2003 NSEI (CHATHAM) SABLEFISH POT SURVEY REPORT

F/V Melissa Lynn
June 15–July 3, 2003

by
Beverly Richardson

REGIONAL INFORMATION REPORT[1] NO. 1J03-38

Alaska Department of Fish and Game
Division of Commercial Fisheries
Juneau, Alaska

[1] The Regional Information Report series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate timely reporting of recently collected information, reports in this series undergo only limited internal review and may contain preliminary data, this information may be subsequently finalized and published in the formal literature. Consequently, these reports should not be cited without prior approval of the author or the Division of Commercial Fisheries.

AUTHOR

Beverly Richardson is a Research Analyst II for the Alaska Department of Fish and Game, groundfish project in Region I, Southeast Alaska. Her address is P.O. Box 667, Petersburg, AK 99833-0667 and she can be reached through email at beverly_richardson@fishgame.state.ak.

ACKNOWLEDGEMENTS

The author wishes to thank Victoria O' Connell and Becky Knight for editing and making comments to this report, Annabelle Reedy for formatting and editing this report and Cleo Brylinski for producing the map figures.

This research was partially supported under the NOAA grant Nearshore Marine Research III - NA16FN1560.

This research was partially supported under NOAA grants Alaska Fisheries Information Network NA97FN0121, Interjurisdictional Fisheries Act (IJF) NA06FI0074, and Nearshore Marine Research (NMR) IV NA16FN2808.

TABLE OF CONTENTS

AUTHOR ii
ACKNOWLEDGEMENTS ii
LIST OF TABLES iv
LIST OF FIGURES iv
LIST OF APPENDICES iv
INTRODUCTION 1
OBJECTIVES 1
METHODS 1
Setting 2
Gear 2
Bait 3
Sablefish Marking 3
Previously Tagged Sablefish 4
Biological Sampling 4
Bycatch 5
Data Management 5
RESULTS 5
Setting 5
Sablefish Marking 5
Previously Tagged Sablefish 6
Biological Sampling 6
Bycatch 7
APPENDICES 25

LIST OF TABLES

Pages

Table 1. Target number of fish to mark by statistical area, NSEI pot survey, 2003. 8
Table 2. Survey crew, NSEI pot survey, 2003. 8
Table 3. Set summary, NSEI pot survey, 2003. 9
Table 4. Number of tags released by statistical area, NSEI pot survey, 2003. 10
Table 5. Sablefish length summary for biological sub-sample and for all sablefish landed, NSEI pot survey, 2003. 10
Table 6. Sablefish maturities, biological sub-samples, NSEI pot survey, 2003. 10
Table 7. Bycatch, by set and overall, NSEI pot survey, 2003 11

LIST OF FIGURES

Pages

Figure 1. Sablefish survey area, NSEI pot survey, 2003. 12
Figure 2. Sablefish marks, NSEI pot survey, 2003. 13
Figure 3. F/V Melissa Lynn setting gear, NSEI pot survey, 2003. 14
Figure 4. Set locations and number of tags released per station, NSEI pot survey, 2003. 15
Figure 5. Stacked sablefish pots, NSEI pot survey, 2003. 16
Figure 6. Sablefish pot hooked to groundline, NSEI pot survey, 2003. 16
Figure 7. Sash weight, NSEI pot survey, 2003. 17
Figure 8. Anchor and buoys, NSEI pot survey, 2003. 17
Figure 9. Slack-taking reel, NSEI pot survey, 2003. 18
Figure 10. Hanging bait, NSEI pot survey, 2003. 18
Figure 11. Dumping a pot into the hopper, NSEI pot survey, 2003. 19
Figure 12. Sablefish in hopper, NSEI pot survey, 2002. 19
Figure 13. Recording data, releasing sablefish into chute, and placing the next sablefish, NSEI pot survey, 2002. 20
Figure 14. Tagging a sablefish, NSEI pot survey, 2003. 20
Figure 15. Clipping upper lobe of caudal fin of sablefish, NSEI pot survey, 2003. 21
Figure 16. Fresh cut upper lobe of caudal fin on sablefish, NSEI pot survey, 2003. 21
Figure 17. Sampling station, NSEI pot survey, 2003. 22
Figure 18. Percent frequency of lengths of marked, sampled and total sablefish, NSEI pot survey, 2003. 23
Figure 19. Sablefish lengths by sex from biological samples, NSEI pot survey, 2003. 23
Figure 20. Sablefish lengths by sex as portion of total lengths, NSEI pot survey, 2003. 23
Figure 21. Pacific sleep shark in caught sablefish pot, NSEI pot survey, 2003. 24

LIST OF APPENDICES

Pages

Appendix A. Sablefish Pot Survey Set Form, NSEI 2003 26
Appendix B. Sablefish Pot Survey Tag Release Form, NSEI 2003. 27
Appendix C. Sablefish Maturity Codes. 28

INTRODUCTION

The Alaska Department of Fish and Game contracted the *F/V Melissa Lynn* for 21 days, beginning June 15, 2003, to conduct the fourth in a series of sablefish surveys using pot gear within the Northern Southeast Inside (NSEI) Subdistrict (Chatham Straits). The survey was conducted in the six major commercial fishery statistical areas in Chatham Strait between the latitudes of 56°10' N. and 58°11' N. (Figure 1). During the survey, 7,788 sablefish were captured, tagged, tail clipped, and released. Fish were released by statistical area in proportion to the 2002 commercial harvest and distributed as evenly as possible within each statistical area. This research is part of a mark-recapture project to aid in the management of the State of Alaska's commercial sablefish fishery in the NSEI Subdistrict. This report describes the methods and preliminary results of this survey.

OBJECTIVES

1. Mark a total of 8,000 sablefish that are greater than 50 cm fork length with an external "T-bar" tag at the base of the dorsal fin and by clipping the upper lobe of the caudal fin (Figure 2).

2. Apportion the 8,000 marked sablefish according to the sample size distribution, among Statistical Areas 345603 as far south as 56°10' N latitude, throughout all of 345631, 345702, 345701 and 345731, and in 345803 as far north as 58°11' N latitude, as evenly as possible in a north to south direction (Table 1).

   The purpose of apportioning the marked fish among the statistical areas is to distribute the marked fish approximately in proportion to the distribution of the commercial fishery catch in 2002. This apportionment is intended to promote adherence to catchability assumptions necessary to estimate abundance under mark-recapture theory.

3. Collect biological samples, including length, sex, stage of sexual maturity and ageing structures (otoliths) from a random sub-sample of 450 to 500 sablefish.

METHODS

The *F/V Melissa Lynn*, a 58-foot, steel-hulled commercial fishing vessel was used to conduct the survey. The *F/V Melissa Lynn*, previously a limit seiner owned by Ward Cove Packing, was recently purchased and refitted to fish for sablefish with pots in the Bering Sea (Figure 3). It is a miniature version of the *F/V Miss Conception*, the 79-foot vessel used to conduct this survey the previous 2 years. The vessel was contracted for a 21-day vessel charter from Melissa Lynn LLC

for $69,995. David (Cowboy) Hasslequist was skipper for the second consecutive year. There were four fishing crew and a cook in addition to the skipper. The scientific staff consisted of three ADF&G staff on each leg of the survey (Table 2).

Setting

Within the constraints of attempting to distribute the marked fish uniformly north to south throughout each statistical area, the skipper was given free reign to fish in a manner that would maximize the catch of sablefish. Except for avoiding fishing on ADF&G longline survey stations, there were no location, depth, or soak-time restrictions. Sets were made in areas of potentially productive sablefish habitat. In 2003, many of the sets were made at the same or similar locations to those of the 2001 and 2002 pot surveys. When prospecting for new set locations, the vessel surveyed the area and checked bottom bathymetry prior to setting gear. Several potentially productive sets were precluded due to the presence of commercial king crab gear in area.

The general objective was to capture, double mark and release sablefish, and to distribute them geographically in proportion to the 2002 commercial fishery. To achieve this goal, the following protocol was followed:

1) Continue to mark fish on a set when the marking goal for that statistical area was exceeded on that set.
2) Release all unmarked fish from any additional sets that were still in the water after goals for that statistical area had been achieved.
3) Do not make additional sets in a statistical area if within 50 fish of that area's goal.
4) If catch rates are very low in an area discontinue that area after achieving 80% of the goal and make up the additional fish in another statistical area.

The daily routine was to haul one set, reset that set, haul the second set and then reset it, and let both sets soak over the night. For the lower end, we made the previously most productive sets going southward to assess catches and filled in the remaining areas when heading back northward when necessary to reach marking goals.

For each set, the beginning and ending latitude and longitude, anchor times, number of pots per set, and depths where each pot went overboard were recorded by ADF&G staff on the Sablefish Pot Survey Set Form (Appendix A). To facilitate tagging and releasing fish quickly, the catches were enumerated per set and not by pot. The distribution of the location of the sets between and among statistical areas is shown on the chart in Figure 4.

Gear

The vessel provided the sablefish pots and the other gear necessary to longline the pots. The pots were 5-foot round sablefish pots equipped with two opposing tunnels, which were designed, constructed, and webbed by the contractor (Figure 5).

A string of gear consisted of floating line with two 18" hard buoys followed by two large plastic buoy bags, 50 fathoms (fm) of line, a sash weight, buoy line equal to ± 350 fm depending on set depth, a surge weight, 50 fm of line, an anchor, and the groundline which was configured with 40 beckets spaced at 50 fm intervals (Figures 6, 7 and 8). At the end of the ground line were a second anchor and the reversal of the gear. In 2003 the number of pots per string varied from 37 to 47, an increase over previous years due to the increase in the overall survey marking goals. Set 26 and 27 are recorded as 20 pots each, however these 2 sets were actually 1 set, split for recording purposes because it spanned 2 statistical areas. Pots were placed onto the string at 50 fm intervals. The maximum number of pots per string was normally 40, however when setting in shallow waters additional pots were added to the string in areas of suspected low catches to increase the catch. Regardless of the number of pots on the set, a string of groundline per set covered roughly 2.2 miles.

One string of groundline, running line, and buoy line were stored on a slack-taking reel, additional strings of line were stored, and could be hauled directly into the bait hold (Figure 9). It was faster to haul using the slack-taking reel and therefore efforts were made to always have a string in the water. This also eliminated time and effort, as the pots did not need to be stacked so tightly. Both strings of pots were stacked onboard when moving substantial distances.

Bait

A standardized amount of bait was used in each pot throughout the 2003 survey to reduce variables. The bait consisted of squid and herring and was provided by the contractor (Figure 10). No hake was used in 2003, as the bait was purchased from Icicle in Petersburg and none was available. Bait was loaded at the beginning of the survey and again during the crew change in Petersburg midway through the survey.

Sablefish Marking

All healthy sablefish greater than 50 centimeter (cm) fork length were measured, tagged, tail clipped and released. Sablefish 50 cm and smaller were released without marking due to concerns that these small fish might not be retained consistently by all vessels during the commercial fishery and that this would adversely affect the mark-recapture estimates.

A tagging station was set up adjacent to the hopper on the starboard side of the vessel. A pot was brought on board and the fish were released into the hopper that contained enough water to cover the fish (Figures 11 and 12). A vessel crewmember randomly captured the sablefish by hand one at a time, carried it over to the sampling station and placed it on the measuring board (Figure 13). An ADF&G staff member measured the fish to the nearest centimeter (fork length) and tagged the sablefish near the anterior base the dorsal fin on the left side of the fish with an orange plastic T-bar anchor tag from Hallprint™[2] in Australia (Figure 2 and 14). To aid in the tags being as visible as possible during the commercial fishery, this year's tags were orange in color and were thicker and longer than those used in 1997-2000. This year's tags were 2.1 mm in diameter and

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

50 mm in length with 2 mm of exposed filament. Tag numbers 03-0001 through 03-7890 were used for this year's survey. The fish were tagged using Avery Dennison™ Mark II™ Pistol Grip Tools, (#10651) with Avery Dennison™ Heavy Duty short needles (#08913). A second ADF&G staff clipped the upper lobe of the caudal fin (Figures 2, 15 and 16). The fish were then placed head first into a chute with running water that released the fish overboard with minimal damage. A third ADF&G staff stood nearby and recorded the tag number and length onto the NSEI Sablefish Pot Survey Tag Release Form (Appendix B). This person also recorded the bycatch and the recovery data for previously tagged sablefish, and kept track of each fifteenth sablefish sampling purposes.

Previously Tagged Sablefish

Sablefish captured during the 2003 survey that had been tagged by ADF&G either this year or in previous years were not retagged. The sablefish tagged in previous years were measured, the tag number was recorded, the set location was noted, and the fish were then re-released with the original tag in place. Sablefish that had been tagged on this year's survey were noted and released. Sablefish captured that had been tagged previously by other agencies were either harvested or re-released depending on the preference of the tagging agency.

Biological Sampling

The biological sampling goal for sablefish, for the survey, was 450–500 samples.

A sampling station was set up across the deck from the tagging station on the port side of the vessel (Figure 17). The ADF&G staff recording the tagging data kept track of every fifteenth sablefish (including those less than or equal to 50 cm) at each station and this fish was set aside for biological sampling. This sampling rate was chosen to provide the required 450–500 samples and this rate was continued throughout the survey to assure that each station was sampled at the same rate.

The third ADF&G staff took biological data including length (to nearest 10 mm), sex, stage of gonad maturity, and otoliths. 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 C). 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 ageing. Weights were not taken due to the concern that at sea, weights may not be accurate. The biological data was recorded on the Biological Data Collection Form.

ADF&G staff cleaned and dressed the fish to industry standards, vessel crew iced the sampled fish, and the fish were sold to offset survey costs. The fish were sold to Icicle Seafood in Petersburg on June 24 and to Taku Fisheries at Auke Bay on July 4 at market price.

Bycatch

The bycatch of groundfish was identified by species and recorded for each set.

Data Management

Between sets, all field data was entered into a portable version of the Region 1 relational database Alexander (Alex). Database programming problems limited data-entry on the first leg; as a result some of the survey data was not entered until after the completion of the survey. Data entered in the field were uploaded onto the Regional Alex database at the completion of the survey. The ability to enter data in the field, soon after the data was collected, provides for more accurate data and precludes several days of data entry upon return from the survey. The survey data were further edited and summarized after completion of the survey. Age data will be entered at a later time when it becomes available from the ageing lab.

RESULTS

Setting

Thirty-three sets were made resulting in a total of 1,290 individual pots being set and retrieved. A total of 9,715 sablefish were captured. Catches were enumerated per set and not by individual pot; therefore per pot catch data is not available. The average number of sablefish captured per pot for a set ranged from 2 to 16 with the survey's average being 8 sablefish per pot. The minimum and maximum depths recorded for the ends of the sets were 182 and 395 fathoms respectively. The mean of the average depth per set (the average of the depth of each pot on a string) was 326 fathoms. Soak time was measured from the first anchor overboard to the first anchor on board and ranged from 5 hours 18 minutes to 42 hours 12 minutes. The average soak time for a set was 20 hours 6 minutes (Table 3).

Two sets (Set 14 and Set 15) were left in the water for 42 hours while the vessel traveled to Petersburg to change crew; there was no discernable damage to these fish on one set and 4 badly flea bit fish on the second. There was excessive flea damage to a set (Set 32) that was soaked 14 hours; over one-third of the fish on that set were too flea bit to mark and 70 percent of the fish that were tagged had some degree of flea damage (Table 3).

Sablefish Marking

Of the 9,715 sablefish captured during the survey 184 sablefish were determined to be in questionable condition and therefore not marked prior to release, 935 fish measured 50 cm or less and therefore were released unmarked, 251 were released healthy without a 2003 tag or tail clip as they already had a tag, and 556 were retained for biological samples. The remaining 7,788

sablefish were marked and released. Of these, 7,781 were tail clipped; 7 were released accidentally prior to clipping (Table 3).

Marking goals were exceeded in two of the six statistical areas (Table 4). Unexpected good catches resulted in exceeding the goal for Statistical Area 345603. Goals were exceeded in Statistical Area 345731 as an additional set was made there to catch up from not making goals in lower statistical areas. Goals were not met in the 2 new statistical areas: in Statistical Area 345702 due to low catches and in Statistical Area 345803 due to sand flea predation, underwater cables and limited habitat. In addition the goal was not met in Statistical Area 345701 due to concern of limited remaining time and in Statistical Area 345631 due to limited remaining habitat and the necessity to keep away from the longline survey sets.

Previously Tagged Sablefish

Two hundred and forty-nine sablefish that had been tagged in previous years by ADF&G were captured in the pots. These previously tagged sablefish were all originally released in NSEI and consisted of six from the 1998 release, two from the 1999 release, nine from the 2000 release, 66 from the 2001 release, and 145 from the 2002 release. Twenty-one tags from this survey were recaptured at a subsequent set. All these previously tagged sablefish were re-released except for 3 unhealthy ones that were harvested. Fifteen sablefish tagged in previous years were captured and released for the third time with their original tag in place. Several previously tagged fish had lost their tags in the pots on their way to the surface, evidenced by recent bloody tag wounds.

One National Marine Fisheries Service (NMFS) Auke Bay and one NMFS Seattle tagged sablefish were captured and re-released. The recovery and re-release data for these tags were returned to the appropriate tagging agency.

Biological Sampling

Of the 9,715 sablefish captured, fork lengths were recorded for 9,672 fish. The sablefish ranged in length from 42 cm to 105 cm (Table 5). The mean length was 60 cm and a mode was noted around 56 cm (Figure 18).

On the biological sub-sample of 556 sablefish where sex was noted, lengths were taken on 555 fish. Females ranged in length from 46 to 92 cm and averaged 61 cm while males ranged from 46 to 80 cm and averaged 58 cm (Figures 19 and 20). The mode at 56 cm noted for all survey sablefish lengths was missing for this sub-sample. This sub-sample showed 46 percent males and that the majority of the adults were resting and the juveniles were either immature or maturing (Table 6; Appendix C). One male and no females were found in ripe condition.

Ages from the samples are not available at this time.

Bycatch

Bycatch was minimal. The primary bycatch consisted of 130 arrowtooth flounder and 402 Dover sole. Forty-one shortspine thornyhead, 42 rougheye rockfish, 3 redbanded rockfish, 2 shortraker rockfish, 32 halibut, 6 Pacific, 5 Pacific sleeper sharks and 27 brown king crab were also landed in the pots (Table 7, Figure 21).

Table 1. Target number of fish to mark by statistical area, NSEI pot survey, 2003.

Statistical Area	% of catch contributed to 2002 fishery	% of subtotal of catch among those stat. Areas contributing >5% of 2002 total catch	Target number of sablefish to tag from stat. Area from overall, NSEI-wide target of 8,000
345603	9%	9%	720
345631	31%	32%	2534
345701	33%	34%	2716
345702	5%	6%	444
345731	11%	11%	872
345803	9%	9%	715
	98%	100%	8000

Table 2. Survey crew, NSEI pot survey, 2003.

Vessel Crew	ADF&G Staff, Leg 1	ADF&G Staff, Leg 2
David Hasselquist (skipper)	Kamala Carroll	Eric Coonradt
Robin Hasselquist	Kyle Hebert	Jeff Kelly
Ryan Barr	Beverly Richardson	Deidra Holum
Steve Custodio (deck boss)		
Jeff Evalt		
Jim Hall		

Table 3. Set summary, NSEI pot survey, 2003.

Set	Statistical Area	Start Latitude	Start Longitude	End Latitude	End Longitude	Second Anchor	Soak Time (hrs)	Pots Retrieved	Start Depth	End Depth	Avg Depth	Discard not healthy	Discard too small	Released previously tagged	Retained bio sample	Tagged and released	Total Captured	Avg Sable per pot
1	345701	57 9.46	-134 42.70	57 11.16	-134 45.69	6/16/03 11:33	20.4	39	366	327	346	3	35	6	29	393	466	12
2	345701	57 1.35	-134 43.90	57 3.45	-134 44.94	6/16/03 15:09	23.5	39	341	346	348	1	28	8	17	258	312	8
3	345631	56 56.93	-134 41.82	56 58.98	-134 39.91	6/17/03 13:43	18.2	38	340	323	334	1	30	5	19	262	317	8
4	345631	56 52.65	-134 40.18	56 52.35	-134 36.33	6/17/03 19:00	20.5	39	337	369	361	4	55	9	21	296	385	10
5	345631	56 47.98	-134 33.14	56 47.74	-134 37.14	6/18/03 14:39	16.4	39	393	391	395		47	16	22	308	393	10
6	345631	56 42.58	-134 33.62	56 40.97	-134 36.34	6/18/03 20:16	16.2	38	386	376	376	1	32	10	15	187	245	6
7	345631	56 38.36	-134 36.06	56 37.93	-134 32.26	6/19/03 11:21	20.3	39	345	364	351		34	5	20	299	358	9
8	345631	56 31.68	-134 28.67	56 32.175	-134 32.54	6/19/03 17:23	19.3	40	296	345	339	1	4	1	8	110	124	3
9	345603	56 27.80	-134 36.17	56 25.78	-134 34.67	6/20/03 11:37	19.1	42	319	324	321	2	29	24	28	363	446	11
10	345603	56 20.11	-134 28.80	56 21.51	-134 26.5	6/20/03 17:45	20.0	37	365	395	395	5	73	13	31	355	478	13
11	345603	56 10.68	-134 26.97	56 12.6	-134 27.74	6/21/03 12:17	19.2	39	337	370	355		33	1	17	224	275	7
12	345631	56 41.64	-134 30.25	56 39.65	-134 31.58	6/22/03 14:52	16.5	39	358	377	378		1	1	4	56	62	2
13	345631	56 44.70	-134 32.04	56 46.723	-134 30.58	6/22/03 17:55	19.3	39	385	355	363		3	5	7	115	130	3
14	345631	56 55.39	-134 38.06	56 54.27	-134 34.98	6/23/03 11:52	42.2	38	347	366	356	5	26	12	24	306	373	10
15	345702	56 57.25	-134 21.98	56 58.51	-134 17.54	6/23/03 17:13	41.6	43	190	184	189	4	2	2	9	130	147	3
16	345631	56 52.37	-134 37.59	56 53.01	-134 33.9	6/24/03 9:57	21.4	38	367	363	368	4	49	12	19	338	422	11
17	345702	57 5.55	-134 10.73	57 3.5	-134 13.02	6/25/03 15:51	23.5	47	182	197	178		1		6	109	116	2
18	345701	57 3.10	-134 40.13	57 5.06	-134 40.93	6/26/03 12:37	18.4	39	342	348	348	2	124	7	37	470	640	16
19	345702	57 0.37	-134 20.08	56 58.59	-134 22.32	6/26/03 18:55	19.3	47	192	190	193	1	1		6	95	103	2
20	345701	57 7.49	-134 44.58	57 9.59	-134 41.39	6/27/03 11:35	21.4	39	333	376	354	3	33	6	15	169	226	6
21	345701	57 17.38	-134 40.37	57 15.42	-134 41.47	6/27/03 20:46	17.5	41	276	326	300	1	3		5	110	119	3
22	345701	57 19.53	-134 40.17	57 21.626	-134 40.08	6/28/03 13:30	18.1	41	365	341	344	14	4	7	9	111	145	4
23	345701	57 26.19	-134 43.64	57 27.63	-134 40.85	6/28/03 19:18	16.5	44	320	271	299	6	71	37	29	392	535	12
24	345701	57 23.85	-134 40.38	57 25.144	-134 41.47	6/29/03 9:27	21.5	41	338	300	334	7	6	9	16	204	242	6
25	345701	57 25.75	-134 40.64	57 27.55	-134 41.81	6/29/03 16:16	22.4	38	290	286	286	12	91	18	26	357	504	13
26	345731	57 31.55	-134 48.04	57 30.01	-134 47.55	6/30/03 13:53	17.4	19	329	347	339		1		2	37	40	2
27	345701	57 30.01	-134 47.55	57 29.692	-134 47.23	6/30/03 14:03	18.0	21	355	348	355		4		6	84	94	4
28	345731	57 42.48	-134 45.78	57 44.36	-134 46.93	6/30/03 20:06	17.5	42	261	285	274	6	13	17	20	316	372	9
29	345731	57 48.66	-134 50.88	57 47.195	-134 52.88	7/1/03 13:02	18.5	41	295	285	288	20	61	13	33	381	508	12
30	345731	57 52.80	-134 45.88	57 54.689	-134 47.02	7/1/03 18:36	21.6	42	257	292	274	17	19	5	20	362	423	10
31	345803	58 0.22	-134 51.03	58 2.198	-134 52.74	7/2/03 14:15	17.0	40	364	347	365	6	6	1	13	188	214	5
32	345803	58 8.75	-134 55.01	58 10.548	-134 56.78	7/2/03 21:23	14.3	41	356	330	345	58	5	1	8	135	207	5
33	345803	58 1.53	-134 54.46	58 3.663	-134 55.96	7/3/03 11:08	5.3	41	302	323	324		11		15	268	294	7
						Totals		1290				184	935	251	556	7788	9715	
						Average	20.1				326.5	8	28	9	17	236	294	8
						Maximum	42.2		393	395	395	58	124	37	37	470	640	16
						Minimum	5.3		182	184	178	1	1	1	2	37	40	2

Table 4. Number of tags released by statistical area, NSEI pot survey, 2003.

Statistical Area	Tagged and Marked		Objective	
	Number	Percentage	Number	Percentage
345603	942	12%	720	9%
345631	2277	29%	2534	32%
345701	2548	33%	2716	34%
345702	334	4%	444	6%
345731	1096	14%	872	11%
345803	591	8%	715	9%
Survey Area Total	7788	100%	8000	100%

Table 5. Sablefish length summary for biological sub-sample and for all sablefish landed, NSEI pot survey, 2003.

	Subsamples			Survey
	Male	Female	Total	Overall
N (lengths) =	255	300	555	9672
Average length cm	58	61	60	60
Maximum length cm	80	92	92	105
Minimum length cm	46	46	46	42

Table 6. Sablefish maturities, biological sub-samples, NSEI pot survey, 2003.

	Male		Female		Total	
	n	% of males	n	% of females	n	% of total
Immature	78	30%	30	10%	108	19%
Maturing Juvenile	77	30%	139	46%	216	39%
Mature/Developing	19	7%	13	4%	32	6%
Spawning	1	0%		0%	1	0%
Spent/Post Spawning	13	5%	13	4%	26	5%
Resting	68	27%	105	35%	173	31%
Total	256	100%	300	100%	556	100%

Table 7. Bycatch, by set and overall, NSEI pot survey, 2003.

Set	Sablefish	Arrowtooth Flounder	Dover Sole	English sole	Shortspine Thornyhead	Rougheye Rockfish	Shortraker Rockfish	Redbanded Rockfish	Halibut	PacificSleeper Shark	Pacific Cod	Golden King Crab	Total
1	466	1	21		5				1	1			495
2	312	2	17		4				3	1		8	347
3	317	4	9		2								332
4	385	14	14	1	1				2				417
5	393	4	35						2				434
6	245	14	13						1			2	275
7	358	11	22						2	1			394
8	124	22	6		1		1	1	1	1			157
9	446	3	5				1		2				457
10	478	2	9		1								490
11	275	16	1						3				295
12	62	8	14		3					1			88
13	130	3	13		7								153
14	373		36		1								410
15	147	2	4		2	14			5		2	3	179
16	422	1	22		2								447
17	116	12				20		2	1		3	2	156
18	640		10										650
19	103		8		3	6			3		1	11	135
20	226		43		3							1	273
21	119	4	22										145
22	145		22										167
23	535												535
24	242		9		1	2							254
25	504				1								505
26	40		11										51
27	94		18										112
28	372	3	1										376
29	508		1		2				1				512
30	423		1						1				425
31	214		5										219
32	207	2	5						2				216
33	294	2	5		2				2				305
Total	9,715	130	402	1	41	42	2	3	32	5	6	27	10,406

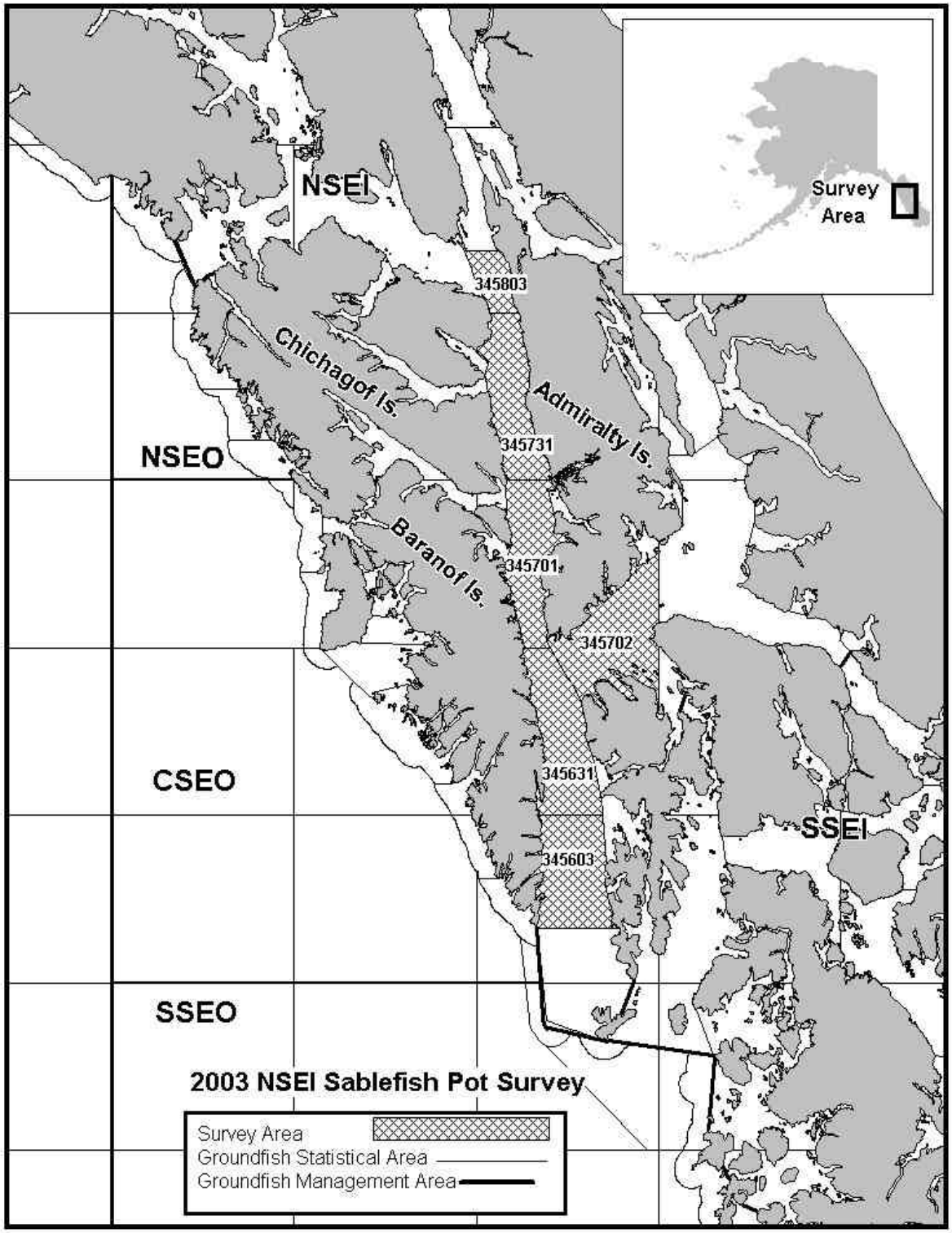


Figure 1. Sablefish survey area, NSEI pot survey, 2003.

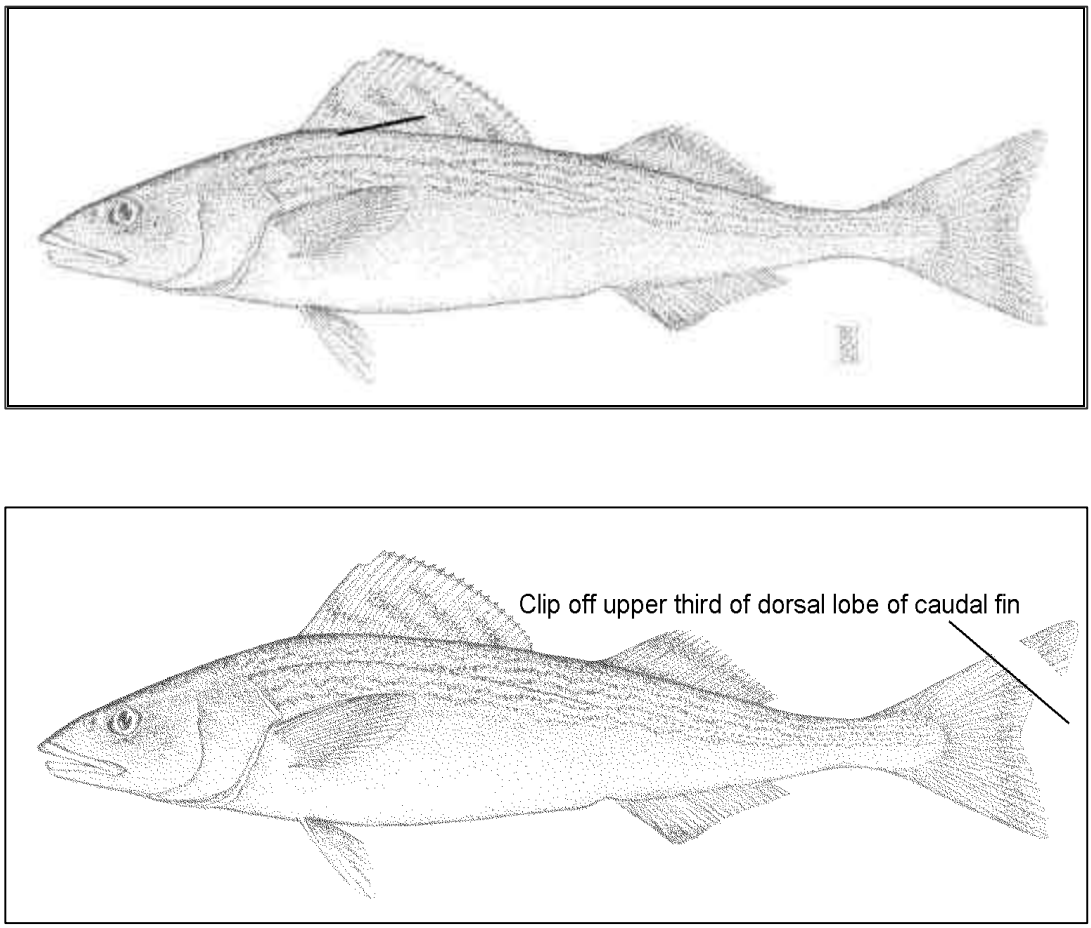


Figure 2. Sablefish marks, NSEI pot survey, 2003.

Figure 3. *F/V Melissa Lynn* setting gear, NSEI pot survey, 2003.

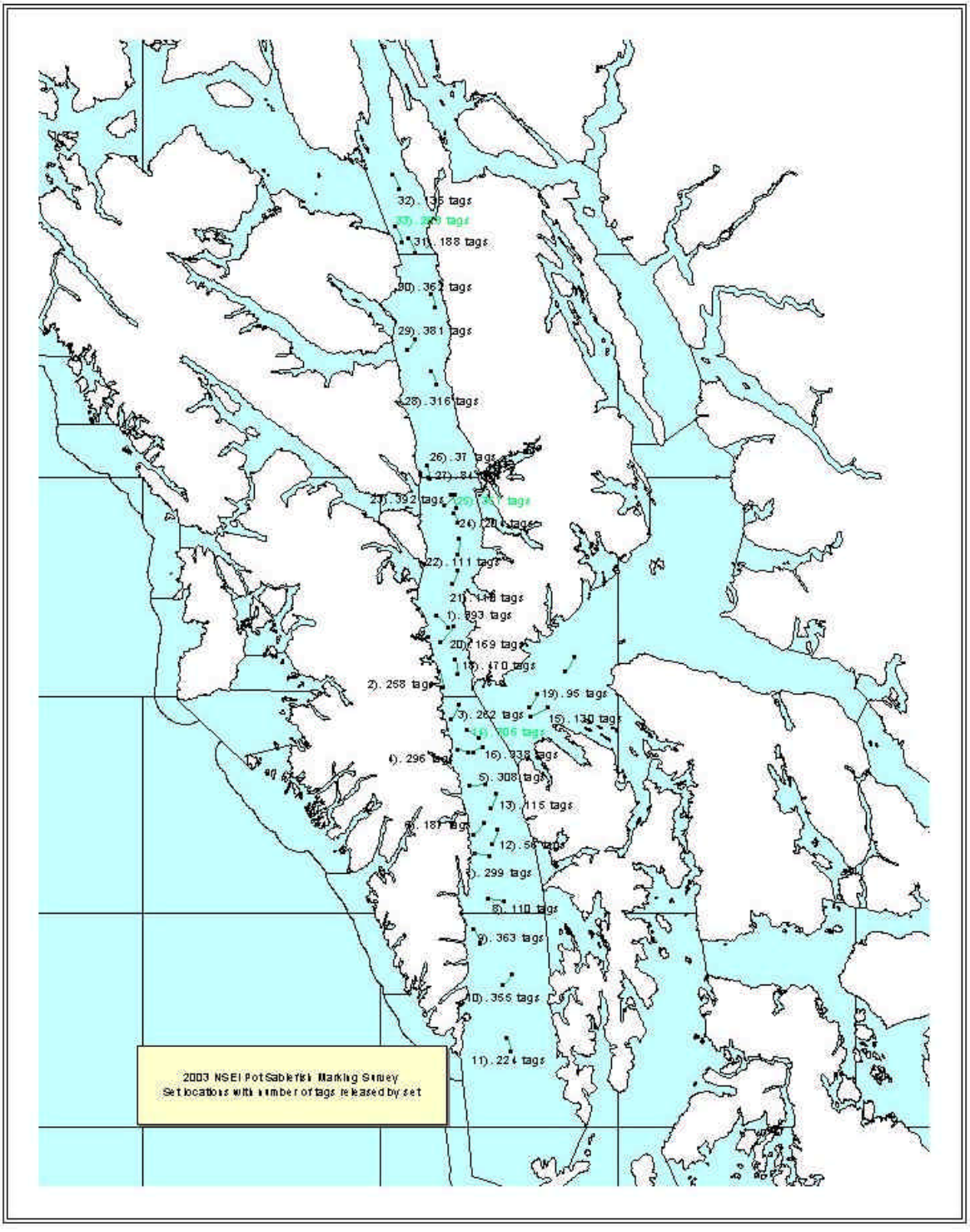


Figure 4. Set locations and number of tags released per station, NSEI pot survey, 2003.

Figure 5. Stacked sablefish pots, NSEI pot survey, 2003.

Figure 6. Sablefish pot hooked to groundline, NSEI pot survey, 2003.

Figure 7. Sash weight, NSEI pot survey, 2003.

Figure 8. Anchor and buoys, NSEI pot survey, 2003.

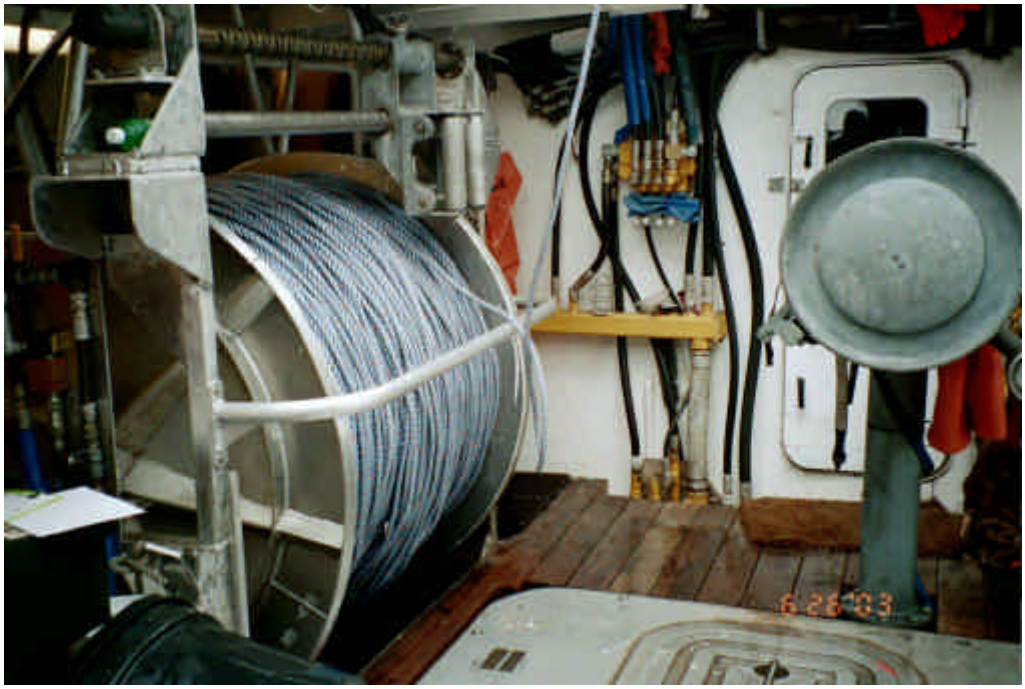


Figure 9. Slack-taking reel, NSEI pot survey, 2003.

Figure 10. Hanging bait, NSEI pot survey, 2003.

Figure 11. Dumping a pot into the hopper, NSEI pot survey, 2003.

Figure 12. Sablefish in hopper, NSEI pot survey, 2002.

Figure 13. Recording data, releasing sablefish into chute, and placing the next sablefish, NSEI pot survey, 2002.

Figure 14. Tagging a sablefish, NSEI pot survey, 2003.

Figure 15. Clipping upper lobe of caudal fin of sablefish, NSEI pot survey, 2003.

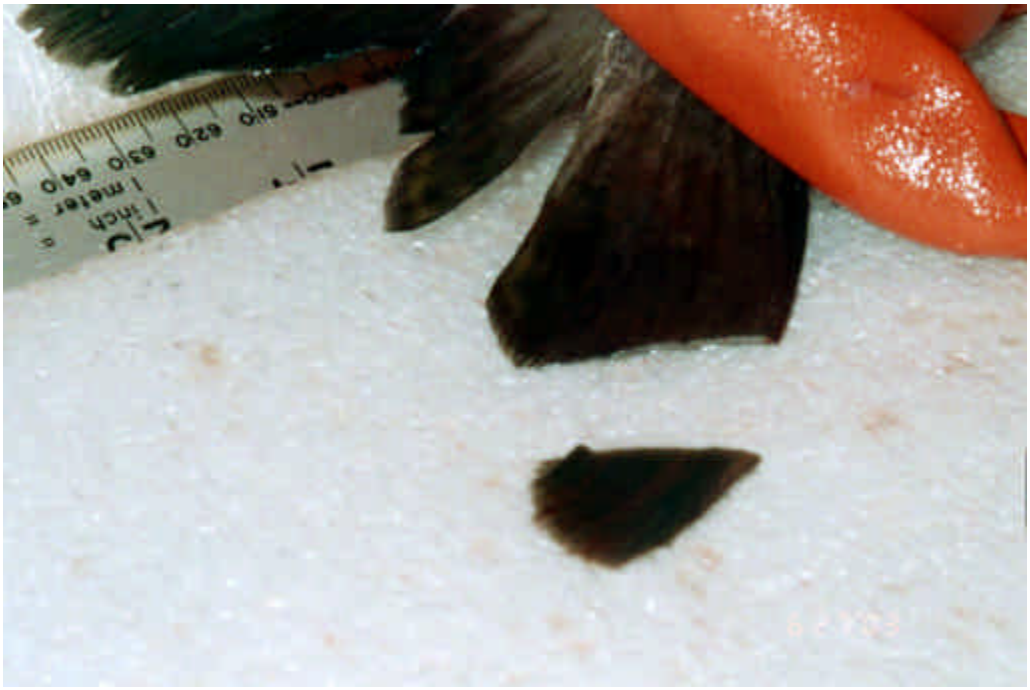


Figure 16. Fresh cut upper lobe of caudal fin on sablefish, NSEI pot survey, 2003.

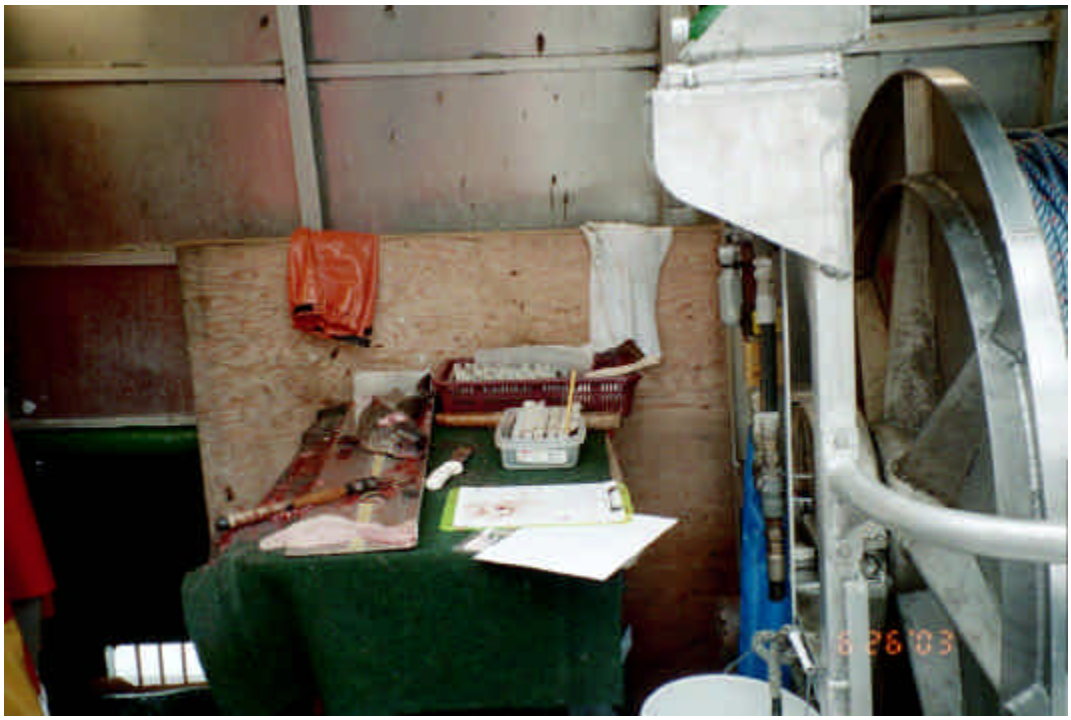


Figure 17. Sampling station, NSEI pot survey, 2003.

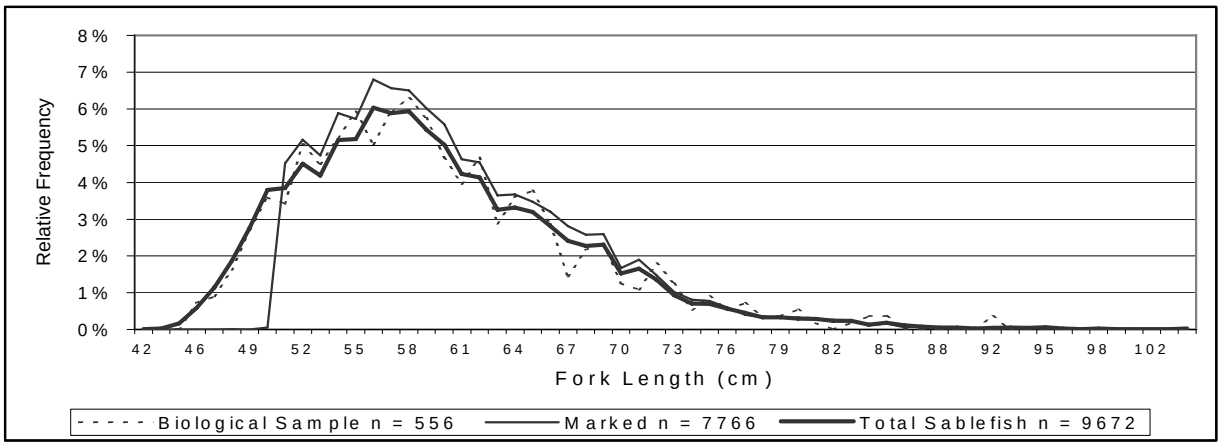


Figure 18. Percent frequency of lengths of marked, sampled and total sablefish, NSEI pot survey, 2003.

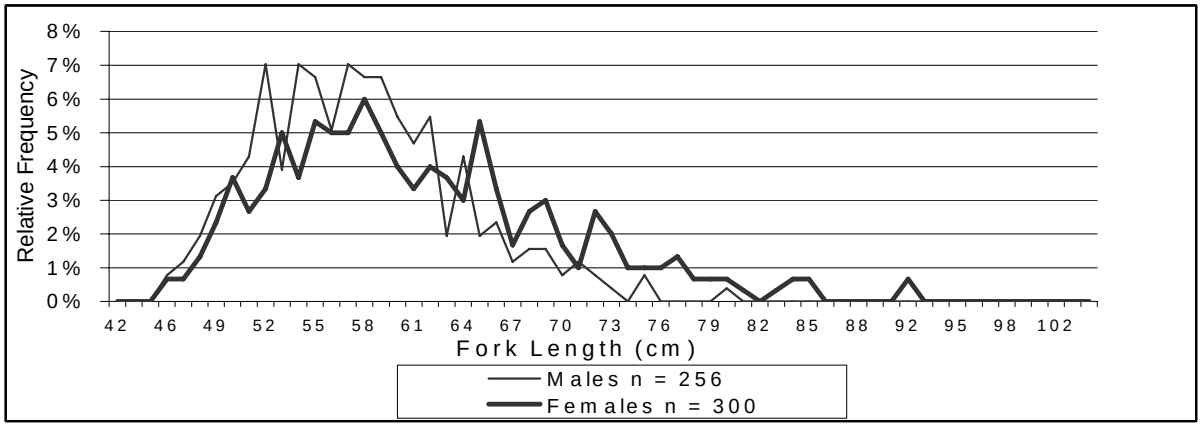


Figure 19. Sablefish lengths by sex from biological samples, NSEI pot survey, 2003.

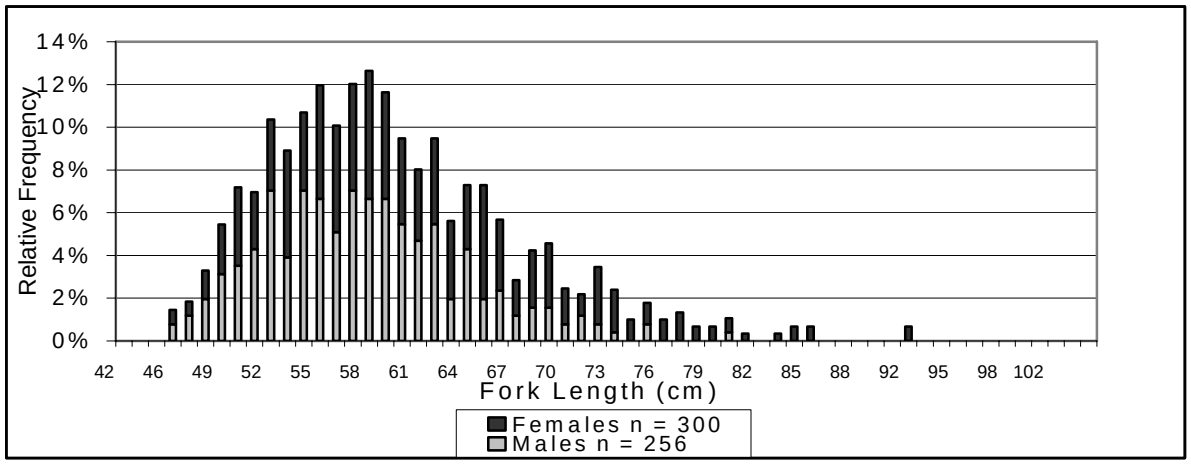
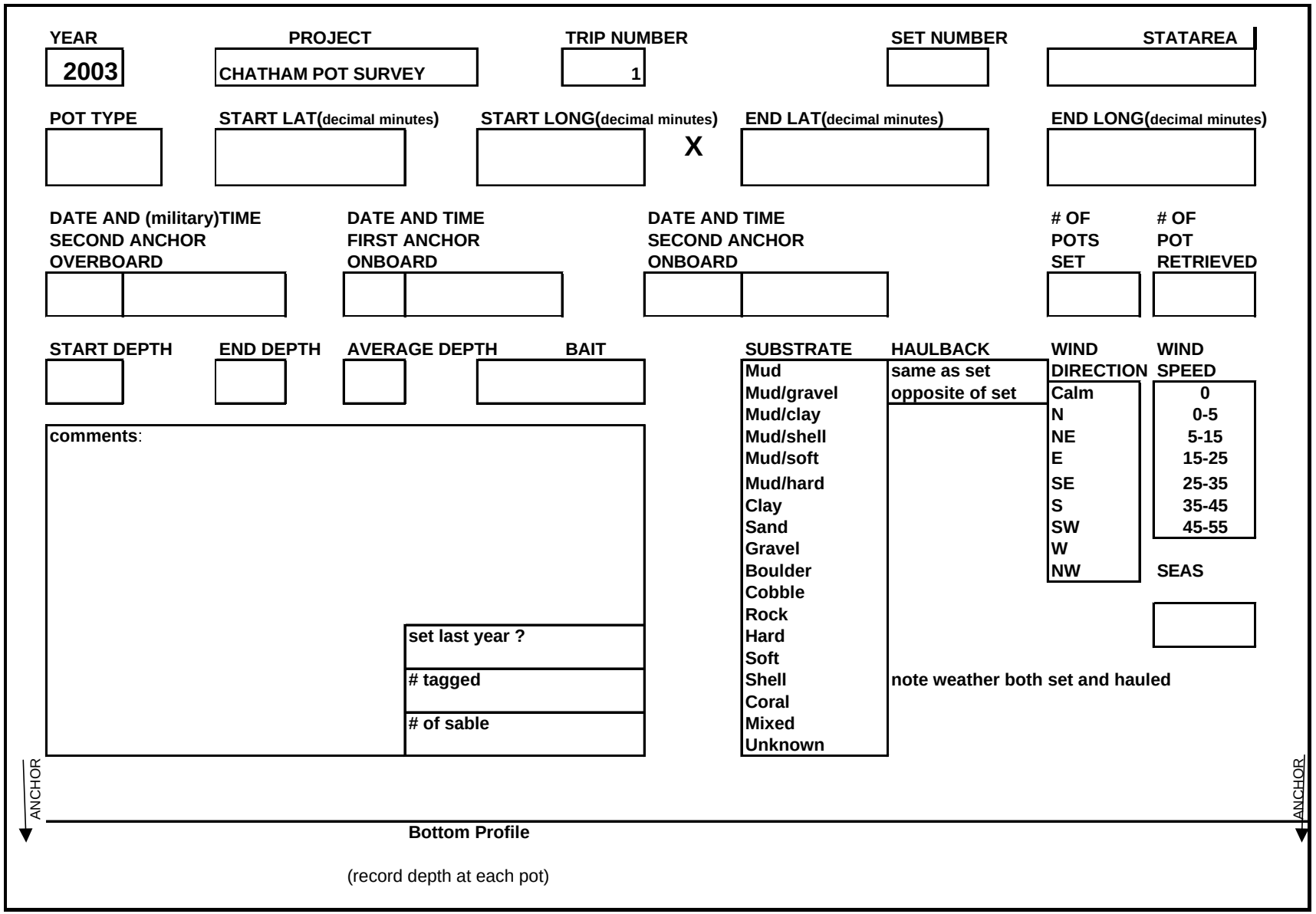


Figure 20. Sablefish lengths by sex as portion of total lengths, NSEI pot survey, 2003.

Figure 21. Pacific sleep shark in caught sablefish pot, NSEI pot survey, 2003.

APPENDICES

Appendix A. Sablefish Pot Survey Set Form, NSEI 2003.



Appendix B. Sablefish Pot Survey Tag Release Form, NSEI 2003.

Project: NSEI Sablefish Pot Survey Tag Release Form **Set**_____

Year_**2003**__ **Trip** ___**1**_ __ **Date**_____ **Pg no.**____

(number sets consectutivelythroughout trip)

	TAG NUMBER	LENGTH	COMMENTS		TAG NUMBER	LENGTH	COMMENTS
1				26			
2				27			
3				28			
4				29			
5				30			
6				31			
7				32			
8				33			
9				34			
10				35			
11				36			
12				37			
13				38			
14				39			
15				40			
16				41			
17				42			
18				43			
19				44			
20				45			
21				46			
22				47			
23				48			
24				49			
25				50			

Tagger _____ **Recorder**_____

Appendix 2. Sablefish Maturity Codes.

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 vained. (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 coming year. More veined. Cloudy, but not necessiarily 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. Noticible folical structure.

(R J 1982, 1987, 1994, 1997. Maturity code 6 (resting) added J 1994)

The Alaska Department of Fish and Game administers all programs and activities free from discrimination based on race, color, national origin, age, sex, religion, marital status, pregnancy, parenthood, or disability. The department administers all programs and activities in compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972.

If you believe you have been discriminated against in any program, activity, or facility, or if you desire further information please write to ADF&G, P.O. Box 25526, Juneau, AK 99802-5526; U.S. Fish and Wildlife Service, 4040 N. Fairfield Drive, Suite 300, Arlington, VA 22203; or O.E.O., U.S. Department of the Interior, Washington DC 20240.

For information on alternative formats for this and other department publications, please contact the department ADA Coordinator at (voice) 907-465-4120, (TDD) 907-465-3646, or (FAX) 907-465-2440.