/10/2001 17:30	7:47	9:25	Same	1:38
3	7	345731	44	8/11/2001 7:21	8/11/2001 11:18	8/11/2001 12:30	3:57	5:09	Same	1:12
3	8	345731	42	8/11/2001 7:58	8/11/2001 13:33	8/11/2001 15:47	5:35	7:49	Same	2:14
3	9	345731	41	8/11/2001 8:10	8/11/2001 15:58	8/11/2001 17:29	7:48	9:19	Opp	1:31
3	10	345731	39	8/12/2001 7:20	8/12/2001 10:56	8/12/2001 12:30	3:36	5:10	Same	1:34
3	11	345731	35	8/12/2001 7:50	8/12/2001 13:40	8/12/2001 15:00	5:50	7:10	Opp	1:20
3	12	345731	37	8/12/2001 8:51	8/12/2001 15:56	8/12/2001 17:30	7:05	8:39	Same	1:34
3	13	345701	30	8/13/2001 7:55	8/13/2001 12:03	8/13/2001 13:35	4:08	5:40	Same	1:32
3	14	345701	32	8/13/2001 8:45	8/13/2001 15:02	8/13/2001 15:45	6:17	7:00	Same	0:43
3	15	345701	33	8/13/2001 9:40	8/13/2001 17:00	8/13/2001 18:10	7:20	8:30	Same	1:10
Trip 1.						**average**	**5:35**	**7:23**		**1:48**
Trip 2.						**average**	**4:20**	**6:01**		**1:40**
Trip 3.						**average**	**5:53**	**7:26**		**1:33**
					All Trips	**max**	**8:16**	**10:02**		**3:28[1]**
						min	**3:14**	**4:35**		**0:43**
						median	**5:07**	**6:46**		**1:35**
						average	**5:15**	**6:56**		**1:40**

[1] Station 1&2 set double amount of gear.

Table 6. NSEI longline survey status of hooks by station, 2001.

2001 NSEI Longline Survey catch by Station (includes only valid subsets).															
Station	Total Hooks	Bare	Bait	Invalid	Sablefish	Halibut	Idiot	SR	RE	RB	Rock other	Dog-fish	Skates	ATF	Other
1	2,197	472	973	34	509	10	136	9	12	0	0	0	24	6	12
3	1,107	327	348	27	299	1	75	3	0	0	0	0	16	0	10
4	962	433	145	24	304	2	14	0	0	0	0	0	36	2	2
5	1,103	501	148	25	402	1	14	0	1	0	0	0	6	0	5
6	890	289	192	26	302	3	41	8	0	0	0	0	18	6	5
7	1,092	335	294	28	334	0	70	7	2	1	0	0	10	5	5
8	1,118	549	50	6	475	1	11	0	0	0	0	0	20	1	5
9	860	289	222	17	281	0	41	0	0	0	0	0	4	1	5
10	1,080	497	62	45	402	0	66	0	0	0	0	0	5	2	1
13	1,115	362	238	21	383	3	67	0	22	3	0	0	13	0	0
15	1,029	408	31	15	530	1	31	0	0	0	0	0	7	1	5
16	1,127	329	293	40	388	1	55	0	1	0	0	0	8	3	9
18	1,029	439	93	51	369	1	40	0	0	0	0	0	16	1	15
19	905	252	278	31	262	0	40	1	0	0	0	0	24	1	16
21	1,085	468	129	20	442	1	11	0	0	0	0	0	12	0	1
22	1,058	317	142	21	518	1	13	0	0	0	0	0	42	2	2
23	1,124	225	611	25	209	0	27	21	0	0	0	0	2	0	4
24	1,086	319	237	13	364	2	82	10	23	15	0	0	13	0	7
25	1,060	373	175	29	427	1	42	0	0	0	0	0	8	2	3
27	1,075	211	537	22	286	0	15	0	0	0	0	0	1	1	2
28	1,029	221	524	12	180	0	63	17	0	0	0	0	9	1	2
29	1,085	386	236	18	409	0	20	0	0	0	0	0	16	0	0
30	1,126	234	312	17	450	4	36	59	0	0	0	0	7	0	7
32	1,035	274	261	42	413	0	25	1	0	0	0	0	6	1	12
33	1,031	255	292	26	415	0	20	0	0	0	0	0	19	0	4
35	1,075	235	296	33	460	0	28	1	0	0	0	0	16	2	4
37	1,035	206	297	22	437	0	30	0	0	0	0	0	31	5	7
39	1,120	240	446	36	294	1	46	32	2	2	0	0	13	1	7
41	940	245	174	47	422	6	13	2	3	0	0	0	21	2	5
42	1,115	229	305	17	520	1	11	0	0	0	0	0	30	1	1
43	1,055	319	110	33	530	3	6	2	1	0	0	0	41	1	9
44	996	155	252	43	522	3	6	0	0	0	0	0	14	1	0
45	1,121	228	146	24	698	2	2	0	0	0	0	0	19	0	2
46	1,121	240	225	21	577	5	8	4	2	0	0	0	35	1	3
47	1,081	366	151	37	452	6	0	1	2	0	0	0	55	6	5
49	941	316	47	17	515	4	4	0	0	0	0	0	34	0	4
51	1,133	318	130	37	597	4	7	6	1	1	0	0	20	3	9
52	1,099	176	499	36	315	4	55	2	0	0	0	0	6	1	5
53	1,111	295	419	48	311	2	18	1	0	0	0	0	13	0	4
54	1,096	313	349	23	146	9	139	32	1	0	0	0	37	26	16
55	1,104	339	208	16	436	13	54	4	1	0	0	0	14	13	6
56	1,109	248	331	10	349	5	80	3	0	0	0	0	64	14	4
57	1,105	222	535	45	237	1	42	4	0	0	0	0	7	5	7
58	1,105	205	571	11	190	2	100	15	3	0	0	0	5	3	0
Total	47,870	13,660	12,314	1,191	17,361	104	1,704	245	77	22	0	0	817	121	237

Table 7. NSEI longline survey status of hooks and catch on valid subsets, 1997–2001.

	2001	2000	1999	1998	1997
NUMBER_HOOKS	47,867	48,400	48,538	46,716	45,778
BARE	13,660	12,254	16,393	11,380	15,235
BAIT	12,314	17,662	15,739	17,785	15,236
INVALID	1,191	1,669	875	1,124	18
SABLEFISH	17,361	12,122	12,708	12,472	12,336
HALIBUT	104	142	101	159	214
THORNYHEAD	1,704	2,491	1,541	1,909	1,381
SHORTRAKER	250	183	217	215	184
ROUGHEYE	69	111	173	79	91
REDBANDED	22	22	37	39	34
ROCKFISH_OTHER	0	0	0	0	1
DOGFISH	0	1	1	5	0
SKATE	817	1,097	439	1,189	788
ARROWTOOTH	121	197	135	116	131
OTHER	237	425	174	234	127
Percent bait remaining on valid hooks, (total hooks minus invalid hooks)	26%	38%	33%	39%	33%
Percent bait remaining on total hooks	26%	36%	32%	38%	33%
Sablefish-per-(valid)-hook	0.37	0.26	0.27	0.27	0.27
Sablefish-per-hook .	0.36	0.25	0.26	0.27	0.27
Percent of total bycatch on total hooks	7%	10%	6%	8%	6%

Table 8. NSEI longline survey sablefish per hook and kilogram per hook by station, 2001.

Station	Total Hooks Set	Number of Sablefish	Sablefish per Hook	Avg Kg of Samples	Kilogram per Hook	
1	2,197	509	0.23	3.68	0.85	
3	1,107	299	0.27	5.03	1.36	
4	962	304	0.32	2.69	0.85	
5	1,103	402	0.36	2.54	0.93	
6	890	302	0.34	3.66	1.24	
7	1,092	334	0.31	3.35	1.02	
8	1,118	475	0.42	2.82	1.20	
9	860	281	0.33	3.79	1.24	
10	1,080	402	0.37	3.18	1.18	
13	1,114	383	0.34	3.58	1.23	
15	1,029	530	0.52	3.37	1.73	
16	1,127	388	0.34	3.34	1.15	
18	1,029	369	0.36	2.98	1.07	
19	905	262	0.29	2.54	0.74	
21	1,085	442	0.41	1.92	0.78	
22	1,058	518	0.49	2.03	0.99	
23	1,124	209	0.19	5.33	0.99	
24	1,086	364	0.34	3.57	1.20	
25	1,060	427	0.40	3.41	1.37	
27	1,075	286	0.27	3.69	0.98	
28	1,029	180	0.17	3.34	0.58	
29	1,085	409	0.38	2.30	0.87	
30	1,126	450	0.40	3.77	1.51	
32	1,035	413	0.40	3.19	1.27	
33	1,031	415	0.40	1.32	0.53	
35	1,075	460	0.43	2.55	1.09	
37	1,035	437	0.42	2.22	0.94	
39	1,120	294	0.26	3.56	0.94	
41	938	422	0.45	3.95	1.78	
42	1,115	520	0.47	1.99	0.93	
43	1,055	530	0.50	3.16	1.59	
44	996	522	0.52	2.30	1.20	
45	1,121	698	0.62	2.07	1.29	
46	1,121	577	0.51	2.65	1.36	
47	1,081	452	0.42	1.73	0.72	
49	941	515	0.55	1.73	0.95	
51	1,133	597	0.53	3.72	1.96	
52	1,099	315	0.29	4.82	1.38	
53	1,111	311	0.28	3.61	1.01	
54	1,096	146	0.13	2.96	0.39	
55	1,104	436	0.39	3.15	1.25	
56	1,109	349	0.31	3.44	1.08	
57	1,105	237	0.21	3.46	0.74	
58	1,105	190	0.17	4.55	0.78	
Total	47,870	17,361	0.36	3.04	1.10	Overall
			0.37	3.14	1.10	Average
					1.96	station 51 max
					0.39	station 54 min

Table 9. NSEI longline survey overall fish-per-hook by survey portion and overall, 1997–2001

	2001	2000	1999	1998	1997
Overall fish-per-hook, northern portion	0.46	0.35	0.31	0.29	0.28
Overall fish-per-hook, center portion	0.35	0.21	0.26	0.23	0.31
Overall fish-per-hook, southern portion	0.28	0.19	0.22	0.28	0.22
Overall fish-per-hook entire survey area	0.36	0.25	0.26	0.27	0.27

Table 10. NSEI longline survey, number of shortspine thornyhead captured by statistical area, 1997–2001.

Statistical Area	2001	2000	1999	1998	1997
345603	488	726	237	440	261
345631	621	868	585	728	621
345701	434	723	610	610	389
345731	161	174	109	131	110
Annual Total	1,704	2,491	1,541	1,909	1,381

Table 11. NSEI longline survey sablefish lengths by survey area, 2000–2001.

		2001	2000
Southern Portion	Average (cm)	67	66
	Maximum (cm)	103	111
	Minimum (cm)	47	45
Central Portion	Average (cm)	65	66
	Maximum (cm)	98	90
	Minimum (cm)	44	45
Northern Portion	Average (cm)	61	63
	Maximum (cm)	91	86
	Minimum (cm)	45	46
Survey Overall	Average (cm)	64	65
	Maximum (cm)	103	111
	Minimum (cm)	44	45

Table 12. NSEI longline survey sablefish percent males, 1997–2001.

	2001	2000	1999	1998	1997
n =	746	424	345	368	581
Female	348	226	157	203	283
Male	398	198	188	165	298
% Male	53%	47%	54%	45%	51%

Table 13. NSEI Longline Survey sablefish sex and maturities by number of fish and percentage of total by sex, 2000–2001. For maturity descriptions see Appendix F for the chart of Sablefish Maturity Codes.

		2000		2001	
Sex	Stage of sexual maturity	n	Percentage of sex total	n	Percentage of sex total
Males	Immature	30	15%	63	16%
	Maturing juvenile	22	11%	64	16%
	Mature/developing	60	30%	109	27%
	Spawning	0	0%	0	0%
	Spent/post spawning	14	7%	20	5%
	Resting	72	36%	142	36%
	Total males	198	100%	398	100%
Females	Immature	4	2%	25	7%
	Maturing juvenile	76	34%	112	32%
	Mature/developing	78	35%	53	15%
	Spawning	1	0%	2	1%
	Spent/post spawning	19	9%	56	16%
	Resting	45	20%	100	29%
	Total females	223	100%	348	100%

Table 14. NSEI Longline Survey shortraker rockfish length, weight, sex, and stage of maturity 1997–2001.

Shortraker Rockfish					
	2001	2000	1999	1998	1997
Lengths					
n =	225	175	124	203	136
Minimum length cm	44	38	41	45	43
Maximum length cm	95	100	98	97	102
Average length cm	64	63	66	68	68
Weights					
n =	225	151			
Minimum kg	1.0	0.9			
Maximum kg	11.8	17.2			
Average kg	4.6	4.4			
Minimum lb	2.2	2.0			
Maximum lb	26.0	37.9			
Average lb	10.1	9.7			
Sex					
n =	223	170			
% male	49%	47%			
Maturities					
n =	178	148			
Immature	2	9			
Maturing	30	29			
Mature	37	11			
Developing	0	0			
Spawning	0	1			
Spent	18	44			
Resting	91	54			
% Immature	1%	6%			
% Maturing	17%	20%			
2001 Age data not available					

Table 15. NSEI Longline Survey rougheye rockfish length, weight, sex, and stage of maturity 1997–2001.

Rougheye Rockfish					
	2001	2000	1999	1998	1997
Lengths					
n =	77	128	149	75	35
Minimum length cm	31	32	33	32	34
Maximum length cm	79	69	69	64	59
Average length cm	45	44	47	44	44
Weights			na	na	na
n =	77	62			
Minimum kg	0.6	0.6			
Maximum kg	7.9	2.8			
Average kg	1.5	1.3			
Minimum lb	1.3	1.3			
Maximum lb	17.4	6.2			
Average lb	3.3	2.9			
Sex					
n =	77	115			
% male	35%	51%			
Maturities					
n =	77	83			
Immature	32	43			
Maturing	27	27			
Mature	5	5			
Developing	0	0			
Spawning	0	0			
Spent	1	3			
Resting	12	5			
% Immatures	42%	52%			
% Maturing	35%	33%			
2001 Age data not available					

Table 16. NSEI Longline Survey redbanded rockfish length, weight, sex, and stage of maturity 1997–2001.

Redbanded Rockfish					
	2001	2000	1999	1998	1997
	22 captured				
Lengths					
N =	21	18	37	45	29
Minimum length cm	36	39	37	37	38
Maximum length cm	53	52	57	70	71
Average length cm	45	46	46	51	50
Weights					
N =	21	13	na	na	na
Minimum kg	0.8	1.2			
Maximum kg	2.9	2.6			
Average kg	1.8	2.0			
Minimum lb	1.8	2.6			
Maximum lb	6.4	5.7			
Average lb	4.0	4.4			
Sex					
n =	20	16			
% male	60%	38%			
Maturities					
n =	20	16			
Immature	3	0			
Maturing	2	1			
Mature	1	4			
Developing	0	0			
Spawning	0	0			
Spent	3	7			
Resting	11	4			
% Immature	15%	0%			
% Maturing	10%	6%			
2001 Age data not available					

Table 17. NSEI Longline Survey shortspine thornyhead lengths, 1997–2001.

Shortspine Thornyhead					
	2001	2000	1999	1998	1997
Lengths					
n=	718	913	393	849	87
Minimum length cm	28	23	30	31	32
Maximum length cm	67	76	80	68	54
Average length cm	40	39	43	42	41

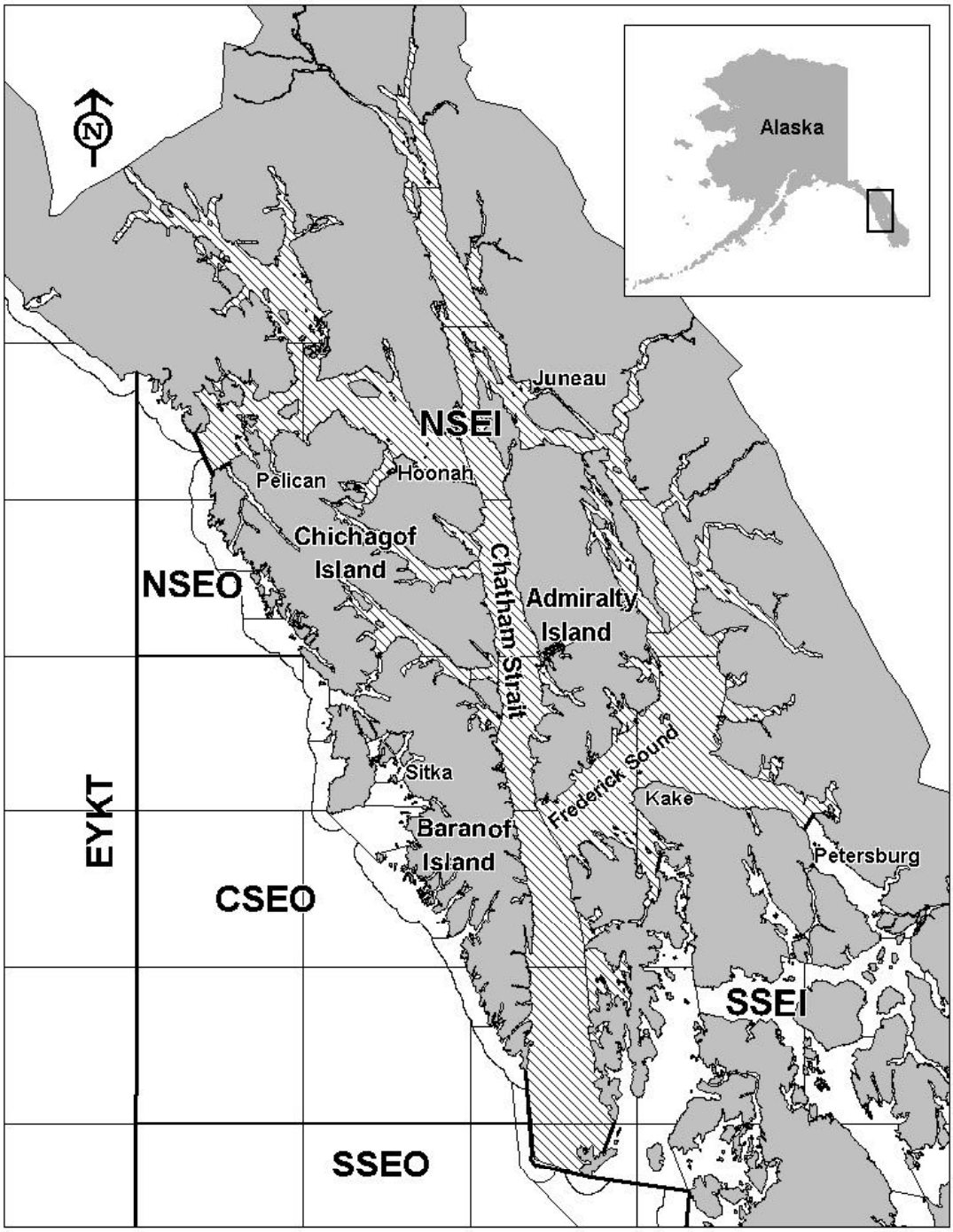


Figure 1. Northern Southeast Inside subdistrict.

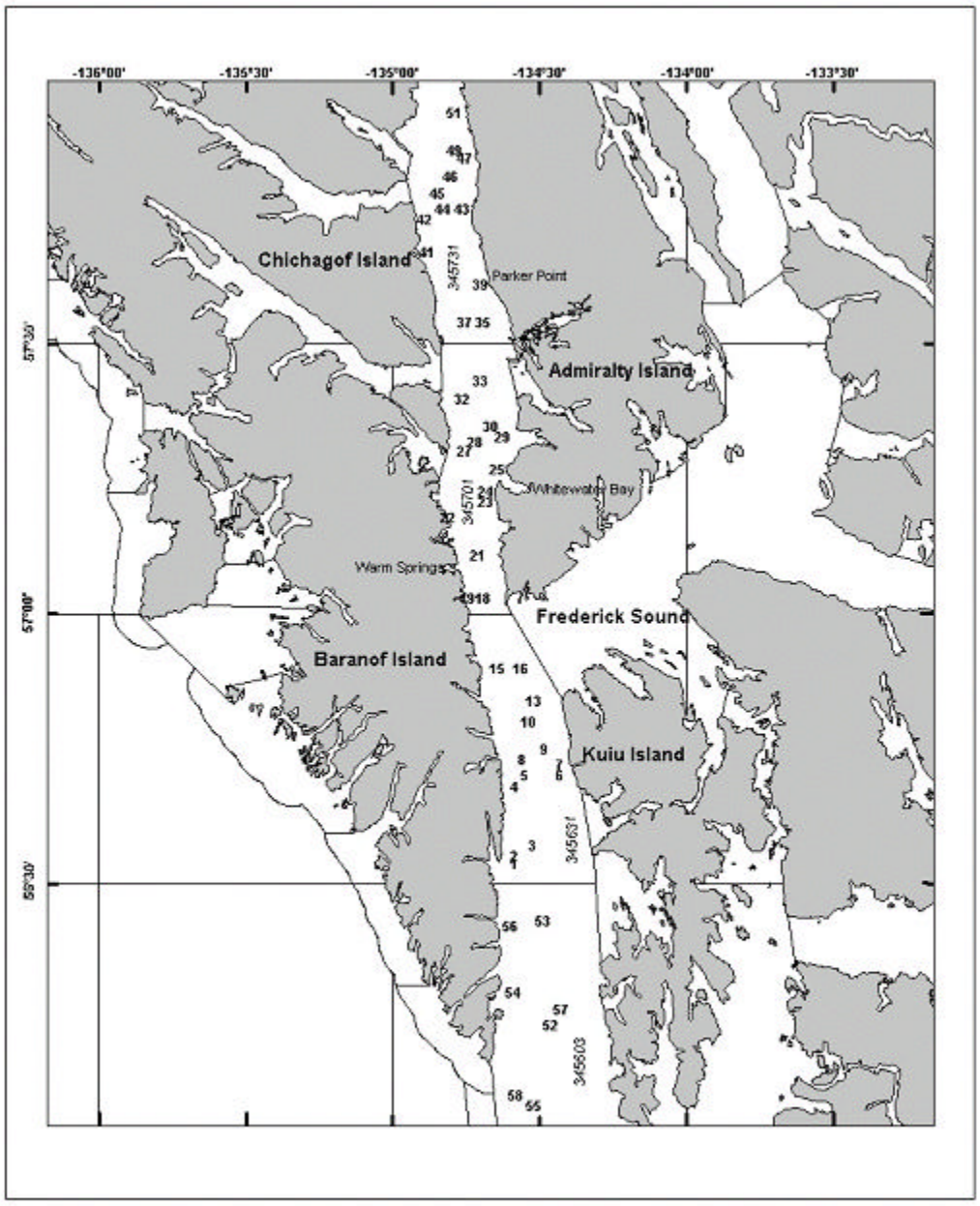


Figure 2. NSEI Longline Survey station chart, 2001.

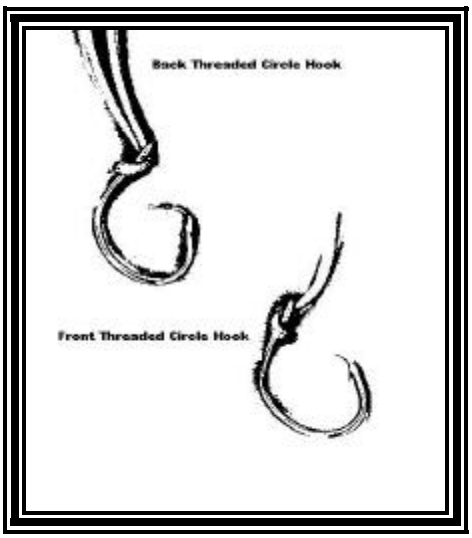


Figure 3. NSEI Survey front and back threaded circle hook.

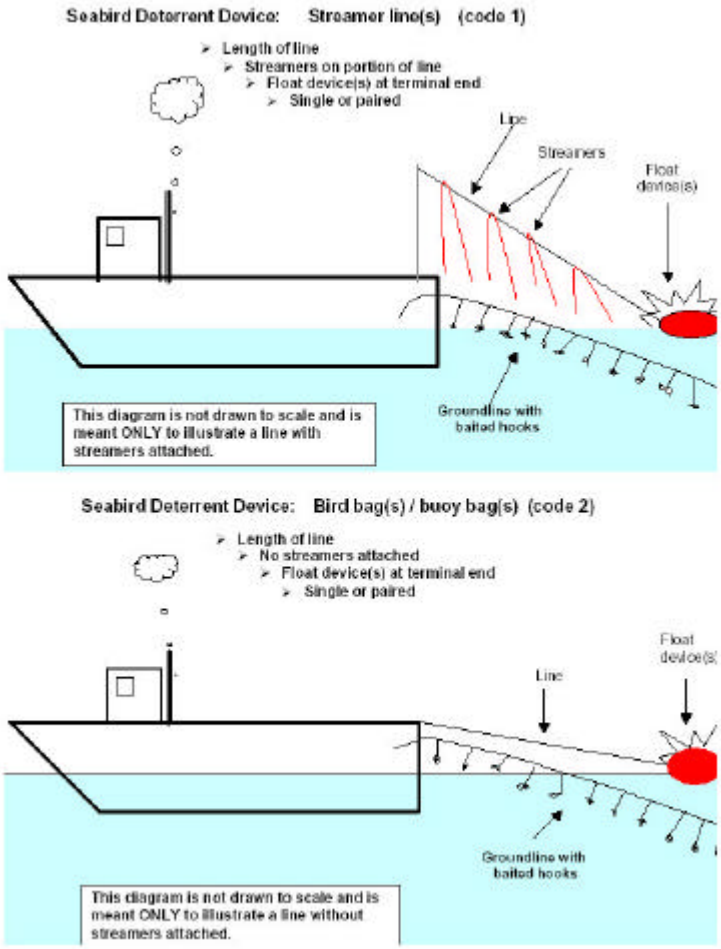


Figure 4. Seabird Avoidance Device.

Figure 5. NSEI Longline Survey Vessel, *F/V Ida June*, Fairweather 1997.

Figure 6. NSEI Longline Survey Vessel, *F/V Charles T,* 1999.

Figure 7. NSEI Longline Survey Vessel, *F/V Sylvia*, 2001.

Figure 8. NSEI Longline Survey Carl Wood coiling down the line, *F/ V Sylvia* 2001.

Figure 9. Setting skates of gear, F*/V Jennifer Lee* SSEI 1999.

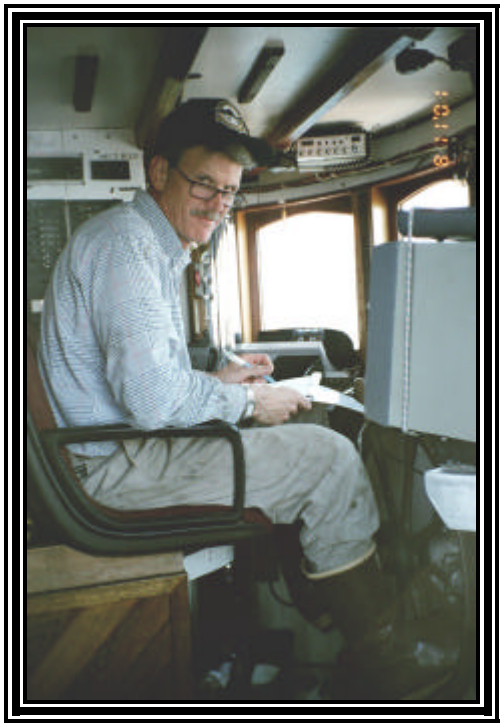


Figure 10. NSEI Longline Survey Skipper Bill Lewis recording the set data, *F/V Sylvia*, 2001.

Figure 11. NSEI Longline Survey Kamala Carroll counting back the hooks at the roller, *F/V Sylvia*, 2001.

Figure 12. NSEI Longline Survey, setup to sample, *F/V Sylvia*, 2001.

Figure 13. NSEI Longline Survey Beverly Richardson weighing a sablefish on the hanging scale, *F/V Charles T* 1999.

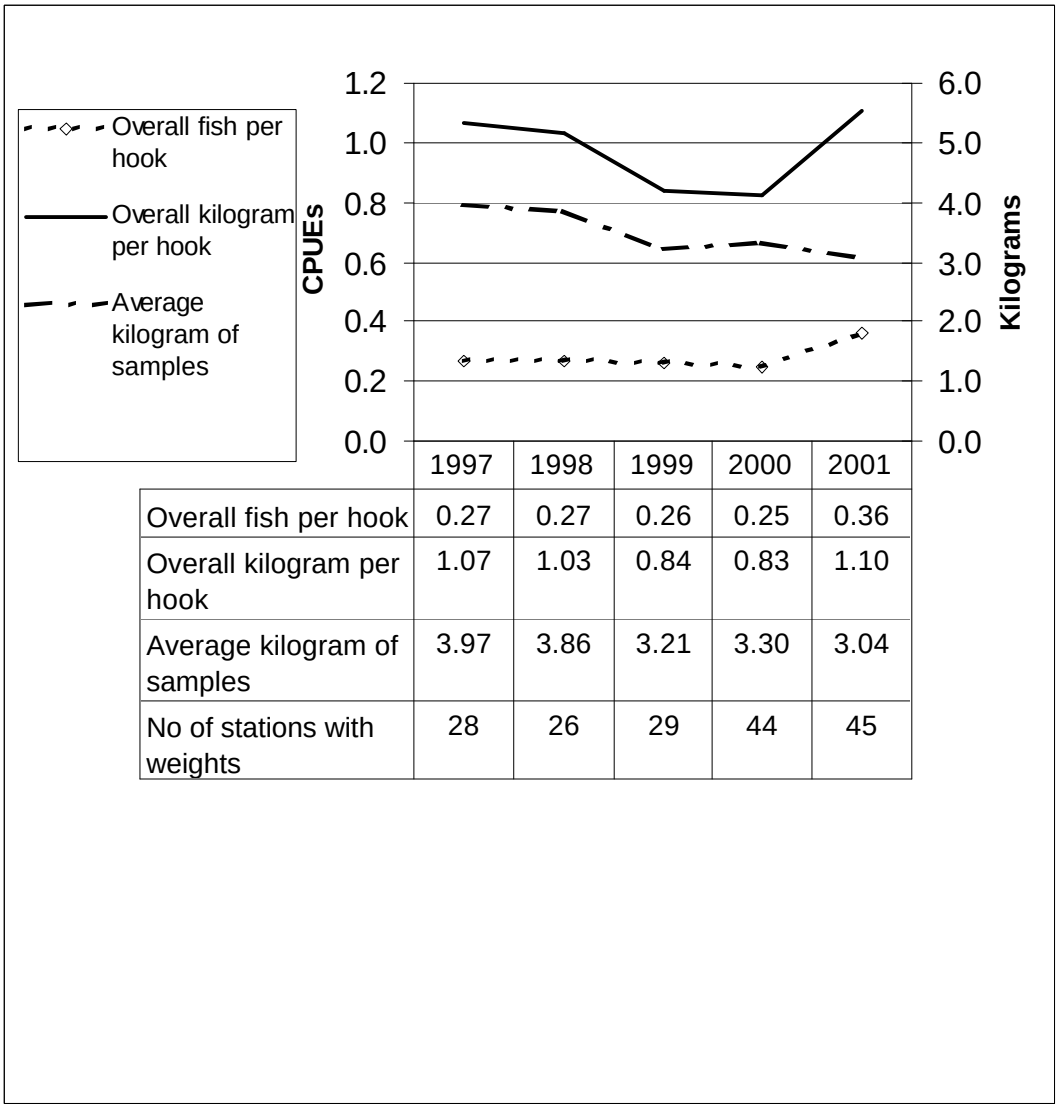
Figure 14. NSEI Longline Survey sampling sablefish, *F/V Sylvia*, 2001.

Figure 15. NSEI Longline Survey, Kamala Carrol processing otoliths, *F/V Sylvia*, 2001

Figure 16. NSEI Longline Survey sorting rockfish by species, *F/V Sylvia*, 2001

Figure 17. NSEI Longline Survey, Kamala Carroll entering data, F/V Sylvia, 2001.

Figure 18. NSEI Longline Survey; calm weather the entire survey, 2001.



	1997	1998	1999	2000	2001
Overall fish per hook	0.27	0.27	0.26	0.25	0.36
Overall kilogram per hook	1.07	1.03	0.84	0.83	1.10
Average kilogram of samples	3.97	3.86	3.21	3.30	3.04
No of stations with weights	28	26	29	44	45

Figure 19. NSEI Longline Survey overall fish-per-hook, kilogram-per-hook and average weight of sampled sablefish 1997–2001.

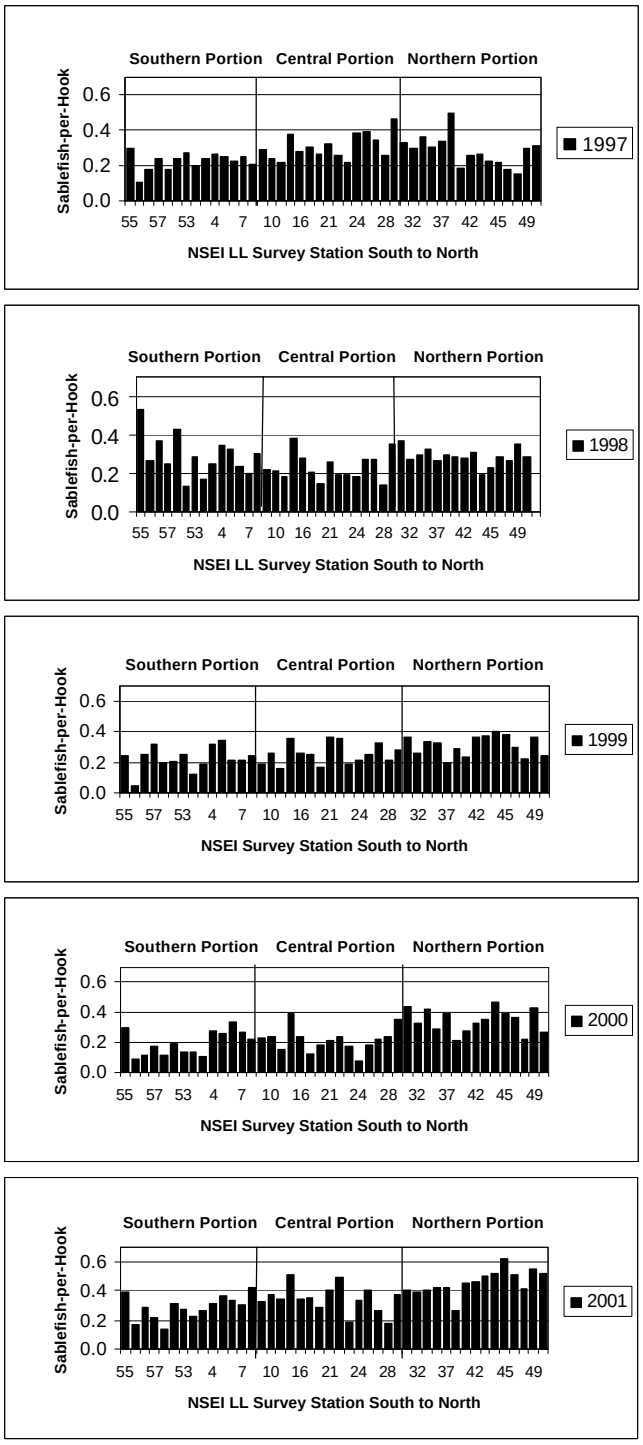


Figure 20. NSEI Longline Survey fish-per-hook by station with stations ordered south to north, 1997–2001.

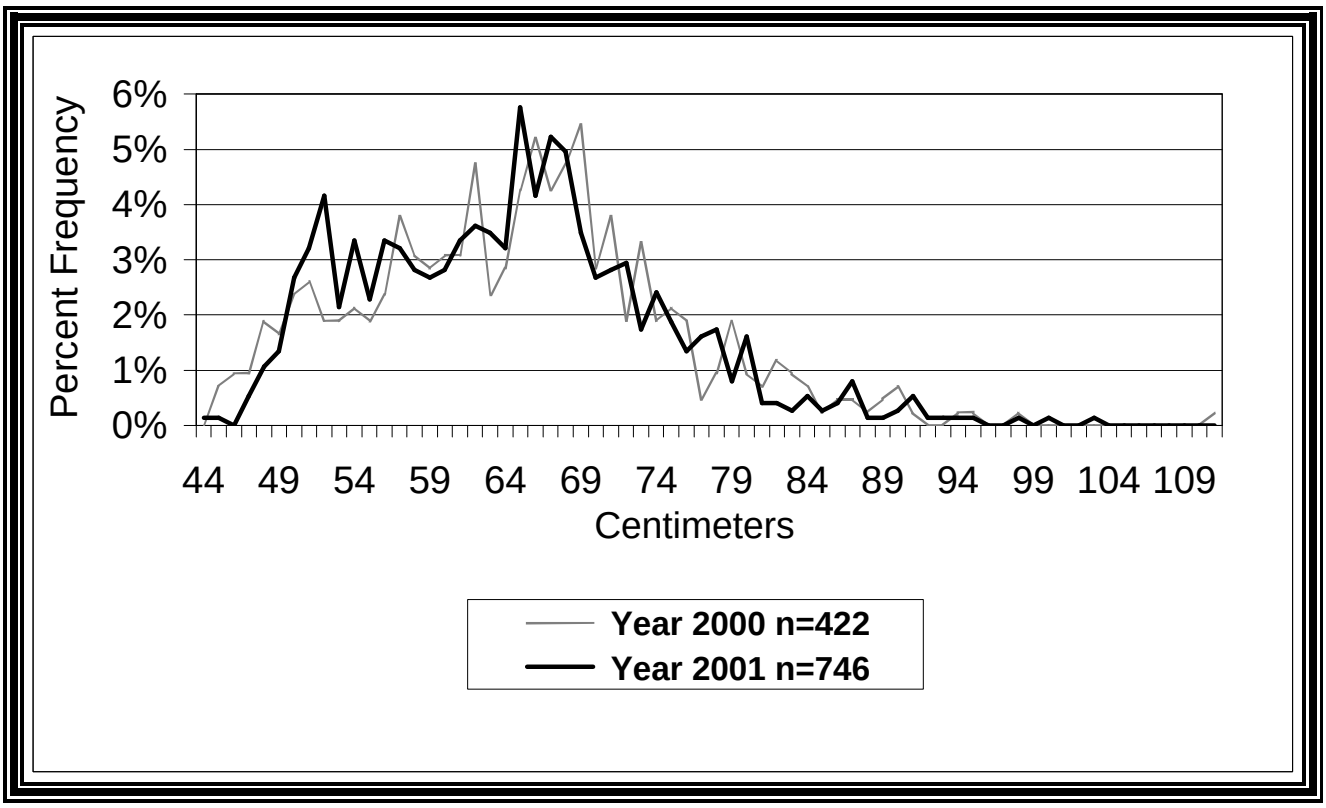


Figure 21. NSEI Longline Survey, sablefish lengths of samples, 2000–2001.

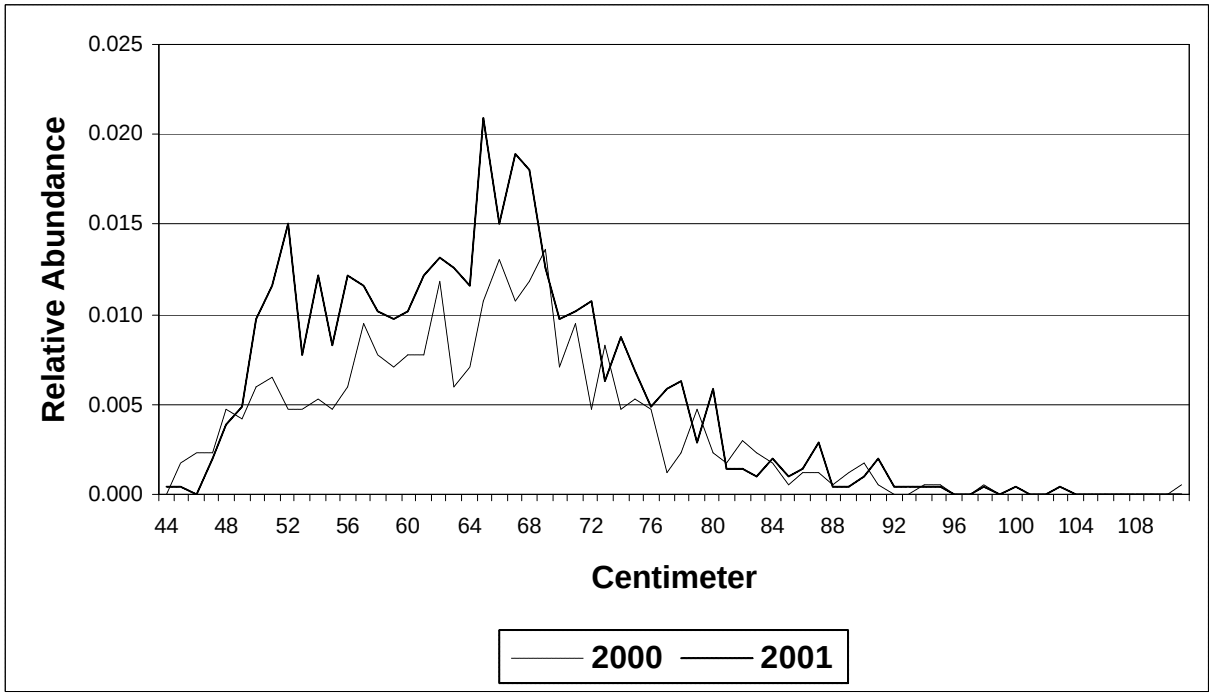


Figure 22. NSEI Longline Survey, lengths of sampled sablefish standardized by percent frequency and adjusted by the overall fish-per-hook for the survey 2000–2001.

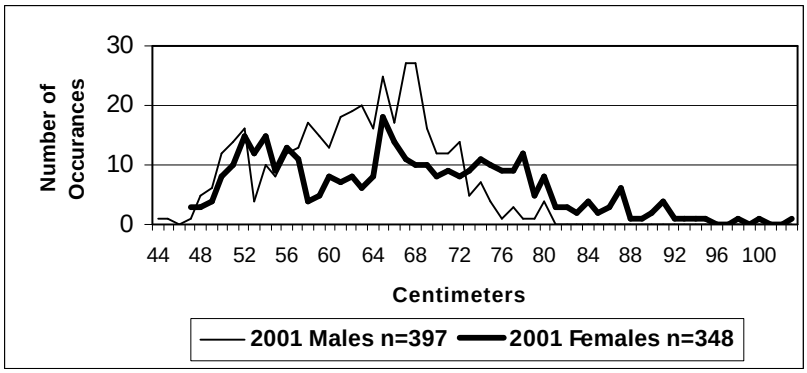


Figure 23. NSEI Longline Survey frequency of sablefish lengths by sex, 2001.

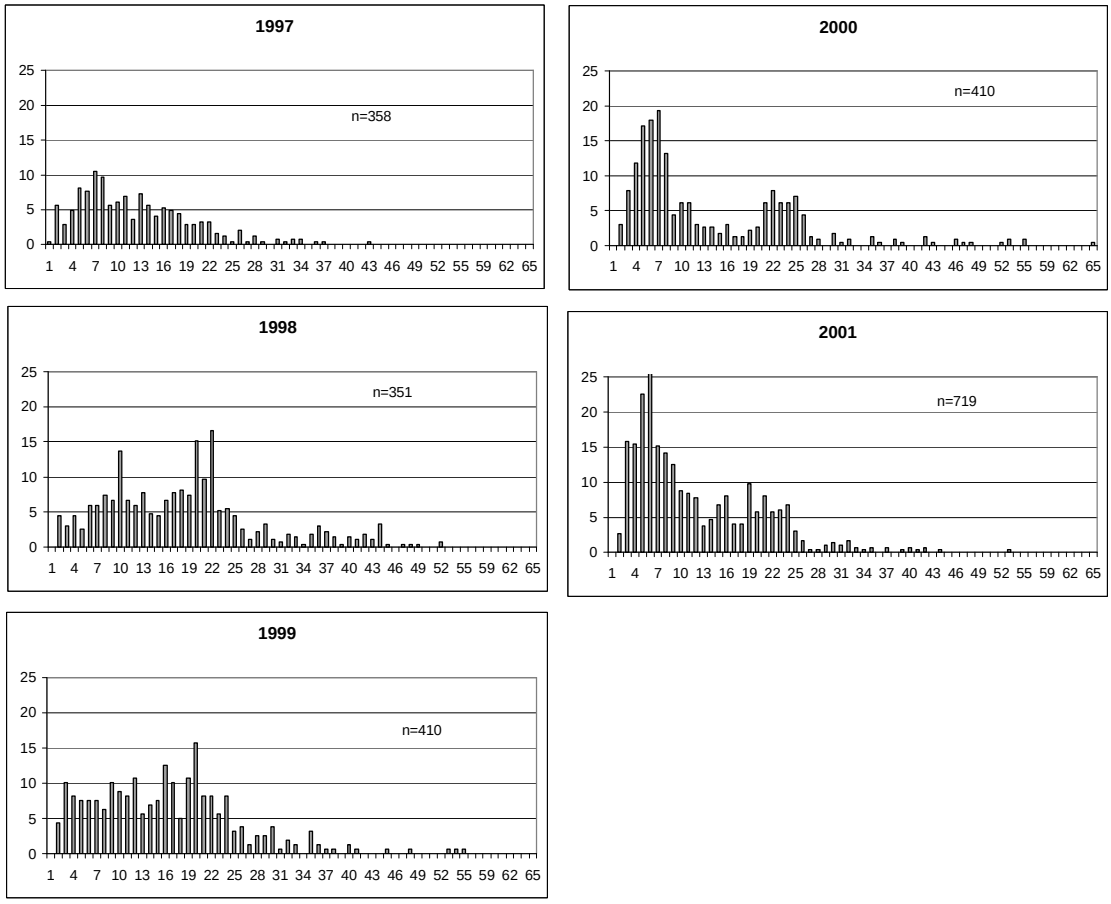


Figure 24. NSEI Longline Survey annual percent frequency for sablefish ages adjusted by survey rounds pounds-per-hook, 1997–2001.

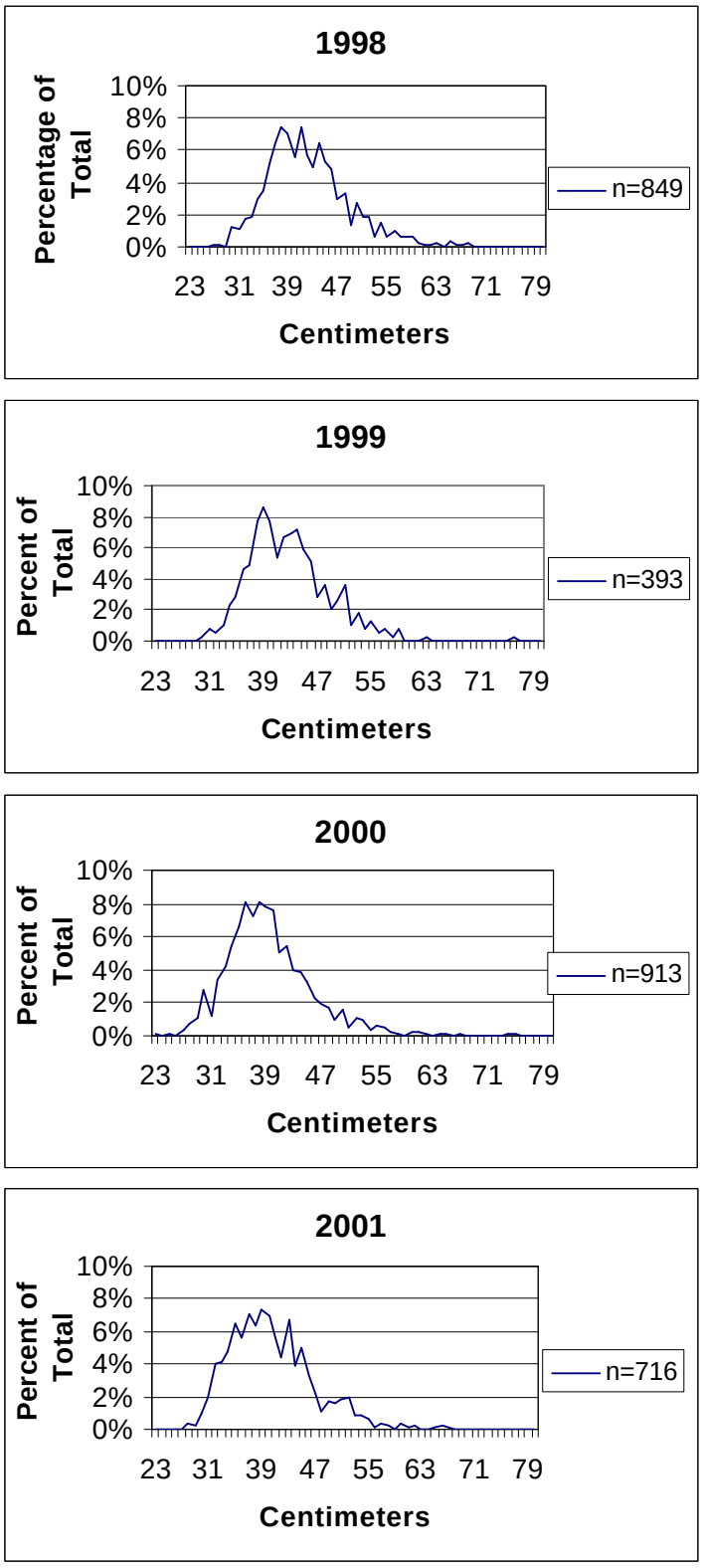


Figure 25. NSEI Longline Survey, shortspine thornyhead lengths, 1998–2001. The sample size for 1997 was too small to include for comparison.

APPENDICES

Appendix A. NSEI Longline Survey tide table, August 2001.

Survey Dates, August 8–August 13, 2001

PETERSBURG *DISTRICT* — Petersburg, Alaska

AUGUST 01	HIGH TIDES A.M.	FT.	P.M.	FT.	LOW TIDES A.M.	FT.	P.M.	FT.
1 Wed	.....	.....	**12:38**	**12.9**	6:24	-0.4	**6:20**	**3.9**
2 Thu	0:09	15.4	**1:18**	**13.5**	7:05	-0.9	**7:03**	**3.5**
3 Fri	0:50	15.8	**1:53**	**14.0**	7:41	-1.3	**7:41**	**3.0**
4 Sat	1:27	16.0	**2:26**	**14.3**	8:14	-1.5	**8:17**	**2.7**
5 Sun	2:02	16.0	**2:57**	**14.5**	8:46	-1.4	**8:51**	**2.4**
6 Mon	2:36	15.8	**3:27**	**14.5**	9:16	-1.2	**9:26**	**2.3**
7 Tue	3:10	15.4	**3:56**	**14.5**	9:46	-0.7	**10:01**	**2.3**
8 Wed	3:44	14.7	**4:27**	**14.3**	10:17	0.1	**10:39**	**2.5**
9 Thu	4:21	13.9	**4:59**	**14.1**	10:49	1.0	**11:21**	**2.6**
10 Fri	5:02	12.9	**5:34**	**13.8**	11:23	2.0	.....	.....
11 Sat	5:51	11.9	**6:17**	**13.6**	0:09	2.8	**12:04**	**3.1**
12 Sun	6:54	11.0	**7:11**	**13.5**	1:08	2.9	**12:56**	**4.1**
13 Mon	8:16	10.6	**8:18**	**13.6**	2:20	2.6	**2:05**	**4.9**
14 Tue	9:43	10.9	**9:30**	**14.2**	3:35	1.8	**3:25**	**5.1**
15 Wed	10:56	11.9	**10:37**	**15.3**	4:43	0.4	**4:39**	**4.5**
16 Thu	11:53	13.3	**11:36**	**16.5**	5:40	[illegible]	**5:41**	**3.5**
17 Fri	.....	.....	**12:41**	**14.6**	6:31	[illegible]	**6:35**	**2.2**
18 Sat	0:29	17.7	**1:25**	**15.8**	7:18	[illegible]	**7:25**	**1.0**
19 Sun	1:18	18.5	**2:07**	**16.8**	8:02	[illegible]	**8:13**	**0.0**
20 Mon	2:07	18.7	**2:49**	**17.4**	8:45	[illegible]	**9:00**	0.7
21 Tue	2:54	18.3	**3:31**	**17.6**	9:28	[illegible]	**9:48**	0.9
22 Wed	3:43	17.4	**4:13**	**17.3**	10:10	[illegible]	**10:37**	0.8
23 Thu	4:33	15.9	**4:57**	**16.7**	10:54	[illegible]	**11:30**	**0.1**
24 Fri	5:27	14.3	**5:45**	**15.8**	11:41	1.2	.....	.....
25 Sat	6:30	12.7	**6:39**	**14.7**	0:29	0.9	**12:34**	**3.0**
26 Sun	7:47	11.5	**7:44**	**13.9**	1:38	1.7	**1:39**	**4.4**
27 Mon	9:16	11.1	**8:58**	**13.5**	2:58	2.0	**2:58**	**5.3**
28 Tue	10:36	11.5	**10:09**	**13.6**	4:15	1.7	**4:17**	**5.3**
29 Wed	11:34	12.2	**11:07**	**14.2**	5:18	1.1	**5:20**	**4.7**
30 Thu	**12:19**	**13.0**	**11:55**	**14.8**	6:06	0.5	**6:08**	**4.0**
31 Fri	.....	.....	**12:54**	**13.8**	6:44	-0.1	**6:48**	**3.2**

3 11 18 25

91

Lite Type = A.M. **Bold Type = P.M.**

Appendix B. NSEI longline survey solicitation to bid.

2001 SOLICITATION TO BID
CHATHAM STRAIT TEST FISHERY SABLEFISH

The Alaska Department of Fish and Game will be conducting the annual sablefish longline survey in Chatham Straits between Cape Ommaney and Pt. Hepburn. The department has contracted three vessels to simultaneously fish the survey area. The *F/V Charles-T*, *F/V Sylvia* and the *F/V Ida June* will begin fishing on or about August 8th. The *F/V Charles-T* and the *F/V Sylvia* will depart from and return to Petersburg. The *F/V Ida June* will depart from and return to Sitka. Weather permitting, the survey is expected to take 6–7 days. The survey may be extended until August 21 if necessary.

The department is soliciting bids from area processors to purchase the fish caught during the survey. The total expected landed catch based on last year's catch is estimated to be approximately 89,000 round pounds of sablefish plus an additional 2,000 round pounds of rockfish bycatch. The facility or tender must be capable of handling up to 50,000 pounds of round sablefish and be able to provide sufficient high-quality ice for each vessel. The facility or tender must be available to offload fish seven days a week.

It is the responsibility of the successful bidder to provide ice from a local processor for all vessels including those departing other ports. Bidders must have processing capabilities in Kake or provide tender service in Chatham Strait. Deliveries will be made mid-way through the survey, and again at the end of the survey. If weather or other conditions extend the survey, additional tender service may be required. The quoted price of the fish shall include the cost of the required tender service.

The sablefish will be delivered round. They will be iced on the *F/V Ida Iune* and the *F/V Sylvia*, and slush-iced on the *F/V Charles T*. In addition, a total of approximately 400 eastern cut sablefish will be delivered. Rockfish will be delivered gutted/head on. Please include as general information the number of days allowed to fish before off-loading and any other special handling instructions.

no 1's	**cut**		**dr pound**	**price per pound**	**extended price**
Sablefish	Eastern cut	under 2	2,736		
Sablefish	Eastern cut	2-3	4,471		
Sablefish	Eastern cut	3-4	6,274		
Sablefish	Eastern cut	4-5	10,847		
Sablefish	Eastern cut	5-7	14,444		
Sablefish	Eastern cut	7 up	13,897		
no 2's					
Sablefish	Eastern cut	under 2	175		
Sablefish	Eastern cut	2-3	285		
Sablefish	Eastern cut	3-4	400		
Sablefish	Eastern cut	4-5	692		
Sablefish	Eastern cut	5-7	922		
Sablefish	Eastern cut	7 up	887		
Rougheye	gutted	gutted	923		
Shortraker	gutted	gutted	1,157		
	Total price of bid				

Quantities listed above are estimates based on the 2000 survey, extrapolated from samples, and are for evaluation purposes only. The state expects to catch a comparable amount of fish this year; however, the state does not guarantee a minimum or maximum amount of fish. The total poundage delivered and the poundage breakdown by size category for sablefish from the 2000 NSEI survey samples is not a guarantee for sablefish or miscellaneous rockfish deliveries for the 2001 survey.

All survey fish landed will be the property of the successful bidder and payment for the fish to the state will be based on the price bid by the company. All survey fish will be landed on a Department of Fish and Game limited entry gear card. Payment in the form of a check for the delivered survey fish is expected at the time of each landing. All checks will be made payable to the State of Alaska.

For further information contact Beverly Richardson in Petersburg at 907-772-5233.

CONTRACTOR'S INFORMATION FORM:

Bidders must complete the information form below. A bidder's failure to provide this information may cause the State to reject the bid as non-responsive.

PROCESSING COMPANY NAME: _____

ADDRESS: _____

PHONE: ( ) _____

FAX (OPTIONAL): ( ) _____

EMAIL (OPTIONAL): _____

PROCESSOR TYPE
(SHORESIDE/FLOATER/CATCHER-PROCESSORS): _____

PROCESSOR LOCATION: _____

SSB CALL NUMBERS AND STAND-BY FREQUENCY: _____

CONTACT PERSON: _____

BUSINESS HOURS IN August_____

THE FOLLOWING IS FOR INFORMATIONAL PURPOSES ONLY:

MAXIMUM NUMBER OF DAYS ALLOWED TO FISH BEFORE OFF-LOADING_____

ANY SPECIAL INSTRUCTIONS:

_____

_____

_____

_____

_____

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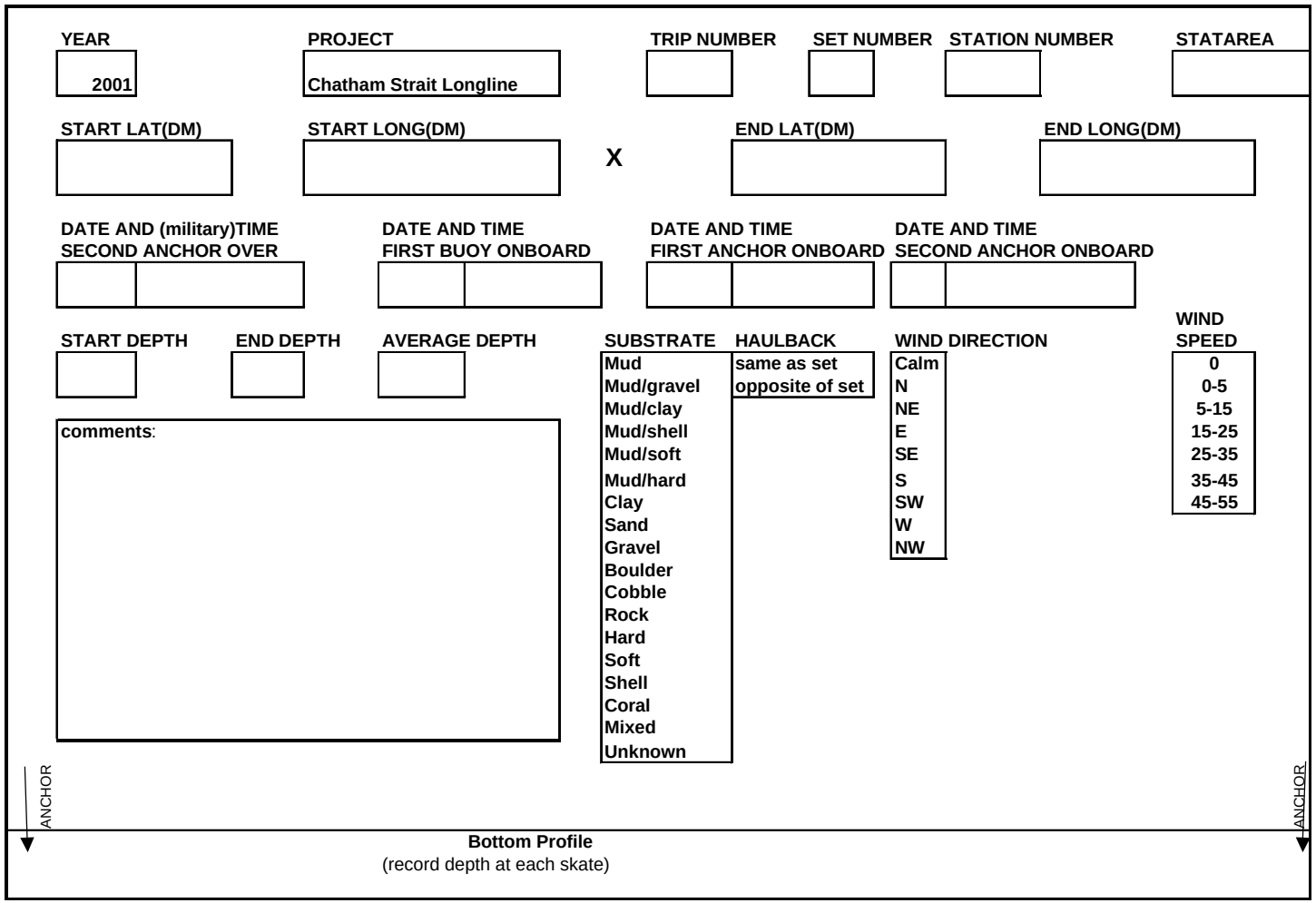
Appendix C. Sablefish survey set form.



Appendix D. Hook accounting form.

HOOK ACCOUNTING **Date:_August______2001 Observer___**

Year: 2001 **Project: CHATHAM STRAIT Sablefish Survey Trip:_______ Set _ _____Station_______**

1stBuoy:time:_______ 1st Anchor:time:_________substrate_______ 2nd Anchor:time________substrate_______

SUBSET		Bare(1): Invalids(3):
#		Bait(2):
		(710) Sable(1): Discard(2): Sm(3): lost(4):
		(200) Halibut:
		(143) Thorneyhead:
		Rockfish: (151) RE: (152) SR: (153) RB:
		(691) Dogfish: (692) Pacific Sleeper
VALID?		(701) LNSK: (700) OSK: (121) ATF: (110) PCOD: (270) POL: (124) Dover
Y or N		**TOTAL**

SUBSET		Bare(1): Invalids(3):
#		Bait(2):
		(710) Sable(1): Discard(2): Sm(3): lost(4):
		(200) Halibut:
		(143) Thorneyhead:
		Rockfish: (151) RE: (152) SR: (153) RB:
		(691) Dogfish: (692) Pacific Sleeper
VALID?		(701) LNSK: (700) OSK: (121) ATF: (110) PCOD: (270) POL: (124) Dover
Y or N		**TOTAL**

SUBSET		Bare(1): Invalids(3):
#		Bait(2):
		(710) Sable(1): Discard(2): Sm(3): lost(4):
		(200) Halibut:
		(143) Thorneyhead:
		Rockfish: (151) RE: (152) SR: (153) RB:
		(691) Dogfish: (692) Pacific Sleeper
VALID?		(701) LNSK: (700) OSK: (121) ATF: (110) PCOD: (270) POL: (124) Dover
Y or N		**TOTAL**

SUBSET		Bare(1): Invalids(3):
#		Bait(2):
		(710) Sable(1): Discard(2): Sm(3): lost(4):
		(200) Halibut:
		(143) Thorneyhead:
		Rockfish: (151) RE: (152) SR: (153) RB:
		(691) Dogfish: (692) Pacific Sleeper
VALID?		(701) LNSK: (700) OSK: (121) ATF: (110) PCOD: (270) POL: (124) Dover
Y or N		**TOTAL**

SUBSET		Bare(1): Invalids(3):
#		Bait(2):
		(710) Sable(1): Discard(2): Sm(3): lost(4):
		(200) Halibut:
		(143) Thorneyhead:
		Rockfish: (151) RE: (152) SR: (153) RB:
		(691) Dogfish: (692) Pacific Sleeper
VALID?		(701) LNSK: (700) OSK: (121) ATF: (110) PCOD: (270) POL: (124) Dover
Y or N		**TOTAL**

Appendix E. 2001 NSEI longline survey biological data form.

BIOLOGICAL DATA COLLECTION FORM

DATE: August___ 2001 Set_____ Station______

YEAR: 2001 PROJECT: Chatham Strait Sablefish Survey TRIP NO.:_____

Sablefish are to be on 1 series of pages, all rockfish will be together on seperate series.
Sablefish Oto # begins with 1 for each trip. Rockfish Oto # begins with 1001 for each trip.
****** Each **set** starts with Alex (specimen) # 1 and is numbered consectutively including all species for that set.

		nearest 10 mm	tenths								
Alex #	**Species**	**LENGTH-MM**	**WT-KGS**	**SEX**	**MAT**	**Oto #**	**AGE**	**RI**	**COMMENTS**	**Alex #**	**thorneys**
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Sampler________________ Recorder______________

Appendix F. Sablefish maturities chart.

SABLEFISH MATURITY CODES

MATURITY CODE	GONAD CONDITION	MALES (1) DESCRIPTION	FEMALES (2) DESCRIPTION
1	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 2-1 from 2-2 while ovaries are intact in fish)			
2	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 coming year. More veined. Cloudy, but not necessarily throughout.
3	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.
4	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.
5	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.
6	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.

(Revised 1982, 1987, 1994, 1997. Maturity code 6 (resting) added April 1994)
c:document\maturity.doc

Appendix G. Otolith instructions.

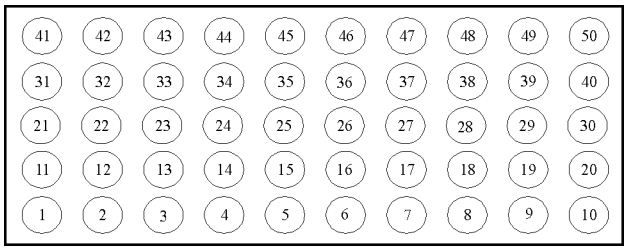
INSTRUCTIONS FOR LABELING AND SHIPPING OTOLITHS

by Deidra Holum

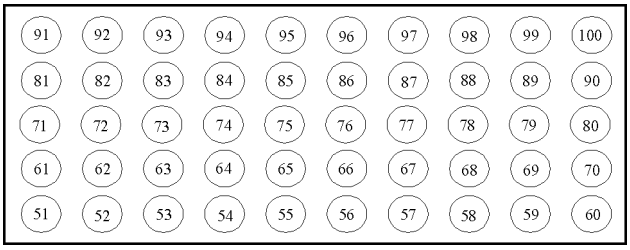
ON THE DECK

Materials needed: measuring board, scale, otolith form, tweezers, and otolith collection tray.

1. Select a sablefish and number appropriately.
2. Record a weight and a length then cut a thin slice off the top of the head starting just back of the eyes to expose the otoliths.
3. Using tweezers, remove both otoliths from the sablefish. Gently rub off any tissue connected to otoliths.
4. Starting in the **LOWER**, **LEFT HAND CORNER** of the collection tray, place the first pair of otoliths in the first open plastic vial. Immediately close the lid tightly! Leave tweezers in the next open vial to avoid losing between samples.



5. Since there are no physical numbers in or on these plastic otolith vials, it is imperative the correct otoliths go in the corresponding container! For every 4–5 sablefish sampled, verify the sample number with the corresponding vial number (i.e., on the page the sample number reads #4, are you filling vial #4?).
6. Once 50 pairs of otoliths have been collected, the tray is full and its ready to take inside to prepare the otoliths for storage. At this point, get a new collection tray (each vessel should have 2 trays of 50 vials each) and continue the numbering system starting with the lower, left-hand vial. The second tray will start with #51, the third tray will start with #101, the fourth tray will start with #151 etc. Always make sure the sample number corresponds to the correct vial no matter how many new trays are started!



DON'T FORGET: Complete the sample form by recording the SEX and SEXUAL MATURITY CODE for each sample. After this point, you can toss the sampled sablefish head overboard and clean the body.

INSIDE

At the countertop or the table, you will need the 24-cell otolith trays correctly labeled, acetates, paper napkins, electrical tape, rubber bands, and a black, permanent marker.

1. Complete the labels with the appropriate sampling information (see next page for examples). The sequence of numbers to be entered under "Sample Range/Species" are year, area code (01=SSEI, 03=NSEI), trip #, and sample #. For example the 10th sample on trip 2 in the 1999 SSEI survey would be "99-01-02-10". Turn the label over and begin numbering the cells with pencil. Make sure you begin in the corner marked "A1."

2. Once the label information is completed, fully—but lightly—wet the tray label using a damp sponge or paper napkin. To attach the label to the otolith cell tray, **use the alpha-numeric grid stamped on the plastic unit to orient the cell tray with A1 in the upper left hand corner and cell D6 in the lower right hand corner.**

3. Align the label with the bottom of the tray. A1 should be in the upper left hand corner with penciled numbers facing into the plastic cells. Rub label into place. Check that edges are securely in place or re-wet the edges and rub into place again.

Now you are ready to transfer the otoliths to storage in a 24-cell otolith tray. At this point you will also need:

- a bowl of warm water with a small amount of dish soap mixed in
- a stack of colored paper napkins
- tweezers or a knife

4. Open an otolith vial (you may want to use the edge of the tweezers or a knife edge to help pry open some of these vials).

5. Dump contents into the bowl of warm, soapy water (there should be two otoliths unless noted on the sample form). Swish gently through the water to remove any remaining blood or tissue.

6. Remove otoliths from the water and blot dry on colored paper napkins (the colored background makes it easier to keep track of tiny otoliths).

7. Using tweezers, place the cleaned, dried otoliths into the appropriate storage cell. Place the first pair of otoliths in cell **A1,** located in the upper left hand corner of the tray. Continue filling cells from left to right, top to bottom until the **last cell, D6, lower, right-hand corner**, is filled.

8. Once all the cells are filled, place 2 acetates and a folded paper napkin to fit over the cells (to prevent otoliths from slipping out of their numbered chamber) and then add the lid. Secure all with a continuous loop of electrical tape around the seam of the tray.

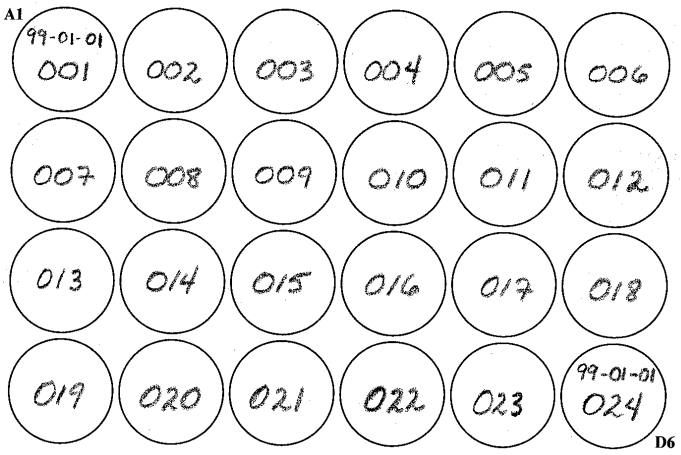
9. When all is secured, label the lid in the upper, right-hand corner with a permanent marker

TRIP #____
Cruise number (i.e. 99-01)
Case #1 of___
(fill in end of cruise when total known)

If you do not completely fill a 24-cell tray at one sitting, place acetates over the cells as usual, cover with a lid, but secure the otolith tray with 2 rubber bands until the next use.

10. Rinse all plastic vials, Styrofoam holders, and outdoor otolith trays in soapy, warm water to clean in preparation for additional samples or storage.

Example labels for 24 Cell Otolith Trays



ALASKA DEPT. OF FISH & GAME - CFMD/GROUNDFISH MNGMT.

SAMPLE DATE: May 4-10, 1999 **TRAY #** 1 **OF** _____

PORT/LOCATION: 99 - SSEI - Trip #1

SAMPLE RANGE/SPECIES: Sablefish (710)

99-01-01-001 —— 99-01-01-024

SAMPLER(S): Holum, Castwright

COMMENTS: _____

Return filled **24 Cell Otolith Trays** to:
Kris Munk, ADF&G CWT & Otolith Processing Lab, Box 25526, Juneau, Alaska 99802

Appendix H. Protocol for previously tagged sablefish.

Protocol for previously tagged sablefish.(2002)

Tagging Agency	**Condition of fish**	**Re-release with old tag**	**Re-tag**	**Otolith**	**Otolith Storage**	**Biological data**	**Recovery data. Put on ADFG recovery form**
ADF&G tag	in good health	**no**	**no**	no		length	date, latxlong, depth, gear, new #
	in poor health/dead	no	no	no		length & weight, sex and maturity	date, latxlong, depth, gear, the tag
NMFS tag	in good health	**yes**	no	no		length	date, latxlong, depth, gear, tag no.
	in poor health/dead	no	no	**yes**	dry, ship immediately	length & weight, sex and maturity	date, latxlong, depth, gear, the tag
Auke Bay tag	in good health	**yes**	no	no		length	date, latxlong, depth, gear, tag no.
	in poor health/dead	no	no	**yes**	dry, ship immediately	length & weight, sex and maturity	date, latxlong, depth, gear, the tag
Japanese tag	in good health	**yes**	no	no		length	date, latxlong, depth, gear, tag no.
	in poor health/dead	no	no	**yes**	dry, ship immediately	length & weight, sex and maturity	date, latxlong, depth, gear, the tag
COOP	in good health	**yes**	no	no		length	date, latxlong, depth, gear, tag no.
(ADFG/AB)	in poor health/dead	no	no	**yes**	dry, ship immediately	length & weight, sex and maturity	date, latxlong, depth, gear, the tag
PINK tag	in good health	no	no	**yes**	Vial with Alcohol	length & weight, sex and maturity	date, latxlong, depth, gear, tag no.
Auke Bay	in poor health/dead	no	no	**yes**	Vial with Alcohol	length & weight, sex and maturity	date, latxlong, depth, gear, the tag
Canadian tag	in good health	no	no	**yes**	dry, ship immediately	length & weight, sex and maturity	date, latxlong, depth, gear, tag no.
	in poor health/dead	no	no	**yes**	dry, ship immediately	length & weight, sex and maturity	date, latxlong, depth, gear, the tag

* All tagged fish recaptured should be recorded on **ADFG Tag Recovery Forms**. All data, including tags, date of recapture, lat x long, depth, recovery gear must be recorded. Note if the fish was re-release, or sacrificed.
* All other agency's otoliths must be shipped promptly to release agency.
* NMFS, Auke Bay, Japanese and Pink NMFS Growth Study tags, data and otoliths should be shipped to Nancy Maloney at Auke Bay Lab.
* Canadian tags, data and otoliths should be sent to Wendy Milton; Pacific Bio Station; Nanaimo BC V9R 5K6

Appendix I. Gonad condition criteria applied to *Sebastes* from Alaska landings used in 1988. (Stages in bold are for externally examined fish, all other stages apply to internally examined fish only).

SEX	CODE	CONDITION	GONAD DESCRIPTION
MALE (1)	1	Immature	Very small, string-like, translucent
	2	Maturing	Small size, translucent, white testes with slight swelling
	3	Mature	Medium size, swollen brown to white, ribbon-like testes
	4	Developing	Large size, swollen testes easily broken, milt in sperm duct
	5	**Spawning**	**Large size, white swollen testes with milt flowing when pressure applied to testes**
	6	Spent	Large to medium size, swollen, brown testes with white center and milt in sperm duct
	7	Resting	Medium size, flat, ribbon-like tan or brown testes
	9	Externally Indiscernible	
FEMALE (2)	1	Immature	Very small size, translucent, pink ovaries
	2	Maturing	Small size, translucent or opaque, yellow or pink
	3	**Mature**	**Large ovary, yellow opaque eggs**
	4	**Fertilized**	**Large ovary, orange-yellow, translucent eggs, eggs run easily**
	5	**Ripe**	**Large ovaries, translucent yellow or gray with embryos and larvae (eyed embryos look black)**
	6	Spent	Large, flaccid, red ovaries. A few larvae may be present
	7	Resting	Moderate size, firm, red-gray, some black blotches
	9	Externally Indiscernible	
UNKNOWN (99)			
T OBSERVED (00)			