UNITED STATES DEPT. OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

NATIONAL MARINE FISHERIES SERVICE

ALASKA FISHERIES SCIENCE CENTER

SEATTLE, WASHINGTON

Manual for Biologists

Aboard Domestic Groundfish Vessels

1991

[Revised December 1991]
11/27/91

PREFACE

This manual has been prepared to assist you in your duties as an observer aboard domestic groundfish vessels operating in the eastern Bering Sea and Northeast Pacific. This manual plus training sessions and your perusal of reports filed by previous observers should adequately prepare you for your observer experience. It must be borne in mind, however, that conditions can and do change and that no set of instructions covering as broad an area as we have attempted to cover here can ever be complete. It is therefore the responsibility of the observer to objectively evaluate each unfamiliar situation on the vessel before deciding on a course of action. Study the manual carefully, refer to it often and consider ways in which it may be improved as a guide for future observers.

TABLE OF CONTENTS

ROLE OF THE OBSERVER IN THE DOMESTIC FISHERIES OBSERVER PROGRAM .... 1 - 1
OBSERVER DUTIES AND PRIORITIES .... 1 - 3
CONFIDENTIALITY OF OBSERVER DATA .... 1 - 3
STANDARDS OF OBSERVER CONDUCT .... 1 - 4
CONFLICT OF INTEREST STANDARDS .... 1 - 5
SPECIAL CAUTION ON DEPORTMENT .... 1 - 5
RESPONSIBILITIES OF VESSEL AND PLANT OPERATORS .... 1 - 7
PROHIBITED ACTIONS .... 1 - 9

PREPARATION AND DEPARTURE .... 1 - 10
COMMUNICATIONS .... 1 - 10
THE TRAINING PERIOD .... 1 - 11
Domestic Observer Training Syllabus .... 1 - 11
OBSERVER CLOTHING AND EQUIPMENT .... 1 - 14
Personal Items Supplied by Observer .... 1 - 15
Sampling Gear Provided by NMFS .... 1 - 16
Preparation and Care of Sampling Equipment .... 1 - 20
TRAVEL TO THE SHIP .... 1 - 21
Shipment of Gear .... 1 - 21
Expenses Incurred While Traveling .... 1 - 22
Transport to Port .... 1 - 22
ARRIVAL ABOARD THE SHIP .... 1 - 22
Living Conditions Aboard Vessels .... 1 - 22
Illness and Accidents Aboard .... 1 - 23
Safety Aboard Vessels .... 1 - 25
Safety in At-Sea Transfers .... 1 - 27
First Days On Board .... 1 - 28

OBSERVER OBJECTIVES AND GENERAL INSTRUCTIONS .... 1 - 30
SAMPLING DUTIES FOR VESSEL OBSERVERS .... 1 - 30
RANDOM SAMPLE TABLE .... 1 - 32
GENERAL INSTRUCTIONS FOR DATA FORMS .... 1 - 35
Cruise Numbers And Vessel Codes .... 1 - 35
Sampling Over The Change To A New Year .... 1 - 36
When A Vessel Fishes With More Than One Type of Gear .... 1 - 36
Page Numbering .... 1 - 36
Calculation Guidelines: The Rounding Rule .... 1 - 36

HAUL SUMMARY FORM 2US FOR U.S. TRAWLERS .... 2 - 1
FORM 2US - EXAMPLE .... 2 - 2
FORM 2US--HAUL FORM INSTRUCTIONS .... 2 - 3
VESSEL FISHING AND CUMULATIVE PRODUCTION LOGS .... 2 - 8
RETAINED CATCH WEIGHT ESTIMATIONS .... 2 - 8
Retained Catch Estimation Methods for Catcher-Only Vessels .... 2 - 9
Retained Catch Estimation Methods for Catcher/Processor Vessels .... 2 - 11
Preferences - Detailed Review .... 2 - 14
OFFICIAL TOTAL CATCH WEIGHT ESTIMATIONS .... 2 - 15
OTC Weight Estimation Methods for Catcher-Only Vessels .... 2 - 15
OTC Weight Estimation Methods for Catcher/Processor Vessels .... 2 - 17
Preferences, Detailed Review .... 2 - 19
OBSERVERS TOTAL CATCH ESTIMATES .... 2 - 21

Methods for Observer Estimates of Codends . . . . . 2 - 22
Density Sampling . . . . . 2 - 23
Observer Estimates by Bin Volume . . . . . 2 - 24

SPECIES COMPOSITION OF THE CATCH . . . . . 3 - 1
FORM 3US - EXAMPLES . . . . . 3 - 2
FORM 3US - INSTRUCTIONS . . . . . 3 - 6
DEFINITIONS OF SAMPLING TERMS . . . . . 3 - 8
OBJECTIVES AND RULES FOR SPECIES COMPOSITION SAMPLING . . . . . 3 - 9
METHODS OF SPECIES COMPOSITION SAMPLING . . . . . 3 - 10
Whole-Haul Sampling . . . . . 3 - 11
Partial Haul Sampling . . . . . 3 - 14
Basket Sampling . . . . . 3 - 15
Mixing of Hauls . . . . . 3 - 17
PROHIBITED SPECIES SAMPLING . . . . . 3 - 18
BIOLOGICAL DATA COLLECTED FROM PROHIBITED SPECIES . . . . . 3 - 20
Collecting Data From Salmon and Steelhead . . . . . 3 - 20
Collecting Data From King and Tanner Crab . . . . . 3 - 21
Collecting Data From Halibut . . . . . 3 - 22
Viability of Halibut . . . . . 3 - 22

SPECIES IDENTIFICATION . . . . . 3 - 24
ROCKFISH SPECIES DESCRIPTION FORM . . . . . 3 - 25
FLATFISH SPECIES DESCRIPTION FORM . . . . . 3 - 27
MISC. SPECIES DESCRIPTION FORM . . . . . 3 - 29

SPECIES CODE LIST . . . . . 4 - 1

DEFINITION OF HALIBUT CONDITION . . . . . 4 - 7

DEFINITION OF KING CRAB AND TANNER CRAB CONDITION . . . . . 4 - 8

USEFUL FORMULAS YOU MAY NEED . . . . . 4 - 9

TABLE OF EQUIVALENTS . . . . . 4 - 10
CONVERTING POUNDS TO METRIC TONS . . . . . 4 - 10

RELATIONSHIP OF HALIBUT LENGTHS TO WEIGHT (LIVE WEIGHT) . . . . . 4 - 11

LENGTH FREQUENCIES . . . . . 4 - 13
FORM 7US--LENGTH FREQUENCY OF MEASURED SPECIES . . . . . 4 - 14
LENGTH FREQUENCIES OF PROHIBITED SPECIES . . . . . 4 - 15
SELECTION OF A SAMPLING SPECIES . . . . . 4 - 15
SPECIAL PROJECTS, SAMPLING SPECIES AND LENGTH FREQUENCIES . . . . . 4 - 16
LENGTH FREQUENCY SAMPLING METHOD . . . . . 4 - 17

SCALE SAMPLES AND RANDOM STRATIFIED OTOLITH SAMPLES . . . . . 4 - 20
FORM 9US INSTRUCTIONS . . . . . 4 - 21
RANDOM STRATIFIED OTOLITH SAMPLING . . . . . 4 - 24
OTOLITH REMOVAL . . . . . 4 - 25
SCALE SAMPLES . . . . . 4 - 27

MARINE MAMMALS . . . . . 5 - 1
FORM 10US - MARINE MAMMAL INCIDENTAL CATCH DATA . . . . . 5 - 1

Common and Scientific Names and Species Codes for Marine Mammals ..... 5 - 4
Length Measurements of Seals and Sea Lions ..... 5 - 9
Collection of Sea Lion and Fur Seal Teeth ..... 5 - 10
FORM 11(A) - MARINE MAMMAL SIGHTING FORM ..... 5 - 11
Pacific Whiteside Dolphin Description ..... 5 - 17
Dall's Porpoise Description ..... 5 - 18
Northern Right Whale Dolphin Description ..... 5 - 19

OBSERVING ON LONGLINE AND POT FISHING VESSELS ..... 5 - 21
CATCH RATE ESTIMATES ..... 5 - 22
FORM 1US CATCH SUMMARY FOR LONGLINE AND POT VESSELS ..... 5 - 25
SPECIES COMPOSITION SAMPLING ON LONGLINERS ..... 5 - 29
SPECIES COMPOSITION SAMPLING ABOARD POT FISHING VESSELS ..... 5 - 30
EXAMPLE FORM 3US FOR LONGLINE AND POT VESSELS ..... 5 - 31
FORM 3US - INSTRUCTIONS FOR LONGLINE OR POT VESSELS ..... 5 - 32
OTHER SAMPLING REQUIREMENTS ..... 5 - 32
CATCH MESSAGE FORMS A & B FOR LONGLINE AND POT VESSELS ..... 5 - 33

PROCESSING PLANT OBSERVER INSTRUCTIONS ..... 5 - 35
SAMPLING WORKLOAD ..... 5 - 35
FORM A - PORT SAMPLE SUMMARY FORM ..... 5 - 36
SAMPLING INSTRUCTIONS ..... 5 - 41
PLANT OBSERVER WEEKLY CATCH MESSAGES ..... 5 - 42
DOMESTIC OBSERVER PLANT REPORT ..... 5 - 43

TELEPHONE, RAPIDFAX, TELEX NUMBERS, ETC. ..... 6 - 1

INSTRUCTIONS FOR WEEKLY CATCH MESSAGES ..... 6 - 2
Notes for Observers Aboard "Floaters" ..... 6 - 4
BSA AREA MAP ..... 6 - 4
BSA/GOA BOUNDARY MAP ..... 6 - 5
GOA AREA MAP ..... 6 - 7
REPORT GROUPS AND CODES FOR CATCH MESSAGES ..... 6 - 6
Bering Sea/Aleutians ..... 6 - 6
Gulf of Alaska ..... 6 - 8
CATCH MESSAGE FORM A EXAMPLE ..... 6 - 10
CATCH MESSAGE FORM A - INSTRUCTIONS ..... 6 - 11
Determination of Report Week of Catch for Catch Messages ..... 6 - 11
CATCH MESSAGE FORM B EXAMPLE ..... 6 - 16
CATCH MESSAGE FORM B - INSTRUCTIONS ..... 6 - 17
FORMAT FOR TELEX CATCH MESSAGES ..... 6 - 18
SPECIAL PROBLEMS ..... 6 - 23
If Your Ship Fishes Outside of the EEZ ..... 6 - 23
Lack of Sampling Data from an Area or Gear Type for a Day Fished ..... 6 - 23
Two Distinct Types of Fishing Strategy within a Day ..... 6 - 23

DAILY CATCH MESSAGES ..... 6 - 24

DIAGONAL BOUNDARY LINE TABLES FOR THE BERING SEA ..... 6 - 27

LOGBOOK ENTRIES ..... 6 - 32

DOMESTIC OBSERVER REPORTS ..... 6 - 33

MULTIPLE CHOICE AND WRITTEN QUESTIONS ..... 6 - 33
MAP OF AREAS FISHED ..... 6 - 45
BOTTOM TRAWL GEAR DIAGRAM ..... 6 - 46
PELAGIC TRAWL GEAR DIAGRAM ..... 6 - 47
LONGLINE GEAR DIAGRAM ..... 6 - 48

HOW TO SURVIVE DEBRIEFING ..... 6 - 49
PREPARATION ..... 6 - 49
Data Preparation ..... 6 - 51
THE DEBRIEFING PROCESS ..... 6 - 57
Gear Check-In ..... 6 - 58
The Interview ..... 6 - 58
Affidavits ..... 6 - 58
Decertification ..... 6 - 59

APPENDIX ..... 7 - 1
THE 43 MOST COMMON MISTAKES ON DATA FORMS ..... 7 - 2
TABLE OF EQUIVALENTS ..... 7 - 4
Conversion of Pounds to Kilograms ..... 7 - 4
HALIBUT LENGTH TO WEIGHT TABLE ..... 7 - 5
OBTAINING INFORMATION ON PRODUCT RECOVERY RATES ..... 7 - 7
Worksheet For Product Recovery Rate and Unit Weight Tests ..... 7 - 9
FORM 8US - PRODUCT RECOVERY RATES ..... 7 - 10
LIST OF ALASKA PRODUCT TYPES ..... 7 - 12
NMFS PRODUCT RECOVERY RATES ..... 7 - 13
NMFS REPORT GROUP CODES FOR LOGBOOKS AND CATCH MESSAGES ..... 7 - 14
TAGGED FISH AND CRAB ..... 7 - 15
HOW TO SEX FISH ..... 7 - 17
LENGTH MEASUREMENTS FOR VARIOUS SPECIES ..... 7 - 20
OTOLITH AND SCALE COLLECTION FOR SELECT SPECIES ..... 7 - 22
LOCATION OF PREFERRED SCALE SAMPLING ZONES ..... 7 - 24
HOW TO COLLECT FISH ..... 7 - 25
Specimens Needed For Teaching Collection ..... 7 - 26
Specimen Collection Form ..... 7 - 27
MARINE MAMMAL SPECIMEN COLLECION PERMIT ..... 7 - 33
HOW TO MEASURE MESH SIZE ..... 7 - 36
HOOK SIZE CHART FOR LONGLINERS ..... 7 - 37
ADVICE TO WOMEN GOING TO SEA ..... 7 - 38
RADIO COMMUNICATIONS ..... 7 - 41
MEDICAL DIAGNOSTIC CHART (MDC) ..... 7 - 46
CPR INSTRUCTION SHEET ..... 7 - 52
HELICOPTER EVACUATION SHEET ..... 7 - 53
PREVENTING BACK INJURIES ..... 7 - 54
MAP OF NOAA WESTERN REGIONAL CENTER ..... 7 - 55
MAP OF OBSERVER PROGRAM FACILITIES ..... 7 - 56
CHARTS OF ALASKAN PORTS ..... 7 - 57
Dutch Harbor ..... 7 - 57
Kodiak ..... 7 - 58
Seward ..... 7 - 59
GLOSSARY ..... 7 - 60

ROLE OF THE OBSERVER IN THE DOMESTIC FISHERIES OBSERVER PROGRAM

As American harvest of groundfish resources replaced the foreign and joint venture fisheries, domestic observer programs were implemented to provide biological data to take the place of the data base formerly provided by the Foreign Fisheries Observer Program. The re-authorization of the Marine Mammal Protection Act of 1972 mandates observer coverage of 20 - 35% of groundfish trawlers to monitor incidental take of marine mammals but this coverage requirement will be superseded by a domestic observer program created by amendments to the Bering Sea and Gulf Of Alaska Groundfish Fishery Management Plans. Under the new program, there is a 100% observer coverage requirement on all vessels 125 feet or greater in length and 30% coverage on vessels from 60 - 125 feet. Processing plants which receive 1,000 metric tons (mt) or more of groundfish in a month must have 100% observer coverage during that month and plants which receive 500 - 1,000 metric tons in a month must arrange for observer coverage 30% of the days of that month. Though the stocks of fish are now harvested by U.S. vessels, the need for observers to make independent observations of the fishing operations has not changed.

The primary objectives of the observers are to: record fishing effort and obtain daily catch rates; determine species composition; monitor for the incidental take of marine mammals; gather data on species, size, and age compositions; determine incidence of Pacific halibut, salmon, king crab and Tanner crab in the landings; and report on possible violations of U.S. fishing regulations. The estimates of catch rates by species obtained through the observers, will be compared with weekly production data reported by vessels to enable the National Marine Fisheries Service (NMFS) to estimate total daily landings of the various fisheries and pace the progress of the groundfish fisheries towards the quotas.

Data collected by observers aboard U.S. fishing vessels will be used in much the same way as data collected by observers in foreign and joint venture fishery operations. The data will be used in: helping to assess the status of the stocks; estimating the bycatch rates of non-target and prohibited species; investigating population interrelationships; assessing the impacts of proposed fishery management plan amendments; assessing the impacts on fisheries of proposed actions by other federal agencies (e.g. oil leasing); assisting fishery development activities; and analyzing fishery-marine mammal interactions.

Data obtained by the observers on catch size and species composition will give fishery biologists some idea of the catch per unit effort of each species in a fishery, an important factor in determining the status of the stocks. Length frequencies and age structure collections of the target species obtained from the commercial catch are also vital in determining the condition of a fishery resource, and hence, of determining how much is available to be caught without causing fishery deterioration. Mathematical models used to assess certain fish populations (such as Shelikof Strait pollock, Bering Sea pollock, yellowfin sole, Greenland turbot, and others) are dependent upon a measure of the current age composition of the commercial catch. Without these data and models, the ability of fishery scientists to determine the condition of commercially important stocks of fish would be diminished. Resulting decisions on allowable catches will be based on a higher degree of uncertainty and thus may be more conservative.

Another important use of observer data is to obtain estimates of the percentage of bycatch in each of the domestic fisheries. As one fisherman's discarded bycatch may be another fisherman's target species, the determination of bycatch rates is important in calculating the total removal of each species. This also applies to the determination of the incidence of salmon, halibut, and crab in the groundfish catches. These data, along with individual size, average weight, viability, and distribution data can help determine the impact the groundfish fisheries have on the shellfish, salmon, and halibut fisheries and provide information for studies of ways of reducing that impact. As a step in that direction, the prohibited species management proposals developed by the North Pacific Fishery Management Council's, (NPFMC's), Bycatch Committee require that each target fishery's bycatch requirements be estimated annually based upon the best estimates of bycatch rates from each target fishery. Without data provided by domestic observers, data from some other source such as joint venture catch rates would have to be used to determine domestic annual processing (DAP) bycatch needs and to set the bycatch caps by which those DAP fisheries will be managed. Bycatch data collected by observers will be beneficial to both the industry and fishery managers in determining realistic DAP bycatch needs.

Data obtained by domestic observers should be useful in studying particular fisheries questions, such as the stock relationships between pollock caught in the Shelikof Straits and those caught off East Kodiak. Another study in which observer information may play a part is analyzing the extent of interaction between killer whales and sablefish longline fishermen. Observer data will be used to estimate the frequency of the interactions and the economic impact to the fishermen of killer whale predation. In addition to planned uses, there are many other uses of data which come up as the need arises. Examples include the use of the data to help estimate the impact of impending oil lease sales on the commercial fisheries, or the location of marine cables or closed military activity areas. Our experience with the Foreign Fishery Observer Program has indicated that it is impossible to foresee all of the important questions that the observer data may help answer.

Because the management councils are dependent upon the data obtained by observers in order to assess the impact of fisheries upon the stocks, the necessity for accuracy in data collections, accurate determinations of species, and complete fulfillment of the sampling plan cannot be over stressed. Data forms must be carefully completed and checked. Sample forms in this manual serve as guidelines. (All observer data and reports are subject to certain restrictions of the Privacy Act and Trade Secrets Act, so any private use of them must be cleared by your contracting agency, who must receive permission from the National Marine Fisheries Service--please refer to the "Confidentiality ..." section which follows.)

This manual, along with the training sessions, should adequately prepare you for an observer trip. Because of the variations in fish handling by different ships, observers may be confronted with sampling problems not fully covered in the training sessions. We ask that you adapt to whatever sampling procedure is necessary to insure unbiased samples and devise sampling methods that insure representative samples of the landings for your ship. If you devise your own sampling procedure, make sure that you are able to collect all of the necessary data we ask you to obtain.

OBSERVER DUTIES AND PRIORITIES

Primarily, the observer's duties and priorities consist of collecting catch information, determining catch weight estimates, sampling for species composition and the incidence of king crab, Tanner crab, halibut and salmon in the catch, collecting biological data on various species, and watching for incidental take of marine mammals. Priorities may change according to cruise, so observers will be notified of the specific duties and priorities. A list of the observers main duties is given below.

1. Record daily fishing effort and catch rate information. Special instructions will be issued describing methods of obtaining these estimates and how your estimates of catch should be used.

2. Record species, numbers, and viability of incidentally-caught marine mammals and occurrence of marine mammals in the fishing areas.

3. Determine the species composition of the catch according to specified instructions.

4. Record the numbers, and weights, of certain "prohibited species" in the catch as per instructions. These species include, but may not be limited to: king crab, Tanner crab, halibut and salmon.

5. Send a summary of this information (items 1 - 4) to Seattle weekly. On time & Accurate

6. Obtain biological data and samples on target and other species as directed. This may include length frequencies, sexes, otoliths or scales for ageing, stomach content samples, or other information as requested.

7. Observe the compliance or lack of compliance to U.S. fishing regulations and document instances of violations when observed.

8. Prepare a final report for the vessel which includes complete answers to report questions that are pertinent.

CONFIDENTIALITY OF OBSERVER DATA

The fishermen are concerned that the information you are collecting can be obtained by anyone who may be interested in finding out where a particular boat caught fish. If this is brought up to you, reassure them that the information you are collecting is handled under strict rules of confidentiality and that you (the observer) are bound by the confidentiality rules as well. If you are asked by vessel personnel about another vessel you were on, explain that just as you can't talk about this vessel after you get off it, so you can't tell them about a previously observed vessel.

Observers must know that all data collected are the property of the U.S. government. No observer can retain or copy any data or reports following their return unless granted express permission of the National Marine Fisheries Service. This includes information used as part of a school project, thesis paper, articles for publication, or interview with news media. The main reason for this restriction is due to the Privacy Act, which protects the privacy rights of the vessel owners. NMFS also reserves the right to review for accuracy the draft for any article or publication concerning your observer experiences. Any questions concerning this or requests for permission should be directed to Russell Nelson.

STANDARDS OF OBSERVER CONDUCT

[Note: This is a copy of the text from the regulation which implements the observer program. Further instructions regarding conduct follows in the "Special Cautions ..." section.]

Observers must abide by the standards of conduct listed in Title 15 CFR Subtitle A, Part O of the Department of Commerce Regulations. In addition, the observer must avoid any behavior which could adversely affect the confidence of the public in the integrity of the program. Observers are thus expected to conduct themselves in a manner which will reflect favorable upon the program. This means acting in an honest, professional, business-like manner in all situations. Specific guidelines follow:

1. Observers must diligently perform their assigned duties.

2. Observers must accurately record their sampling data, write reports, and report honestly any suspected violations that are observed. Falsification of observer data will be grounds for decertification.

3. Observers must keep all collected data and observations made on board the vessel or in the processing plant confidential according to the Federal guidelines on confidentiality.

4. Observers must refrain from engaging in any illegal actions or any other activities that would reflect negatively on their image as professional scientists, on other observers, or on the observer program as a whole. These actions or activities include, but are not limited to:

   a) excessive drinking of alcoholic beverages (however, if the vessel or shoreside facility maintains a stricter alcoholic beverage policy for its employees, then the observers must comply with said policy);

   b) use or distribution of illegal drugs; and

   c) physical or emotional involvement with vessel or shoreside processing plant personnel.

Behavior which is contrary to these standards or the intent of these standards are grounds for the decertification of the offending observer.

CONFLICT OF INTEREST STANDARDS

A NMFS-certified observer:

1. must be employed by an independent contracting agent certified by NMFS to provide observer services to the industry;

2. may not have a financial interest in the observed fishery;

3. may not have a personal interest in the vessel or shoreside facility to which he or she is assigned;

4. may not solicit, accept, or receive, directly or indirectly, a gift, whether in the form of money, service, loan, travel, entertainment, hospitality, employment, promise, or in any other form, that is a benefit to the observer's personal or financial interests, under circumstances in which the gift is intended to influence the performance of official duties, actions or judgement. it could be reasonably inferred that

SPECIAL CAUTION ON DEPORTMENT

As a fisheries observer:

1. You must abide by the standards of conduct developed by your hiring contractor.

2. When conflicts or sampling problems occur which affect your attempts to get unbiased samples of the catch (presorting of fish for example), you can usually work it out by talking with the crewmen, factory foreman or deck boss. If this doesn't help, talk to the captain and ask him to help you but don't be demanding in your attitude. Present a case which shows you have thought about both sides. Listen and consider their objections. Negotiate compromises as long as they don't interfere with your ability to get good data. If talking fails, contact your contractor or the Observer Program office for arbitration.

3. Maintain a friendly but professional demeanor to vessel personnel. Your behavior should be governed by remembering that, politically, you are highly visible. Before acting in any given situation, be mindful of the diplomatic nature and sensitivity of your position. Tactful, mature handling of problems is expected. Remember, you are on the job 24 hours per day.

4. Do not offer, even if asked, any <u>authoritative</u> advice on what a vessel can and cannot do under terms of the permit under which they are operating. If you know the answer to a question about fishing regulations, answer the question with a qualifying statement such as, "I think...". If you are not sure, admit it and refer the captain to the Code of Federal Regulations (CFR) book or to the NMFS Regional Office in Juneau.

5. Consumption of alcoholic beverages by observers at sea is prohibited. Remember that your conduct must be above reproach at all times. While in port, drinking a glass of wine or beer with a meal or having one or two drinks while relaxing during off hours is

permissible. When you are in port, your alcohol consumption should be kept at a very low level. Observers are not allowed to be intoxicated, much less drunk, while deployed. Anything that damages your character in the eyes of the people you are working with -- now or later -- is detrimental to your effectiveness on the job.

6. Observers should never accept gifts, (even of fish to take home), as this may appear to compromise your impartiality. You may not accept payment for any work you perform for the vessel (or plant, company, owner, or operator) during your employment as an observer. Any act which could be construed as acceptance of a bribe, such as responding favorably to an offer of future employment, must be avoided. Work on developing the large perspective of the arena you're in. What you say or do in the context of a private conversation may seem perfectly reasonable at the time, but how would it appear when written in a formal report?

7. An obvious point (but one of extreme importance) is the prohibition of any sexual activity with vessel or plant personnel while deployed as an observer. Besides the personal danger of sexually transmitted diseases, involvement with industry personnel detracts from your involvement with your work. Also, understand that an intimate relationship will be general knowledge in a short period of time. Vessels and fishing ports are very close knit communities; secrets are stock-in-trade. If NMFS observers develop relationships with members of the industry they are there to observe, it erodes the respect and professional credibility of the individual involved and that of all observers. No one operates in a vacuum, no one is exempt from community opinions. **Observers after you will be subject to the precedents you set.** This program's credibility rides with each and every observer. If a person you meet is special enough to warrant paying this terrible price, consider then, that the whole situation should be handled with respect and developed at an appropriate time. To act unprofessionally is purely self-indulgence and grounds for de-certification.

8. As an observer you will abide by all rules and regulations relating to the conduct of the host vessel. You shall not utilize, for any purpose other than obtaining required data, any species which the governing federal or state permit prohibits the vessel from fishing for or retaining, including especially salmon, halibut, crab, and marine mammals. (This includes eating them in the ship's mess, if served.) Do not accept or transport any item violating laws relating to endangered or protected species. There is a copy of a permit in the appendix of this manual which does allow you to bring back sea lion or fur seal canine teeth for age analysis by the National Marine Mammal Laboratory. However, no specimen materials may be taken from walrus.

9. If your host vessel is boarded by the Coast Guard, do not attempt to interfere with their activities, or those of NMFS enforcement agents, in any way. You may let them know that you are aboard, then stand by. Do not allow boarding officers to draw you into a discussion of your observations in front of vessel personnel. Tactfully suggest that if they wish to ask you any questions you'll be in your cabin (or go to some other place that's private).

10. Once you are aboard your sampling ship, avoid making visits to other vessels.

Sometimes other ships, tenders, or catcher boats may tie up to your vessel. Consider going aboard in these circumstances only if your transfer there and back can be made under extremely safe conditions and if your work performance is not affected. Do not make social visits to other vessels if they are not tied up to your vessel. Do not stay away from your vessel overnight. This is necessary to insure that planned levels of observer coverage are met.

11. Consider safety first in everything you do.

RESPONSIBILITIES OF VESSEL AND PLANT OPERATORS

An operator of a vessel must:

1. Provide, at no cost to the observer or the United States, accommodations on a participating vessel for the observer which are equivalent to those provided for crew members of the participating vessel;

2. Maintain safe conditions on the vessel for the protection of the observer during the time the observer is on board the vessel, by adhering to all U.S. Coast Guard and other applicable rules, regulations, or statutes pertaining to safe operation of the vessel and by keeping on board the vessel:
   a) adequate fire fighting equipment;
   b) one or more life rafts capable of holding all persons on board; and
   c) other equipment required by regulations pertaining to safe operation of the vessel.

3. Allow the observer to use the vessel's communication equipment and personnel on request for the transmission and receipt of messages

4. Allow the observer access to and the use of the vessel's navigation equipment and personnel on request to determine the vessel's position;

5. Allow the observer free and unobstructed access to the vessel's bridge, trawl or working decks, holding bins, processing areas, freezer spaces, weight scales, cargo holds and any other space which may be used to hold, process weigh, or store fish or fish products at any time.

6. Notify the observer at least 15 minutes before fish are brought on board for fish and fish products are transferred form the vessel to allow sampling the catch or observing the transfer, unless the observer specifically requests not to be notified;

7. Allow the observer to inspect and copy the vessel's daily fishing logbook, daily cumulative production logbook, transfer logbook, and any other logbook or document required by regulations, information from which will be kept confidential by the observer under Federal guidelines;

8. Provide all other reasonable assistance to enable the observer to carry out his or her duties;

9. Move the vessel to such places and such times as may be designated by the contractor, as instructed by the Regional Director, for purposes of embarking and debarking the observer;

10. Ensure that transfers of observers at sea via small boat or raft are carried out during daylight hours, under safe conditions, and with the agreement of the observer involved;

11. Notify the observer at least three hours before an observer is transferred so the observer can collect personal belongings, equipment, and scientific samples;

12. Provide a safe pilot ladder and conduct the transfer to ensure the safety of the observer during the transfer; and

13. Provide and experienced crew member to assist the observer in the small boat or raft in which the transfer is made.

A manager of a shoreside processing facility must:

1. Maintain safe conditions at the processing facility for the protection of the observer by adhering to all applicable rules, regulation,m or statutes pertaining to safe operation and maintenance of the processing facility;

2. Accept and provide for an observer, at no cost to the observer or the United States, for the purposes of complying with the Observer Plan;

3. Notify the observer on a daily basis of the planned facility operations and expected receipt of groundfish.

4. Allow the observer to use the processing facility's communication equipment and personnel on request for the transmission and receipt of messages;

5. Allow the observer free and unobstructed access to the processing facility's holding bins, processing areas, freezer spaces, weight scales, warehouses and any other space which may be used to hold, process, weigh or store fish or fish products at any time;

6. Allow the observer to inspect and copy the shoreside processing facility's daily cumulative production logbook, transfer logbook, and any other logbook or document required by regulations, information which will be kept confidential by the observer under Federal guidelines; and

7. Provide all other reasonable assistance to enable the observer to carry out his or her duties.

PROHIBITED ACTIONS

No person may:

1. Forcibly assault resist, oppose impede, intimidate, or interfere with an observer;

2. Interfere with or bias the sampling procedure employed by an observer, including sorting or discarding any catch before sampling; or tamper with, destroy, or discard an observer's collected samples, equipment, records, photographic film, papers, or personal effects without the express consent of the observer;

3. Prohibit or bar by command, impediment, threat coercion, or by refusal of reasonable assistance, an observer from collecting samples, conducting product recovery rate determinations, making observations or otherwise performing the observer's duties; or

4. Harass an observer by conduct which has sexual connotations, has the purpose or effect of interfering with the observer's work performance, or otherwise creates an intimidating, hostile, or offensive environment. In determining whether conduct constitutes harassment, the totality of the circumstances, including the nature of the conduct and the context in which it occurred, will be considered. The determination of the legality of a particular action will be made form the facts on a case-by-case basis.

PREPARATION AND DEPARTURE

COMMUNICATIONS

While deployed as an observer, it is not uncommon to feel as if you are "way out on a limb". Trying to communicate with your contractor and/or NMFS can be frustrating at times. Patience, perspective and maturity will be needed. Please remember that you are employed as a professional and all your communications should reflect this. Know that all voice radio communications at sea are **public**, not private. Transmitted messages are often passed through company offices as well as to your contractor and to NMFS so **no idle comments, offhand remarks, or unauthorized personal business please.** Make all messages complete, but concise and to the point. Remember that no one will be in the NMFS Seattle office on Saturdays, Sundays or federal holidays.

Observers will not receive mail through NMFS or their contractor while at sea. To receive mail while in training or after your cruise, you must make your own arrangements either through your contractor or the place where you're staying. Observers have had personal mail forwarded to and from the vessel through the fishing company, but keep in mind that this is done only as a favor to the observer and **no demands** can be made by an observer for this service. Any mail you wish to send out via the company must be stamped and ready for mailing. Do not send or expect to receive any personal messages while at sea except in the event of emergencies. Before you depart, provide the contractor with phone numbers and addresses of whom to contact in case of emergencies or drastic changes in your scheduled return. Any person listed should be notified to contact anyone else who should know of the change in plans or emergency. If a family emergency should arise at home, relatives should contact your hiring contractor.

The following information for the NMFS Observer Program is supplied for your reference.

	Addresses:
Becky Renko (catch messages) 1-800-437-9092	
Russ Nelson (supervisor) (206) 526-4194	Observer Program, F/AKC2
Janet Wall (supervisory assistant) (206) 526-4195	Alaska Fisheries Science Center
Bob Maier (program manager) (206) 526-6195	7600 Sand Point Way NE, Bldg. 4
Debriefing Office (206) 526-4192	Bin C15700
Gear Office (206) 526-6376	Seattle, WA 98115-0070
Karen Teig, Mike Brown or Sheryl Corey (training) (206) 526-4191	
Kodiak Office, Martin Loefflad, Rob Markle	1211 Gibson Cove Road, Suite B
Phone: (907) 486-6920, fax: (907) 486-6028	Kodiak, AK 99615
Observer Program Dutch Harbor Office	P.O. Box 638
Charlie Yustan, Carolyn Griffin	Dutch Harbor, AK 99692
Phone: (907) 581-2060 or -2063, fax: (907) 581-2066	

THE TRAINING PERIOD

The observer who requires certification training will spend approximately three weeks in Seattle for orientation and training. Training will consist mainly of learning how to identify common species of fish and crabs found in the Bering Sea and Northeast Pacific, explanations of the sampling procedures, and familiarization with groundfish fishing regulations. The following outline lists some of the activities covered during the training period. The outline is not necessarily complete and the items are not necessarily given in the order that they will be presented.

Domestic Observer Training Syllabus

Day 1

Orientation Day: Administrative information, introductions all around.
MFCMA and management of the EEZ, (brief overview lecture).
Slides and lecture on the history of N.E. Pacific groundfish fishing, commercially important fish, vessel types and their operations.
Observer sampling duties - emphasis on terminology, visual orientation and safety on board.
Seasickness, medical advice, living accommodations, clothing and other items to bring.
Communications - with home, NMFS.

Day 2

Slide show on Alaskan ports, safety in boarding and disembarking vessels, life at sea, hazards, and observer work.
Hardships, deportment, and conduct lecture.
Definitions of statistical areas, species report groups and prohibited species.
Fisheries regulations and the role of the observer.
Duties: objectives and priorities, workload.

Day 3

Species Identification: a general review of identification terminology and slides of various representatives of N.E. Pacific fish families: presented by a U.W. ichthyologist.
General instructions on data forms, ratio and proportion and the metric system.
Explanation of vessel logbooks.
Obtaining haul information: data form 2US.
Overnight, Form 2US homework assignment.

Day 4

Correction of homework and quiz over haul data form.
Estimation of catch size - by the observer and by the ship.
Catch Composition Sampling: determining a sample weight.
Data entry on species composition form 3US.
First exercise - homework practice assignment.

Day 5
Methods for random, representative and unbiased sampling.
Slide presentation on sampling.
Classroom practice of sampling methods and data entry.
Classroom practice of haul weight estimation.
Video on navigation and classroom practice on use of a navigational chart.

Day 6
Correction of homework.
Considerations and requirements for sampling shoreside delivery vessels.
Collecting biological information from Tanner crab, king crab, halibut and salmon in samples: weights and lengths, viability, sex, and salmon scale sampling.
Collecting data on tagged fish and crab.
Identification of Sebastes and Sebastolobus (rockfish) and other species: lecture, slides and laboratory session presented by U.W. ichthyologist.

Day 7
Vessel reporting requirements, production logbooks, ADF&G Fish Tickets.
Obtaining vessel production information and product recovery sampling.
Formatting weekly catch messages, (Catch Message Forms A and B) (lecture, classroom exercise and homework).
Safety video

Day 8
Correction of homework and assignment of 2nd data exercise.
Transmission of weekly and daily catch messages.
Identification of flatfish species: lecture, slides and laboratory session presented by U.W. ichthyologist.

Day 9
Length frequency sampling, (form 7US).
Otolith and scale sampling, (form 9US).
Fish dissection and otolith removal: slides and lab practice.
Species identification of crab: slides and classroom practice.
Safety video

Day 10
Safety videos and discussion on hypothermia, medical emergencies at sea, fire control and sea and shore survival.
Medivacs, radiotelephone procedures and preparation of a medical diagnostic chart.
Check-out of survival suits.
Survival suit and life-raft water practice.

Day 11
Correction of 2nd exercise homework
Receive special project instruction.
The Marine Mammal Protection Act, Exemption System and the observer's role
Recording information on marine mammals: as incidental take, (form 10); sightings, (form 11).
Guest Lecture: discussion and slides on identification of marine mammals at sea.

Day 12
Longline and pot fishing vessels: Slides of gear and fishing methods, sampling longline catches and recording data; computation of total catch.
Species identification of salmonids and lab practice review

Day 13
Species identification exam.
Guest Lecture: Dr. Aron, Director of Alaska Fisheries Science Center.

Day 14
Plant sampling - on-shore and aboard floating processors.
Marine Mammal watches for plant observers.
Gear issue: familiarization and care of equipment, gear check-out and calibration of scales.

Day 15
Final Exam.
Observer's logbook entries, methods of documentation.
Guest speaker: Debriefing supervisor discusses data review process and final reports.
Preparation for first day aboard.
Travel rules and parting information from contractors.
Review of previous cruise reports and reading files.

If a complete grasp of the duties is not demonstrated, the observer will not be certified. An observer will be de-certified or dismissed by their contractor if they violate rules of conduct, rules of data confidentiality, or lack the appropriate human relation skills necessary for the job.

Vessel and observer schedule arrangements are a difficult task. Though you may express a preference for a vessel type, an observer must be willing and able to accept any assignment. The observer-in-training should be prepared for changes in ship assignments and departure times. Some observers wait for their first vessel assignment longer than was originally planned, so be prepared for this eventuality, and be patient. Similarly, dates of return may also be affected by vessel schedules, so notify your contractor, before leaving, if you have any pressing dates soon after your expected return (such as the beginning of a school quarter).

After completing their trip at sea, observers report to their contractor to make an appointment for debriefing. Observers must then work with their contractor and the Program staff until their data forms and trip reports have been properly completed and have been accepted by NMFS. The debriefing process normally takes one or two weeks.

OBSERVER CLOTHING AND EQUIPMENT

NMFS will provide the scientific observers with adequate rainproof clothing and boots. All equipment necessary for the collection of biological data will be similarly provided. The observer is responsible for the transport and return of the sampling gear issued. If the observer needs replacements for torn raingear or lost equipment during their deployment, the field offices can usually re-supply them. The observer must make an effort not to lose and to prevent theft of the gear issued to them. If issued durable equipment is not returned (regardless of condition) when the gear is checked back in, the observer's contractor must replace it. Contractors may make the observer pay the replacement cost.

Observers will provide their own personal clothing, warm work clothes for wearing under raingear, toilet articles including a towel, and other items of a personal nature. A sleeping bag will be issued with the equipment. Unless otherwise informed, the vessel upon which the observer is to be stationed will be expected to provide adequate quarters and meals. It is expected that the vessel captain will allow the observer an adequate and safe space in which to carry out the sampling duties.

The following pages are lists covering the clothing and equipment necessary to perform 60 - 90 days sampling aboard a U.S. vessel.

Personal Items Supplied by Observer

The following is a recommended list of personal clothing. The amount and type of heavy clothing is dependent on personal preference, fishing area, and time of year.

Work clothes--minimum number and type

Shirts, wool - 2 (1 light, 1 heavy)
Shirts, cotton - 2
Shirts, cotton sweat - 1
T-shirts - 3
Trousers, wool work - 1
Trousers, cotton - 2
Wool knit cap
Slippers or sandals
Handkerchiefs, large - 3
Underwear, long-thermal - 2 pairs
Underwear - 5 pairs
Socks, wool work - 2 pairs
Socks, cotton - 5 pairs
Jacket, medium wool or synthetic - 1

Other items or articles

Towel, medium cotton - 2
Pillowcase - 1
Toilet articles
Duffel bag - sturdy, medium size, old or inexpensive - 1
Small daypack or knapsack - 1
Traveler's checks purchased with the cash advanced
If corrective lenses are used for eyesight - a spare pair

Optional/Recommended Items

Felt/wool boot insoles (not liners) - 2 pair
Needle and thread, safety pins, and duct tape for repairs
Camera and film
Watch and travel alarm
Medication for seasickness
Athlete's foot cream
Vitamins
Hand cream
Paperback books
Small cassette player and tapes
Water bottle (1 qt.) - to keep drinking water in your cabin

Sampling Gear Provided by NMFS

The following gear will be handed out during training class:

Observer Sampling Manual (1)
Mechanical Pencil (1) with extra lead
Eraser stick (1)
Highlighter pen (1)
Calculator (l)
Handouts - Key to the Families, Gadidae Key, Flatfish Key, Rockfish Key
Book by Hitz, rockfish i.d. (1)
Book by Eschmeyer, general fish i.d. (1)
Book by Leatherwood, marine mammal guide (1)
Species Identification Manual (in-house publication)
ADF&G Statistical Area Charts

To be packed loose in baskets:

Baskets (2 issued, maximum of 4) with at least one wooden lid
Set of castors or wheels for one or two baskets
Rope (one length, approximately 15 - 20 feet)
Scouring powder (l can)
Lubrication oil (l6 oz. bottle with applicator cap)
50 kg scale (l) - (observer should check accuracy with standard weights on all scales before leaving)
5 kg scale (l)
2 kg scale (l)
Scale hook
Fish gaff (1)
Tape measure (15 or 30 meter, reel-type)
Sponges (2)
Scale envelopes (50-200)
Plastic bags for salmon snouts (5)
Plastic bags (l0)
Glove liners (3 pair)
Wristers (2 pair)
Hardhat and chin-strap (l)
First aid kit (l) - (check contents for completeness)
Clipboards (2)
Logbook (l)
Shipping Label for basket (1)
Plastic measuring strips (3)
Length measuring board (1)
Plastic data sheets (5)

To be packed in cardboard box in basket:

Pencils #2 (6)
Pencils #3B (2) - (soft lead - for use on plastic forms)
Pens (4)
Eraser block (1)
Plastic ruler (1)
Looseleaf rings for extra forms (3)
Paper hole reinforcements
Thumbtacks and paper clips (1 container)
Rubber bands (1 container; about 40 rubber bands)
Forceps (1, or 2 if assigned to collect age structures)
Scalpel handles (2)
Hooked scalpel blades (10)
Tape measure (1 small, steel, 2 meter)
Thumb counter (1) - (longline observers take 3)
Earplugs (3 pair)
Sheath knife (1)
Whet stone (1)
Flashlight and batteries

The following items are checked out during gear issue:

Sleeping bag (1)
Survival suit, signal light, whistle (1 each)
Life vest (with whistle)
Rain pants and jacket (1 set)
Boots (1 pair)
Rubber gloves (3 pair)

Optional and special project equipment:

Extra baskets (4 total maximum of standard type)
Knee pads, recommended for catcher boats (1 pair)
Leg wrap bands, recommended for catcher boats (2 pair)
Mustang coveralls worksuit, only for those sampling on deck or on longline vessels
Longline observers - extra thumbcounters? (maximum of 4)
Safety goggles (for observers on longliners, optional item for others)
Plant Observers - survey tape for marking totes
WOC hake fishery - book, Coastal Marine Fishes by Miller & Lea
Crab Special Project:
    Measuring dividers (1 pair)
    Plastic crab measuring form
    Molting crab instructions and Form 4's (about 45 forms)

Optional and special project equipment, continued:

Otolith Special Project:
- Otolith vials (200 for vessels observers, plant observers - see instructions)
- Vial block (1)
- Extra forceps? (maximum of 2)
- Liter bottle of alcohol for roundfish (default) or glycerol for flatfish age structures (1)
- Squirt bottle for alcohol (1)
- Plastic otolith form (1)
- Large knife for cod otoliths

Stomach Sampling Equipment:
- Buckets, bags, labels, formalin, etc. is issued by the stomach lab and these items should be returned to that lab when debriefing.

Book - Hart, Pacific Fishes of Canada (Optional, issued on request)
Laminated photo i.d. guide, optional
Extra calculator batteries or AC adapter
Twine (about 6 ft), optional
Cellophane tape, optional
Pencil sharpener, optional
Looseleaf rings, 1 in. (to organize sets of forms), optional

Vessel Data Forms for 3 months:

Form 1US (for longliners)	20
Form 2US	20
Form 3US (for trawlers)	150
Form 3US (for longliners)	150
Species Description Forms (3 types)	20 ea.
Form 7US	45
Form 9US (obs. collecting age structures)	30
Form 9US (other obs.)	5
Form 10US	10
Form 11	15
Catch message Form A	50
Catch Message Form B	30
Plain white paper for misc. fax messages	5

Vessel Reports:

Vessel Coverage Sheet for Final Report	1 per vessel
Form 12 Vessel Data Form	5
Map of Areas Fished	5
List of Catcher Boats for Processor	1
Gear Diagrams (3 types)	3 ea.
Report Questions	Listed in this manual

Port Sampling Forms	**No. of Pages per Month:**
Form A	10
Form 3US	10

Preparation and Care of Sampling Equipment

The sampling gear provided for you may not be new, but should be in good working order. Most gear is expected to be used for several observer cruises, therefore we depend on you to give proper care and maintenance to the equipment. All gear given to you will be examined upon return, to see that it is in good condition before it is checked in. There are facilities for cleaning gear at NMFS offices if this could not be done aboard ship. All returned gear must be clean and free of scales. All metal parts must be clean, free of rust, and oiled. Here are a few tips for shipboard maintenance that should make your job easier:

1. Protect your gear from loss overboard and from theft. Do not leave gear items such as baskets and scales on the weather deck unless there is no alternative and they are well secured. Stow all sampling gear when you are finished and inform the skipper and crew not to borrow or use your equipment without your permission.

2. Keep all paper products and small, loose equipment (pencils, pens, thumb tacks, scissors, counters, etc.) in plastic bags throughout your trip.

3. Try to keep as dry as possible: calculator, stopwatch, thumb counters, and tape measure. Books should be protected from water and slime at all times.

4. Most important: Every day before use, the weighing scales must be checked over. Keep them cleaned and oiled. Adjusting screws must be kept coated with grease. The scales have steel springs inside which will rust - oil must be squirted up inside the scales.

5. Tape measures, calipers, and thumb counters must also be cleaned (and oiled if necessary) each day when used. (Be careful to keep oil away from plastic forms, since pencil marks tend to wipe off a slick surface).

6. Keep your otolith alcohol in your room. Sometimes crew members consume alcohol which has been left at the work station.

Remember--others must use this gear after you, and proper care of equipment will help make all our work easier.

Do not give away any gear or books. Many of the government equipment items you are issued will have to be replaced if they are not returned regardless of the reason for loss. Replacement calculators for instance cost about $30.00 and must be of the type specified. Your contractor may make you personally responsible for replacement.

Calibrate your scales during gear check-out. Then prepare a known weight by selecting items which may be easily assembled later. (i.e. a basket, wheels, and books) List the items weighed and their total weight. This known weight may then be used later to check your scale adjustment or to check the accuracy of shipboard scales.

Prior to using your baskets for weighing, weigh the empty baskets so you will know how

much to subtract from each weight figure to reflect the weight of the basket contents only. Be sure to keep track of the basket fitted with wheel sockets as it will be heavier than the others.

Accurate weights are sometimes hard to obtain when the ship is rolling. When possible, secure the top of the scale directly to a fixed structure, such as a ceiling brace. If the top of the scale has to be attached to the ceiling by a length of rope, use three ropes attached to widely separated points on the ceiling to minimize the swing of the scale. Shortening the length of the ropes to the basket also helps. Scales located close to the center of the ship tend to swing less. If a shipboard scale is available for your use, by all means use it, but check it for accuracy first.

All sampling gear and forms will be packed in sampling baskets for transport to and from the vessel. The baskets may be exposed to salt spray, therefore sensitive items should be packed in plastic bags. Pack the life vest so that it will be accessible prior to ship boarding. Just before checking in your baggage at the airport, remove the wheels from the baskets to avoid losing them and fouling the airline conveyors. You'll want to have a plastic bag handy to carry the wheels in.

TRAVEL TO THE SHIP

Shipment of Gear

The observer carries the sampling baskets with him to the various ports whether traveling via auto, bus, train, or airplane. If traveling by plane, the baskets are normally transported as part of your personal luggage. Excess baggage costs may be avoided by careful planning and keeping the number of personal and equipment items at a minimum. Your personal baggage should not weigh more than about seventy pounds. Distribute baggage weight between your pieces of luggage so that no piece exceeds the weight limit of the airline you are flying with. The usual procedure is to pay cash for the amount of excess baggage at the time of check-in, so it is very important to limit the amount of personal items and to allocate enough cash to pay for the excess baggage upon your return. (Excess baggage charges will typically run $200-250 from Dutch Harbor to Seattle.) Do not ship your baggage unaccompanied. You cannot do your job without your gear. If you get separated from your luggage, initiate a luggage search from your end immediately. **Do not board a vessel without your luggage even if you are told it can be brought out to you later.**

On the flight to the embarkation port, carry the observer training manual in your carry-on luggage. (Some extra sampling supplies are kept at Kodiak and Dutch Harbor but manuals are not easily replacable.) On the return journey from the ship, pack your manual and carry the completed data forms with you. If these forms are lost, your whole trip is essentially wasted.

Some observers have had their otolith alcohol confiscated by the airlines because we do not have a blanket permit for the transport of alcohol. If the airline personnel do not permit you to take the alcohol, do not argue--dump the alcohol, rinse the container if necessary, and when you get to your destination, purchase rubbing alcohol to replace the ethyl alcohol that was

dumped. Inform the debriefing staff upon your return and note on the top of the Form 9's that rubbing alcohol was used as the preservative.

Expenses Incurred While Traveling

The contractor should inform the observer before departure, on the procedure for accounting for money spent while traveling from Seattle to the vessel and back again. While in some cases it may not be necessary, it is a good idea to save all receipts for transportation, hotels, meals, and other legitimate expenses. Be cautious in spending your travel advance. Costs are high in Alaska and observers are frequently delayed, both in getting on their ships and while in port between assignments. Some hotels and restaurants in Dutch Harbor, Ak. do not accept credit cards but you may be able to use them as identification for a personal check. If you have to pay cash for any excess baggage charges on your return flights, don't forget to allow enough money (and get a receipt). Remember, excess baggage charges from Dutch Harbor to Seattle can typically run from $200 - $250. Retain any unused airline tickets and turn them in to your contractor upon your return.

Transport to Port

Normally, airplane flights are arranged so that an observer arrives at the embarkation port at least one day in advance. This is often necessary since the weather is notoriously bad in certain parts of Alaska, and flights are often postponed. Delays caused by weather may be unavoidable, but it is important that the observer not be the cause of delays by missing the flights, or having his equipment miss the plane. If you **do** miss your flight, notify your contractor immediately.

Upon arrival at the embarkation port, follow your contractor's logistics instructions and stay in contact. Let your contractor or agent know of your whereabouts so that they can contact you if there is a last-minute change of plans. The observer program has offices in Dutch Harbor and Kodiak where you can get help if there is a problem and your contractor may have a permanent contact in port to help with logistics.

ARRIVAL ABOARD THE SHIP

Vessel assignments are arranged by your contractor with the vessel company. Logistic arrangements are also made by your contractor. Observers must be aware that fishing schedules are often changed by weather, mishap, break-down or fishing success and these events often change observer schedules. If you find out that your ship's schedule is changing unexpectedly, call or send a message to your contractor explaining the matter. Do not make changes in your schedule yourself. Observer coverage of vessels is a large logistical "net". Movement in one part affects the whole and your contractor has logistical perspective that you cannot see.

Living Conditions Aboard Vessels

Conditions vary widely depending on the ship type and size, company and skipper's policies, and the fishing success. "Conditions" include cleanliness and upkeep, safety, comfort of

quarters, quality of food, general attitude, and good personnel management. Of these, only accommodations equivalent to crew members and compliance to safety requirements and regulations is addressed by the regulation for observers. Observers must be flexible as only a few generalities on what to expect can be made. Personal quarters are usually cramped. The most personal luggage one should ever carry on is a duffle bag. When going aboard a shoreside delivery vessel, experienced observers recommend taking only a day pack or knapsack of personal gear. Petty theft is likely to happen. It is a good idea to have a small lock on your bag or at least to keep your valuable items, such as tape players and cassettes, out of sight when not in use.

Crew's quarters range from twelve to two per room. Catcher/processors will usually arrange separate quarters by sex but on catcher boats and small longline vessels, women observers may need to be quartered with men for lack of alternatives. In these cases, however, the work aboard is often so intense that no one has the excess energy to be concerned about gender differences. For bedding, sleeping bags will be provided by the observer program. Showers and laundry facilities (or laundry service by a steward) will be available on larger vessels. Smaller vessels may or may not have showers and laundry is done by hand or waits until port. Catcher/processor vessels will have cooks and routine meals available. Shoreside delivery vessels **may** have a designated "cook" and a meal may be prepared on the way to the fishing grounds, but once fishing has begun, the galley will probably just be open for "help yourself" food. If the fishing pace is hectic, observers may find themselves caught up in a little-or-no-sleep and "survive on coffee, candy and pop" routine until the return trip to port. Cigarette smoking inside is the rule rather than the exception.

Guidelines developed from experience are: show respect to others and it will be returned to you. Be a good neighbor. One way to accomplish this is to make a conscious effort to remain clean and neat. Clean up after yourself and chip in to help where you can as you will need their help in return (especially with sampling on the smaller catcher boats). Do your best to maintain your sense of humor... Adaptable observers with an easygoing attitude are apt to receive more consideration than those who criticize and make demands.

Illness and Accidents Aboard

On catcher/processors there will be someone designated as medic who will treat minor illnesses and injuries connected with life at sea. On shoreside delivery vessels there will probably be a first aid or EMT's (Emergency Medical Technician's) kit aboard and the most able person to deal with an emergency will surface or, by default, the skipper must take responsibility. When serious injuries or illnesses occur, it is up to the captain to decide when (or if) to return to port. Interim treatment and the decision to interrupt fishing can be aided by calling the Coast Guard and relaying symptoms to a medic or doctor.

In the event of an emergency such as an injury or illness requiring hospitalization, the Coast Guard should be contacted via voice radio and they will attempt a rescue and/or advise you on how to proceed. If it is you or another observer that is involved, have the Coast Guard also notify an Observer Program office and keep them advised.

If you become ill, such as coming down with a severe cold or flu which inhibits your

work for more than three days, you must inform your contractor of your situation just as you would if you were expected to show up at an office each day. If your illness gets progressively worse or continues to affect your performance over more than three days, your assignment may need to be changed (when possible). If you are sick, you would be negligent in your performance **if you did not** communicate your situation to your employer (or have someone do it for you).

Seasickness often hampers observers at the beginning of a cruise, but give it time - most of the effects of seasickness disappear after a few days. Seasickness occurs because, "information about the vertical line as it is received by the eyes is forever clashing with the information assimilated by our sense of position and sense of balance. When it comes to a conflict of sensations like this, the visual system almost always dominates. ...This perceptual conflict is one of the causes of seasickness. With time, however, one learns to perceive the 'perpendicular' which arises from the movements of the boat and the direction of gravity. Thus the body maintains its balance when upright and learns to ignore the conflicting visual data afforded by the interior of the boat and the horizon outside the window. Movements with low frequency and greater amplitude are more likely to make us ill than movements with a high frequency and smaller amplitude... Head movements in addition to the external motion stimuli serve to precipitate discomfort... There are additional factors besides movement which can precipitate the syndrome."[1] Indigestible stomach contents, unpleasant fumes or cooking smells, and anticipatory fear will trigger seasickness. The symptoms are nausea, headache, drowsiness, and depression. This is **normal**, it's just difficult to live with. Remember, no one ever dies of seasickness, but what can be a danger is weakness, so you must make yourself drink water or some non-acidic juice and try to eat some mild food (soda crackers are often recommended) to keep up your strength.

Take some seasickness medication along even if you don't plan on using it. Scopolamine works very well for many people. Scopolamine is currently sold under two trade names, Transderm Scop (the "ear patches"), available only with a prescription, and Triptone, an oral, non-prescription form. Some people cannot tolerate scopolamine's side effects. Dramamine (the trade name of Meclizine), Bonine and Cyclizine (trade name is Marezine) are the usual over-the-counter drugs which will inhibit vomiting. The U.S. Coast Guard formerly used Meclizine with moderate success. The Coast Guard's research "found that a combination of two drugs, promethazine hydrochloride (an antihistamine, trade name Phenergan), and Ephedrine sulfate (a decongestant), was by far the most effective treatment available. Similar tests on Navy and Air Force personnel corroborated the Coast Guard's results. The recommended dosage is 25 mg of each drug one to two hours prior to motion stress, and at six-hour intervals as needed thereafter."[2] Promethazine hydrochloride is a prescription drug, may cause drowsiness, cannot be used by pregnant women (none of the drugs mentioned here can) and ephedrine sulfate may aggravate existing cases of hypertension. Neither drug can be taken

---

[1]Michael Stadler PhD., Psychology of Sailing (Camden, Maine: International Marine Publishing Co., 1987), p. 57 - 74.

[2]Wayne Haack, Motion Sickness (Sea Kayaker magazine, Summer 1986).

within 12 hours after ingesting alcohol. It is recommended that you take one dose of a motion sickness medication as directed before you leave the dock as taking the medication afterward will at least delay or may nullify effectiveness. In addition, here are some guidelines for getting through a bout of seasickness actively. These actions will speed up the process of re-adaption:

"Try not to think about seasickness, put it out of your mind, force yourself to think of other things.
Take heart and build up your confidence.
Practice releasing the tension in your muscles; as soon as you begin to feel apprehensive try and relax (desensitization).
Avoid unpleasant smells (especially tobacco, damp clothing, and vomit). Stay away from the galley
Below deck: lie down, keep your eyes closed.
In the saloon: fix your eyes on a freely suspended object.
Seek out cool, fresh air and take calm, deep breaths.
Where possible, keep away from enclosed spaces, go up on deck.
Reduce the amplitude of the motion stimuli: keep amidships or astern, avoid the fo'c'sle berth.
Try not to sit and let yourself be rocked passively back and forth with the motion of the boat.
When standing, avoid leaning against anything, stand erect and make active compensatory movements to keep your balance.
Try to move your head as little as possible.
'Lock' onto the horizon; watch the swell and anticipate the movement of the waves
Participate in the normal duties on board.
At all events see a job through to the end, do not give up on it."

Determine that you will persevere through the mental and physical discomfort due to seasickness, do not dwell on fear. It is simply a matter of adjustment. If severe discomfort persists for more than five days let your contractor know. They can arrange for the vessel to drop the observer off onto a transport boat or at the nearest port, but this is done only for extreme cases.

Safety Aboard Vessels

Fishing vessels have many potentially dangerous areas. Extreme care should be taken to avoid injury. In addition to the personal suffering that would result, the observer program could be drastically hampered. The following points must be adhered to while on the vessel:

1. The first day aboard, note where the lifeboats, life preservers, and other safety devices are kept. Memorize the exit route from your cabin, the factory, the galley, and other locations where you spend a fair amount of time. Keep your survival suit where you can get at it in a hurry.

2. During your first talk with the captain, ask him to explain to you what to do in the event of a major emergency such as a fire aboard the ship, a serious collision with another vessel, or other conditions which might require abandoning the ship.

3. Observers are required to wear a hard hat, life vest or other flotation and steel-toed rubber boots when on the trawl deck for any reason. (If life vests are worn under your rain jacket, they will stay cleaner.)

4. Be cautious whenever wading through fish since fish spines (especially rockfish) can penetrate rubber boots and cause painful wounds to the feet.

5. Apparel with loose strings or tabs should be avoided, as they might become caught in the equipment or belts.

6. Don't run aboard ships, particularly up stairwells. Slipping, tripping, and falling are the most common sources of observer injury. These accidents often happen when an observer is in a hurry. Specifically, watch out for slick spots where the deck is wet and oily or frozen, step carefully over the half-foot combing rising from the bottom of metal latch doors and passageways, and look out for low overheads in vessel stairwells and watertight doors.

7. The observer should not stay outside on the aft deck during rough seas. An observer has been swept forward over the winches by waves sweeping up the stern ramp. When the observer is outside, he/she should remain in full view of a second party at all times.

8. Cables that break under strain frequently kill sailors. Whenever a cable is subjected to tension, stand in a place where a backlash would not hit you. If your sampling station is on deck, do not work while a trawl is being set or retrieved, interrupt your work to go to a safe place during the process. When nets are being hoisted off the deck, stand well clear. Heavy nets have fallen near observers when the suspending cables parted.

9. When working near the exit chutes in the factory floor, where bycatch and factory offal wash out, the observer should be extremely cautious not to slip and fall in the wash of bilge water.

10. Observers are cautioned not to pry loose any fish caught in the chinks of slat or rubber conveyors, since this may result in getting a finger or hand mangled in the machinery.

11. Factory processing areas are crowded with machinery, electrical lines, and conveyor belts. It is often difficult to get to the area where an observer needs to sample because of the maze of equipment. Climbing over, under and around heading, filleting, and skinning machines on oily and wet floors especially at sea in rough weather is extremly hazardous. Observers must watch carefully where they step and where they grab for handholds.

12. The observer should notify or have the skipper notify the U.S. Coast Guard should an injury or illness occur to him/her which requires immediate hospitalization.

13. Treat all minor cuts, especially those on hands, with antiseptic to avoid infection from fish slime. Poisoning from fish slime is called cellulitus and is a form of staph infection. Should a staph infection be left untreated and allowed to develop, your lymphatic system

becomes involved and the threat to your health becomes much more far-reaching than simply a pair of inoperative hands. Wash hands thoroughly after sampling in a solution of very hot water and an antiseptic such as betadine or providone iodine (1-2 oz.per qt. of water). Disinfectants such as Clorox, Lysol or Purex tend to sap your skin's natural chemicals and prolonged use may make you even more vulnerable to fish poisoning.

14. Take extra precautions against infection, such as new gloves, when collecting specimens from marine mammals. As these animals have similar biological systems to our own, organisms which infect them can infect us. "Seal finger" is a fungal infection of the hands which can easily be contracted.

15. Ask ship personnel which water sources are safe to drink. Some ships have lines containing water for washing and not drinking.

Safety in At-Sea Transfers

Observers will normally board and disembark their vessel at dock, but a transfer at sea may be necessary in certain circumstances. Transfers between vessels are potentially hazardous, especially in rough weather. The observer must assume responsibility for deciding whether or not transfer based upon their own evaluation of the transfer conditions.

There are no hard and fast rules for allowable safety limits during transfers. Conditions such as mode of transfer and vessel size, swells versus waves, current and impending weather, good visibility and distance to cross affect the decision as to whether or not to transfer. Observers must use their best judgement. Be cautious--not foolhardy. Do not be forced into transferring against your better judgement by an anxious or impatient captain. Whenever possible be preceded or accompanied by a crewman. Always go with an experienced crewman if you are transferring in a small boat or raft. Never transfer via a small boat if you can't see your destination. If boarding a small skiff or inflatable boat, see that the engine has been started and warmed up, and that there are oars stowed as a backup. As general guidelines, do not transfer at dusk, in darkness, or in any other low visibility conditions. Transfers involving a small boat or raft should never be carried out at night. Observers should not transfer when the sea state is two meters or more. An ADF&G crab observer and two crewmen died when their small transport skiff overturned in rough water. Points to remember when transferring:

1. Observers will wear life jackets at all times on skiffs or other small-sized vessels and while transferring.

2. Observers will not encumber themselves with baggage when transferring vessels. Balance is important. Both hands must be free during transfers.

3. All baggage will be secured with lines and transferred via rope lines or cargo nets. Observer baskets have been lost overboard because they were thrown between ships without lines attached.

4. Given a choice between using a Jacob's rope ladder or a gangway (accommodation walkway), to board a ship, in most cases use the Jacob's ladder since the use of a rigid

gangway in rough seas can be extremely hazardous to the observer and to the transfer boat.

5. If a cargo net, transfer basket, or cage is used to transfer observer or baggage, make sure that a line is attached to the conveyance from both vessels for greater control and to reduce swinging. The observer should maintain a crouched (knees bent) position as opposed to sitting or standing with straightened legs, to avoid back injury. Be sure to wear your hardhat in addition to your lifevest when using this mode of transfer. Keep your arms, particularly elbows and fingers, inside the conveyance when transferring

First Days On Board

As quickly as possible, the observer should adapt to the new surroundings, meet people, and make preparations for work. Soon after boarding you should have a meeting with the captain. Cooperation from the captain, mates and crew is essential in many instances in order to obtain the unbiased samples the observer needs for his work. It is important at this meeting to set the tone for a friendly but business-like working relationship. Give the captain a copy of your letter of introduction and use it to briefly explain what you'll be doing and your needs. Observers on vessels making short trips should try to take care of the introductory details before leaving dock or on the way to the fishing grounds. If the captain is receptive, take this opportunity to mention the following points:

1. Tell the captain that you want to routinely see the ship's fishing logs.

2. On catcher/processor vessels, inquire as to how to send the weekly catch messages.

3. Ask to be informed, in advance, of changes in the fishing schedule so that you may adjust your schedule accordingly.

4. Ask to be notified if any marine mammals are found in the catches; request that mammals be held for your examination. If possible, sightings of marine mammals would also warrant notifying the observer.

5. After having done your own survey of safety equipment and instructions ask the captain additional questions. Ask about the location and operation of the EPIRB(s) on board; what are the procedures on board in case of emergency such as fire; Where is the VHF radio and how does it operate; what are the working channels of nearby vessels; are there any hazards that you should be aware of?

During the first few days aboard a catching and processing trawler, as you familiarize yourself with life on board, initiate your work by noting the following:

1. When the deck is inactive, perhaps on the way to the fishing grounds, make measurements which will aid you in estimating codend dimensions. Then watch the net retrieval and handling. Decide when and where you will need to take additional measurements and who to enlist for help.

2. Watch how and where the codends are opened and how thick and fast the fish are dumped. Look to see if the crew does any sorting on deck and whether different hauls are mixed in the tanks.

3. Notice where the catch is sorted by species and size and what is the destination of fish on each line of conveyor belts. What products are being made?

4. Consider the location of your sampling station. Remember, you have to be present at or ahead of any sorting area. If at all possible, avoid having to haul baskets of fish long distances or up or down stairs. Basically, you need a place where you can gather your samples, have a few baskets of fish around you and a place to hang your scale. Adequate lighting will be necessary and you'll need to locate the nearest hose for cleaning yourself and your area.

5. Try collecting one or more baskets of fish. Familiarize yourself with the species being caught, start writing species descriptions and practice using the keys. Practice sexing the target species and/or other species that will have to be sexed for your work.

6. Work out routines for sorting, weighing, and counting fish.

7. Get started with the most obvious methods for making catch weight estimations and determining sample weights. Then after your work is underway, consider variations or other methods which may improve your sampling or be contingency plans should the catch composition change.

On board a catcher-only trawler, the operation is much simpler and an observer has less opportunity to get oriented as only a few tows are made each trip. Do your best to find or rig a place to weigh fish. Ask where the last observer weighed fish. Ask what they'll be fishing for and get an idea how diverse the catch will be. If they sort on deck, ask which fish go where. Let the skipper and crew know you'll need to take a few quick measurements of the net. Get any deck measurements you can before fishing begins.

As retrieval begins, get yourself and your sampling tools ready. When fish are dumped, watch what's happening all around you as you go to grab a couple baskets of catch. Learn quickly where you can be and where not to be! Watch how they handle the catch. Then you can get some i.d. and sexing work done while figuring out and practicing your sampling methodology for the next tow.

OBSERVER OBJECTIVES AND GENERAL INSTRUCTIONS

The main work objectives of observers are to record any incidental take of marine mammals, make independent estimates of catch weight, determine the catch composition, sample to determine the incidence of specified prohibited species in the catch, collect biological data on the prohibited, target and other species and monitor for compliance to fishery regulations. Secondary objectives include marine mammal observations, gathering factory production information, recording gear design and vessel layout, etc.

Since ship design and procedures vary from ship to ship, in many fisheries it will be the responsibility of the observer to select the best sampling methods to obtain the needed data. In the following sections, the methods of sampling will be outlined. To use any of the prescribed sampling methods, the observer will be relied upon to devise and apply good, statistically sound, fish collection techniques.

When conducting biological sampling, the most important thing to remember is to take random, unbiased samples such that your data will be representative, not of any particular catch but of the vessel's catches over time. We stress the taking of random samples in all data collections. Accuracy is important in all aspects of the work, including: the physical sampling, recording the data on plastic sheets, transposing the data on the plastic sheets to the final paper copy, and correctly summing and transposing data for the weekly catch reports. The need for random, unbiased sampling and accuracy cannot be over stressed.

SAMPLING DUTIES FOR VESSEL OBSERVERS

Every Haul, Delivery, or Set:

Obtain haul, delivery or set data on fishing location and effort (Form 1US or 2US).

Sampled Hauls, Deliveries or Sets: (numbered items presented in order of priority)

1. Record any incidental take of marine mammals (Form 10US).

2. Sample for species composition of catch (Form 3US). Observers sampling trawl catches sample according to the random sample table schedule, longline and pot vessel observers sample 2 - 3 sets daily. In your sampling, do not leave out any species or species group, such as sampling only for prohibited species. Try to sample the whole catch for king crab, Tanner crab, halibut and salmon if possible.

3. Estimate haul weight (Form 2US) from as many hauls as possible, but aim for at least 3 per day--estimates should be made of some hauls that were not sampled as well as of sampled hauls.

Biological data from prohibited species:

4. Sex and identify to species, all the salmon, king and Tanner crab in your sample if

possible, or take a random subsample for sexing (Form 3US).

5. Take length measurements of all halibut, and salmon in your sample (Form 7US). Subsample, if necessary, when incidence rates are high. A subsample should be of at least 20 fish. Measure king and tanner crab only if given this as a special project.

6. Determine the viability of all halibut in your sample or take a random subsample for viability, such as every third fish (Form 3US). If assigned to work on crab for your special project, then record the viability of the king and tanner crab in your samples as well.

7. Collect scales from salmon in your samples for species confirmation and ageing (Form 9US).

8. Check salmon for missing adipose fins or other fin clips or marks, and other fish and crab for tags. If you collect a tag be sure to record all pertinent data as requested in the "Tagged Fish and Crab" section of this manual.

Every Day:

9. Take length measurements of 150 randomly selected fish per day (Form 7US). Lengths should be taken of the target species unless you are also collecting otoliths of a sampling species other than the target species. Remember that the otolith collection must be a subset of the length frequency collection. If it is not possible to measure 150 fish per day, try to do at least 70 per day. You may have to forego sexing the fish.

10. Otolith/scale collection - If given this assignment, choose a sampling species according to the directions given in this manual and/or in class (Form 9US).

Other special projects - if assigned any other special project, such as stomach sampling, conduct work according to directions given.

Per Vessel: (not in order of priority)

Evaluate the accuracy of the vessel's catch weight estimations and report on their method of estimation.

Describe the fish processing products. Record the product recovery rates they use, if any. List what species are discarded (see vessel report questions).

Make pertinant diagrams: fishing gear, fish tanks, factory, or weather deck.

Make catch report messages and either phone them in at end of trip (short trips), or transmit them weekly via telex, rapidfax, or phone (trips over one week in length).

A vessel report includes: vessel coverage summary, Form 12 - Vessel Data, map of areas fished, list of mothership's catcher boats (if appropriate), gear diagram(s), and complete answers to information asked for in report questions, plus anything else you feel would be helpful to staff members or future observers.

RANDOM SAMPLE TABLE

To select which trawler catches will be sampled, the appearance of the catch, area or gear type must not be a deciding factor. Therefore, the hauls you are to sample for species composition and prohibited species have been predetermined by NMFS using a random sample table. (Observers on longline and pot fishing boats do not need to use this table.) The random sample table you will be given to use will allow for between 50 and 80 percent of a vessel's hauls to be sampled. All trawler observers are to refer to the random sample table developed by NMFS to determine which hauls will be sampled during a fishing trip.

The Random Sample Table is made up of rows of numbers in **bold-faced** type alternating with rows in normal-faced type. The bold-faced rows indicate the number of consecutive hauls you sample, the normal-faced rows are the number of consecutive hauls you do not sample. During training you will be instructed how to determine your starting point on the table. From that point, move vertically down through the table sampling or not sampling the number of hauls as indicated. If you reach the bottom of a column continue at the top of the next column. If you reach the end of the table (Z, Z), continue on at the top of the table (A, A). Example table:

	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	**Y**	**Z**
A	**2**	**3**	**2**	**4**	**4**	**2**	**3**	**2**	**4**	**3**	**4**	**2**	**4**	**2**	**4**	**3**	**2**	**3**	**4**	**3**	**4**	**4**	**2**	**3**	**2**	**4**
	1	2	1	2	1	2	1	1	1	1	2	1	1	1	1	1	2	2	1	2	1	2	2	1	1	1
B	**4**	**3**	**4**	**4**	**3**	**2**	**3**	**2**	**3**	**3**	**2**	**3**	**2**	**2**	**3**	**2**	**3**	**2**	**4**	**3**	**2**	**4**	**2**	**2**	**3**	**2**
	2	2	2	2	2	1	2	1	1	2	2	2	1	2	2	1	1	2	1	1	1	2	2	2	1	2
C	**2**	**4**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**4**	**3**	**3**	**2**	**3**	**4**	**3**	**3**	**2**	**4**	**2**	**3**	**2**	**2**	**4**	**3**
	1	1	2	2	1	2	2	1	2	1	2	1	2	1	1	1	2	1	2	2	1	1	1	1	1	1
D	**4**	**4**	**3**	**4**	**4**	**4**	**3**	**4**	**4**	**4**	**4**	**3**	**4**	**3**	**3**	**2**	**4**	**2**	**2**	**2**	**2**	**3**	**3**	**2**	**3**	**3**
	1	2	1	1	1	2	1	2	1	2	2	1	1	2	2	2	2	1	2	2	2	2	1	2	2	1
E	**3**	**3**	**3**	**2**	**2**	**3**	**4**	**2**	**4**	**2**	**4**	**3**	**3**	**3**	**2**	**4**	**2**	**2**	**3**	**4**	**2**	**2**	**4**	**2**	**4**	**4**
	2	2	1	1	1	2	2	2	2	1	1	2	1	2	1	2	2	1	2	2	2	1	1	1	2	2
F	**4**	**4**	**4**	**4**	**4**	**3**	**3**	**2**	**3**	**2**	**2**	**2**	**3**	**2**	**2**	**2**	**2**	**4**	**2**	**3**	**4**	**4**	**4**	**4**	**3**	**2**
	2	2	2	1	1	1	2	1	2	2	2	2	2	2	2	1	2	2	1	2	2	2	1	2	1	2

Since it takes most observers a couple of days to set up their sampling station, observe the operation, and get comfortable with their sampling duties you do not need to use the Random Sample Table on your first days of sampling. Observers on catcher processors should begin using the table on their second or third day on board, and observers on shore-side delivery vessels should begin using the table on their second trip, or as soon as your sampling methodology is established.

If you find that this sampling schedule is too rigorous, look at whether you are allocating your time properly. Sampling a catch should usually take two to three hours. If you are spending more than three hours per sample you will not be able stick to the table when more than four hauls per day are being landed. First reduce the sampling time by reducing the sample size of one or more hauls in the series. If you were sampling the entire catch for prohibited species, try cutting back to partial haul sampling or to basket sampling for all species (8 - 10 baskets or a minimum of 300 kg) so that all designated hauls in the series can be sampled. It is important that you look ahead at your table schedule and plan to make best

use of your rest time. For example, if the table dictates that you have a four on, one off, four on schedule, get more rest before this series and plan on getting your paperwork, chores and meals done in between samples so you have as large a block of rest time in between the sets of four sampling hauls as possible. Consider altering your sampling method. Is it practical to whole haul sample a series of four hauls or will you need to basket sample some to complete the set? If you get caught in an un-workable situation you can, if necessary, skip one of the hauls in the series to be sampled but then complete the remainder of the sample series, counting the un-sampled haul as part of the block. As in the example of a four on, one off, four on series, if the observer needs to rest for two hauls, the observer should sample four hauls, rest for two, and sample three hauls to complete the series. Each haul made is counted as one on the table, whether or not you sample it. In your logbook you will make a table of your sampling effort as discussed below. In your daily logbood entry, record any sampling circumstances which are preventing you from sticking to the table schedule. If it is necessary to skip sampling hauls on a continuing basis, get in contact with an NMFS office for advice.

If you are assigned to a new vessel, or if your vessel delivers fish to either a plant or a floater, continue from where you left off in the table. Begin using the table immediately, there are no days off to get acclimated. If you were in the middle of a sampling block continue with that block. If you have just finished a sampling block, or if you are in the middle of a non-sampling block, then go to next sampling block.

If you find yourself on a vessel that makes few hauls per day it is acceptable to sample additional hauls. If you are assigned to a catcher-only vessel and you are sampling the delivery at the plant, you will be sampling the fish mixed together from all the hauls and you will exceed the table requirements. This is fine. The NMFS will not use data from additional hauls in any Incentive Program calculations, but it will be used in all other computer programs. Please note in your logbook which are the additional hauls (if any) that you sample.

Example: Suppose you begin following the example table given above with Vessel A's haul number six and your starting point on the table is row C, column N. You leave Vessel A after haul 10 and board Vessel B. The first haul to come on board after your arrival is number 56 and you stay on board for 5 hauls. Using the above table you would sample 2 hauls, not sample 1 haul, sample 3 hauls, not sample 2 hauls, sample 3 hauls, etc. Your activity for all hauls landed while you were on board must be recorded in the back of your logbook in a table like this:

	Vessel A			Vessel B	
3/21	Haul 6	Sampled	3/26	Haul 56	Sampled
	Haul 7	Sampled		Haul 57	Not sampled
3/22	Haul 8	Not sampled		Haul 58	Not sampled
	Haul 9	Sampled	3/27	Haul 59	Sampled
	Haul 10	Sample cancelled, cut hand		Haul 60	Sampled
				Haul 61	Sampled

In the next section on obtaining and recording haul information, you are also asked to record the captain's deck estimates for each haul in your logbook. Those figures could be recorded as an additional column in this table.

Twelfth Random Sample Table

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A	2	2	2	2	2	2	4	3	4	2	4	4	3	2	2	2	3	4	3	3	4	4	2	4	3	3
	2	2	2	2	1	2	1	1	2	2	1	2	2	1	1	2	1	2	1	2	1	2	1	2	2	2
B	3	2	2	2	3	4	4	3	2	4	3	4	4	2	4	4	4	2	2	3	2	3	4	2	4	3
	1	1	1	2	1	1	1	2	2	2	1	1	1	2	1	2	1	1	1	2	1	1	1	1	2	1
C	4	4	4	4	2	2	3	2	2	2	4	4	2	4	4	4	3	4	2	3	3	3	2	2	3	3
	1	2	2	1	1	1	1	2	1	2	2	2	2	1	1	1	2	1	1	1	2	1	2	1	1	2
D	4	2	3	3	4	3	2	2	2	2	3	2	2	4	3	2	2	3	3	3	4	2	4	3	2	3
	2	2	1	1	2	1	1	1	1	1	2	2	2	1	1	2	2	1	1	2	1	2	2	2	1	1
E	3	3	4	2	3	2	4	2	4	2	2	2	2	3	2	2	4	2	4	2	2	3	4	4	4	3
	2	2	2	1	1	1	1	2	1	2	1	1	1	1	1	2	1	1	1	1	2	1	1	1	2	2
F	3	2	2	4	4	2	4	3	4	4	4	4	4	3	2	4	4	4	2	2	2	4	2	3	4	2
	1	1	2	1	1	2	1	2	1	2	1	2	1	1	2	2	1	1	2	1	1	1	2	1	2	1
G	3	4	2	4	4	2	4	4	3	3	2	4	3	4	2	4	2	4	4	2	3	4	4	4	2	2
	2	1	2	1	2	1	2	1	1	1	2	1	1	2	2	2	2	2	2	2	2	2	2	1	2	1
H	3	3	3	4	2	4	4	2	2	3	4	3	4	3	4	4	4	2	2	4	3	2	4	2	2	4
	2	1	1	1	2	1	1	2	1	1	2	2	2	2	2	1	1	2	1	2	1	1	2	1	1	2
I	2	3	2	4	3	4	2	3	2	2	4	2	2	3	4	4	3	2	3	3	3	2	2	4	4	2
	1	1	2	1	2	2	2	2	1	1	2	1	2	2	1	1	2	1	1	2	2	2	1	2	1	2
J	3	2	4	2	2	2	4	3	3	2	2	4	2	2	2	2	3	3	3	2	3	2	2	3	2	2
	1	2	1	1	2	1	2	1	1	2	2	2	2	2	1	1	2	1	1	1	2	1	2	2	1	2
K	4	4	2	2	2	4	2	4	2	4	4	3	4	4	2	3	2	2	3	4	4	4	4	3	4	3
	1	2	2	1	1	1	2	1	2	1	2	1	2	2	2	1	1	2	1	1	2	2	2	2	2	1
L	3	4	3	2	2	3	3	4	4	4	2	2	2	2	2	4	4	4	4	4	3	3	4	3	3	3
	2	1	1	1	2	1	2	1	2	1	2	1	2	1	1	1	1	1	1	1	2	1	1	1	2	2
M	2	2	4	3	4	2	4	3	4	2	4	3	4	2	4	2	4	3	2	4	3	2	3	2	4	2
	1	1	2	2	2	2	1	1	2	1	1	2	2	2	2	1	2	1	2	2	1	2	2	2	1	2
N	3	4	2	3	4	3	2	3	2	2	3	3	4	4	4	2	2	2	3	3	3	2	3	2	2	4
	1	2	2	1	2	1	2	1	1	1	2	2	2	1	2	1	2	2	1	1	2	2	2	2	1	2
O	3	3	3	4	2	3	2	4	3	2	2	3	4	3	4	3	3	4	3	2	2	4	3	4	3	2
	2	1	2	1	2	2	2	2	1	1	1	1	2	1	1	2	1	2	2	2	2	1	2	1	1	2
P	4	4	3	4	2	2	4	3	3	3	4	3	4	3	2	3	3	3	4	4	3	4	2	3	2	3
	1	2	2	1	1	1	1	1	2	1	1	1	2	1	2	2	2	1	1	1	2	2	2	1	2	2
Q	3	3	4	4	3	3	3	4	3	4	4	2	3	4	4	3	3	2	2	4	2	3	3	2	3	2
	2	2	1	2	1	1	1	2	2	1	2	2	2	1	2	1	1	1	1	2	1	1	2	2	1	2
R	4	3	3	4	3	3	3	4	4	2	3	2	2	3	3	3	2	2	2	4	3	2	3	2	4	3
	1	1	1	2	1	1	1	1	2	2	2	1	2	1	2	1	2	2	2	2	2	1	2	1	2	2
S	4	4	3	4	2	3	2	2	2	3	3	4	3	4	2	2	3	3	3	2	4	4	2	3	3	3
	2	1	1	1	1	1	1	1	1	2	1	2	2	1	1	1	2	1	2	1	1	1	1	2	2	2
T	3	4	3	4	4	4	2	3	3	3	4	2	3	4	4	4	4	4	3	4	3	3	4	4	2	4
	1	2	2	1	2	1	2	1	1	2	2	1	2	1	2	2	1	2	2	1	2	2	2	2	2	1
U	3	3	3	2	2	4	3	4	2	3	4	2	4	4	3	2	4	4	2	2	2	2	4	2	2	4
	2	1	2	1	1	1	2	1	2	1	2	1	1	1	1	1	2	1	1	1	2	2	2	1	2	1
V	3	4	3	3	4	4	2	4	4	4	3	3	2	3	2	4	4	2	3	2	4	4	4	4	4	2
	1	2	2	1	2	1	2	2	1	1	1	1	1	2	1	2	1	2	1	1	2	2	2	1	2	1
W	3	3	3	4	4	2	4	3	4	4	4	2	3	3	3	3	4	2	4	2	3	3	2	2	3	4
	2	1	1	1	2	2	1	1	1	2	2	1	1	2	2	1	2	1	2	1	2	1	1	2	2	2
X	2	4	3	4	3	2	3	3	4	3	3	3	4	4	4	2	3	3	4	4	3	2	2	4	4	4
	2	2	2	2	1	1	2	2	1	2	2	1	1	1	2	2	2	2	2	1	1	2	2	2	2	2
Y	4	4	3	4	4	4	4	2	3	4	4	3	4	2	3	2	3	2	2	4	3	2	4	4	2	3
	1	1	2	1	2	2	1	2	1	1	2	1	2	1	1	1	1	2	1	2	2	2	1	1	2	1
Z	2	3	4	3	4	2	4	4	3	2	4	2	3	2	2	2	2	4	2	4	3	3	4	2	4	4
	2	1	2	1	1	2	2	1	1	1	2	2	2	2	1	1	1	1	2	1	2	1	2	2	1	2

GENERAL INSTRUCTIONS FOR DATA FORMS

In gathering the necessary data, observers occasionally have to be inventive to overcome sampling problems, but once the data are ready to be transferred from the plastic on-deck sampling forms to the paper keypunch forms, all creativity must cease. Data from hundreds of cruises a year have to be processed, analyzed, and summarized, and there is no way to footnote the data from a particular cruise after they are fed into the computer. Thus, certain data columns always have to be filled in and they have to be filled in a certain way, with leading zeros in some places but not others, zeros filled in behind printed decimal points, and decimal points added by observers in other cases. Refer to the specific directions and examples for each form. If you do need to make a note to alert us to make a decision on some of the data, place the comment on a portion of the form which is not keypunched.

The forms should be neat - all the numbers should be precisely printed in conventional arabic numbers so that they are readily legible. Sloppy forms multiply the number of keypunch mistakes and sometimes require guesswork to interpret. Use a sharpened pencil, not a pen, to fill out all forms so that erasures can be neat if changes have to be made. Brackets and arrows (refer to example forms) can be used to indicate that the numbers in a column are to be repeated. Ditto marks cannot be used to repeat a number in key punch columns.

Much of forms 1US, and 2US should be filled out from the ship's fishing logs. Observers should take care to record the correct information and avoid making copying errors. All sampling data require the vessel position data on these forms, so if these are missing, other data cannot be used.

A captain may request copies of your catch composition or length frequency forms. Carbon paper is provided so that the forms can be made out in duplicate. Copies are to be made at the observer's convenience, but before leaving the ship. Vessel captains have no right to demand that any form be completed at a given time. However, if the captain is waiting for your species composition data, so that he can fill in a calculated estimate of the weight of discards or bycatch, then it may be to your advantage to provide the captain with copies of your form 3's so that you can get a final ship's estimate of catch size and complete your species composition extrapolations. (Note: It is permissible for the captain to use your sampling data to help him fill out the ships' fishing logs.)

Cruise Numbers And Vessel Codes

The cruise number and vessel code identifies each set of data from the observer on each vessel. A cruise number is assigned for each observer deployed and the observer program also assigns a vessel code to each boat. The vessel code is for our program use only and does not have anything in common with the ADF&G boat number, the permit number, the processor code number or the radio call sign. Each of these identifiers is for a specific use and observers must be careful to record the specific identifier asked for! Cruise numbers and vessel codes will be assigned during your trip, and you can find out what they are when you debrief. In the meantime, start and maintain separate sets of data for each boat and mark your name and the ship's name on the first page of each set of forms for each boat.

Sampling Over The Change To A New Year

There are two instances when you would have more than one cruise number for a trip. If you are sampling in December and over the new year transition, you will be assigned a new cruise number for the new year's data. Start a new page for each set of forms and start their numbering again from page one as of January 1st (0000 hours, between December 31 and January 1). For the weekly report, the week ending date of the last week of December is December 31st. The first day of the first week of the new year is January 1.

When A Vessel Fishes With More Than One Type of Gear

If a vessel uses two different types of gear such as a trawl net and cod pots, the observer should keep separate sets of data forms for the samples from each gear type. A different cruise number will be assigned to the data from each gear type to categorize it and allow duplication of haul or set numbers. It would be very important to sample catches from each type of fishing each day it occurs. These instructions **do not** pertain to the different types of trawl nets but only to trawl versus longline versus pot gear, etc.

Page Numbering

On the top of each sheet of each form is a phrase "page ___ of ___." This helps to keep the forms in order and alerts us to a missing sheet. Each set of forms, for each cruise, should have pages numbered separately and consecutively. Enter the first number as you do the daily forms and fill in the second number after the cruise is complete. For example, if you used 58 Form 3US's on a cruise, then the first sheet will be page 1 of 58 and the last sheet will be page 58 of 58. Form 9US's are further subdivided by species so that you may have a page 1 of 10 for king salmon scales, a page 1 of 3 for coho salmon scales and a page 1 of 32 for pollock otoliths.

Calculation Guidelines: The Rounding Rule

"Computations carried out on an automatic desk computer are so simple that it is very possible that the final result of a sequence of calculations will appear more precise than it really is. Rules concerning numbers of significant digits resulting from the application of the arithmetic operations are available but somewhat impractical. In most statistical work, it is best to carry more figures, say not less than two extra, into the final computations than seem necessary and then to round the result to a meaningful number of digits, relative to the accuracy of the original measurements."[3]

---

[3]Robert G. D. Steel and James H. Torrie, Principles and Procedures of Statistics With Special Reference to the Biological Sciences (New York: Mc Graw-Hill Co., 1960), p.30.

In all your data:

≥ 5 is rounded up, < 5 is rounded down.

Example: rounded to two decimal places: .52499 = .52

(When rounding, look only at the first digit to the right of the place you are rounding off at. In the example above, since we are rounding off at the hundredth's, we would only look at the "4" and thus leave the "2" as it is. We would not look at the "9" and change the "4" to a "5" and continue to round the "2" to a "3" thus getting an answer of ".53".)

HAUL SUMMARY FORM 2US FOR U.S. TRAWLERS

OBJECTIVE:

Ascertain and record the best information available on fishing effort and catch. Catch per unit of effort, the type of gear used, where in location and depth that gear is deployed, and who's doing the fishing are the basic pieces of information that fishery managers need to monitor and control the harvest of the public resource. "Fisheries" management is not management of fish as much as management of the fishermen and our use of the resource. The haul summary information forms the basis of all the rest of the data gathered aboard a vessel. If this form is not complete and correct, the rest of the data collected is useless as well. The collection of haul summary information is the top priority for an observer. All subsequent sampling data for a vessel is tied to the Haul Summary Form with the date and haul numbers. Be certain your haul and date correlations are correct on this and all other forms.

Topics:

HAUL SUMMARY FORM 2US FOR U.S. TRAWLERS 1
- FORM 2US - EXAMPLE 2
- FORM 2US--HAUL FORM INSTRUCTIONS 3
- VESSEL FISHING AND CUMULATIVE PRODUCTION LOGS 8
- RETAINED CATCH WEIGHT ESTIMATIONS 8
  - Retained Catch Estimation Methods for Catcher-Only Vessels 9
  - Retained Catch Estimation Methods for Catcher/Processor Vessels 11
  - Preferences - Detailed Review 14
- OFFICIAL TOTAL CATCH WEIGHT ESTIMATIONS 15
  - OTC Weight Estimation Methods for Catcher-Only Vessels 16
  - OTC Weight Estimation Methods for Catcher/Processor Vessels 17
  - Preferences, Detailed Review 19
- OBSERVERS TOTAL CATCH ESTIMATES 21
  - Methods for Observer Estimates of Codends 22
  - Density Sampling 23
  - Observer Estimates by Bin Volume 24

FORM 2US - HAUL FORM FOR U.S. TRAWLERS

Observer name Jane Observer

Vessel name Sea Gull

Page 1 of 3 for transmission

Page 1 of _____ for vessel

1. Leading zeros in columns 12, 14, 34-41 ONLY.
2. Skip a line after each day.
3. On days with no hauls, enter date, noon position in columns 25-33 and a haul # = 0. Note reason in columns 34-72.
4. Trailing zeros are required in columns 56-72.
5. For depths in columns 50 and 55: use M = meters and F = fathoms

List of catcher boats

Full name of catcher boat	ADF&G #
American Beauty	24255
Aleutian Challenger	50570

Cruise number: 1 2 3 4 5 | Vessel code: 6 7 8 9 | Year: 10 11 = 9 1

Monitored for MM (Y/N?)	Haul sampled	Date: Month (12 13)	Date: Day (14 15)	Haul # (16-18)	Gear type (21)	Gear performance (22)	Processing mode (23)	Location code (24)	Haul or Delivery position: Latitude (N) (25-28)	E or W (29)	Longitude (100) (30-33)	Fishing times in ALT: Nets on bottom (34-37)	Nets off bottom (38-41)	Fishing duration (minutes) (42-45)	Average fishing depth (46-49)	M or F (50)	Average bottom depth (51-54)	M or F (55)	Avg. speed (knots) (56-57)	Retained catch: round weight in metric tons (58-62)	Official Total Catch in metric tons (63-67)	Observer's Total Catch Estimate in metric tons (68-72)	ADF&G statistical area (73-78)	Catcher boat's ADF&G # (79-84)
Y	✓	09	14	101	1	1	3	R	5838	W	7624	2315	0525	340	130	F	130	F	3.5	15.80	16.00	18.50	765830	
N				102		1			5837		7630	0610	0920	190	135		135		3.5	7.94	8.25	.		
Y	✓			103		2			5837		7607	1015	1435	260	140		150		3.2	19.90	20.00	18.00		
Y	✓	↓	↓	104	↓	1	↓	↓	5838	↓	7647	1530	1850	200	140	↓	145	↓	3.2	10.50	12.00	13.50	↓	
Y	✓	09	14	105	1	1	3	R	5838	W	7654	1935	2330	235	138	F	138	F	3.5	17.92	18.62	.	765830	
															location				.	.	.	.		
		09	15	0				N	5832	W	7620	Arrive	Best Seafoods	at	0630	Completed	delivery		-16:40				765830	
		↓																	.	.	.	.		
		09	16	0				N	5826	W	7553	No	Fishing -	Rough	Weather	.			.	.	.	.	755800	

A catcher vessel ↑ A catcher/processor taking outside deliveries ↓

Y	✓	08	23	28	2	1	1	R	5859	W	7531	2215	0045	150	70	F	73	F	4.5	60.00	60.00	.	755830	self
Y		↓	↓	29	↓	↓	↓	↓	5851	↓	7531	1730	0300	570			72	F	4.1	63.97	64.00	62.85	↓	24255
N				30					5851		7554	0330	1000	390	66	F	71	F	4.4	89.92	90.00	85.81		self
Y	✓	08	23	31	2	1	1	R	5846	W	7551	1720	2200	280	66	F	71	F	4.4	89.96	90.00	.	755830	self
																			.	.	.	.		
Y	✓	08	24	32	2	1	1	R	5840	W	7552	1700	0730	870	70	F	70	F	4.1	63.98	64.00	67.10	755830	50570

created 11/90

FORM 2US--HAUL FORM INSTRUCTIONS

This form summarizes fishing effort and total catch by haul for catcher-only trawlers, catcher/processor trawlers and motherships. Observers on floating processors which pump the holds of catcher boats and observers at shoreside plants do not fill out 2US but fill out the Port Sampler Summary Form instead. (Refer to the Plant Sampling section of this manual.) Obtain the data for 2US forms from the ship's logs, from vessel personnel, and from direct observation. Logbook information may need to be adjusted if it is not correct or not recorded according to instructions below. Check carefully to see that no errors are made in copying the data to the forms and that the data are reasonable. Points to note:

1. Collect Form 2US data for the entire period you are aboard. Make certain that you have all of the hauls recorded. **Do not** make the mistake of recording only the sampled hauls. Shaded columns are not telexed. **Fill in all columns, shaded and white.**

2. The identifying cruise number and vessel code are assigned during your trip. The "vessel code" is **not** part of any code system outside of the observer program and should only be obtained from our offices or your contractor. Just keep data for each vessel separate and get your cruise number and vessel code(s) from your contractor before debriefing.

3. Enter a "Y" or "N" in the first column to indicate which hauls were monitored for marine mammals. Place check marks in the next column to indicate which hauls you sampled for species composition.

4. A given haul number should be used only once - no duplicates. The haul numbers should usually be in numerical sequence. Observers on pair trawlers and mixed gear types may need to skip haul numbers and if this is done, an explanation should be written on the head of the form. Haul numbers must be in ascending order. Make sure that the haul numbers do not exceed 3 digits. (If the haul number recorded in the fishing log is 1657, for instance, then drop the first digit and call the haul 657. This will enable you to more easily compare your data with the ship's.) All hauls must be recorded unless there was a gear malfunction resulting in a zero catch. If a zero catch is not due to a gear malfunction then the haul must be recorded. A haul number must be assigned to every haul. If you reach number 999, the next haul should be "1", not "0." Haul number "0" means a nonfishing day.

5. Enter the code for gear type based on the configuration of the gear, not whether it's fished midwater or not. Leave this column blank temporarily if the gear doesn't fit the categories given below.

   1 - Non-pelagic trawl - any trawl net other than as defined below.

   2 - pelagic trawl - a trawl which does not have discs, bobbins, rollers, or other chafe protection gear attached to the foot rope, but may have weights on the wing tips. (1) The net must have stretched mesh sizes of at least 64 inches, as measured

between knots, starting at all points on the fishing line, head rope, and breast lines and extending aft for a distance of at least ten meshes from the fishing line, head rope, and breast lines and going around the entire circumference of the trawl. Webbing is to be tied to the fishing line with no less than 20 inches between knots around the circumference of the net and may not contain inserts or collars or other configurations intended to reduce the mesh size of the forward section. (2) Alternatively, the net can have parallel lines spaced no closer than 64 inches, or a combination of parallel lines and meshes with stretched mesh sizes of at least 64 inches, measured as described above, for a distance of at least 33 feet, starting at all points on the fishing line, head rope, breast lines and going around the entire circumference of the trawl.

4 - pair trawl - A trawl net (usually a large pelagic net) towed between two vessels. Each vessel has one of the two warp cables and no doors are used. The catch is landed aboard one of the two vessels.

6. Enter the gear performance code:

1 - no problem
2 - problem--crab pot was in the haul
3 - problem--net hung up on some bottom obstacle (vessel had to back down)
4 - problem--net ripped
5 - problem--other problem, put a note of explanation on a non-keypunched part of the form 2US

7. Enter the processing mode: (Indicates where the utilized fish from that haul are processed)

1 - Most of the processing is done on board the catcher vessel (a catcher/processor). The products are placed in a freezer hold and the trip usually lasts more than a few days.

2 - The vessel is a mothership; it accepts unsorted catch via codend transfer for processing at sea.

3 - Retained catch is delivered to a processing plant (shorebased or "floater"). The catch is kept on ice or in RSW (refridgerated seawater) tanks, not frozen.

5 - The fishing vessel sells the majority of their catch over-the-side to other fishing vessels who will utilize the fish for bait.

8. For the location code, enter R if the location in columns 25-33 is a retrieval position, and N if it is a noon position on a nonfishing day. Observers on motherships should enter "R" and retrieval positions if at all possible. If retrieval positions are not available from the catcher boats, enter "D" and the position of the mothership at the time of delivery. The location entered **must** correspond to the location code type.

[Note for Mothership observers: Deliveries of catcher boats will not always (or perhaps, not even usually) be made in the order in which they were retrieved. As you will probably obtain the information in order of delivery, you will need to re-copy the data in order of codend retrieval on another set of Form 2US's. Keep the original records and include on them the delivery time and date because catches are attributed to a report week based on delivery times, not retrieval times. See the instructions in the section on "Catch Messages" under "Determination of Report Week for..."]

9. If there were no hauls on a given day (due to bad weather, mechanical breakdowns, traveling etc.) enter 0 in the haul number column, enter a "N" for noon position under location code and the Alaska Local Time (ALT) noon position in columns 25-33. In columns 34-72, comment on the reason there was no fishing and enter the ADF&G statistical area corresponding to the noon position in columns 73 - 78. All days at sea must be accounted for in this manner.

10. Each delivery of a catcher boat must be noted on a line of 2US. Record the time you reached dock, the plant name(s) and the date and time the delivery was completed.

11. For mothership observers, information on gear type and performance, retrieval location, fishing times and/or fishing duration, fishing and bottom depth, and average towing speed has to be obtained from the catcher boat skipper. This may be accomplished by talking to the skipper on the VHF radio after the delivery is complete, that is, when they are no longer busy coordinating the delivery maneuvers. If the skipper is not cooperative in providing the above information, try at least to get his estimate of fishing duration.

12. The location entered should be the haul retrieval position - the location of the ship when a particular haul is begun to be retrieved, i.e. when the winches begin bringing in the cable. (For a mothership the location entered may be a delivery postion if retrieval positions are not available.) Check the latitude and longitude for all positions entered on 2US to make sure that they are reasonable - i.e., 58°63´ does not exist; double check positions that indicate large movements if you have not been aware of any. Plot a few positions on a chart yourself to verify that they correspond to where you believe yourself to be. The first digit of longitude (1) is understood, so record only the following digits. Each haul must have a position. On nonfishing days, record ALT noon position in these columns.

13. The time system used (on this and all other forms) should be Alaska Local Time (ALT) and dates. From the last Sunday in April through the summer to the last Sunday in October, entries should be made according to daylight savings time. Times must be recorded according to the 24-hour system.

14. A haul is assigned to a day according to the time the net is begun to be retrieved from the fishing level (nets off bottom time), which is not necessarily the same day the net was set or the day that you sample. Thus, hauls retrieved before 0000 hours are attributed to the previous day, and hauls retrieved on or after 0000 hours are assigned to the next day. For mothership observers who can't get retrieval times from catcher boats, estimate the day of retrieval to the best of your ability.

this context refers to the fishing level rather than the actual ocean floor.) "Nets on bottom" refers to the time that the net first reaches the fishing level and the winches stop paying out cable.

16. All 2400-hour notations should be changed to 0000 hours. If this occurs in the "nets off bottom" time, the date should be changed accordingly.

17. Double check haul times to see if they are reasonable times for your vessel. An overlap in haul times for two hauls is an obvious error.

18. Record both the "nets on/off bottom" times (cols. 34-41) and the fishing duration in minutes (cols. 42-45). You will use the sum of the duration entries to report fishing effort in your weekly catch messages. On/off bottom times provide us with more detailed information however, so when the form 2US data is compiled on the database the duration will be calculated from the difference in the on/off bottom times. [**Note:** If the **actual** fishing duration is substantially different than what would be obtained by calculation from the on/off bottom times, record only the duration and off bottom time. This may occur if the net is raised and lowered several times during the haul. If this is the case, minutes duration would be more accurate than on/off bottom times. Note the reason for the unusual entry at the top of the form.]

19. The average fishing depth (cols 46-49) and average bottom depth (cols 51-54) can be recorded in either fathoms (more likely) or meters, depending on their preference. Try to obtain both fishing and bottom depths as that will indicate whether the net was fishing on or off the bottom. Record depths only to the nearest whole number, no decimal values please. Be sure to indicate the units (fathoms or meters) for every depth that you record (cols 50 and 55).

20. Record the average trawl speed to tenths of a knot in columns 56-57.

21. Retained catch: this is the original or fresh weight of any fish that is retained or consumed aboard the ship (recorded in metric tons, not pounds or short tons--see Table of Equivalents). The fresh or round weight is recorded whether the fish is retained in whole or in part. This figure should always be filled in for unsampled as well as sampled hauls, and must be recorded to two decimal places. On vessels that deliver catch to shoreside processing plants, your job would be to estimate the amount that is delivered to the processing plant, not what is eventually retained by the processing plant. Use your judgement as to how to obtain the most accurate data according to instructions on a following page.

22. Official total catch (OTC): this is the observer's best estimate of total catch weight (round weight, all species included) for each haul. All subsequent uses of haul weight by the observer and in the observer program data base will use these figures. Thus, it is the "Official" Total catch. There must be an entry of OTC for every haul recorded on the 2US form. The entry must be made to two decimal places.

~~the 2US form. The entry must be made to two decimal places.~~

Occasionally an observer will be on a ship when a haul comes in containing mud or boulders which makes up a large percentage of the weight/volume of the catch. NMFS is only interested in the catch of organisms so do not include the weight of the mud, logs, oil drums or other non-living component in your catch estimation, and avoid including it in your species composition data.

23. Observer's estimate: this is an estimate made from independently derived or verified information. Make independent estimates of as many of the catches as possible. Instructions and information on making estimates of catch weight follow. Record the weight estimate to two decimal places.

24. Enter the 6-digit, Alaska Department of Fish and Game (ADF&G) statistical area that the haul retrieval position places each haul in. Refer to the special supplement on the ADF&G statistical areas to determine the correct area. Do not use ADF&G area records from the vessel log unless you verified them. The ADF&G statistical area must correspond with the latitude and longitude entered in the location columns.

25. The "Vessel Code" columns (and the "List of Catcher Boats" at the top of the form) are for mothership observers only. If you are on a catcher/processor or catcher boat, leave these areas blank. Mothership observers will actually enter the ADF&G Boat Number in the column labeled incorrectly as "Vessel Code". If a catcher/processor is operating as a mothership and also fishes for itself, enter the word "self" in columns 79 - 82 for those tows made by the processor.

26. Leading zeros should be in the dates (cols 12 & 14) and the times (cols 34-41) only, as needed and skip a line after each day. Any notes, or comments (other than notes for nonfishing days) should be placed in a part of the form that is not keypunched.

Checking the 2US form: The correct haul/date correlation, retrieval position, duration, and total catch weight are especially important items--without this information the observer's sampling data cannot be used. The observer must cross-check all data for accuracy. After a week's worth of data, or for each page, check the "Nets off bottom" time of the last tow of each day. The tow cannot span midnight and be the last tow. Check to see that no two haul times overlap. Check any change in degrees of latitude and longitude. Unless the minutes indicate the position is close to the next degree, changes of degree would mean long distances traveled or a recording error. Use the ADF&G statistical area numbering system to check the ADF&G area number against the latitude and longitude. Look at each whole page of form 2US for "holes" where data may be missing.

VESSEL FISHING AND CUMULATIVE PRODUCTION LOGS

A skipper may keep several types of records or logs. He (she?) may keep fuel and fishing logs for himself or his company and there are fishing and marine mammal logs required by NMFS for fishery management. The Alaska Department of Fish and Game (ADF&G) requires information on "fish tickets" for their landing records. Your job is to obtain the best information on the fishing catch and effort from these ship's logs, from vessel personnel, and by direct observation and accurately record it on your Haul Form 2US. **All of the tows made while you are aboard must be recorded on your haul form whether you sampled them or not.**

Though the fishing effort and captain's total catch estimate are to be recorded by haul in the NMFS Daily Fishing Logbook, the information for discard and for production of retained catch is only recorded by day on catcher/processors or by day and by delivery for catcher boats. Since the observer needs to record retained catch **by haul**, manipulation of logbook figures and independent work will be necessary.

The captain may wish to use the observer's sampling data as a basis for logbook entries; perhaps for total catch "deck" estimates but more likely for estimates of amounts of discarded species. Observers may provide the vessel's officers with copies of their "raw" sampling data obtained from that vessel, but observers may not make extrapolations from any of their sample data for entry in vessel logs or use by vessel or company personnel. Should the vessel's log or a statistic be called into question, the observer could be held accountable for release of incorrect information. An observer must never make any entry in the vessel's logbook nor should they sign the log or any statement regarding the catch or operation of the vessel. Refer all requests of this nature to the Observer Program's Seattle office, or the NMFS Regional Office in Juneau, AK.

RETAINED CATCH WEIGHT ESTIMATIONS

Retained catch weight is the weight of fish, in their natural state (also termed "in the round", round, fresh or whole weight) kept by the fishermen at sea. Sometimes crewmen will "dress" or "bleed" the fish (to remove un-wanted body parts or fluids) at sea. Retained catch is the weight of kept fish before they were cut. After off-loading the fish from the catcher vessel, if processing plant workers then discard more fish at the plant, that is not a concern of the observer. Fish consumed aboard the vessel are also part of retained catch.

Objective: To derive or obtain for every haul made while the observer is aboard, the best possible estimate of the round weight of fish retained on board (Form 2US).

Preferences, Catcher-Only Vessels: 1) Proportion the weight of fish as determined upon delivery to the individual hauls using catch estimates made at sea.

2) For each tow, subtract the weight of discarded fish (recorded by the observer at sea) from the Official Total Catch (OTC) weight.

3) From catch composition samples, multiply the ratio of retained fish weight to sample weight

by the OTC weight.

Retained Catch Estimation Methods for Catcher-Only Vessels

Preference 1: For the weight of retained catch of shoreside delivery or catcher-only vessels, observers usually use delivery weight because the fish that are kept are usually weighed at the plant. When fishing, the retained catch is dumped, one tow after the other, into the "live" or holding tanks. So, the observer must proportion the delivery weight based on at-sea catch estimates made of each tow to estimate the retained catch by haul. Usually the delivered catch is weighed at the dock. When this is the case, the observer is expected to verify the delivery weight by being there and recording the scale weights if at all possible. By doing this, the observer has independently verified the delivery weight, has complete data available immediately and bypasses "adjustments" which may be made to the weight figures by the office. Even delivery weights are only as good as the accuracy and calibration of the dock scales though, so an observer's deck estimates serve as an additional check. When the catch is weighed only after sorting by plant workers, the observer of a pollock fishing vessel may be sampling the catch at the plant and if so, may be able to verify scale weights of retained catch during sampling.

Groundfish catch "landed" from state and federal waters off Alaska is required to be reported to the State of Alaska via their Fish Ticket system and a fish ticket must be made out for each delivery. Fish tickets also serve the processors as a record of the deliveries that were made to their plant and they serve fishermen as a receipt of deliveries and price settlements that were made. Observers all too often however, glibly accept fish ticket entries as accurate when there are many potential pitfalls.

The purpose of the groundfish fish ticket is to record domestic groundfish landings from state and federal waters. Now the NMFS permit and logbook system is also required for all groundfish operations of vessels which fish federal waters (outside three miles from the coastline). Prior to the advent of this new federal data gathering program in 1990, the fish ticket program provided data essential to the in-season management of the resource. These data form the historical domestic catch record which is archived at the Pacific States Marine Fisheries Commission in Portland, Oregon. The fish ticket data base is used by the Commercial Fisheries Entry Commission to determine the value of fisheries by gear type. The Department of Revenue utilizes fish ticket data to evaluate tax compliance by fishermen and processors. The North Pacific Fisheries Management Council has used fish ticket data to evaluate new management strategies, in particular, the proposed Individual Fishing Quota (IFQ) system for the sablefish fishery. In 1990, NMFS signed a three year contract for funding ADF&G to collect, edit and enter data from the fish tickets into the groundfish data base. Personnel in Kodiak, Sand Point and Dutch Harbor collect the tickets which are then edited for accuracy and completeness by groundfish staff in Kodiak. The tickets are merged into a statewide database by a manager in Juneau.

When observers use the fish ticket information we see three commonly made mistakes. These are: 1) assuming that the reported weights are always for whole fish, 2) assuming that the three digit ADF&G species codes are the same species codes which the observer program requires for it's sampling forms, and 3) assuming that the weights and species identification of

discarded fish are complete and correct. In practice, none of these assumptions are correct. Also, processing plants pay very little attention to discard figures. They generally weigh the discarded fish as a group and deduct it from the total delivered weight of "money fish". The composition of this discard is generally reported as "waste" fish or "flatfish" and is generally composed of several species. Fish that were discarded at sea may or may not have been reported on the ticket. In addition, watch for an "A" designation on products such as cod stomachs. This refers to ancillary or additional product produced from fish already listed on the ticket. As the fish used in these ancillary products have already been accounted for, it would be incorrect to convert this product weight to round weight and add it to the total for a retained catch weight.

ADF&G statistical areas fished are listed on the fish ticket but these are frequently incorrect. Look up the area codes yourself, based on the position coordinates listed in the NMFS Fishing Log. Figures given for landed crab, halibut and salmon are usually numbers rather than weights. The fish tickets need to be, and are, extensively edited by ADF&G before they are passed on for data entry. To the chagrin of the editors, people have been very creative in filling out these tickets and the editor often needs to go to the plant for clarifications and corrections. All of these editing corrections take place well after observers have used the ticket data so observers need to be extremely careful that what they get off of the tickets is interpreted correctly and makes sense.

Also, completion of fish tickets is often delayed and too often, observers have stepped off a boat missing figures they expected to get from the fish ticket only to step on another boat or an airplane with their data a mess. For these reasons, obtaining retained catch weight by subtraction of discard weight from a deck estimate of total catch or by applying a percentage of the retained fish weight in a sample to the total catch (as explained below) may be preferable.

Preference 2: If you have good total catch weight estimates (see next section) and you are able to quantify the weight of discards, obtaining retained catch weight by subtraction is a good alternative. Discarded catch weight (of fish and any other organisms) could be actually weighed by the observer if the amount was less than half a metric ton (500 kg), and the crew assisted the observer in collecting it. If one undesirable species is prevalent, that part of the discard (collected by the crew) could be counted by the observer. An average weight, as obtained from a sample of 30 to 50 individuals, multiplied by the total number would estimate the discard weight of that species. Then, any other discard would have to be weighed and added in for a total discard weight. The observer could extend this system to two prevalent species and could be doing this in conjunction with their sampling work. The observer must not rely on crewpersons to count fish they are throwing overboard; crew are not employed to make accurate counts!

Preference 3: The round weight of retained fish can be derived directly from the observer's species composition sample of the catch, where: a ratio of the weight of fish in the sample which would be retained to the sample weight multiplied by a good estimate of total catch will give an estimate of the retained catch in the haul. This is more direct than using a ratio of discarded fish in the observer's sample to derive the estimated discard weight in the haul and subtracting that from the OTC weight. This method assumes the following relationship:

$$\frac{\text{Wt. of retained fish in sample}}{\text{Total sample wt.}} = \frac{\text{Wt. of retained fish in haul}}{\text{Total haul weight}}$$

Preferences, Catcher/Processor Vessels: 1) If factory production information can be obtained by haul, the observer can calculate what the fresh weight of the fish was before processing.

2) From the daily totals of production entered in the vessel's NMFS logbook, the observer can calculate the daily total fresh weight and then proportion the daily total to the retained weight by haul.

3) From an estimate of total catch made before processing, subtract the weight of the fish that were discarded, the remainder is what was retained. *

4) From catch composition samples, multiply the ratio of retained fish weight in sample to sample weight, by the OTC weight.*

[* For hauls not sampled, a ratio of retained weight sums to total catch weight sums would have to be applied to the total catch weight of hauls not sampled.]

Retained Catch Estimation Methods for Catcher/Processor Vessels

Preference 1: In addition to haul data and deck estimates, catcher/processor vessels are required to report daily production weight totals and the amounts of discarded species in the Daily Cumulative Production Logbook for NMFS. Product weights are grouped by species (or species group), and by product type. To record this, a count of the number of units of each product produced by the factory for each haul or each day will be reported to the bridge. A unit of product would be a tray of fish packed for freezing or a bag of fish meal.

Number of Product Units x Average Unit Weight = Total Weight of Product

For observers to use the ship's production information to derive round weight of retained catch, the observer needs a count of product units produced for each haul, or else the day's total weight of product will have to be proportioned. Aboard a catcher/processor, examine the packing and freezing end of the processing lines. Make diagrams and notes on the procedure in your logbook. If pans or trays are loaded into compressing plate, flash freezers, are there two, four or six banks of these freezers? What is their tray capacity? In what order are they loaded? Note the sounds associated with each segment of the operation so that you might know what is taking place by the sounds from across the factory or even from a different part of the ship. Watch for record keeping and/or ask the factory manager about this. Is there a tally sheet or grease board where the workers record their progress? Investigating these things should enable an observer to determine whether a count of product units by haul can be independently made or verified. This is essential if production information will be used for observer data.

The second variable in the use of product information for retained weight is the average unit weight. The observer should weigh units of product once or twice per week (recommending ten units per test). Be sure to subtract the container weight and weigh the product before the addition of water, if any, and before freezing. If each unit is weighed during the packing process, check the calibration of their scale with a known weight from your own scale.

A recovery rate represents the proportion of the organism that is used in any given product. A product recovery ratio (PRR) or a conversion factor can be applied to the product tonnage to estimate the round weight of catch used to make that amount of product.

Product weight ÷ round weight of sorted fish = product recovery ratio

Recovery rates are expressed as a percent or as a ratio. Headed and gutted cod may have a recovery ratio of .62 to 1, or 62% recovery, while fish frozen whole would have a recovery ratio of 1.00 to 1, or 100% recovery. The product weight divided by the product recovery ratio equals the fresh weight of the fish used to make the product.

Product Weight ÷ Recovery Rate = Whole Weight of fish used to make the product

[Note: Another term you may hear is "conversion factor". A conversion factor is the reciprocal of the recovery ratio and is **multiplied by** the product weight to obtain the round or fresh weight of the fish. A conversion factor is always greater than 1. To convert a conversion factor to a recovery rate, or vice versa, divide the number 1 by one of them to obtain the other.]

Product Weight x Conversion Factor = Whole Weight of fish used to make the product

Catcher/Processor captains may not be as concerned with catch weights as they are with production weights. Their primary concern may be to keep the factory supplied with enough fish to keep it running at full production capacity. As availability of the target species becomes more limited, captains can ill afford to be this short sighted, but for many certainly, this is the **most important** consideration. Therefore, product recovery rates can be formulated differently by different people. Some might figure it as the ratio of total product weight to total catch weight, others as product weight to the total catch weight of a utilized species, before sorting. The National Marine Fisheries Service (and therefore the Observer Program) defines a product recovery rate as the ratio of the product weight to the round weight of fish **used** to make the product, that is, the round weight after sorting for species, size, sex or condition. When asking vessel personnel for product recovery rates, be sure to inquire how they are determined. Observers are asked to record this and any PRR sampling information on a Product Recovery Rate Form which will be presented later in this manual.

The retained product information in the ship's logbook is useful to observers except that the information is entered **by production day**. Observers will need product information **by haul** to estimate the round weight (also termed: whole or fresh weight) of the retained catch for each haul. Except in the case of surimi or fish meal production, the observer may be able to obtain production data by haul by requesting it. If catches are not mixed together by dumping successive catches into the live tank, production tallies by haul may be made. Observe the

handling of fish into the live and holding tanks and through the processing line(s). If fish from different tows are kept separate, watch the clean-up of one catch and the starting of the next. If product counts by haul are feasible, discuss your information request with the factory manager.

Preference 2: As an alternative then, the observer could find out which hauls are attributed to each "production day" and divide the day's production data by the proportion of each haul based on deck estimates (either the observer's estimate, the skipper's or a combination of both). The following example is from a vessel which produces a minced fish paste called surimi. Surimi production is usually a continuous rather than a batch process. Therefore, information on units produced per haul is not usually available.

Hauls 14 - 17 (roughly) went into production on a day when 20 metric tons (mt) of surimi was put up. Surimi has an average product recovery ratio of .15 (as of 1/91).

20 mt of surimi ÷ .15 PRR = 133.33 mt round wt. of pollock went into production.

Haul No.	Deck Est.	% of Day's Catch	Retained Catch/Haul
14	45 mt	45/150	40.00 mt
15	30	30/150	26.67
16	55	55/150	48.89
17	20	20/150	17.78
	150 mt		133.34 mt

These retained catch weights derived from the logbook production data can now be entered on form 2US.

Preference 3: As discussed for catcher boats, round weight of retained catch can also be estimated by subtraction of discard weight from total catch weight. Being able to count or weigh all the discards does not happen often on catcher/processor vessels, but if it can be done, it is potentially more accurate than deriving retained catch from a small sample of the catch (see paragraph below). Discards could be quantified by the observer actually collecting and weighing them before putting them overboard if there are only small amounts, i.e., less than half a ton. This would only be possible for very small mixed species tows (which are usually avoided by catcher/processor vessels as un-profitable) or with very pure catches of pollock where little or no pollock were discarded! A vessel might have a weighing scale built into the discard conveyor belt so that discard weights are recorded accurately and automatically. This is new technology for the fishing industry though, and belt scales are expensive, so their use on a discard belt is unlikely. If the rate of discard was observed to be consistent (the extent of observations would need to be documented in the observer's logbook), and the discard weight per unit of time is shown with sample data, the observer could multiply this rate by total processing time to derive an estimate of total weight of discard. Discard weights could also be closely estimated by having factory sorters fill baskets or tubs with discard fish which are periodically counted and emptied. An average fish weight per container can then be multiplied by the number of containers counted for a total discard weight. With the backing and cooperation of the captain and crew, this could be done easily on some boats. Some observers may be able to negotiate this type of cooperation.

Preference 4: As with catcher boats, the round weight of retained fish can be derived directly from the observer's species composition sample of the catch:

$$\frac{\text{retained weight in sample}}{\text{total sample weight}} \times \text{OTC weight} = \text{Retained weight in haul}$$

On catcher, or harvest-only vessels, the observer often samples every tow as only two to six tows are made per three or four day trip. On the twenty to thirty day trips of catcher/processors however, observers don't usually sample every tow and therefore would not have available the discard or sample information needed to get retained catch weight via methods 3) and 4). It is preferable to use the production information to derive retained catch but the observer may not be able to make sense of it, feels it is not accurate, or perhaps there is too much of a delay in the entry of production figures into the logbook.

Therefore, to obtain retained catch weight for hauls not sampled, calculate an adjustment ratio for the day and multiply the total catch of the un-sampled haul times the adjustment ratio for that day. If you observed the catches to be very different in composition, and have samples of each type, you might calculate different adjustment ratios from different samples and apply the most appropriate ratio to hauls you observed but did not sample.

$$\frac{\text{sum of calculated retained catch weights for the sampled hauls for the day}}{\text{sum of the total catch estimates for the sampled hauls for the day}} = \text{adjustment ratio for the day}$$

$$\text{un-rounded adjustment ratio for the day} \times \text{total catch est. for a nonsampled haul} = \text{retained catch est. for that haul}$$

Preferences - Detailed Review

Preferences, Catcher-only vessels: 1) Proportion (a) observer-verified delivery weight or (b) ADF&G fish ticket delivery weight to hauls using (a) the skipper's deck estimates if they have been corroborated by the observer's own independent deck estimates or (b) using the observer's deck estimate.

2) From Official Total Catch weight for each tow, subtract the weight of discarded fish that was determined by weighing and/or by counting and applying an average weight.

3) Multiply the ratio of retained fish weight in the sample to the OTC.

Preferences, Catcher/processors: 1) Use observer-verified production data obtained by haul and calculate round weight using observer-verified product recovery ratios (PRR).

[Observer verification of production is preferred but when this hasn't been done, product weights from the logbook and PRR values from the NMFS table (in the appendix) may be used.]

2) Calculate round weight of day's production totals using (a) observer-verified PRR or (b) NMFS Product Recovery Rate table. Proportion the daily production totals by (a) OTC weights or (b) skipper's deck estimates.

3) From (a) Official Total Catch or (b) captain's deck estimate, subtract the weight of discarded fish that was determined by the observer (a) verifying weights, (b) weighing or (c) counting and applying an average unit weight.*

4) Apply the ratio of retained fish weight in the species composition sample to the OTC weight.*

[* For hauls not sampled, a ratio of retained weight sums to total catch weight sums would have to be applied to the total catch weight of hauls not sampled.]

OFFICIAL TOTAL CATCH WEIGHT ESTIMATIONS

Total catch weight is the fresh weight of all species caught whether utilized or not. The only thing official about "Official" Total Catch is that the observer has determined that to be the best weight figure available and will be using that value in all subsequent references to total catch weight.

Objective: For each haul made while the observer is aboard, derive or obtain the best possible total catch weight estimate (round weight, all species, whether utilized or not, Form 2US).

Preferences, Catcher-Only Vessels: 1) Record the weight of each haul as weighed by the vessel.

2) Proportion the round weight of fish delivered to a plant to the individual hauls and add to each retained catch weight the weight of any catch discarded at sea.

3) Calculate OTC from observer sample data for species composition using the formula:

$$\frac{\text{Species Composition Sample Weight}}{\text{Weight of Retained Fish in the Sample}} = \frac{\text{Total Catch}}{\text{Retained Weight in the Haul}}$$

4) Record the skipper's deck estimates if they have been corroborated by the observer's own independent deck estimates on an ongoing basis.

5) The observer makes a estimate of catch volume and calculates weight with a volume to weight ratio (density value) obtained from each sample (which is averaged for non-sampled hauls).

OTC Weight Estimation Methods for Catcher-Only Vessels

Preference 1: Vessels currently fishing do not weigh their catch at sea yet but the technology exists. Certainly if it was mandatory or incentives were given to do so, it could be done and would be preferable. Total catch weight, catch composition and fishing effort information are the basic pieces of information needed by fishery managers.

Preference 2: When cut fish are delivered, such as bled cod, delivery weights may have to be divided by a PRR from the NMFS table of values listed in the appendix of this manual to obtain a round weight of retained catch. To proportion the delivery weight of retained catch, the observer must use an estimate of relative catch weights and must choose either the skipper's visual estimates of the weight of fish in each net or use their own volume estimates which are substantiated by measurements and samples. Our preference for this choice is first, the skipper's estimates if they have been corroborated by the observer's routine deck estimates, and secondly, the observer's estimates of catch weight. An explanation of why the catcher boat skipper's estimates are preferred for proportioning follows, under Preference 4. To each retained haul weight, the weight of any (and all) catch discarded at sea must be added. If the discard amount is small (500 kg or less) it can be actually weighed. If the amount is more than half a metric ton but is mostly one species (such as arrowtooth flounder) and little else, the predominant discarded species can be counted and an average weight applied while only the rest of the discard is actually weighed. (Refer also to the previous section on "Retained Catch Weight Estimations for Catcher-Only Vessels" for cautions on using delivery weights and suggestions for determining weight of discards.)

Preference 3: When the observer can't weigh or tally the total discard for a haul, the amount of discarded catch can be estimated by their proportion in the observer's composition sample. If the crew sorts the catch at sea, the observer will be doing species composition sampling at sea also. The observer can sort the composition sample in the same way the crew sorts the total catch and use the following equation:

$$\frac{\text{Species Composition Sample Weight}}{\text{Weight of Retained Fish in Sample}} = \frac{\text{Total Catch Weight in Haul}}{\text{Retained Catch Weight in Haul}}$$

You cannot use a ratio of discarded fish in sample to sample weight because the proportional equivalent to the sample weight is the unknown object of our quest! On the right side of the equation above, the retained catch weight in the haul can be obtained by proportioning the delivery weight (verified for accuracy by the observer) to individual hauls using the skipper's or the observer's haul size estimates (as demonstrated on page 2 - 13 in proportioning retained catch and as explained above in Preference 2). Remember: retained weight must always be whole fish weight. If product data are the only information available for retained weight, a product recovery rate must be used to convert product weight to fish "round" weight before proceeding with this calculation.

Preference 4: The delivery of fish may not be weighed at the dock and the subsequent delay and potential errors of using fish ticket data may make using at-sea estimates a better alternative for OTC weight. The accuracy of judgement of the weight of a net and the fish in his holds is more directly rewarded to a catcher boat skipper than to the skipper of a

catcher/processor. When his holds are full or his available time is up, he makes a delivery and gets paid. A catcher/processor captain's success is measured by the production of his factory and he is trying to match his net retrieval timing and catch size to his factory's capacity. This is a much more continuous process over a longer period of time. A shoreside delivery skipper's fishing time may be strictly limited by the processing plant which does not want any catch older than a given number of hours and is expecting his delivery according to a schedule, in line with other boats. To be most profitable, his fishing must be successful within a limited amount of time. At the end of each three to four day trip, his actual catch weight is reported to him. Therefore, the appearance of the net coupled with the net maker's specifications and past experience with delivery weights can make catcher-only skipper's deck estimates or "estimates by eye" very accurate. However, do not accept the skipper's deck estimates out of hand without verifying them with your own substantiated estimates. Sometimes a captain is only estimating the weight of fish he will get paid for and is not estimating total catch!

Preference 5: Observers may choose to use their own estimates (based on catch volume) when at-sea estimates are necessary and the captain's estimates are not consistant with their own and are, for reasons the observer has discovered, in-accurate. Refer to the next section on "Observer's Total Catch Estimates" for a discussion of volumetric methods.

Preferences, Catcher/Processor Vessels: 1) Record the weight of catch weighed by the vessel.

2) To the retained catch weight for the haul derived from production data add the weight of discards as determined by the observer.

3) The observer makes an estimate of catch volume for every haul and calculates weight with a volume to weight ratio (density) obtained from each sample (which may be averaged for non-sampled hauls).

4) The observer's volume to weight estimates are used when available but the skipper's deck estimate is recorded for catches not estimated by the observer.

5) The skipper's deck estimate is recorded as the OTC weight but the observer continues to make independent volumetric and/or production data estimates for comparasion.

OTC Weight Estimation Methods for Catcher/Processor Vessels

Preference 1: As explained for catcher vessels above, if the vessel weighed its catch, this would be the best (and easiest!) weight to record for OTC. As of yet, no catcher/processors are doing this.

Preference 2: An accurate total catch weight may be calculated using the retained catch weight calculated from production data and adjusting for the non-utilized, discarded fish. If the observer is able to obtain a total discard weight, as described for retained catch weight under method 3) in the previous section, total catch is:

Round weight of retained fish + Total weight of discarded fish = Official Total Catch

Discards normally consist of prohibited species, bycatch species and undersized and damaged target fish. When the observer cannot sort the whole catch for bycatch and obtain a total weight of bycatch discard, the species composition sample can be used to extrapolate the total catch weight from the round weight of retained catch:

$$\frac{\text{Species composition sample wt.}}{\text{Weight of retained fish in sample}} = \frac{\text{Total Catch Weight}}{\text{Retained Catch wt. in Haul}}$$

In a fishery for pollock or whiting where the catch is very pure and is not too large (or is sorted very quickly as for surimi production), the amounts of prohibited species and bycatch are often small enough that they can be weighed by an observer who is able to sort the entire catch. The discard of damaged, undersized and particularly old target fish may be more difficult to estimate as the discard is continous for the many hours it takes to process a haul. When the observer cannot weigh the discarded target fish but has an actual weight for the discarded bycatch, a sub-sample of only the target species can be used to extrapolate the total weight of the target fish for the haul, thus accounting for the amount of target species (sp.) discard:

$$\frac{\text{Total weight of target sp. in sample}}{\text{Wt. of retained target sp. in sample}} = \frac{\text{Total weight of target sp. in haul}}{\text{Round wt. of retained target sp. in Haul}}$$

Then: Total weight of target sp. + weight of discarded bycatch = Official Total Catch

Discard of target fish is often not consistant however. With a load of fresh fish just brought in, a factory boss may decide to discard the remainder of the last catch in preference for fresh fish. This leaves the observer with these last two alternatives: You may estimate the amount of discard based on the rate determined by samples (as shown above) and add to it the weight of wholesale dumping that takes place occasionally as estimated by eye or by the report of a trusted crewman or factory manager. Failing this, the observer is left with giving up on estimating discards altogether and using deck estimates for OTC.

The observer must be present and working in order to make estimates and take samples for the above method. Similar to the procedure given above for retained catch weights, to obtain total catch for hauls which you did not sample, calculate an adjustment factor for the day (see example below) and multiply the retained catch for the unsampled haul times the adjustment factor for that day. If you observed the catches to be very different in composition, and have samples of each type, you might calculate different adjustment factors from different samples and apply the most appropriate factor to hauls you observed but did not sample.

$$\frac{\text{sum of calculated total catch weights for the sampled hauls for the day}}{\text{sum of the retained catch estimates for the sampled hauls for the day}} = \text{adjustment factor for the day}$$

$$\text{adjustment factor for the day} \times \text{retained catch est. for a nonsampled haul} = \text{total catch est. for that haul}$$

Example--see 9/14 on example form 2US:

$$\frac{16.00 + 20.00 + 12.00 + 18.62}{15.80 + 19.90 + 10.50 + 17.92} = \frac{66.62}{64.12} = 1.0390 \qquad 1.0390 \times 7.94 = 8.25$$

Preference 3: The methods for observers to use in making volumetric estimates of catch size and weight are presented in the next section. If the observer's catch estimates are being used as the official total catch because they are the most accurate, the observer should try to estimate all of the catches brought in while the observer is aboard.

Preference 4: If making an observer estimate for OTC weight is not possible for every tow, record your observer estimates when possible and use the captain's deck estimates for the other hauls. The skipper or mate on watch will make a deck estimate by looking at the codend and counting the number of sections full of fish. The codend of the net has reinforcing cables or "expansion straps" around it at regular intervals. The amount of fish between each strap can be added as a consistent unit of weight. Their deck estimate is required to be reported in their Fishing Log for NMFS. As discussed in the previous section for catcher vessels, the skipper's deck estimates aboard a catcher/processor are commonly not accurate. Observers report that they can be highly optimistic with large catches and pessimistic with small ones.

When using the skipper's deck estimates only for hauls the observer doesn't estimate, there is no recorded comparison to indicate the accuracy of their catch weight estimates on Form 2US. Therefore when using this method, we ask that the observer make a table of comparisons in their logbook of the captain's deck estimates, observer's volumetric estimates and their differences by haul for hauls the observer has estimated.

Preference 5: As a last resort then, the observer could use the captain's deck estimates for OTC weights. The observer must still make their own estimates (as described in the next section) which will be recorded in the "Observer Total Catch" estimation columns on Form 2US. A separate table in the observer's logbook will not be necessary in this case.

Preferences, Detailed Review

Preferences, Catcher-only Vessels: 1) Record the weight of each haul as weighed by the vessel.

2) Proportion (a) observer-verified delivery weight or (b) fish ticket weights of pollock fishing vessels, **using** (a) the skipper's deck estimates if they have been corroborated by the observer's own independent deck estimates or (b) the observer's deck estimate. Add to the proportioned delivery weight the weight of discards as (a) weighed by the observer, (b) tallied and average weight applied or (c) derived by proportions in sample data.

3) Using observer species composition sample data, calculate the catch weight with the formula on page 2-16.

4) Record the skipper's deck estimates if they have been corroborated by the observer's own independent deck estimates on an ongoing basis.

5) The observer makes volume estimates of all codends and calculates weight with a volume to weight ratio (density value) obtained from each sample which is averaged for non-sampled hauls.

Preferences, Catcher/Processors: 1) Use the weight of the haul as weighed by the ship.

2) Calculate round weight from product weights using observer-verified counts, unit weights, and prr values and add the weight of discarded fish where discard weight is (a) verified by observer, (b) weighed by observer, (c) determined by counting containers of discards and applying an average unit weight, (d) determined by samples of discard rate per unit of time, (e) derived based on sample weight proportions or (f) estimated by eye and/or by reports.
Using the proportion of daily total discard weight from the logbook is not recommended except for days when the observer is not able to work and the skipper's deck estimates are a worse alternative.

Observer verification of production is preferred but when this has not yet been done, product weights from the logbook and PRR values from the NMFS table (in the appendix) may be used. The appropriate questions as discussed in the previous section should have been investigated though, such as: Which catches made up the day's production totals? What is the average unit weight per tray of fish? What does the factory manager estimate the product recovery rates to be and how do they compare with the NMFS tabled values? How do they keep track of the number of units of product produced?

3) The observer makes volume estimates of all catches from (a) the live tank or bin, or (b) the codend and calculates weight with a volume to weight ratio (density value) obtained from each sample which is averaged for non-sampled hauls.

4) Observer's volumetric estimates are recorded when available but captain's deck estimate is recorded for catches not estimated by the observer. The observer makes a table in their logbook of the captain's deck estimates, observer's volumetric estimates and their differences by haul.

5) The skipper's deck estimate is recorded as OTC but the observer continues to make independent volumetric and/or production data estimates for comparison.

OBSERVERS TOTAL CATCH ESTIMATES

The observer estimate must be an **independent, non-biased and substantiated** estimate of catch weight. Each component of the estimate has been obtained by the observer or the observer was working with the person or machine collecting the information. Without this tool, how are you to know (or prove to anyone else) how accurate the OTC, a skipper's deck estimate, the delivery weights or fish ticket weights are? When discrepencies occur, your estimates will be used as a touchstone. Your estimates of total catch are an important part of the reason you are there, so you should do your best to get good data. Do not, for instance, make any estimates simply "by eye", where you probably learned your mental guage from the skipper - who's estimates you are there to check! Continue to document your measurements and calculations in your logbook and record your estimates of catch weight on the 2US form even if your estimates are close to those obtained from another source for OTC. Even when your observer estimates are used as the "Official Total Catch", record them also in columns 68 - 72 on Form 2US.

Objectives: Observers should make an independent estimate of the total catch weight of as many tows as you can, certainly at least the tows you sample for species composition as well as some that are not sampled. Each component of the estimate is measured or verified and documented by you, the observer in your logbook, estimates are recorded on Form 2US.

Preferences, Catcher Boats: 1) Entire catch is weighed aboard the vessel at sea and the weight is verified by the observer.

2) Delivery weights verified by the observer plus the weight of catch discarded at sea which was (a) weighed by the observer or (b) derived from the observers samples taken at sea.

3) Volume estimates (a) of checker bins, (b) of codends or (c) of codend sections added together are converted to weight estimates using the observer's density sampling data.

Preferences, Catcher/Processors: 1) Entire catch is weighed aboard the vessel at sea and the weight is verified by the observer.

2) Round weight from verified production data plus discard weight as (a) verified, (b) weighed, or (c) derived from observer samples. (As verifying product count, unit weights, and prr values as well as determining the amount of discard is more than many observers can do, this first preference for method is rarely used.)

3) Volume estimates (a) of live tanks or holding bins or (b) of codends are converted to weight estimates using the observer's density sampling data.

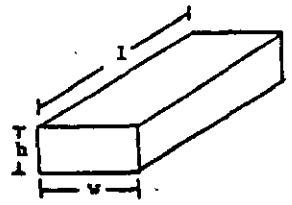
Our fisheries management would be greatly improved if the whole catch, before sorting, could be routinely weighed at sea and these weights could be verified by an observer. This is not yet done on any of the vessels in our experience, but technology advances may soon make this possible and then it may be required.

Methods for verification of production information aboard catcher/processors, estimating

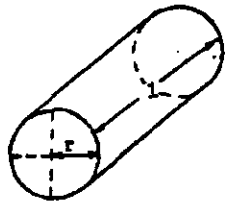
discards and verifying the delivery weights of catcher-only vessels has been presented in the previous two sections. Later in this manual you will find additional guidelines on sampling for product recovery rates.

Methods for Observer Estimates of Codends

As scientists, observers must have data to verify their estimations. Codend measurements are taken to determine volume (m^3) and volume is multiplied by weight per volume mt/m^3 (density) to derive an estimate of the catch weight. Observers must not record "eyeball estimates" as part of their work. The first step in the estimation of the volume of fish in the codend is to decide which geometric shape a particular codend most closely resembles: a rectangular solid, a cylinder, an ellipsoidal solid, a semi-ellipsoidal solid, or perhaps a combination of two of these shapes. Determine the needed dimensions for volume calculation of the chosen solid. Then measure the codend of fish or use known dimensions to gauge the net size using, for instance, pre-measured deck lengths; deck width; height to your shoulder, nose or whatever; or other standards of reference.

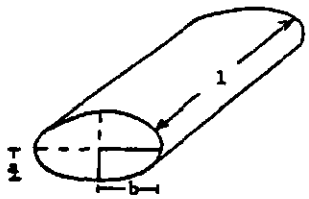


Rectangular solid
Volume = height x width x length
$V = hwl$

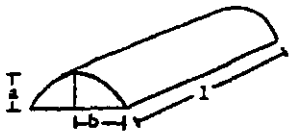


Cylinder
Volume = π x radius^2 x length
$V = \pi r^2 l$

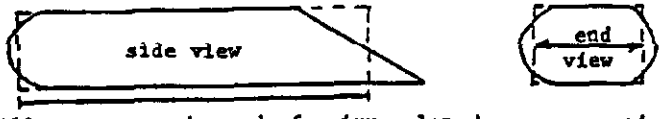
$(\pi = 3.1416)$



Ellipsoidal solid
Volume = π x short radius x long radius x length
$V = \pi abl$



Semi-ellipsoidal solid
Volume = $\frac{1}{2}\pi abl$
$V = \frac{1}{2}\pi abl$



(Allowances can be made for irregular shapes or partially filled portions of the net by the way in which the measurements are taken.)

On vessels less than a hundred feet in length, it is common that a full codend will be longer than the trawl deck and can only be emptied several sections at a time while the remainder hangs off the stern ramp, still in the water. It is necessary for the observer to measure the volume of fish in several banded sections to determine the volume per section and then to count the number of full sections and add them together instead of treating the whole codend as a single unit. The codend's reinforcing cables or "expansion straps" around it and the "riblines" which are often made of chain running it's length, limit extreme bulges and allow the amount of fish between each strap to be added as a consistent unit of weight. Take into account the number of full sections plus the adjustments for the end section which often contains a bit more fish and the first section which is deflated as the fish are not compressed and slide forward. Also, like any mesh bag, when the net is very full, the mesh will expand and bulge and there will be more tonnage per section. Record measurements in your loogbook for each net. Also in your log, calculate the volume in cubic meters using the appropriate formula, then multiply the volume times the density, obtained as explained below, to obtain the metric tonnage of the catches.

The deck crew will often have orders or for their own reasons will want to empty the net as quickly as possible. They may be reluctant to allow an observer time to make the needed measurements. Prepare for this possibility by making sure the skipper is aware of your needs and by being ready to get your measurements as quickly as possible. Be ready to step on deck as soon as the winch cables are relaxed and know which measurements you need to take. Having one of the deck crew help you regularly will help everyone. The two of you will soon learn to work quickly as a team; measuring will be easier for you and you will finish faster so they can get on with their work. On a big net of fifty tons or more, single handed measurements might take ten minutes. With help you should be able to shave several minutes off that time. If the deck crew are reluctant to follow your reasoning, explain your plan to the skipper and ask his cooperation.

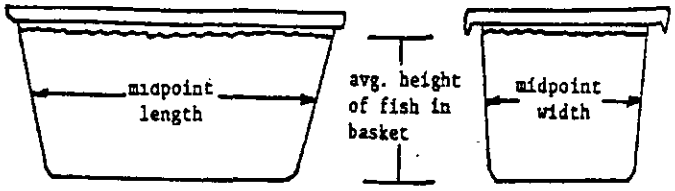
Density Sampling

Codend volume (in cubic meters) is multiplied by a weight per cubic meter ratio, (termed "density") to obtain a catch weight estimate for that haul. Density is the ratio of mass, or weight, to volume. One cubic meter of fresh water by definition weighs one metric ton. It's **density** then is 1 ÷ 1, or 1.00. The density of seawater is 1.026. The density of fish in a fish bin, (their weight per cubic meter of volume) should be close to 1.00, (they commonly range from .87 - .98). The fish in a codend are often very tightly compacted and thus their density would be greater than the density of fish dumped loosely into a bin or basket. It has been theorized that densities of fish in tightly compacted codends approach 1.00 and may even be greater than 1.00 but no studies have been done to substantiate this. Therefore, we ask that observers sample for density as explained below and do not make unsubstantiated assumptions.

Density is variable and should be derived from random basket samples for each sampled haul. Average density values for the day or area should be calculated and used for catch weight estimates of unsampled hauls. A minimum of four baskets should be used to calculate density. First obtain the volume of fish in the sampling baskets, (or some other small container which is larger than a basket but not larger than a cubic meter), such that fish weight and volume can be accurately determined. The basket sides are sloped slightly, so use the midpoint width and

length measurements. Remember that the midpoint is half the distance from the bottom to the level **of fish** in the basket (or other container) not necessarily to the top of the basket. It is important to fill all the baskets to the same level. It is also important to examine the way that the fish are packed in your basket or small container and make sure that it approximately duplicates the way that the fish are packed in the fish bin or codend. For instance, if you have very large fish in your basket, such as Pacific cod or turbot, they may not be laying flat on top of each other as they would in a large fish bin. The density of the fish in the basket will be less than the density of fish in the bin because there are more spaces or air pockets between the fish in the basket. It may be appropriate to lay or settle the fish into the container but do not compact or smash the fish in an attempt to duplicate the force in the codend. Your resulting density value would be too subjective. A better solution would to find a larger container or or have one built. To calculate the volume of the basket, use the following equation:

Midpoint length x height of fish x midpoint width = total volume



After the volume of an average basket is calculated, you need to obtain the average weight of four or more baskets. Be careful to take a random sample of the catch and to fill all your baskets consistently to the same level. Then simply divide the average weight of a basket by the average volume of a basket to calculate the density value for that haul. Using the volume of the fish in the codend or live tank and the density of those fish, you can calculate a total catch weight estimate. Remember:

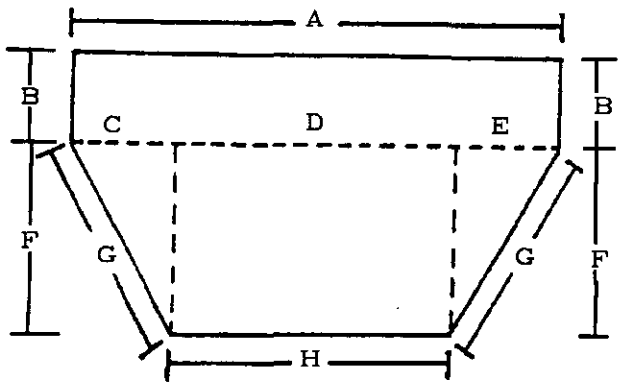
Volume of fish (m^3) x density (mt/m^3) = weight of fish (mt)

Observer Estimates by Bin Volume

On some ships, it may be possible to estimate the catch size by the volume of fish in a live tank, holding tank (surimi vessels) or checker bin (catcher boats). Tank or bin volume is preferred over codend volume because of the consistency of the shape but often cannot be used. The tanks may be enclosed such that the depth of fish cannot be determined; the tank may hold fish **and** an indeterminate amount of water; the tank may be too difficult a shape to measure; or tows may be mixed by dumping them in together.

Measure the fish bin into which the fish will be emptied to obtain the volume in cubic meters. If the fish bin is shaped like a rectangle or square, it would be relatively easy to calculate the volume. Simply multiply the floor area (length x width) by the height of fish.

However, many fish bins are irregularly shaped, in which case the floor area of the bin must be broken into sections which can be easily measured. The example below shows how one fish bin was broken into shapes easily calculated or measured to obtain floor area.



Useful Formulas You May Need

Area of a circle = πr^2 Circumference = $2\pi r$ (π = 3.1416)
Area of a square or rectangle = length x width (In diagram above: A x B)
Area of a triangle = ½ base x height (In diagram above: ½ E x F)
For bin floors with a conical shaped depression: Volume of a right angle cone = $1/3\pi r^2 h$

The height of fish in the bin is the third dimension needed to determine volume. If the bin is sided with common width boards of known dimension, use the height of each board to estimate the height of fish in the bin. If the bin is of other composition, ask if you can use some paint to make a height guage at a couple of places on the sides. To determine an average height of fish, it is best to measure the height of fish at four or more points around the inside of a bin. Be aware of overhead structures which may reduce the volume capacity of a bin when it is filled above a certain point. When working with enclosed tanks, some observers have successfully used a "dip stick" which they had made, to measure fish depth through the hatches from the trawl deck. Height guages painted on the sides of the tank might also be read from the trawl deck. The area of the fish bin (a constant) multiplied by the height of fish from that catch equals the volume. Volume times density equals the catch weight.

There is no need to be surreptitious about your estimates of catch weight or composition. In some cases, captains have improved their record keeping by learning from the observer. On the other hand, do not argue with the captain about catch estimations. His logbook hail (deck) weights do not have to equal or even approximate yours as we will not be comparing deck estimates. Catch weight estimation is a difficult task and the accuracy is often dependent on the circumstances.

In summary remember, retained catch and official total catch must be filled in for every haul (record it to two decimal places). The OTC is the weight that you will use species composition data and for catch reports. Refer to our list of preferences which are presented in order and document in your logbook the circumstances which lead you to choose the method you used.

SPECIES COMPOSITION OF THE CATCH
FORM 3US

OBJECTIVE:

Resource managers need composition of catch to determine, for each gear type, what species will be caught in association (bycatch) with the species of interest (target species) and in what relative quantities. One fisherman's discarded bycatch is another fisherman's target species. Groundfish fishing (target species: pollock, cod, flatfish, rockfish, sablefish, and Atka mackerel) geographically overlaps all of the other major fisheries of Alaska (halibut, salmon, crab, shrimp, herring). Observers species composition data is used for both in-season management of the fishery and for long term stocks assessment. Strive for data that is representative of the catch over time by collecting random, unbiased samples of unsorted catch.

Topics:

SPECIES COMPOSITION OF THE CATCH 1
- FORM 3US - EXAMPLES 2
- FORM 3US - INSTRUCTIONS 6
- DEFINITIONS OF SAMPLING TERMS 8
- OBJECTIVES AND RULES FOR SPECIES COMPOSITION SAMPLING 9
- METHODS OF SPECIES COMPOSITION SAMPLING 10
  - Whole-Haul Sampling 11
  - Partial Haul Sampling 14
  - Basket Sampling 15
  - Mixing of Hauls 17
- PROHIBITED SPECIES SAMPLING 18
- BIOLOGICAL DATA COLLECTED FROM PROHIBITED SPECIES 20
  - Collecting Data From Salmon and Steelhead 20
  - Collecting Data From King and Tanner Crab 21
  - Collecting Data From Halibut 22
  - Viability of Halibut 22

SPECIES IDENTIFICATION 24
- ROCKFISH SPECIES DESCRIPTION FORM 25
- FLATFISH SPECIES DESCRIPTION FORM 27
- MISC. SPECIES DESCRIPTION FORM 29

EXAMPLE 1

Jane Observer
Sea Gull

Page 1 of ____

FORM 3US–SPECIES COMPOSITION

Leading zeros in columns 12 and 14 only. Skip line between sample sizes when space permits.

Worksheet

6 baskets

Species:	POLLOCK	P. COD	TOTAL WT minus BYCATCH:			Salmon Shark
No. weighed:	285	33	Poll + cod wt.			consensus
Wt. of above:	230.5 kg	160.1 kg	16000.0kg − 261.37kg =		15738.63kg	20016. or
Avg. weight:	.808 kg	4.852 kg				90.0 kg

Other calc.; comments: Whole haul sampled for two predominant species. Tanners subsampled.

POLLOCK: 230.5kg/390.6kg x 15738.63kg = 9287.65kg | 9287.65 ÷ .808 = 11495 Pollock

COD: 160.1kg/390.6kg x 15738.63kg = 6450.98kg | 6450.98 ÷ 4.852 = 1330 COD

* Calculations full field on calculator.

Cruise no.					Vessel code				Year		Mo.		Day		Haul no.		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
									9	1	0	9	1	4	1	0	1

ST = Sampling Type: B= basket; W = whole haul

Check Type:	W	P	B
Halibut	☑	☐	☐
Salmon	☑	☐	☐
King crab	☑	☐	☐
Tanner crab	☑	☐	☐

Species name	Sex	Species code	ST	Number	Weight (in kg. w/ decimal pt.)	Sample weight (in kg. w/ decimal pt.)	Viability: Number excellent	Viability: Number poor	Viability: Number dead
	19	20 21 22	23	24 25 26 27 28 29	30–40	41–51	52 53 54	55 56 57	58 59 60
(Keypunch check)	X	9 9 9	X	1 3 5 5 3	16000.0	Haul wt: 16000.0	21	23	45
POP		301	W	9	4.9	16000.0			
NORTHERN ROCKFISH		303	|	1 1	18.7				
SCULPIN unid.		400	|	3	2.3				
ROUGHEYE R.F.		307	|	1	3.2				
SHORTSPINE THORNYH.		350	|	1 2	4.5				
FLATHEAD SOLE		103	|	1 5	6.3				
ARROWTOOTH FLOUNDER		141	|	2	5.0				
REX SOLE		105	|	6	1.45				
ALASKA PLAICE		106	|	1	4.1				
SALMON SHARK		66	|	1	90.0				
TANNER CRAB unid.	U	3	|	5 6 2	89.5				
OPILIO TANNER	M	5	|	3	.43				3
OPILIO TANNER	F	5	|	1	.17			1	
BAIRDI TANNER	M	4	|	3 2	5.44		6	5	18
BAIRDI TANNER	F	4	|	5 9	8.7		15	16	23
PACIFIC HALIBUT	U	101	|	2	6.2			1	1
KING SALMON	M	222	|	1	1.62				
KING SALMON	F	222	|	1	2.1				
KING SALMON	U	222	|	1	1.76				
KING CRAB	U	2	|	0	0.0				
PACIFIC LAMPREY		79	|	2	1.4				
SQUID		50	|	5	3.6				
POLLOCK		201	↓	1 1 4 9 5	9287.65	↓			
P. COD		202	W	1 3 3 0	6450.98	16000.0			

Bairdi #s: 91/95 x 562 = 538.94, 538 + 91 = 629

Opilio #s: 4/95 x 562 = 23.66, 24 + 4 = 28

Bairdi wt.: 14.14kg/14.74kg x 89.5kg = 85.8568kg

85.8568 + 14.14 = 99.997kg

Opilio wt.: 104.24 kg

Tanners unid. − 99.997kg

Bairdi = 4.243 kg Opilio

EXAMPLE 2

FORM 3US–SPECIES COMPOSITION

Leading zeros in columns 12 and 14 only. Skip line between sample sizes when space permits.

Worksheet

Species:						
No. weighed:						
Wt. of above:						
Avg. weight:						

Other calc.; comments: Partial haul for some prohibs. using Bin Volume method.

Cruise no.					Vessel code				Year		Mo.		Day		Haul no.		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
									9	1	0	9	1	4	1	0	3

ST = Sampling Type:
B= basket
W = whole haul

Check Type:	W	P	B
Halibut	☑	☑	☐
Salmon	☐	☑	☐
King crab	☐	☑	☐
Tanner crab	☐	☐	☑

Species name	Sex	Species code	ST	Number	Weight (in kg. w/ decimal pt.)	Sample weight (in kg. w/ decimal pt.)	Viability: Number excellent	Viability: Number poor	Viability: Number dead
	19	20 21 22	23	24 25 26 27 28 29	30–40	41–51	52 53 54	55 56 57	58 59 60
(Keypunch check)	X	9 9 9	X	4 9 0	476.8	Haul wt: 20000.0	70	42	19
HALIBUT	U	101	P	1 1	55.0	9348.7		1	10
KING CRAB	U	2	↓	0	0.0	↓			
KING SALMON	M	222	↓	4	12.6	↓			
KING SALMON	F	222	↓	3	9.3	↓			
CHUM SALMON	M	221	P	1	1.9	9348.7			
BAIRDI TANNER CRAB	M	4	B	1 8 0	68.4	398.0	40	28	2
BAIRDI TANNER CRAB	F	4	↓	1 3 2	52.8	↓	30	13	7
POLLOCK		201	↓	7 3	40.8	↓			
P. COD		202	↓	6 1	214.1	↓			
ARROWTOOTH FLOUNDER		141	↓	3	3.5	↓			
FLATHEAD SOLE		103	↓	1 4	7.1	↓			
POP		301	↓	1	.8	↓			
SABLEFISH		203	B	7	10.5	398.0			

Example 3

FORM 3US—SPECIES COMPOSITION Page 3 of ____

Leading zeros in columns 12 and 14 only. Skip line between sample sizes when space permits.

Worksheet

Species:						
No. weighed:						
Wt. of above:						
Avg. weight:						

Other calc.; comments: Basket sampled for prohibs and sp. comp. Tanner crab were sub sampled for viability and length.

Cruise no.					Vessel code				Year		Mo.		Day		Haul no.		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
									9	1	0	9	1	4	1	0	4

ST = Sampling Type: B= basket; W = whole haul

Check Type:	W	P	B
Halibut	☐	☐	☑
Salmon	☐	☐	☑
King crab	☐	☐	☑
Tanner crab	☐	☐	☑

Species name	Sex	Species code			ST	Number						Weight (in kg. w/ decimal pt.)	Sample weight (in kg. w/ decimal pt.)	Viability: Number excellent			Number poor			Number dead		
	19	20	21	22	23	24	25	26	27	28	29	30–40	41–51	52	53	54	55	56	57	58	59	60
(Keypunch check)	X	9	9	9	X			1	6	5	6	537.1	Haul wt: 12000.0	2	0		3	8		6	8	
Pacific Halibut	U	101			B						1	3.6	537.1								1	
Red King crab	M	13								1	4	6.1		1	0		3			1		
Red King crab	F	13									6	.70			4		2					
Opilio Tanner	M	5							1	2	6	9.2			5		1	6		3	9	
Opilio Tanner	F	5								6	1	6.1					1	0		2	0	
Bairdi Tanner	M	4								1	3	1.1					3			3		
Bairdi Tanner	F	4								1	5	1.0			1		4			4		
Salmon unid	U	220									0	0.0										
Arrowtooth fl		141								3	1	89.1										
flathead sole		103							8	0	2	160.2										
rock sole		104								8	6	26.4										
yellowfin sole		140							4	3	1	200.5										
rex sole		105			↓					7	0	16.7	↓									
skate unid.		90			B						2	16.4	537.1									

FORM 3US—SPECIES COMPOSITION Example 4

Leading zeros in columns 12 and 14 only. Skip line between sample sizes when space permits.

Worksheet

Species:	Halibut					
No. weighed:	22 +	1est 200cm	+ 1 @ 147cm	= 24		
Wt. of above:	83.6 +	119.373	+ 44.023	= 247.0kg		
Avg. weight:						

Other calc.; comments: Whole haul sampled for halibut, salmon, and King crab. Basket sampled for tanner crab and sp. comp. One halibut handled by crew only - estimated length 2 meters.

Cruise no.					Vessel code				Year		Mo.		Day		Haul no.		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
									9	1	0	9	1	4	1	0	5

ST = Sampling Type:
B= basket
W = whole haul

Check Type:	W	P	B
Halibut	☑	☐	☐
Salmon	☑	☐	☐
King crab	☑	☐	☐
Tanner crab	☐	☐	☑

Species name	Sex	Species code	ST	Number	Weight (in kg. w/ decimal pt.)	Sample weight (in kg. w/ decimal pt.)	Viability: Number excellent	Viability: Number poor	Viability: Number dead
	19	20 21 22	23	24 25 26 27 28 29	30–40	41–51	52 53 54	55 56 57	58 59 60
(Keypunch check)	X	9 9 9	X	7 1 8	757.6	Haul wt. 18620.0	.	3	26
Salmon unid.	U	220	W	0	0.0	18620.0			
King crab unid.	U	2	↓	0	0.0	18620.0			
Pacific halibut	U	101	W	2 4	247.0	18620.0		2	20
Bairdi Tanner	M	4	B	1	.32	510.6		1	
Bairdi Tanner	F	4	↓	6	1.89	↓			6
Pollock		201	|	6 7 5	478.93				
P.cod		202	|	4	21.4				
POP		301	|	2	1.49				
Dusky rf.		330	|	1	1.04				
Northern rf.		303	|	1	.84				
Shortraker rf.		326	|	1	2.6				
Squid		50	↓	2	1.23	↓			
Jellyfish		35	B	1	.86	510.6			

SPECIES COMPOSITION FORM 3US - INSTRUCTIONS

The Form 3US is for the recording of detailed composition sampling data by haul. When catches from two or more hauls have been combined before sampling, data still must be recorded by haul. Observing the differences in composition during the emptying of the net will help in attributing catch to particular hauls, or the composition must simply be proportioned to hauls based on relative catch weight. (See also the section on "Mixing of Hauls".)

1. **Enter the date, and haul number.** (The cruise number and vessel code will normally be given to you during debriefing.) Remember that the date of the sample should correspond to the information on Form 2US. The date should thus be the day the trawl began to be hauled in, which is not necessarily the date you sampled it.

2. **Group your species composition samples by the sample size, starting with the largest sample size first.** Whole-haul sample data first (if any), partial haul samples secondly and basket sample data last. Skip a line between sample types.

3. **List each species or species group by their common name** and the corresponding code from the alphabetically arranged Species Code List in the "Reference Section" of this manual. Look up a species under its group name--rockfish, sculpin, sole, etc. Most fish, especially the commercially important species, should be identified to species, if possible. See also the section on Species Identification which precedes the Code List.

4. **You cannot have two sample weights for any species.** Each species (except those whose listings are by sex) may only be listed once for each haul.

5. **All Tanner crab, king crab, or salmon should be listed separately by species and sex** whenever possible. Pacific **halibut should be listed with "U"** for sex unknown. (Do not sex halibut, even the dead ones.) **For these species only**, record an "M", "F", or "U" in column 19. **Sub-sampling:** If large quantities of one of the crab or salmon species groups are seen, it is permissible to take a random subsample of the group and record all of the individuals in the subsample by species and sex. Either count or weigh all of the remaining members of the group and apply an average weight (from your subsample totals) to get the weight or number, and record these as (Tanner crab/king crab/salmon) unid. and unknown sex. Make sure that no individual is recorded twice on the forms (none of the subsample should be reported in the larger group of unidentified individuals). (See 3US example 1, Tanner crab for an illustration of how to record the data in this type of a subsample situation.)

6. **Indicate the sampling type** for each sample size in column 23. For species that you whole-haul sampled, use "W"; for partial haul sampling, use "P"; for basket sampling data use "B".

7. Skip a line between species with different sample weights (see examples 2 and 4).

8. **Every number must have a weight and every weight must have a number.** All weights should have a **well-defined decimal point** as the decimal point itself will be keypunched

8 x 8 = 700 lbs
317.5 kg

and must be present even if the weights are not carried to a tenth or a hundredth of a kilogram (see the examples of Form 3US). **Enter a trailing zero** after the decimal point if you do not carry the weights to a tenth or a hundredth of a kilogram. **Do not enter any weight to more than two decimal places.** If something weighs much less than .01 kg, ignore it.

For occurrences of decomposed fish (sp. code 899) and/or miscellaneous items (code 900) in your samples, record the total weight, not a weight by species or by item, and record the number as "1" because total numbers and thereby, average weights, are not needed. Decomposed or waste fish are those obviously in a state of decomposition as evidenced by a breakdown of skin and muscle. Decomposing fish must be distinguished from damaged but fresh fish. Damaged fish must be coded and listed along with undamaged fish of the same species. Miscellaneous items are garbage, debris, fishing gear, wood, seaweed and other such items that may occur in your samples. Decomposed fish and miscellaneous items are reported under the "non-allocated" category in your catch messages.

9. **Enter the weight sampled for each species in columns 41-51, using a well-defined decimal point and trailing zero.** If you whole-haul sampled for the species composition, the sample weight must match the official total catch estimate (cols. 63-67 on the Form 2US). Logically, the sample weight can equal but never exceed the official total catch weight. Yet this is an easy mistake to make when using an un-rounded weight which is a conversion from pounds to kilograms (2US is in metric tons and 3US is in kilograms). **Whole-haul sample weights should be recorded to the nearest ten kilograms.** If you basket sampled, the sample weight should be the sum of the weights of the individual species that were basket sampled (marked with a "B" in column 23).

   Please note: if an observer is whole or partial haul sampling for some species, the observer should not include the weight of any of these in the basket sample weight if some are found in the basket samples. These of course should be entered with any others as a part of the whole or partial haul sample data.

10. **Record on the worksheet, at the top of the form, any raw data** that might otherwise be lost because an extrapolated figure is entered on the keypunched portion of the form. The following are examples of the use of the worksheet:

a) **If more individuals of a species were counted than could be weighed,** enter the actual weight of the individuals weighed on the worksheet, calculate the average weight, and enter the total extrapolated weight for all observed on the keypunch part of the form (see how the cod were handled on Form 3US example 2). **Similar entries should be made for the reverse situation** when, for example, large quantities of small Tanner crab are weighed, and a total number must be extrapolated.

b) When whole or partial haul sampling for composition, the **samples for average weight of target species must be recorded in the worksheet area of the form.** See the Form 3US example 1 for pollock and the instructions for "Recording Whole-Haul Sampling..." in the following section on "Methods".

c) **Individuals whose weight is estimated** can be entered on the worksheet as in Form 3US, example 1 for salmon shark. If you feel a non-weighed individual is of a different size than those that were weighed, enter an estimate on the "wt of above" line just below the number estimated. **On the keypunch portion of the form, include the total number observed and the combined weight of the actual and estimated individuals.** (Note: For halibut there is a statistically valid length/weight relationship that can aid you in estimating the weight of large individuals, see Reference Section. Length/weight relationships cannot be predicted for other species.)

Note in the comments section the type of sampling you used, number of baskets taken, density values, and anything unusual about the catch or sampling.

11. **Each of the four prohibited species groups must be represented on each form.** It is necessary to have some indication of how much catch was monitored for each of the prohibited species groups--halibut, king crab, Tanner crab, salmon/steelhead. **If no individuals of that species group were observed, then the observer should enter that group name, species code (use codes 2, 3, 101, 220), sample type, sample weight, 0 for the number, and 0.0 for the weight.** (See the 3US examples 1, 2, 3, and 4.)

1.
will change

12. **Under "Viability", record the number of halibut (and crab if assigned), judged to be in each category.** For the definition of "excellent", "poor", and "dead" conditions, please refer to the table in the Reference Section. **Do not sample salmon for viability.** The sum of the numbers recorded in those three categories should be the **total number** of halibut (or crab, if assigned) examined for viability but it doesn't have to match the **numbers weighed** (on the same line to the left of the viability).

13. **Complete the keypunch check (line 999 at the top of each form)** by adding all of the figures in the number column and enter the sum on line 999, columns 24-29. Add the weights and enter on line 999, columns 30-40. Enter the official hauling weight in columns 41-51 of line 999. (Previous observers have found it useful to have this information present on this form for ease in filling out the 3US and catch report forms.) **Add the numbers in each viability category and enter in columns 52-60 of line 999.**

14. **Check the sampling method for each of the prohibited species groups** in the boxes just above the column heading labelled "Viability". This will enable the debriefers/data editors to see quickly what your sampling methods were and will serve as a check if you forget to enter 0 data for non-observed prohibited species groups.

DEFINITIONS OF SAMPLING TERMS

Basket sample - When the amount of catch which was sampled by the observer is actually weighed. The sample weight minimum is 300 kg, the maximum is equal to the OTC weight.

Bycatch - any species in the catch other than target species.

Partial haul sampling - When less than the Official Total Catch (OTC) weight was sampled (sorted) by the observer. The sample weight is estimated in one of two ways. The sample was not actually weighed.

Predominant species - species which are the most abundant in the catch - not necessarily the target species!

Prohibited species - For groundfish fishing vessels, species whose allowable catch and retention is zero. In regards to observer sampling, the prohibited species groups are salmon, halibut, king crab and tanner crab. For the vessel, the prohibited species include the above as well as herring and any other species declared prohibited by a notice of closure.

Prohibited species sampling - the weight of groundfish catch sorted by the observer to determine only the numbers and weights of salmon, halibut, king crab, and tanner crab present.

Sample weight - the weight of catch which was sorted and sampled by the observer.

Species composition sample - To sort a defined weight of catch such that each organism present is grouped by family or by species and, to determine the number and weight of the organisms in each group, thereby accounting for all of the sample weight.

Sub-sample - the weight of catch designated by the observer which weighs less than the sample weight and is processed for a more specific purpose than determining the composition of a haul.

Target species - the species the vessel was fishing for.

Weighed sample - a "basket" sample. The catch sampled by the observer is weighed on a scale.

Whole haul sample - The entire catch was sampled (sorted) by the observer. The sample weight equals the OTC weight as recorded on Form 2US.

OBJECTIVES AND RULES FOR SPECIES COMPOSITION SAMPLING

Determination of the species composition of the catch is one of the high priority duties of an observer. When random sampling, the relative amounts of species in the sample will not necessarily reflect their proportion in the haul. However, from many samples taken within an area/week, a reflection of the relative species proportions over time should be apparent. **Never** should you "hand-pick" a "representative" sample based on your visual estimate of the composition. Observer's species composition samples must be collected such that (ideally) every fish (or organism) in the catch has an equal opportunity of landing in the observer's sample. It is up to you to choose a sampling method and devise a sample collection technique which is

most appropriate for your vessel situation. If you feel you must deviate from the methods described in this manual, contact an Observer Program office for consultation and document your procedures fully. Remember, you must have defendable sampling data to back up any assumptions that form a basis for the rest of your data collection. Your choice of a sampling method must fall under the natural constraints of your available time, energy, and work space as well as consideration of the size of the catch and its diversity. To guide your judgement in choosing a sampling method, please comply with the following additional constraints to ensure proper and accountable data collection:

1. Strive for data that is representative of the catch by collecting random, unbiased samples. Believe in the scientific method of random sampling and in the "long run" accuracy of it. As a result of reducing your sample size, you may find that a species whose occurrence is "patchy" is over-represented in some of your samples and under-represented in others. Over time and many samples, the level of occurrence will closely approximate the true value (assuming random samples). Remember that in many analyses your data will be merged with all other observer's data in that area, year, month and vessel type classification. **It is better to produce accurate data using a small sample size than to have a much larger sample size with dubious data.**

2. Allocate your time appropriately. Sampling a catch at sea should usually take two to three hours. If you are spending more than three hours per sample you won't be able to keep up with the Random Sample Table. If your ship is hauling more than four catches per day, you should reduce your sampling time by reducing your sample size.

3. You cannot sample for only one species or group. Conversely, you cannot leave out any component of the catch. When sampling for prohibited species, you must also sample for target and other bycatch and vice versa.

4. The weight of catch which was sorted by the observer is the "sample weight". You must be present to sort, or directly supervise the sorting, through the entire collection of **all** of every sample. If you see or suspect that the sorting of your sample is not completely thorough, reduce your sample size and/or change your sampling situation until you can be sure that you are getting all the bycatch--allowing for human error. This usually occurs because (a) the fish that are passing by you are too deep or moving too quickly or (b) you do not have enough supervisory control over those assisting you to sort.

5. There can be **only one sample weight for target species and bycatch** other than the four prohibited groups (halibut, salmon, king crab and tanner crab), per haul. The four prohibited species **groups** do not have to have the same sample weight.

6. You cannot have two sample weights for any one species or species group.

7. The sample is sorted according to species or species groups, and the weight, and number of individuals for each group is recorded. It is best to count and weigh all of a species sorted from your sample weight, but if you cannot, you must at least count them all and weigh some of them or vice versa. You cannot estimate both the number and the weight of any species.

METHODS OF SPECIES COMPOSITION SAMPLING

There are a number of different ways the above information can be obtained. The sampling methods you choose are dependent on the diversity and size of the catch, the shipboard setup and your time and energy. Whenever a vessel's catch fits the definition of an Incentive Program fishery where observer sampling is stipulated, an actually weighed sample ("Basket Sample") method is mandatory, including the samples for prohibited species. Basket sampling is the most common means of sampling when the catch is reasonably diverse. When one or two species predominate in the catch and there are very few other species, it may be possible to sample the whole haul to determine composition. Frequently observers are able to sample the whole catch or a large portion of it for prohibited species and basket sample for species composition. These methods will be discussed in detail; it is up to you to decide which methods provide the most accurate information in your particular situation, and to devise a sampling scheme which will provide **complete** species composition data for any sampled haul.

Whole-Haul Sampling

Criteria:

- for composition sampling, hauls must be fairly pure; usually seen in the pollock or whiting fishery - consider that 1% bycatch in a 50 mt haul is 500 kg, or at least 13 baskets of fish.
- for prohibited species sampling, the catch composition may be diverse as long as there are not too many prohibited species per ton of groundfish to deal with.
- you are "upstream" of any sorting of the catch
- the flow of fish is such that you are able to see everything in the haul; either the flow of fish is slow and controlled or the flow of fish is shallow. A processing rate of 25 MT/hr is probably too fast for you to accurately whole haul sample.
- the processing is done in a timely manner. If you are sampling 3-4 hauls in a day, spending 3-4 hours per sample is probably not feasible.

In some cases hauls are composed almost entirely of the target species. This happens very frequently on vessels fishing for pollock or whiting. Whole-haul sampling means that the entire unsorted catch passed by you at one point and you were able to see, and pull out, all bycatch organisms or prohibited species for counting and weighing later. Partial haul sampling is a variation of this where the observer samples a large portion of the catch and sorts it for bycatch or prohibited species. In a pure pollock fishery, catches will normally be whole or partial haul sampled, which allows for a larger sample. The danger is that accuracy may suffer. In this program we place a high value on thorough, accurate sorting. (Refer to "Partial Haul Sampling" on following pages.)

When whole-haul sampling, the sample weight will be the Official Total Catch weight from Form 2US, converted to kilograms. When converting from pounds to kilograms or metric tons, be sure to use the catch weight figure rounded to hundredth's of a metric ton or to tens of kilograms or the sample weight (in kilograms) with more decimal places, may exceed the total catch weight by a small amount. The analysis program will flag this as an error. Retained weight cannot be entered as the sample weight of the predominant species.

An observer must be present **at all times** to sort or supervise the sorting of bycatch when whole haul sampling. Ideally, the fish flow passing by the observer at one point would be **slow** and **shallow** to allow for the complete sorting of catch by the observer alone, but this is not always possible. If you are sorting out bycatch along with the crew, make sure they know that you are sampling (not just helping out) and that you need the bycatch set aside for you. Avoid having crew simply count bycatch for you and then rely on their counts multiplied by an average weight. It is too easy to lose count and you can't supervise what's going on in their minds! You must have direct visual supervision of anyone helping you to gather sampling data. You are expected to work within the constraints of each sampling situation and produce accurate sampling data. Catcher boat observers may have to sample **again** during delivery to the processing plant to get bycatch missed during the sorting at sea. On catcher/processors, if processing is very slow, the observer may have to change to partial haul or basket sampling if sorting the entire catch will take four or more hours.

Bycatch species and/or prohibited species that have been sorted out of the entire catch, must then be counted and weighed. Their numbers and weights are entered on the Form 3US first with a sample type designation of "W". If the observer is whole haul sampling only for prohibited species, the whole haul sampling is then complete. If the observer is whole haul sampling for composition of all bycatch and target species, the observer should next obtain a random sub-sample of the predominant species and count and weigh them. If the predominant species is of average size, 30 - 50 cm (like pollock), take a minimum of 80 kg which is two or three baskets of fish. If the predominant species is large, >55 cm (like cod), collect a minimum of thirty fish for average weight. This sub-sample data must be entered on the worksheet portion on the form and is used to calculate an estimate of the total number of the predominant species:

OTC wt. - total wt. of bycatch = total wt. of predominant sp.
Total wt. of predominant sp. ÷ avg. wt. of predominant sp. = est. no. of predom. sp.

For composition sampling, the sample and sub-sample method above may be expanded to include the situation of whole haul sampling when two species dominate the catch. The extrapolation may not be carried to more than two species. (If more than two species are present in large numbers in the catch, you must basket sample.) If, for example, a majority of the catch is comprised of pollock and cod and there is very little other bycatch, sort the bycatch from the entire haul and identify, count and weigh them. Take a random sub-sample of pollock and cod and count and weigh them to determine their respective average weights and their relative percentage by weight. The sub-sample (of pollock and cod in this case) must be of a minimum of 200 kg, and the data must be recorded in the worksheet portion of Form 3US. These are the calculations which accompany the Form 3US example number 1 data for haul 101.

1. Subtract the total combined weight of the bycatch species from the sample weight. The figure you obtain will be the weight, in this case, the combined weight of the two major species in the haul.

16000.0 kg - 261.37 kg = 15738.63 kg
(sample wt) - (bycatch) = (combined wt. of pollock & cod in total catch)

2. Record the numbers and weights of the sub-sampled pollock and cod (used for determining avg. wts. and percentages) in the worksheet part of the form. Divide the total catch weight of pollock and cod by the proportionate weights of the pollock and cod in the sub-samples, so that you obtain the estimated weight of each species in the whole haul.

   the subsample yielded:

   285 pollock = 230.2 kg
   + 33 P. cod = 160.1 kg
   Total subsample weight = 390.3 kg

   $\frac{\text{kg pollock in subsample}}{\text{total subsample wt}} = \frac{230.2 \text{ kg}}{390.3 \text{ kg}}$ (about 59% pollock by weight)

   $\frac{\text{kg P. cod in subsample}}{\text{total subsample wt}} = \frac{160.1 \text{ kg}}{390.3 \text{ kg}}$ (about 41% P. cod by weight)

3. Then multiply the combined weight of pollock and Pacific cod in the haul by the ratio of the weight of each predominant species over the sub-sample weight.

   $\frac{230.2}{390.3} \times 15738.63 = 9282.69$ kg = wt. of pollock in whole haul

   $\frac{160.1}{390.3} \times 15738.63 = 6455.94$ kg = wt. of P. cod in whole haul

   You must now sum the proportioned species weights to make sure that rounding did not result in a sum greater than the pollock and cod weight obtained by subtraction of bycatch from OTC. (9282.69 + 6455.94 = 15738.63)
   Record the above two figures on the data form opposite each species.

4. Using the average weights of these species obtained from the sub-sample, calculate the number of fish each weight represents.

   9282.69 kg ÷ $\frac{230.2 \text{ kg}}{285}$ = 11492 estimated number of pollock, when rounded to a whole number.

   6455.94 kg ÷ $\frac{160.1 \text{ kg}}{33}$ = 1331 estimated number of Pacific cod, when rounded to a whole number.

The total weights for pollock and cod, obtained by subtraction and relative percentage, and their estimated total number would be entered on the key punched portion of Form 3US.

Remember, that after you have completed the above calculations all the species weights must still add up exactly to the OTC weight as expressed in kilograms.

The predominant species are not necessarily species the vessel was fishing for or "targeting" on. For example, when fishing for pollock, vessels will occasionally tow through clouds of jellyfish and when fishing on the ocean bottom for turbot, they will sometimes pick up lots of brittle stars.

Partial Haul Sampling

Criteria:

- sorting bycatch or prohibited species from the whole haul would be too much to handle or take too long because the catch is large and/or because the processing rate is slow, but you are still able to sample a fairly large portion of the haul.
- the catches are still very pure or else they are relatively small
- you are "upstream" of any sorting of the catch
- the flow of fish is such that you are able to see everything in the portion of the haul that you are sampling
- **you are able to get an accurate sample weight** (this will be discussed later in this section - read it carefully)

There may be times when whole haul sampling is not possible; you are faced with a haul containing large numbers of non-target species (bycatch), an unreasonably long processing time, extremely large hauls, or insufficient access to the entire haul. Sampling only a portion of the haul is an alternative. The sampling procedure is the same as when whole-haul sampling, but bycatch is collected from only a portion of the haul and your sample weight is less than the Official Total Catch weight. There are two methods you can use to determine your partial haul sample size. Visual estimates such as "about ½ or ¼ of the catch" are not allowed. **If you choose to use a partial haul sample method you must report all sample size calculations in your logbook!** Remember, fish tend to stratify in a bin, and if you are frequently partial haul sampling you need to sample from different parts of the haul. **The two methods are presented in order of preference:**

1) The most accurate, and easiest, way of estimating sample weight is by determining the volume of fish sampled from a bin. This is done by measuring the difference in the height of fish in the bin at the beginning and end of the sampling period. Multiply the difference in the height measurements times the area and then multiply that volume by the density, to determine the sample weight.

$$\text{height (m)} \times \text{floor area (m}^2\text{)} \times \text{density (mt/m}^3\text{)} = \text{sample size (mt)}$$

Refer to the section on "Observer's Total Catch Estimates" for instructions on measuring the amount of fish in a bin. You cannot use this method if you have not measured or verified the measure of the bin, if you cannot see into the bin well enough to determine an accurate depth of fish, if there is standing water in the bin sufficient to float the catch load, or if unknown amounts of additional fish are added to the bin during your sampling period.

2) Tallying fish is the primary method for sampling aboard a longline vessel and may be employed on trawlers too. When tally sampling, the target (or predominant) species is

accurately counted and all other bycatch are collected to be sorted, counted and weighed later. Tallying fish with a hand counter should only be done with large, distinctive fish such as cod or turbot. Just before and/or after the tally periods, a random sample of the tallied species is gathered to determine average weight. For the larger fish suitable for counting with a thumb counter (like cod), collect a minimum of thirty fish.

The target species may be counted in two different ways. You may actually count the target species and collect the bycatch yourself as they are leaving the net, passing on a conveyor belt, or being handled by the crew. A second possibility when sampling in a processing factory would be to use the automatic counters found on some of the processing machines. For a partial haul sample you note the count of the target species on the machine, move to the conveyor belt which feeds unsorted fish to that machine and collect all non-target species for your sample, and finally return to the processing machine to note the final count of fish processed while you were sampling. Be aware, the processing counter will only count fish that are put into the machine; fish that are too small, damaged, or simply fall on the floor will not be included. You must account for these "lost" fish in your partial haul sample weight as well. This method should not be used if you need the tally from more than two machines. When you are checking machine counts, sorting, and accounting for "lost" fish there are too many variables to keep track of on more than two processing lines.

When a sub-sample of tallied fish is taken for average weight, the number and weight data are recorded on the worksheet portion at the top of the 3US form. Calculate the average weight of the tallied species and multiply it by the total number counted. (In addition to a machine count, the total number must include your count of lost fish which dropped off the line before the automatic counter.) The total number of tallied fish and their calculated weight is entered on the keypunch portion of the form. The entries for the tallied species and bycatch species are all recorded under the same sample type, "P" for partial haul sample.

Be Careful: average weight = weight ÷ number, **not** the other way around!

(# of fish x avg. wt.) + discarded target sp. + bycatch = sample weight

Prior Observers: There have been other methods for deriving a partial haul sample weight used in the past which are no longer acceptable. On a number of vessels there are two conveyor belts moving fish out of common fish bin. If you monitor one belt, you cannot assume you sampled half of the haul. The speed of the belt and the depth of fish on the belt are too variable to use this generality. Using the tally method would be more appropriate. There are also vessels that divide their catch among one or more bins. If the catch fills two bins of equal size and you sample an entire bin you cannot assume that you sampled half the haul. Calculating an actual bin volume is required. The third method which is not longer acceptable is timing either a crewman or a machine.

Basket Sampling

Criteria:

- When the catch is diverse in composition,
- you cannot whole or partial haul sample,

- for the preferable designation of a "Weighed" or "Basket" sample when a large portion of or the entire catch is actually weighed,
- or when the catch composition fits the definition of an Incentive Program fishery which stipulates that observers must use the "Basket" sampling method.

In the course of your work you will be collecting baskets of fish for various purposes. However, when employing "Basket" sampling for species composition, this means that your sample is limited to an unbiased, random selection of organisms which were actually weighed. A basket sample is **not** necessarily a sample collected and weighed with baskets. A variety of containers are used to collect and weigh the sampled catch: brailers, checker bins, garbage cans, totes and hoppers. Weighed or "Basket" sample sizes may range from a maximum of the Official Total Catch weight to a minimum of 300 kg. At times, or on vessels with a difficult sampling situation, some of your basket samples may be smaller. Be sure to record in your logbook any difficulties you encounter.

Some biases to avoid when collecting samples of catch:

1. The heterogeneity of the catch in the net - i.e., some species, such as rockfish and crabs, tend to be found at the head end of the net while other species, such as flatfish, tend to concentrate at the bottom of the codend. Therefore, samples should be taken from different parts of the trawl.

2. As the fish are dumped into a bin, or as they pass onto a conveyor belt, the physics of fish flow may cause further sorting to take place - sampling should compensate for this.

3. Note the points where species sorting or size selection by crew members or by machines takes place - samples must be taken before such sorting takes place.

Since observers must avoid unconscious selection for certain sizes or certain species when obtaining samples, various methods have been used to obtain random, representative samples. On some ships it may be possible to get samples directly from the cod end by getting assistance from a crewman on the deck to hold a basket into the flow of fish as they fall from the net into a hatch opening in the deck. Another good method is to hold the basket where unsorted fish are falling from the live tank to a conveyor belt, or from one conveyor belt to another. Yet another technique is to find or design a diverter board for the conveyor belt. This is a board hinged into the side of the conveyor belt trough capable of blocking the fish flow along the conveyor belt, thereby allowing the catch to spill off the conveyor belt into a basket. Sometimes the boards of a fish bin can be raised, allowing fish to spill out from a lower layer of fish into a basket, but be careful, this could be a size selective method.

On catcher/processors it commonly takes an hour or several hours for all of the fish to be emptied from the bins to the factory and sometimes you do not have many baskets available and/or the sampling space is limited. Therefore it is recommended that you collect only two or three baskets at a time and do this at intervals during the haul processing. This allows you to gather your samples effectively from different parts of the catch.

On catcher boats the observer usually works on the trawl deck. If the fish are dumped onto the deck for sorting, as is commonly the case in a cod fishery, the observer might partition

off a section of the catch on deck with a board or shovel and sort, count and/or weigh all the catch in the section. On some catcher boats the fish are dumped into checker bins (compartments on either side of the trawl deck) and the observer can work on all of the organisms contained in one of these checkers. If the blue baskets are used to collect fish on deck for a sample, be very careful to avoid size and personal bias in filling the baskets. The best way to fill baskets is to "catch" the fish as they are flowing from point A to point B by inserting a basket into the flow or diverting the flow of fish into the basket.

Once the sample has been taken, there are two ways to handle the weighing of the species groups. One method is to sort the sample before weighing, then weigh each species group, count the number of individuals making up each group, and total the weights of each group to obtain the total sample weight. A second method may be more practical when plant sampling or when one species predominates in the sample. In this method, the unsorted fish are weighed, then observer sorts the sample by species. Count and weigh the bycatch species groups. The weight of the dominant species group can then be obtained by subtracting the total weight of the bycatch species groups from the total sample weight. Divide the total predominant species weight by their average weight to obtain an estimate of their number.

With organisms such as brittle stars or jellyfish it might be easiest to weigh them all and divide the total species weight by their average weight to obtain an estimate of their number. At least thirty to fifty organisms must be sub-sampled for average weight. However, in a Weighed or Basket sample, the weight of a species group may only be obtained by actually weighing or by subtraction (of actually weighed fish). A species weight may not be obtained by the tally method.

Mixing of Hauls

A special sampling problem exists when hauls are being unavoidably mixed and you must sample after mixing occurs. If this happens, there are at least three possible courses of action:

1) Look at the arrangement and capacities of the fish bins and consider the frequency and tonnage of the fish being delivered. If it is possible to do so, ask the captain or fishing master to keep the hauls separate. If several bins empty onto the conveyor belt from which you are sampling at one time, ask the factory manager if he could arrange for only one bin to be emptied at a time while you are sampling.

2) If the fish are thoroughly mixed, sample the combined hauls but divide the sample data proportionally by haul weight and enter the data as two separate samples.

3) If you observe differences in the species composition of the mixed hauls as they are being dumped, use your judgement to attribute bycatch to the appropriate haul. This could only be done if the mixed hauls were very different in composition, such as a pelagic haul of pollock and a bottom haul of turbot.

4) If you observe layering of fish after the mixing of hauls, you possibly could see the difference in new fish versus old fish in freshness and in state of rigor. Noticing this difference can allow you to sample either or both hauls and obtain discrete data.

PROHIBITED SPECIES SAMPLING

Catch landed other than the target species is called incidental catch or bycatch. Among the species caught incidentally are those that have long been the target species of other U.S. fishermen. Therefore, these and species whose allowable catch is zero for protection are designated as "prohibited species" for groundfish vessels. Groundfish regulations state, " Each vessel must sort its catch as soon as possible after retrieval of the catch and, after allowing sampling by an observer (if any), shall return any catch of prohibited species or parts thereof to the sea immediately with a minimum of injury regardless of its condition."

Common Name:	Scientific Name:
Salmonids (includes steelhead)	Oncorhynchus spp.
Halibut	Hippoglossus stenolepis
King crab	Paralithodes spp. and Lithodes spp.
Tanner crab	Chionoecetes spp.
Herring	Clupea harengus pallasi

Also: Any groundfish species in any area where the total allowable catch of that species is zero or any groundfish species declared prohibited by a notice of closure.

The prohibited species listed above that are of particular importance for observer sampling are Pacific halibut, salmon, king crab, and Tanner or snow crab. As these are the target species of other fisheries, there is a great deal of interest concerning their number per ton of catch on domestic groundfish vessels. Determining the incidence of crab, halibut, and salmon is thus a high priority duty for observers. Since these species are normally relatively rare in the catch, whole-haul sample for prohibited species whenever possible. A smaller sample size is recommended whenever there is a high bycatch of prohibited species.

Sampling for the incidence of prohibited species (crab, halibut and salmon) is just a specialized subset of species composition sampling even though it may be referred to as a separate operation. Remember that when sampling a haul, do not leave out any species or species group such as sampling only for prohibited species. Also, the four prohibited species groups do not have to have the same sample weight. For example, you may sample the whole haul for the more visually obvious species like halibut, salmon and King crab while basket sampling for the tanner crabs. Observers have experienced other types of problems in attempting to determine the incidence of prohibited species:

1. Presorting of the prohibited species by crew members on the trawl deck as the catch is emptied into the live tank may cause a problem for you if you were counting on sampling them in the factory. You may make the best of this situation by trying to whole-haul sample for prohibited species on deck and take advantage of the crew's sorting effort. However, you must work with them on deck to oversee the operation as their sorting efforts are likely to be haphazard. The skipper is likely to object to the delay caused by sorting on deck and this would be your opportunity to explain that it is all or nothing and thereby get the captain to order his deck crew not to pre-sort. **Try to watch the dumping of each net you are going to sample to prevent presorting.**

2. If you are whole-haul sampling for prohibited species while trying to gather basket samples for the rest of the composition data, you may feel the need to be in two places at once. You will find it necessary to set aside (where?!) the basket-sampled catch as well as the prohibited spp. you are collecting for biological information so you can continue to monitor the catch for incidence of prohibited species. Space is often a limiting factor in establishing a method for sampling. Look and/or ask for a place to put your fish while you're working.

3. Occasionally a haul comes in with a high incidence of prohibited species. (i.e. >20 halibut, salmon or king crab and/or >50 Tanner crab.) You must decide whether it is possible to sort all of the prohibited species from the whole haul. If more than one prohibited species group is abundant, you should consider a smaller sample size. If there is a high incidental catch of only one prohibited species group, you could basket sample for that prohibited group and whole-haul sample for the others. Alternately, you might tally the numbers of the abundant prohibited species group(s) in the whole-haul sample and subsample for average weight and biological information. Remember that you must at least have an accurate count (or, in the case of many small crab, an actual weight), of <u>all</u> of the prohibited species that occur within your sample weight.

Tanner crab, king crab and salmon must be grouped by species for catch message forms. If you sort from the catch an enormous amount (>300) of say, Tanner crab, and cannot separate them all into species groups, you will need to estimate the data for the unidentified crab based on a sub-sample. If 4 out of 95 crab are "other tanners," how many would be expected out of 562? (See 3US example 1.) Do this for both number <u>and weight</u>. Don't use average weights. Don't forget that the totals of numbers and weights on 3US must match the totals of the equivalent groups on the catch messages. Record these calculations on the worksheet part of Form 3US. The sub-sample should also be worked up for any other biological information required.

4. Sometimes halibut are too large or too numerous to weigh. In that case, measure the fish, look up the weight in the length/weight table for halibut and record the sum of the weights on form 3US. When there are lots of halibut, there may be many similar sized ones that can be counted and sub-sampled for average weight. Then there is often one or two really big fish (two meters or more) which the observer will measure and get a weight estimate from the table. (As in Form 3US, example 4.) This is fine so far, but the length data (Form 7US) must be from a **random** sample. To include the large ones with the randomly sub-sampled, "average-sized" ones constitutes a biased length sample! In this case, with one large halibut, toss a coin; for two or more large ones, relate the number of length measurements to include to the ratio of the number sub-sampled for length over the total number in the sample. <u>Which</u> of the large fish lengths to include, given two or more, is yet another random choice to make!

5. Sometimes a vessel will accidentally pick up a crab pot that has been snagged by the trawling gear. This incident would be recorded as a gear performance code two on form 2US (see instructions for the form). Also, note that you **do not count any crab that may be in the pot as part of your sampling for the incidence of King and Tanner crab.** You should note the incident in your logbook and include a description of the pot and identifying numbers, if any.

BIOLOGICAL DATA COLLECTED FROM PROHIBITED SPECIES

In addition to the numbers and weights of halibut, salmon, Tanner crab, and king crab per metric ton of catch, certain data are required on these groups by species, and in most cases, by sex. The additional data collected will consist of:

1. sex - except for halibut; designate halibut sex as "U"

2. measurements - measure the fork length of salmon and halibut; measure crab only if assigned to do so.

3. viability - all observers take viability data on halibut, take viability data on crab if assigned this as a special project; any entries of salmon viability will have to be erased.

In most cases, it will be possible to obtain the data outlined above from all of the individuals observed in the prohibited species sample. However, in instances when there are too many of a given species group to process in a reasonable length of time, a random representative subsample may be taken. **If you must subsample, try to collect data from no fewer than 20 halibut, 20 salmon, 20 king crab, and 50 Tanner crab per sample.** These are guideline numbers for minimum subsamples. Certainly, if you had only 65 Tanner crab, you should collect information from all of them. Alternately, if you are able to take on more work than these minimum guidelines specify, do not collect biological data on more than 100 of any prohibited group. Instead, devote your extra time to larger, or more, species composition samples.

Collecting Data From Salmon and Steelhead

The following information should be collected from the salmon and steelhead obtained in the prohibited species incidence samples:

(a) Species identification--the six species which may be encountered are -- king, chum, sockeye, pink, coho, or steelhead.

(b) Sex--determine the sex of each salmon; only live salmon that have minimal scale loss should not be sexed, but listed as "unknown" sex. When the observer is not sure of the sex of a salmon or does not have enough time to sex it, the sex should also be listed as "unknown."

(c) Numbers of salmon/steelhead--determine numbers by species and sex groups.

(d) Weight--record the individual weights if scale samples are to be taken; if scale samples are not taken of all fish, obtain the total weight by species and sex group for those fish whose scales were not sampled.

(e) Length--the fork length of each salmon found in the sample is recorded to the nearest whole centimeter on Form 7US, (see "Length Frequencies" in a following section). Length measurements are grouped by species and by sex, and are recorded in ascending

order.

(f) Scale samples--the purpose of taking scale sample is primarily for confirming the observer's identity of the salmon, therefore, observers should take scale samples of the first 20 salmon of each species identified during the deployment period (regardless of the number of vessels the observer was on). The scale samples and data forms will also be used for ageing. Follow the collecting instructions in "Scale Samples and Random Stratified Otolith Samples" in a following section. Do not collect scales from salmon that are not part of your prohibited species sample unless they were tagged salmon.

(g) Check for missing adipose fin, fins that are clipped, brands, and tags. Salmon with these types of marks may also have been tagged with a coded wire in the snout. Follow the directions in the section on "Tagged Fish."

The observer should seldom have to subsample salmon. If time does not allow the observer to gather all of the above information from each fish, get at least numbers and weights by species from your random sample, (failing this, reduce your sample size!). Then take a random subsample for sexed lengths (and watch for tags). Take scale samples from each species identified, as needed.

Collecting Data From King and Tanner Crab

The following information should be collected from the king crab and Tanner crab obtained in the prohibited species incidence samples:

(a) Species identification--species which could be encountered are red, blue, brown, and Lithodes couesi king crab; Chionoecetes bairdi, C. opilio, C. hybrid, C. angulatus, and C. tanneri Tanner crabs.

(b) Sex--determine the sex of each crab. When the observer is not sure of the sex of a crab or does not have enough time to sex it, the sex should also be listed as "U" for unknown."

(c) Numbers of king/Tanner crab--determine numbers by species and sex groups.

(d) Weight--record the total weight by species and sex group.

(e) Check for Tags--follow the directions in the "Tagged Fish and Crab" section.

(f) **When given as a special project:** Viability--an estimate of the survival chance of each crab. This estimate is based upon an appraisal of the condition of the crab upon release to the sea. Refer to the guidelines on sampling viability of halibut. Apply those same instructions when sampling for the viability of crab. Definitions of "excellent," "poor" and "dead" condition are given in the Reference Section following a similar table for halibut. Viability and lengths of crab should be collected only by observers assigned this task as a special project.

(g) **When given as a special project:** Length--measure the lengths of king crabs and widths of Tanner crab according to instructions. King and Tanner crab are the only species of crab which should be measured and measurements are taken only if given this as a special project. See the appendix for information on how to measure crab.

Collecting Data From Halibut

The following information should be collected from halibut that were in your prohibited species sample:

(a) Numbers--of halibut.

(b) Weight--individual weights are not necessary, but you should obtain the total weight of the halibut in the incidence sample. Halibut that are too large to be weighed should be measured only, and the lengths can then be looked up in the halibut length-weight table (Reference Section or in the Appendix) to obtain the corresponding weights. (The total weights of halibut should include these table weights as well as scale weights.) When possible, however, halibut should be weighed instead of using the length-weight table.

(c) Lengths--take lengths of all those in your sample except, when faced with many halibut, measure a minimum of 20 and a maximum of 100 halibut per haul or set. Do not measure more than 20 halibut if they are alive and in good condition. Lengths are recorded to the nearest whole centimeter.

(d) Viability--an appraisal of the condition of the halibut as it would be if the crew were releasing them to the sea.
[Note: Do not sex halibut, not even the dead ones. The data will not be used and so it would be a waste of your time.]

Viability of Halibut

One of our tasks is to assess the condition of halibut returned to the sea as they are normally handled by the crew. Try to arrange your work such that your appraisal of viability and release of the halibut approximates their handling by the crew. However, an observer's **primary** duty is to get accurate incidence data and lengths of halibut, and these tasks may result in the halibut viability being affected by your sampling. If you cannot work with the halibut immediately after they are sorted from the catch, you might be able to arrange a salt water holding tank to put them in temporarily. (A basket lined with plastic and a saltwater hose running into it has worked for other observers.) Or if you didn't whole-haul sample for halibut incidence, when your primary work is done, viability data may be taken on halibut that weren't part of your sample weight but that were from the sampled haul or set. Do not sample for viability of halibut in hauls not sampled for composition. Remember, viability sampling should not take precedence over sampling for their incidence and obtaining the other biological information needed.

If the sample of halibut that is checked for viability is a subsample of the incidence of prohibited species sample, make certain that the subsample is a representative one. Halibut

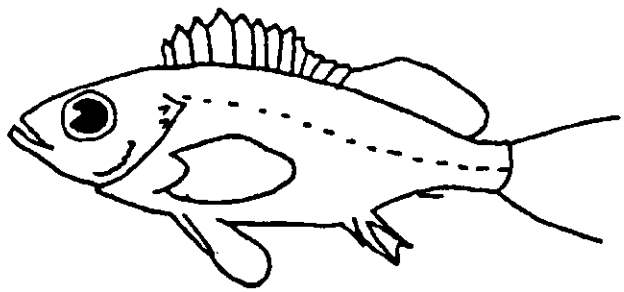
ROCKFISH SPECIES DESCRIPTION FORM

Species Name: _____
Date of Capture: _____
Haul or Delivery Number: _____
Position of Capture (Lat. & Long.): _____
Depth of Capture: _____
Length: _____
Weight: _____
Was an example of this species brought back? Yes No
(Note: If this fish represents a range or depth extension or a record in size, bring it back for species verification.)

(Remember that Sebastolobus is not in Hitz "Field Identification of the Northeastern Pacific Rockfish (Sebastodes)". Check the rockfish section of the "Species Identification Manual" to make sure it is a Sebastes.)

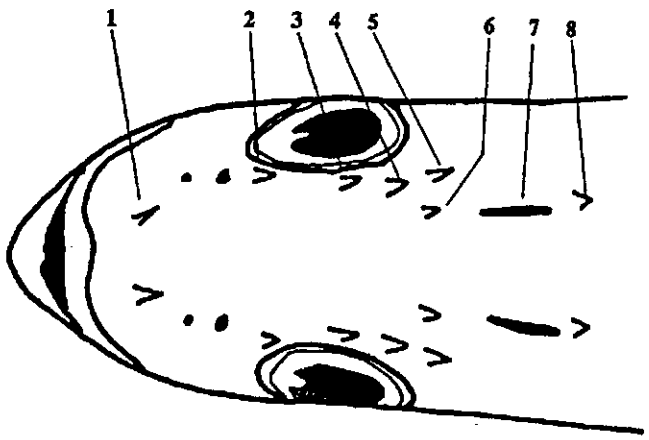
What color category of Hitz's would you place it in?

Please sketch any pattern, stripes, freckles, bars, light or dark areas etc. Draw the shape of the anal fin and include any symphyseal knob. Study your specimen closely.



Please indicate which pair of head spines your specimen has on the diagram below. Remember that all members of a species do not have exactly the same spine distribution that is depicted in Hitz. Also, remember that some spines are very difficult to find.

Strength of Head Spines: WEAK OR STRONG



Which fish in Eschmeyer looks the most like your fish?

Plate number: _____ Common name: _____

Scientific name: _____

Examine the fish and record the following meristic characters: (Note: There is often a fair amount of variability in a fish, even between counts on different sides of the same fish. Therefore, counts on both sides might help.)

Dorsal fin spines: _____
Dorsal fin rays: _____
Anal fin rays: _____
Pectoral fin rays: _____
Pelvic fin spines: _____
Pelvic fin rays: _____
Gill rakers--upper arm: _____
Gill rakers--lower arm: _____
Peritoneum Color: _____

Are the second anal fin spine and third anal fin spine equal in length? Yes No

If not, which is larger? Second spine Third spine

(Note: If you are not absolutely sure of your identification, bring a specimen back or at least take a photograph of it.)

Comments and Additional Notes:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

FLATFISH SPECIES DESCRIPTION FORM

Species Name: _____
Date of Capture: _____
Haul or Delivery Number: _____
Position of Capture (Lat. & Long.): _____
Depth of Capture: _____
Length: _____
Weight: _____

Was an example of this species brought back? Yes No

(Note: If this fish represents a range or depth extension, or a record in size, bring it back for species verification.)

First, please review the abbreviations at the bottom of the "Field Key to Flatfishes", p.31 in your Species Identification Manual. Often one of these abbreviations is misinterpreted and will create errors in identification. Terms such as ADB, and MAX have often caused confusion. Please also check the illustrations that precede the key to make sure you are taking measurements in the same way that the key asks you to.

Is the flatfish right eyed or left eyed? _____

Note: Right-eyed fish belong to the family Pleuronectidae and left-eyed fish belong the family Bothidae. However, remember that not all Pleuronectidae have their eyes on the right side, unusual individuals may have their eyes on the left.

Which fish of those listed in the illustrations on p.32-33 of the Species Identification Manual looks most like it?

Please answer the following questions:

What is the general tail shape?

Does the fish have an accessory dorsal branch (ADB) of the lateral line?
____ Yes (If so, remember to sketch it in.)
____ No

Does the eye protrude over the profile of the head such that its' edge can be seen from the blind side? ___ Yes ___ No

Relative to the lower eye, the maxillary ends:
___ forward of orbit
___ below anterior part of orbit
___ below pupil of eye
___ below posterior part of orbit
___ below posterior margin of orbit or beyond

In regard to mouth symmetry; the maxillary is:
___ same length on eyed and blind sides
___ slightly asymmetrical
___ dramatically asymmetrical

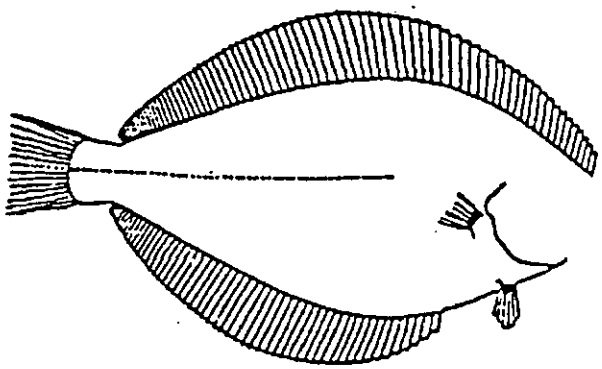
What is the preoperculum shape? Anal spine present?
___ rounded ___ angled ____Yes No____

What is the shape of the lateral line over the pectoral fin?
___ flat ___ arched
___ curved ___ highly arched

What is the shape of the posterior margin of the pectoral fin (on the eyed side)?
___ rounded
___ angular
___ pointed or extended (i.e. upper rays longer than lower rays)

Please make the following counts:
Dorsal fin rays: _____ Gill rakers on the 1st arch:
Anal fin rays: _____ upper arm: _____
pectoral fin rays: _____ lower arm: _____
pelvic fin rays: _____ total: _____
Gill rakers on the 2nd arch:
upper arm: _____

Finish the sketch below as best you can. Make sure to draw in the important features of the flatfish. Include the following in your drawing:
- general head shape
- size and shape of mouth
- shape of the end of the tail
- lateral line (include any arch and ADB)
- shape of preoperculum
- size and shape of pectoral fin
- placement of eyes



Comments:_____
_____
_____

MISC. SPECIES DESCRIPTION FORM

Species Name: _____
Date of Capture: _____
Haul or Delivery Number: _____
Position of Capture (Lat. & Long.): _____
Depth of Capture: _____
Length: _____
Weight: _____
Was an example of this species brought back? Yes No
(Note: If this animal represents a range or depth extension or a record in size, bring it back for species verification.)

This form is to be filled out for the first sighting of all species of fish (except rockfish and flatfish which have their own description forms) and invertebrates. Animals that are only keyed out to family groups, such as sculpin unidentified, poacher unidentified, or jellyfish unidentified need not be described. For fish, include counts of all fin rays, standard body measurements, (fork length, head length, snout length, and caudal peduncle length) and any other pertinent measurements.

List below, the features that led you to your genus or species conclusion. Be detailed in your description and make a sketch showing the main features.

Examine the fish and record the following meristic characters: (Note: There is often a fair amount of variability in a fish, even between counts on different sides of the same fish. Therefore, counts on both sides might help.)

Dorsal fin spines:_____ _____ _____
Dorsal fin rays:_____ _____ _____
Anal fin rays:_____ _____
Anal fin spines_____ _____
Pectoral fin rays:_____
Pelvic fin spines:_____
Pelvic fin rays:_____

Gill rakers--upper arm:_____
Gill rakers--lower arm:_____
Gill rakers total:_____

(Note: If you are not <u>absolutely</u> sure of your identification, bring a specimen back or at least take a photograph of it.)

Comments and Additional Notes:

_____
_____
_____
_____
_____
_____
_____

Draw Specimen on Reverse Side

SPECIES CODE LIST

CODE	COMMON NAME	SCIENTIFIC NAME
106	ALASKA PLAICE	PLEURONECTES QUADRITUBERCULATUS
450	ALLIGATORFISH, (POACHER) - UNIDENT.	AGONIDAE
610	ANCHOVY, NORTHERN	ENGRAULIS MORDAX
55	ANEMONE, SEA - UNIDENT.	ACTINIARIA
620	ARGENTINE - UNIDENT.	ARGENTINIDAE
43	ASCIDIANS, SEA SQUIRT, TUNICATE	UROCHORDATA
204	ATKA MACKEREL	PLEUROGRAMMUS MONOPTERYGIUS
48	BARNACLES	CIRRIPEDIA
795	BARRACUDA, PACIFIC (CALIFORNIA)	SPHYRAENA ARGENTEA
770	BARRACUDINA - UNIDENT.	PARALEPIDIDAE
622	BARRELEYE or SPOOKFISH - UNIDENT.	OPISTHOPROCTIDAE
289	BIGSCALE, (MELAMPHID) - UNIDENT.	*MELAMPHAEIDAE*
998	BIRDS - UNIDENT.	AVES
618	BLACKSMELT - UNIDENT.	BATHYLAGIDAE
260	BLENNY - UNIDENT.	PHOLIDAE, STICHAEIDAE
302	BOCACCIO	SEBASTES PAUCISPINIS
27	BRACHIOPOD, LAMPSHELL	BRACHYOPODA
54	BRISTLEWORM, LEECH, POLYCHAETES	ANNELIDA
32	BRYOZOANS	
604	CAPELIN	MALLOTUS VILLOSUS
44	CHITON - UNIDENT.	AMPHINEURA
199	CHUB MACKEREL	SCOMBER JAPONICUS
29	CLAMS MUSSELS OYSTERS SCALLOPS	PELECYPODA
211	COD, ARCTIC (RACE)	BOREOGADUS SAIDA
203	COD, BLACK (SABLEFISH)	ANOPLOPOMA FIMBRIA
202	COD, PACIFIC	GADUS MACROCEPHALUS
208	COD, SAFFRON	ELEGINUS GRACILIS
214	CODLING - UNIDENT.	MORIDAE
32	CORALS	
1	CRAB - FAMILY, GENUS UNKNOWN	
6	CRAB, BLUE KING	PARALITHODES PLATYPUS
11	CRAB, BOX	LOPHOLITHODES FORAMINATUS
8	CRAB, BROWN KING	LITHODES AEQUISPINA
49	CRAB, CANCER	CANCER OREGONENSIS
16	CRAB, COUESI KING	LITHODES COUESI
39	CRAB, DECORATOR	OREGONIA GRACILIS
12	CRAB, DUNGENESS	CANCER MAGISTER
15	CRAB, HERMIT - UNIDENT.	PAGURIDAE
2	CRAB, KING CRAB - UNIDENT.	LITHODES & PARALITHODES
7	CRAB, KOREAN HORSEHAIR	ERIMACRUS ISENBECKII
37	CRAB, LYRE -- ROUNDED SPINED	HYAS COARCTATUS
9	CRAB, LYRE -- SHARP SPINED	HYAS LYRATUS
840	CRAB, LYRE - UNIDENT.	HYAS
17	CRAB, PARALOMIS MULTISPINA	PARALOMIS MULTISPINA
38	CRAB, PARALOMIS VERILLI	PARALOMIS VERILLI
74	CRAB, PEA	PINNIXA OCCIDENTALIS
13	CRAB, RED KING	PARALITHODES CAMTSCHATICA
31	CRAB, SCALED	PLACETRON WOSNESSENSKII

19	CRAB, TANNER, ANGULATUS	CHIONOECETES ANGULATUS
4	CRAB, TANNER, BAIRDI	CHIONOECETES BAIRDI
5	CRAB, TANNER, OPILIO	CHIONOECETES OPILIO
47	CRAB, TANNER, BAIRDI/OPILIO HYBRID	CHIONOECETES HYBRID
18	CRAB, TANNER, TANNERI	CHIONOECETES TANNERI
3	CRAB, TANNER - UNIDENT.	CHIONOECETES SP.
23	CRAB, TELMESSUS	TELMESSUS CHEIRGONUS
53	CRINOIDS - UNIDENT.	CRINOIDEA
248	CUSK-EEL - UNIDENT.	OPHIDIIDAE
660	CUTLASSFISH - UNIDENT.	TRICHIURIDAE
144	DAB, LONGHEAD (SANDDAB)	LIMANDA PROBOSCIDEA
679	DAGGERTOOTH	ANOTOPTERUS PHARAO
899	DECOMPOSED FISH	
799	DRAGONFISH - UNIDENT.	MELANOSTOMIIDAE
690	DREAMER - UNIDENT.	ONEIRODIDAE
250	EELPOUT - UNIDENT.	ZOARCIDAE
91	EGG CASE, SKATE - UNIDENT.	
34	EGGS, SNAIL	GASTROPODA
601	EULACHON, (CANDLEFISH)	THALEICHTHYS PACIFICUS
901	FISH - UNIDENT.	OSTEICHTHYES
100	FLATFISH - UNIDENT.	
210	FLATNOSE, PACIFIC (CODLING)	ANTIMORA MICROLEPIS
146	FLOUNDER, ARCTIC	LIOPSETTA GLACIALIS
141	FLOUNDER, ARROWTOOTH	ATHERESTHES STOMIAS
145	FLOUNDER, BERING	HIPPOGLOSSOIDES ROBUSTUS
147	FLOUNDER, KAMCHATKA	ATHERESTHES EVERMANNI
142	FLOUNDER, STARRY	PLATICHTHYS STELLATUS
660	FROSTFISH, (CUTLASSFISH)-UNIDENT.	TRICHIURIDAE
390	GREENLING - UNIDENT.	HEXAGRAMMIDAE
80	GRENADIER, (RATTAIL) - UNIDENT.	MACROURIDAE
430	GUNNEL - UNIDENT.	PHOLIDAE
77	HAGFISH - UNIDENT.	MYXINIDAE
660	HAIRTAILS, (CUTLASSFISH)-UNIDENT.	TRICHIURIDAE
206	HAKE, PACIFIC	MERLUCCIUS PRODUCTUS
102	HALIBUT, GREENLAND (TURBOT)	REINHARDTIUS HIPPOGLOSSOIDES
101	HALIBUT, PACIFIC	HIPPOGLOSSUS STENOLEPIS
767	HATCHETFISH - UNIDENT.	STERNOPTYCHIDAE
611	HERRING, PACIFIC	CLUPEA HARENGUS PALLASI
902	INVERTEBRATE - UNIDENT.	
418	IRISH LORD - UNIDENT.	HEMILEPIDOTUS, SP.
33	ISOPOD	ISOPODA
207	JACK MACKEREL	TRACHURUS SYMMETRICUS
35	JELLYFISH - UNIDENT.	SCYPHOZOA
2	KING CRAB - UNIDENT.	LITHODES AND PARALITHODES SP.
608	KING-OF-THE-SALMON, (RIBBONFISH)	TRACHIPTERUS ALTIVELIS
700	LAMPFISH - UNIDENT.	MYCTOPHIDAE
75	LAMPREY - UNIDENT.	PETROMYZONTIDAE
785	LANCETFISH, LONGNOSE	ALEPISAURUS FEROX
700	LANTERNFISH - UNIDENT.	MYCTOPHIDAE
54	LEECH, BRISTLEWORM, POLYCHAETES	ANNELIDA
45	LIMPET - UNIDENT.	
603	LINGCOD	OPHIODON ELONGATUS

14	LITHODID - UNIDENT. (RACE)	LITHODID CRAB UNIDENT.
809	LOOSEJAW, SHINING	ARISTOSTOMIAS SCINTILLANS
525	LUMPSUCKER - UNIDENT.	CYCLOPTERIDAE
204	MACKEREL, ATKA	PLEUROGRAMMUS MONOPTERYGIUS
199	MACKEREL, CHUB (PACIFIC)	SCOMBER JAPONICUS
207	MACKEREL, JACK	TRACHURUS SYMMETRICUS
774	MANEFISH	CARISTIUS MACROPUS
776	MEDUSAFISH	ICICHTHYS LOCKINGTONI
289	MELAMPHID - UNIDENT.	MELAMPHAEIDAE
710	MIDSHIPMAN, PLAINFIN	PORICHTHYS NOTATUS
900	MISC. - UNIDENT.	(ROCKS, MUD, GARBAGE, ETC)
29	MUSSELS, CLAMS, OYSTERS, SCALLOPS	PELECYPODA
25	NUDIBRANCH	NUDIBRANCHIATA
715	OARFISH	REGALECUS GLESNE
810	OCEAN SUNFISH	MOLA
60	OCTOPUS - UNIDENT.	OCTOPODA
61	OCTOPUS, PELAGIC	VAMPYROMORPHA
297	OPAH	LAMPRIS GUTTATUS (L. REGIOUS)
295	OREO, OXEYE	ALLOCYTTUS FOLLETTI
29	OYSTERS, CLAMS, MUSSELS, SCALLOPS	PELECYPODA
301	PACIFIC OCEAN PERCH	SEBASTES ALUTUS
762	PAPERBONES, SCALEY (WEARYFISH) - UNIDENT.	NOTOSUDIDAE
681	PEARLEYES - UNIDENT.	SCOPELARCHIDAE
450	POACHER - UNIDENT.	AGONIDAE
201	POLLOCK, WALLEYE	THERAGRA CHALCOGRAMMA
54	POLYCHAETE, BRISTLEWORM, LEECH	ANNELIDA
765	POMFRET - UNIDENT.	BRAMIDAE
790	POMPANO, PACIFIC	PEPRILUS SIMILLIMUS
750	PRICKLEBACK - UNIDENT.	STICHAEIDAE
205	PROWFISH	ZAPRORA SILENUS
280	RAGFISH	ICOSTEUS AENIGMATICUS
99	RATFISH, SPOTTED	HYDROLAGUS COLLIEI
80	RATTAIL, (GRENADIER) - UNIDENT.	MACROURIDAE
90	RAY, (SKATE) - UNIDENT.	RAJIFORMES
563	RIBBONFISH - UNIDENT.	TRACHIPTERIDAE
300	ROCKFISH - UNIDENT.	SCORPAENIDAE
334	ROCKFISH, AURORA	SEBASTES AURORA
337	ROCKFISH, BANK	SEBASTES RUFUS
306	ROCKFISH, BLACK	SEBASTES MELANOPS
319	ROCKFISH, BLACKGILL	SEBASTES MELANOSTOMUS
316	ROCKFISH, BLUE	SEBASTES MYSTINUS
302	ROCKFISH, BOCACCIO	SEBASTES PAUCISPINIS
332	ROCKFISH, BROWN	SEBASTES AURICULATUS
314	ROCKFISH, CANARY	SEBASTES PINNIGER
325	ROCKFISH, CHILIPEPPER	SEBASTES GOODEI
327	ROCKFISH, COPPER	SEBASTES CAURINUS
311	ROCKFISH, DARK BLOTCHED	SEBASTES CRAMERI
330	ROCKFISH, DUSKY	SEBASTES CILIATUS
339	ROCKFISH, GREENSPOTTED	SEBASTES CHLOROSTICTUS
313	ROCKFISH, GREENSTRIPED	SEBASTES ELONGATUS
323	ROCKFISH, HARLEQUIN	SEBASTES VARIEGATUS
350	ROCKFISH, IDIOT FISH	SEBASTOLOBUS ALASCANUS

352	ROCKFISH, LONGSPINE THORNYHEAD	SEBASTOLOBUS ALTIVELIS
303	ROCKFISH, NORTHERN	SEBASTES POLYSPINIS
301	ROCKFISH, PACIFIC OCEAN PERCH	SEBASTES ALUTUS
335	ROCKFISH, PYGMY	SEBASTES WILSONI
343	ROCKFISH, QUILLBACK	SEBASTES MALIGER
322	ROCKFISH, RASPHEAD	SEBASTES RUBERRIMUS
308	ROCKFISH, RED BANDED	SEBASTES BABCOCKI
324	ROCKFISH, REDSTRIPE	SEBASTES PRORIGER
309	ROCKFISH, ROSETHORN	SEBASTES HELVOMACULATUS
312	ROCKFISH, ROSY	SEBASTES ROSACEUS
307	ROCKFISH, ROUGHEYE	SEBASTES ALEUTIANUS
304	ROCKFISH, SHARPCHIN	SEBASTES ZACENTRUS
318	ROCKFISH, SHORTBELLY	SEBASTES JORDANI
326	ROCKFISH, SHORTRAKER	SEBASTES BOREALIS
350	ROCKFISH, SHORTSPINE THORNYHEAD	SEBASTOLOBUS ALASCANUS
310	ROCKFISH, SILVERGRAY	SEBASTES BREVISPINIS
315	ROCKFISH, SPLITNOSE	SEBASTES DIPLOPROA
328	ROCKFISH, STRIPETAIL	SEBASTES SAXICOLA
329	ROCKFISH, TIGER	SEBASTES NIGROCINCTUS
331	ROCKFISH, VERMILION	SEBASTES MINIATUS
305	ROCKFISH, WIDOW	SEBASTES ENTOMELAS
322	ROCKFISH, YELLOWEYE	SEBASTES RUBERRIMUS
320	ROCKFISH, YELLOWMOUTH	SEBASTES REEDI
321	ROCKFISH, YELLOWTAIL	SEBASTES FLAVIDUS
240	RONQUIL - UNIDENT.	BATHYMASTERIDAE
200	ROUNDFISH - UNIDENT.	
203	SABLEFISH, (BLACK COD)	ANOPLOPOMA FIMBRIA
220	SALMON - UNIDENT.	ONCORHYNCHUS, SP.
221	SALMON, CHUM (DOG)	ONCORHYNCHUS KETA
222	SALMON, KING (CHINOOK)	ONCORHYNCHUS TSHAWYTSCHA
225	SALMON, PINK (HUMPBACK)	ONCORHYNCHUS GORBUSCHA
224	SALMON, RED (SOCKEYE)	ONCORHYNCHUS NERKA
223	SALMON, SILVER (COHO)	ONCORHYNCHUS KISUTCH
40	SAND DOLLARS	ECHINOIDEA
670	SAND LANCE, PACIFIC	AMMODYTES HEXAPTERUS
136	SANDDAB - UNIDENT.	BOTHIDAE
144	SANDDAB, LONGHEAD	LIMANDA PROBOSCIDEA
137	SANDDAB, PACIFIC	CITHARICHTHYS SORDIDUS
239	SANDFISH	TRICHODON
614	SARDINE, PACIFIC	SARDINOPS SAGAX CAERULENS
607	SAURY, PACIFIC	COLOLABIS SAIRA
660	SCABBARDFISH,(CUTLASSFISH)-UNIDENT.	TRICHIURIDAE
29	SCALLOPS, CLAMS, MUSSELS, OYSTERS	PELECYPODA
400	SCULPIN - UNIDENT.	COTTIDAE
431	SCULPIN, GYMNOCANTHUS - UNIDENT.	GYMNOCANTHUS, SP.
418	SCULPIN, IRISH LORD - UNIDENT.	HEMILEPIDOTUS, SP.
440	SCULPIN, MYOXOCEPHALUS SP.	MYOXOCEPHALUS SP.
433	SCULPIN, TRIGLOPS - UNIDENT.	TRIGLOPS SP.
Note:	Many other genera and species of sculpins are present. Group these others under sculpin unidentified.	
55	SEA ANEMONE - UNIDENT.	ACTINIARIA
41	SEA CUCUMBER - UNIDENT.	HOLOTHURIOIDEA
689	SEA DEVIL - UNIDENT.	CERATIIDAE

54	SEA MOUSE, BRISTLEWORM, LEECH	ANNELIDA
43	SEA ONIONS - UNIDENT.	UROCHORDATA
58	SEA PEN, SEA WHIP - UNIDENT.	PENNATULA
43	SEA POTATO - UNIDENT.	UROCHORDATA
25	SEA SLUG, - UNIDENT.	NUDIBRANCHIATA
56	SEA SPIDER - UNIDENT.	PYCNOGANIDA
43	SEA SQUIRTS, ONIONS, POTATOES, TUNICATES	UROCHORDATA
40	SEA URCHINS	ECHINOIDEA
58	SEA WHIP, SEA PEN - UNIDENT.	PENNATULA
54	SEA WORMS (POLYCHAETES)	ANNELIDA
550	SEABASS - UNIDENT.	SCIAENIDAE
240	SEARCHER, (RONQUIL) - UNIDENT.	BATHYMASTERIDAE
900	SEAWEED	MISC. ITEMS
606	SHAD, AMERICAN	ALOSA SAPIDISSIMA
750	SHANNY, (PRICKLEBACK) - UNIDENT.	STICHAEIDAE
65	SHARK - UNIDENT.	SQUALIFORMES
69	SHARK, BLUE	PRIONACE GLAUCA
68	SHARK, BROWN CAT	APRISTURUS BRUNNEUS
62	SHARK, PACIFIC SLEEPER	SOMNIOSUS PACIFICUS
67	SHARK, SALMON	LAMNA DITROPIS
78	SHARK, SIXGILL	HEXANCHUS GRISEUS
64	SHARK, SOUPFIN	GALEORHINUS ZYOPTERUS
66	SHARK, SPINY DOGFISH	SQUALUS ACANTHIAS
63	SHARK, THRESHER	ALOPIAS VULPINUS
70	SHRIMP - UNIDENT.	
90	SKATE - UNIDENT.	RAJIFORMES
212	SKILFISH	ERILEPIS ZONIFER
625	SLICKHEAD, THREADFIN	TALISMANIA BIFURCATA
602	SMELT - UNIDENT.	OSMERIDAE
604	SMELT, CAPELIN	MALLOTUS VILLOSUS
601	SMELT, EULACHON (CANDLEFISH)	THALEICHTHYS PACIFICUS
619	SMOOTHTONGUE, NORTHERN	LEUROGLOSSUS STILBIUS SCHMIDTI
30	SNAIL - UNIDENT.	GASTROPODA
34	SNAIL, EGGS	GASTROPODA
36	SNAIL, SHELL, EMPTY	
500	SNAILFISH - UNIDENT.	LIPARIDIDAE
559	SNIPE EEL - UNIDENT.	NEMICHTHYIDAE
109	SOLE, BUTTER	ISOPSETTA ISOLEPIS
118	SOLE, C-O	PLEURONICHTHYS COENOSUS
117	SOLE, CURLFIN	PLEURONICHTHYS DECURRENS
110	SOLE, DEEPSEA	EMBASSICHTHYS BATHYBIUS
107	SOLE, DOVER	MICROSTOMUS PACIFICUS
108	SOLE, ENGLISH	PAROPHRYS VETULUS
103	SOLE, FLATHEAD	HIPPOGLOSSOIDES ELASSODON
116	SOLE, HYBRID	INOPSETTA ISCHYRA
108	SOLE, LEMON	PAROPHRYS VETULUS
112	SOLE, PETRALE	EOPSETTA JORDANI
105	SOLE, REX	GLYPTOCEPHALUS ZACHIRUS
104	SOLE, ROCK	LEPIDOPSETTA BILINEATA
114	SOLE, ROUGHSCALE	CLIDODERMA ASPERRIMUM
115	SOLE, SAND	PSETTICHTHYS MELANOSTICTUS
111	SOLE, SLENDER	LYOPSETTA EXILIS

140	SOLE, YELLOWFIN	LIMANDA ASPERA
26	SPONGE - UNIDENT.	PORIFERA
622	SPOOKFISH - UNIDENT.	OPISTHOPROCTIDAE
270	SQUARETAIL, SMALLEYE	TETRAGONURUS CUVIERI
50	SQUID - UNIDENT.	DECAPODA
51	SQUID, GIANT	MOROTEUTHIS ROBUSTA
20	STARFISH - UNIDENT.	ASTEROIDEA
21	STARFISH, BASKET	GORGONOCEPHALUS
22	STARFISH, BRITTLE	OPHIUROIDEA
24	STARFISH, SUNSTAR	SOLASTER SP.
226	STEELHEAD	SALMO GAIRDNERI
230	STURGEON - UNIDENT.	ACIPENSERIDAE
3	TANNER CRAB - UNIDENT.	CHIONOECETES SP.
209	TOMCOD, PACIFIC	MICROGADUS PROXIMUS
113	TONGUEFISH, CALIFORNIA	SYMPHURUS ATRICAUDA
227	TROUT, CUTTHROAT (SEA RUN)	SALMO CLARKI
807	TUBESHOULDER - UNIDENT.	SEARSIIDAE
43	TUNICATES, ASCIDIANS, SEA SQUIRTS	UROCHORDATA
143	TURBOT - UNIDENT.	
102	TURBOT, GREENLAND (HALIBUT)	REINHARDTIUS HIPPOGLOSSOIDES
805	VIPERFISH - UNIDENT.	CHAULIODONTIDAE
757	WARBONNET, DECORATED	CHIROLOPHIS DECORATUS
899	WASTE FISH	
762	WEARYFISH, (PAPERBONES) - UNIDENT.	NOTOSUDIDAE
779	WOLFFISH - UNIDENT.	ANARHICHADIDAE
780	WOLF-EEL	ANARRHICHTHYS OCELLATUS
760	WRYMOUTH, GIANT	DELOLEPIS GIGANTEA
783	WRYMOUTH, DWARF	LYCONECTES ALEUTENSIS
999	Z SUMMATION LINE	CODE FOR FORM 3US ONLY

DEFINITION OF HALIBUT CONDITION

Trawl Catches

(1) Excellent: No sign of stress
- (a) Injuries, if any, are minor
- (b) Muscle tone or physical activity is strong
- (c) Gills are red (not pink) and fish is capable of closing gill cover (operculum) tightly

(2) Poor: Alive but showing signs of stress
- (a) Moderate injuries may be present
- (b) Muscle tone or physical activity is weak
- (c) Gills are red (not pink) and fish is capable of closing gill cover (operculum)

(3) Dead: No sign of life or, if alive, likely to die from severe injuries or suffocation
- (a) Vital organs may be damaged
- (b) No sign of muscle tone or physical activity
- (c) Severe bleeding may occur
- (d) Gills may be pink and fish is not able to close gill cover

Longline Catches

(1) Excellent: No sign of stress
- (a) Hook injuries are minor and located in the jaw or cheek
- (b) No sign of severe bleeding; gills are red (not pink)
- (c) No sign of sand fleas

(2) Poor: Alive but showing signs of stress
- (a) Hook injuries may be severe, but vital organs are not injured
- (b) Moderate bleeding may be observed, but gills are still red (not pink)
- (c) No sign of sand fleas

dead & Sand fleas not seen

What comm

(3) Dead: No sign of life or, if alive, likely to die from severe injuries
- (a) Vital organs may be damaged
- (b) Sand Fleas may be present (they usually first attack the eyes)
- (c) Severe bleeding may occur, gills may be pink
- (d) No sign of muscle tone

DEFINITION OF KING CRAB AND TANNER CRAB CONDITION

Trawl and Longline Catches

(1) Excellent: No sign of stress or dismemberment

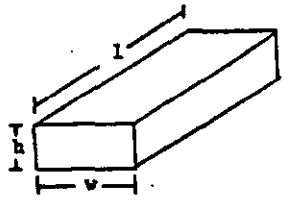
(2) Poor: Alive but showing signs of stress--a few limbs may be missing; minor mouthpart movement may be the only sign of life

(3) Dead: No sign of life, or if alive, likely to die from major carapace fracture or dismemberments

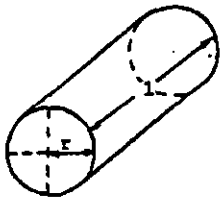
USEFUL FORMULAS YOU MAY NEED

Number of Product Units x Average Unit Weight = Total Weight of Product
Product Weight ÷ Recovery Rate = Whole Weight of fish used to make the product
Product Weight x Conversion Factor = Whole or Fresh Weight of fish used for product

Area of a circle = πr^2 Circumference = $2\pi r$ (π = 3.1416)
Area of a square or rectangle = length x width
Area of a triangle = ½ base x height
Volume of a right angle cone = $1/3\pi r^2 h$

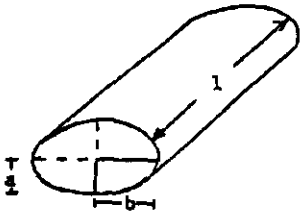


Rectangular solid
Volume = height x width x length
V = hwl

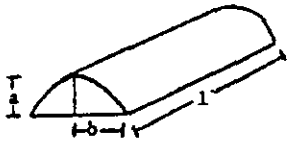


Cylinder
Volume = π x radius^2 x length
$V = \pi r^2 l$

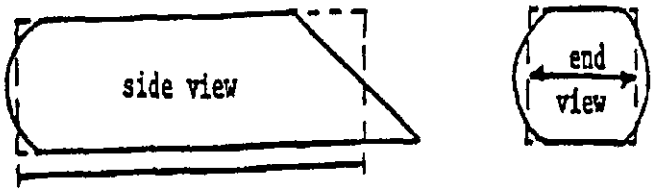
(π=3.1416)



Ellipsoidal solid
Volume = π x short radius x long radius x length
$V = \pi abl$



Semi-ellipsoidal solid
Volume = $\frac{1}{2}\pi abl$
$V = \frac{1}{2}\pi abl$



(Allowances can be made for irregular shapes or partially filled portions of the net by the way in which the measurements are taken.)

TABLE OF EQUIVALENTS

1 inch = 2.540 centimeters
1 foot = .3048 meters
1 foot = .1667 fathoms
1 fathom = 6 feet = 1.829 meters

1 centimeter = .3937 inches
1 meter = 3.2808 feet

1 meter = 100 cm = 0.5468 fathoms

1 statute mile = 5280 feet = 1.609 kilometers = 0.86899 nautical miles
= 880 fathoms
1 nautical mile = 1.15078 statute miles = 1 minute of latitude
= 1.852 kilometers = 1012.6859 fathoms = 1852 meters
1 fathom = 0.0009875 nautical miles = 0.0011364 statute miles

1 pound = 0.4536 kg

1 kg = 2.2046 lb.

total catch wt. in lbs ÷ 2.2046 = total catch wt. in kilograms

1 metric ton = 1000 kg = 2204.6 lbs = 0.9842 long tons = 1.1023 short tons
1 short ton = 907.1847 kg = 2000 lbs = 0.8929 long tons = 0.9072 metric tons
1 long ton (British) = 1016.0469 kg = 2240 lbs = 1.1060 metric tons
= 1.12 short tons

CONVERTING POUNDS TO METRIC TONS

LBS	MT	LBS	MT
1000	0.4536	14000	6.3504
2000	0.9072	15000	6.8040
3000	1.3608	16000	7.2576
4000	1.8144	17000	7.7111
5000	2.2680	18000	8.1647
6000	2.7216	19000	8.6183
7000	3.1752	20000	9.0719
8000	3.6288	21000	9.5255
9000	4.0824	22000	9.9791
10000	4.5360	23000	10.4327
11000	4.9896	24000	10.8863
12000	5.4432	25000	11.3399
13000	5.8968	26000	11.7935

RELATIONSHIP OF HALIBUT LENGTHS TO WEIGHT (LIVE WEIGHT)

Length (cm)	Kilograms	Length (cm)	Kilograms	Length (cm)	Kilograms
10	.007	55	1.821	100	12.635
11	.010	56	1.930	101	13.049
12	.013	57	2.045	102	13.472
13	.017	58	2.163	103	13.905
14	.022	59	2.286	104	14.347
15	.027	60	2.414	105	14.799
16	.033	61	2.547	106	15.260
17	.040	62	2.685	107	15.731
18	.049	63	2.828	108	16.213
19	.058	64	2.976	109	16.705
20	.069	65	3.129	110	17.206
21	.080	66	3.288	111	17.718
22	.094	67	3.452	112	18.240
23	.108	68	3.621	113	18.773
24	.124	69	3.801	114	19.317
25	.141	70	3.978	115	19.871
26	.161	71	4.165	116	20.437
27	.182	72	4.358	117	21.013
28	.205	73	4.558	118	21.600
29	.229	74	4.763	119	22.200
30	.255	75	4.975	120	22.810
31	.284	76	5.193	121	23.431
32	.315	77	5.417	122	24.065
33	.348	78	5.649	123	24.710
34	.383	79	5.887	124	25.366
35	.421	80	6.132	125	26.035
36	.461	81	6.384	126	26.716
37	.504	82	6.642	127	27.409
38	.550	83	6.909	128	28.115
39	.598	84	7.182	129	28.832
40	.649	85	7.463	130	29.563
41	.715	86	7.751	131	30.306
42	.760	87	8.046	132	31.062
43	.820	88	8.350	133	31.831
44	.884	89	8.661	134	32.613
45	.950	90	8.981	135	33.408
46	1.021	91	9.307	136	34.216
47	1.095	92	9.644	137	35.038
48	1.172	93	9.987	138	35.874
49	1.253	94	10.340	139	36.723
50	1.337	95	10.700	140	37.586
51	1.426	96	11.070	141	38.463
52	1.519	97	11.447	142	39.354
53	1.615	98	11.834	143	40.259
54	1.716	99	12.230	144	41.178
				145	42.111

RELATIONSHIP OF HALIBUT LENGHTS TO WEIGHT (LIVE WEIGHTS)

Length (cm)	Kilograms	Length (cm)	Kilograms	Length (cm)	Kilograms
146	43.060	188	97.388	230	187.745
147	44.023	189	99.109	231	190.402
148	45.000	190	101.095	232	193.085
149	45.993	191	102.829	233	195.795
150	47.001	192	104.576	234	198.531
151	48.024	193	106.359	235	201.293
152	49.062	194	108.155	236	204.081
153	50.115	195	109.972	237	206.897
154	51.184	196	111.810	238	209.739
155	52.269	197	113.668	239	212.607
156	53.370	198	116.003	240	215.503
157	54.486	199	117.450	241	218.426
158	55.618	200	119.373	242	221.376
159	56.767	201	121.318	243	224.354
160	57.932	202	123.284	244	227.359
161	59.113	203	125.273	245	230.392
162	60.311	204	127.283	246	233.452
163	61.526	205	129.316	247	236.541
164	62.757	206	131.371	248	239.658
165	64.005	207	133.448	249	242.803
166	65.271	208	135.548	250	245.977
167	66.553	209	137.671		
168	67.830	210	139.817		
169	69.170	211	141.985		
170	70.505	212	144.177		
171	71.858	213	146.392		
172	73.229	214	148.631		
173	74.617	215	150.893		
174	76.024	216	153.179		
175	77.448	217	155.489		
176	78.891	218	157.822		
177	80.353	219	160.180		
178	81.833	220	162.562		
179	83.332	221	164.968		
180	84.850	222	167.399		
181	86.387	223	169.854		
182	87.943	224	172.334		
183	89.518	225	174.840		
184	91.113	226	177.370		
185	92.727	227	179.925		
186	94.360	228	182.506		
187	96.014	229	185.112		

Example – Observer is assigned to measure crab

FORM 7US–LENGTH FREQUENCY OF MEASURED SPECIES

(Includes halibut, salmon, and crab measurements)

Jane Observer "Sea Gull"

Page 1 of ____

Cruise no.	Vessel code	Date		
		Year	Mo.	Day
1 2 3 4 5	6 7 8 9	10 11	12 13	14 15
		91	09	14

1. Leading zeros in columns 12 and 14 only – as needed.
2. For motherships – leave columns 19–21 blank. For longliners – enter set no. in column 19.
3. Start a new row each time when entering data from a different sex, species, or haul.
4. Skip lines between species when space permits.
5. Start each day's measurements on a new side.

M = male
F = female
U = unknown sex
size groups: Fish by 1 cm.
Crabs by 5 mm
(1–5 = 3; 6–0 = 8)

Species name	Species code	Set/haul no.	Sex	Keypunch check	Size groups	Freq.	Size groups	Freq.	Size groups	Freq.	Size groups	Freq.	Size groups	Freq.	Size groups	Freq.	Size group	Freq.	Size group	Freq.
	16–18	19 20 21	22	23–27	30–32	33–35	36–38	39–41	42–44	45–47	48–50	51–53	54–56	57–59	60–62	63–65	66–68	69–71
Pollock	201	101	M	261	32	1	33	2	34	5	35	2	36	2	37	2	39	1
↓		↓	M	129	40	1	42	1	44	1								
			F	300	33	4	34	9	35	12	37	4	38	1	43	2	46	3
Pollock	201		F	48	47	1												
Opilio Tanner	5		M	247	73	1	83	1	88	1								
Opilio Tanner	5		F	79	78	1												
Baicdi Tanner	4		M	466	48	1	53	1	58	3	63	4	68	6	73	6	78	4
↓	↓		M	394	83	2	88	3	103	1	113	1						
			F	468	43	1	48	2	58	1	63	6	68	8	73	10	78	9
Baicdi Tanner	4		F	595	83	7	88	4	93	7	98	1	103	2	108	1		
Pacific Halibut	101		U	130	54	1	74	1										
King Salmon	222		M	39	38	1												
↓	222	↓	F	44	43	1												
King Salmon	222	101	U	41	40	1												
Pacific Halibut	101	103	U	77	76	1												
King Salmon	222	↓	M	223	52	1	53	1	58	1	56	1						
King Salmon	222	↓	F	144	41	1	47	1	53	1								
Chum Salmon	221	103	F	50	49	1												
Pacific Halibut	101	104	U	69	68	1												
Red King Crab	13	104	M	503	53	1	58	1	63	3	68	2	78	2	83	1	88	2
Red King Crab	13	104	M	198	93	1	103	1										

LENGTH FREQUENCIES

FORM 7US--LENGTH FREQUENCY OF MEASURED SPECIES

Form 7US is used for recording the lengths of prohibited species from your samples and the lengths of your sampling species. **Caution: On this form record only lengths which you actually measured, not estimated lengths.**

1. Fill in the date. **Plant observers:** write the name of the catcher boat whose fish you're sampling at the top of each form. Plant observers use the date of delivery, not necessarily the date the fish was measured. **All observers:** Start each day's measurements on a new side of the two sided form. (**Do** use both sides of the page!).

2. Under species name, record the specific common name and the related species code from the same code list as used for Form 3US.

3. Record the haul or set number in columns 19-21. All length frequency data must have a haul number assigned to it. Catcher boat observers who could not collect fish for length measuring at sea must assign a haul number(s) (and corresponding date) to the data collected from the combined hauls delivered to the plant. Choose a haul from the area where most of the fish were caught.

4. Record all those observed for each species by sex, coded "M" for male, "F" for female, and, if no sex is determined or the immaturity of the species makes sex identification impossible, code "U" for unknown.

5. The size group is the length measurement to the nearest whole centimeter for fish and to the nearest 5 millimeters for crab (1-5 mm = 3; 6-0 mm = 8). Record the size groupings in the shaded columns.

6. The frequency is the number observed in each size group. **Include a size group only if there is a frequency of one or more.** Record sequential data horizontally across the form. **List lengths from the smallest to the largest within a species/haul/sex designation.**

7. Start a new row each time there is a change in sex, haul number, or species, or when there are more than seven sizes in a group.

8. In the "keypunch check" columns 23 - 27, simply add all of the numbers in the row (size group and frequencies together) and enter the sum. Be sure to check your work by adding it again to verify your sum.

9. Note that more than one species can be recorded per page as long as each species is identified by name and code. **Skip a line between species unless it means going to a new page.**

10. Note that more than one haul can be recorded per sheet as long as the hauls all ended on the date written at the top of the page. Start each day's measurements on a new side and use both sides of the form.

11. Leading zeros should appear in the month, and day only (columns 12 and 14 only, as needed). No leading zeros should be written in species code, haul number, size, or frequency columns.

12. To indicate the repetition of a number or letter, such as species code, haul, or sex, draw brackets and arrows as shown in the example form. Do not use ditto marks in key punch columns.

LENGTH FREQUENCIES OF PROHIBITED SPECIES

All observers should take length frequencies of all salmon and halibut found in the prohibited species sample except when there are too many prohibited species to process in a reasonable length of time. For sub-sample guidelines, refer to the previous section titled "Biological Data Collected From Prohibited Species". A subsample ~~of the salmon and crab groups (if assigned to measure crab)~~ should be a random sample ~~of the salmon (or crab)~~ as found in the catch. Do not select a single salmon (or crab) species for subsampling. Taking length data from the prohibited species in your samples is a higher priority than length frequency measurements of a sampling species.

Length frequencies are recorded by species and, except for halibut, by sex. Do not use, for instance, the general code 220 for "salmon unidentified". **Do not sex halibut**, ~~but do~~ sex salmon unless they are vigorous **and** have minimal scale loss (see "Sexing Fish" in the Appendix).

Salmon (and crab if assigned as a special project) are recorded by sex

The previous section, "Biological Data Collected from Prohibited Species" includes instructions for subsampling and a full listing of the data to gather for each group. Detailed instructions on taking scale samples for salmon follow in the section on scale sampling and Form 9US.

SELECTION OF A SAMPLING SPECIES

All observers are asked to take length frequencies. This includes catcher boat observers as well as processing plant observers -- one does not substitute for the other. **The fish to be measured may be collected during or after sampling or from an unsampled haul or set,** as long as they are randomly gathered. The selection of a sampling species for length frequency measurements of about 150 fish per day depends on your assigned special project and the target species of the vessel.

If you are not assigned an age structure (usually otoliths) collection as a special project, your sampling species for length frequencies is the target species of the vessel. If you are assigned to collect age structures, your sampling species for length frequencies will be the same

species you take age structures from throughout your sampling work aboard that vessel. There are additional considerations when your sampling species is not plentiful. Refer to the next section.

Assignments of an age structure collection will either be for a particular species or you will be given a table of roundfish and flatfish species-by-area to choose a sampling species from. If given a table, your choice will be dependent upon on what is abundant in the catches of your vessel. Age structure assignments will be for the "first half" or "second half" of your time at sea. The purpose of this is to spread out the sampling effort over time so this request can be adjusted as necessary to conform with your sampling aboard a vessel. Age structure collections are "by vessel" and so should be completed on one boat. Length frequency and all other data is also divided by vessel and so you may choose a new sampling species for length frequencies when you begin work aboard a different boat.

SPECIAL PROJECTS, SAMPLING SPECIES AND LENGTH FREQUENCIES

Many observers will be assigned a special project. Some observers will be asked to collect age structures from either a roundfish or a flatfish species. Others will be assigned to collect age structures from a particular species. While still others may be assigned a special project involving the collection of stomach samples, taking product recovery samples or other projects. Regardless of a special project assignment, all observers on catcher/processors should measure 150 lengths from a selected sampling species each day. Observers on longline, pot, or shoreside delivery vessels may not be able to measure as many fish.

If your special project assignment involves the collection of age structures, then the species that you choose, or are assigned for your collection, will be the same species that you daily collect 150 lengths from on board that vessel. If you are not assigned to collect age structures, then you should collect 150 lengths, on a daily basis, from the target species of your vessel.

If you are assigned to collect age structures from an unspecified group of species, such as flatfish or rockfish, then choose one species from the group for that area which occurs most abundantly in the catch. This will make it easier for you to get 150 randomly collected lengths each day.

If an assigned species is not plentiful, your species composition sample may not contain sufficient fish for a good length frequency sample and you may have to gather fish from outside of your composition sample or from another, un-sampled haul or set. Collect all, or every third, sample species fish passing by you over a period of time, or use some other method to obtain randomly selected fish from a larger sample population. Be sure to collect the additional fish required in an unbiased manner. If you cannot get 150 fish in a day of the sampling species, take lengths and age structures from those you did collect and, additionally, take approximately 150 lengths of the target species each day.

Try to work with the same sampling species throughout your work on any one vessel or plant, regardless of the area you are fishing. If your vessel should change fishing strategies,

move to a different fishing area or if you change ships, then you may choose a new sampling species. However, if you cannot continue the collection of age structures from a sampling species, don't keep a collection of fewer than 50 age structures. Dump it and start a new one. For instance, suppose that you started your sampling species age structure collection in area 513 when the ship was targeting on pollock. After only a few days, the ship moved to area 511 and began yellowfin sole operations. First examine a few catches to see if you could gather 100 - 150 pollock over the course of a day to continue a pollock collection. Also, the skipper might just be searching around and may return to better pollock catches. If this is not the case, you should examine your collection. If you have filled fewer than 50 vials with pollock otoliths, then dump the vials and start over with Pacific cod, a **roundfish** species, which would be present with YFS as bycatch. If you have filled more than 50 vials, then keep the pollock collection and start a new collection of cod otoliths (and scales in the case of cod).

LENGTH FREQUENCY SAMPLING METHOD

The length and age data from observer samples will be used to determine the relative abundance of each year-class of target and selected bycatch species. Length frequency data provide information on abundance of fish of each size category while otoliths are read to determine the corresponding age. The age/length relationship may be quite different for each sex of a species.

Length frequencies should be collected each day from each sampling species selected. The day's length measurements may all be taken during **one** sample period (not necessarily a catch sampled for composition) **or**, when sizes are varying, lengths may be taken from **several** sample periods to ensure that measurements are representative. It is important, however, that any given sample is not selected on the basis of size.

Length frequencies are usually taken from fish that were collected in a random, non-size selective manner during your species composition sampling. Sex all the fish you have set aside for length measurements (refer to "Sexing Fish" in the Appendix). If you wanted to sample 200 fish for length frequencies and the sample you set aside only has 192 fish, don't bother collecting another eight fish. It is too easy to bias your sample by "picking" them out in an inappropriate manner. Group the fish into baskets by sex. If you are unable to sex some fish (usually the small ones), separate them into a third group to measure. Their lengths will also need to be recorded and their sex written in as "U" (unidentified).

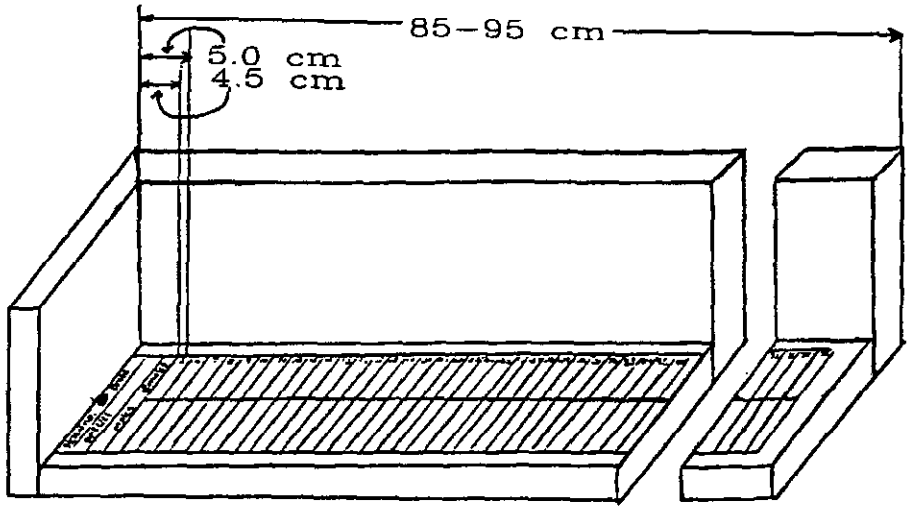
Next, set up a plastic strip on a measuring board, recording on it the haul number, date, and species. Observers on processors and trawlers must keep length frequency data for each tow separate. Record data from different hauls on different plastic strips. The plastic measuring strip is a long, narrow piece of white plastic divided into one centimeter spacings. The strip is attached by thumbtacks to a 3-sided, wood measuring board (bottom, end, and back boards). When using an aluminum measuring board, secure the plastic strip in place by putting a straightened paperclip through a hole pierced in the plastic which matches ones drilled in the aluminum. Re-check the position of the strip in relation to the upright at the end. For species of fish whose length range is less than 75 cm, the strip must be positioned on the measuring board so that the first spacing line is at 4.5 cm from the board across the end and the **center** of

the 5 cm space is at exactly 5.0 cm from the end board. Mark each 10th centimeter strip unit to read 10, 20, 30...etc. For species whose length commonly exceeds 75 cm, the measuring strip may be offset as shown in the illustration following this section. To increase the length of a strip by ten centimeters, for instance, offset the strip so that the first spacing line is at 14.5 cm from the end board and the center of the first centimeter space is at 15 cm. The tenth centimeter units of the strip may then need to be renumbered accordingly.

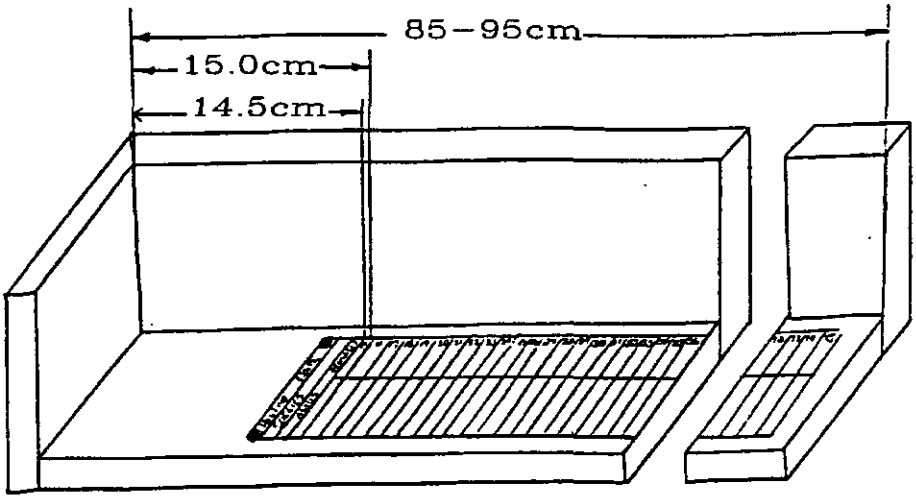
Take one of the baskets of sexed fish. Note that one side or half of the plastic strip is designated for males, and the other half for females. Position each fish on the measuring strip with jaws closed, snout against the end, dorsal surface against the back, and the fish body flat and straight. Spread the caudal fin with your hand to help determine the fork or midpoint of the fin's posterior margin. Fork length measurements should always be taken, even if the tails are ragged and the exact location of the fork has to be estimated. This is often the case when measuring hake. Measurement of round-tailed species (most flatfish) is also taken from the snout to the midpoint of the caudal fin and is still referred to as "fork length". See "Length Measurements for Various Species" in the Appendix.

With a pencil, place a stroke on the appropriate half of the plastic strip in the centimeter space where the fork or midpoint of the tail falls. If the fork or midpoint of the tail lies right on a line, reposition the fish and check it again. If it's still on the line, record the length in the smaller (shorter), adjacent centimeter length space. After recording a measurement on the strip, some fish may be set aside for otolith and/or scale samples. (Refer to "Scale Samples and Random Stratified Otolith Samples" in the following section.)

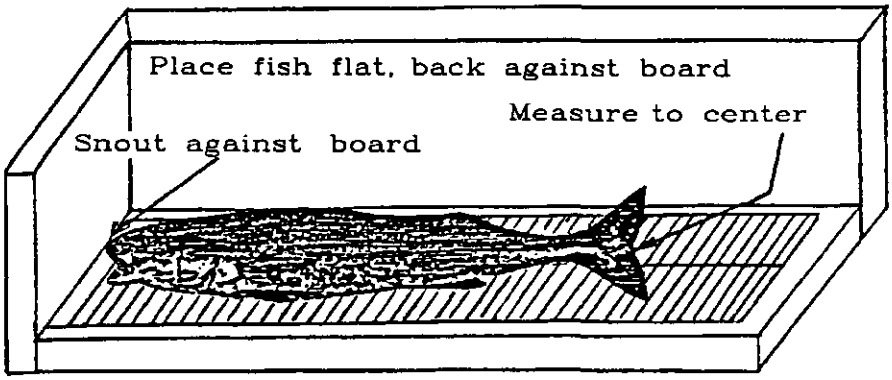
When starting to measure another basket of sexed fish, verify their sex and make sure you are recording their lengths on the appropriate half of the strip. At the end of sampling, the number of pencil strokes per sex, per centimeter length spacing will give the size group's frequency by sex.



Measuring strip set for most fish species.



Strip offset to measure larger fish.



Measurement of a roundfish on measuring board.

Jane Observer
"Sea Gull"

AREA 521

FORM 9US · BIOLOGICAL SAMPLING FORM

Cruise no.	Vessel code	Date Year	Date Mo.	Date Day	Species name	Species code	Specimen type	Sampling system
1 2 3 4 5	6 7 8 9	10 11	12 13	14 15		16 -18	20 -21	22 - 23
	[illegible]	91	09	14	Walleye pollock	201	1	1

Total no. of specimens ____

Catalogue date ____

	Set/haul number (25 26 27)	Specimen number (28 29 30)	Sex (31)	Length (cm) (32 33 34)	Weight (kg) (35 36 37 38 39)	Form 7 (41)	Maturity stage (42 43)	Notes (44 45)	Age (47 48 49)	REMARKS
1	101	65	M	32	.80	Y				
2		66		40	.95					
3		67		35	.93					
4		68		34	.85					
5		69		34	.89					
6		70		42	.96					
7		71		44	.96					
8		72		33	.80					
9		73		35	.86					
10		74	M	34	.83					
11		75	F	34	.90					
12		76		35	.93					
13		77		33	.80					
14		78		43	.95					
15		79		34	.91					
16		80		45	1.05					
17		81		47	1.20					
18		82		43	.95					
19		83		34	.82					
20	101	84	F	38	.88	Y				
21					.					
22					.					
23					.					
24					.					
25					.					
26					.					
27					.					
28					.					
29					.					
30					.					
31					.					
32					.					
33					.					
34					.					
35					.					
36					.					
37					.					

SCALE SAMPLES AND RANDOM STRATIFIED OTOLITH SAMPLES

FORM 9US INSTRUCTIONS

Form 9US is used for recording biological information concerning individual fish. It will most often be used in recording the sex, length, and weight of fish whose age structures (scales, otoliths, or fin rays) are collected for future age determination. It is the record of associated data that must accompany scales of salmon caught incidentally as well as the age structure collections of a sampling species which may have been assigned to you.

1. Form 9US data sheets are filed separately by species and vessel. To make sure that you don't record coho salmon on the reverse side of a chinook salmon sheet, for instance, keep separate groups of pages for each species. Start with page 1 for each new species.

2. At the top of the form, write the number of the three-digit subarea corresponding to the catches on the sheet. Check the subarea you recorded for the haul/set on either 1US or 2US. If the vessel changes subareas during the day, you will need to use a different sheet to record data from the new subarea. (You may use the back of the previous form.)

3. **Plant observers:** Please write the name of the catcher boat that delivered the sampled fish on the top of each Form 9US.

4. Fill in the cruise number and vessel code (when known), date, species common name, and the corresponding species code. Start each day's measurements (or subarea if it changes during the day) on a new side.

5. Leading zeros should appear in the month and day only (columns 12 and 14) as needed.

6. Record the specimen type that is being collected:

    1--otoliths
    2--scales
    3--fin rays
    4--otoliths and scales
    5--otoliths and fin rays
    6--scales and fin rays
    7--otoliths, scales, and fin rays

7. Record the sampling system that was used: (you will be told which sampling system to use before you go out)

    1--stratified random--This is the most common system for collecting age structures in this program. The fish are obtained from your length frequency samples and a tally sheet is used to ensure that age structures are obtained from no more than 5 fish per cm sex group.

2--random--In this system, although the fish may be from your length frequency sample, no stratification is made by size and sex. Instead, you may be instructed to take age structures from every eighth, tenth, fifteenth (or other) fish to ensure that the fish selected are a random collection from the population at large. Salmon scale samples are an example of this because scale samples are taken from all of the salmon or a random subsample of all of the salmon.

3--systematic--Fish are chosen from the length frequency sample in a random fashion (as in 2 above), but the haul/set to be sampled is selected in a "systematic" fashion. For example, the haul closest to the cumulative 200, 400, 600 metric ton catch may be chosen to be sampled.

8. Ignore "Total no. of specimens" and "Catalogue date," as this information will be filled in by others after you return.

9. On trawlers record the haul number in columns 25-27; on longline or pot vessels record the set number in those columns.

10. Note that data from several hauls/sets can be recorded per sheet as long as the hauls were begun to be retrieved or the set retrieval was completed on the date written on the top of the page and they were all taken from hauls/sets in the same area. Go to a new side only when all 37 lines are filled, when you are starting a new day, or a haul/set is in a different subarea.

11. The specimen number is the identifying number on the otolith vial, scale envelope, or other container with the specimen. There should not be any duplicate specimen numbers within a species. The specimen numbers should be listed in sequence. (We want to avoid having specimen containers filled at random.) Salmon scale samples are numbered sequentially by species and the data are recorded on separate sets of Form 9US by species.

12. If you board another ship before completing a collection, you can continue with the same sequence of specimen numbers, but keep separate sets of form 9US for the two different vessels.

13. It is best if the specimen data are recorded separately by sex on the form.

14. Record the sex of the fish using "M", "F", and "U" notation (M = male; F = female; U = unidentified).

15. *Record the length of the fish to the nearest whole centimeter.*

16. The weight is to be filled out to two decimal places. Add trailing zeros where necessary.

17. If you recorded the length of the fish on the Form 7US (which should almost always be the case unless you picked this particular fish from someplace other than your length frequency sample), record a "Y" for "Yes" in column 41. Otherwise, write "N".

18. If you are requested to record maturity stage, record this in columns 42-43. An appropriate maturity scale for the species would need to be provided to you.

19. The columns to the right of maturity stage (columns 44 and above) are for the age readers to complete. If your project specifically directs you to write something, or if you note something extraordinary about an individual fish, write your comments small enough to allow the age readers to also record their remarks, if necessary.

20. If, for some reason, some preservative other that ethyl alcohol was used (such as rubbing alcohol), note the preservative at the top of the first page of each set of Form 9US.

21. As with other forms, you will be recording your name and the ship name at the top of each set of forms. For the Form 9US you should do this at the top of the first sheet for each species.

RANDOM STRATIFIED OTOLITH SAMPLING

Otoliths, or fish ear bones, are collected from a stratified sample of the catch for age determination later. These are read in a similar manner as tree rings to determine age. The fish you take age structures from are your biological sampling species and are a subsample of those in your length frequency sample. Thus, the use of the term "random stratified" which is used for a subsample, stratified by length, from the random length frequency sample of fish.

A maximum of five pairs of otoliths per sex for each centimeter length group are to be taken for this type of collection (5 males and 5 females of each centimeter group). Do not be concerned if after filling your vials you do not have a complete set of five pairs of otoliths per sex for each centimeter length group that you observed. It is expected that you will have only a scattering of one or two samples from fish whose lengths are at the extremes of the size range you see. The object of this collection is <u>not</u> to complete the 5/cm/sex categories on the tally sheet or to fill all the vials. The object is to obtain age structures from most of the commonly observed length groups in the length frequency collection so that age and length information can be used to evaluate the status of the fish populations.

Otoliths are always collected while taking length-frequency measurements by sex from the sampling species. A running tally of your otolith collection on your plastic form 9 helps you keep track of what sizes and sex of fish are needed for your collection. (See an example of the plastic form 9 format on a following page.) Thus a cumulative tally should be maintained for the sampling species, for each collection. (Usually an observer makes only one collection and a collection should be completed on one vessel.) After taking the length measurement, if the fish is of a size and sex needed, weigh the fish with the 2.0 kg or 5.0 kg scale. Record weight, sex, and length on the plastic form 9 next to the vial number in which the otoliths (or otoliths and scales in the case of cod or sablefish) are placed. The otolith vials are to be filled in numerical order and the sexes should be grouped.

Remove the pair of otoliths from each fish. Clean the otoliths by rubbing them between your fingers in water, or on a wet sponge or cloth, to remove slime and tissue, and place them in the vial. Place one set of two otoliths in each vial. Fill the vial half full with the appropriate fluid (if any) and cap it. Most roundfish otoliths are stored in a 50% ethyl alcohol--50% fresh water solution. Flatfish otoliths are stored in the glycerol solution as provided. Check the instructions for your sampling species in the table "Otolith and Scale Collection for Select Species" in the Appendix. At the end of the measuring period, the plastic Form 9 should be completed with species name, haul or set number, otolith number, and all corresponding sex, length, and weight data.

As stated previously, assignments of an age structure collection will either be for a particular species or you will be given a table of roundfish and flatfish species-by-area to choose a sampling species from. If given a table, your choice will be dependent upon on what is abundant in the catches of your vessel. Age structure assignments will be for the "first half" or "second half" of your time at sea. The purpose of this is to spread out the sampling effort over time so this request can be adjusted as necessary to conform with your sampling aboard a vessel. Age structure collections are "by vessel" and so should be completed on one boat. Try not to collect more than 20 age structures per day (10 males and 10 females). We would like the

collection to be made over the duration of your sampling time on one boat, not in one or two days.

It is very important to have a clear understanding of the scheme used to identify the otoliths being collected. A mistake in the numbering sequence or procedure used to relate the otoliths to associated biological data can make a collection useless. If it is necessary to take more otoliths of the same species on a second ship, continue with the same numbering sequence but start the second collection over with a new otolith tally sheet because it will be a new collection. If you have collected less than 50 age structures from a sampling species and you must disembark and start a new cruise, you should dump the age structures that have already been collected and start over on the new ship. (Note: You may be instructed to take two separate sets of otoliths--simply start your tally sheet over the second month.)

OTOLITH REMOVAL

The otoliths are located ventrally and to either side of the brain tissue, about one eye diameter behind the eye in most fishes (refer to the diagram in the Appendix). There are three common methods of cutting into a fish's head to remove this pair of otoliths. On a roundfish, a horizontal cut, in an anterior to posterior direction which cuts off the top of the head can be done to expose the otolith cavity. This cavity can also be reached by going into the back of the mouth with a pair of forceps or scalpel and piercing up through the roof of the mouth. The easiest method to use in locating and removing otoliths is to make a vertical cut down through the top of the head to the location of the otolith pocket. This point is located by this simple rule of thumb: On the side of the fish's head, if you were to make a hypothetical extension of the lateral line and of the curve of the preopercular bone, determine the point at which these two lines would meet. Cut down to that point. Firmly grasp the fish by putting thumb and forefinger into the eye sockets. Bear down on the knife with even pressure as you cut through the bone of the head. Pay attention to the amount of pressure you are required to apply to make this cut. As soon as the cutting gets easier, let up on the knife or you will slice through the otoliths. Put down the knife and break the head open. If you have cut to the correct point, the otolith cavities (one on each side of the brain) will break open and expose the white, calcareous otoliths. They are then easily picked out with forceps and should be wiped clean before storage.

Some fish with bony skulls and small otoliths, such as sablefish and some rockfish, may pose problems at first. You may want to use a small hacksaw instead of a knife. Care should be taken not to break or crack the otoliths, but if an otolith is broken, and the fish is of an uncommon size, include all pieces in the vial. Otherwise simply discard the otoliths because you will probably see fish of that sex and size again.

Start with the lowest number of the vial number sequence when starting your collection and fill consecutively numbered vials. Attempt to take some otoliths each sampling day if the species seems readily available. We prefer that you collect fewer than 20 otoliths per day (10 males and 10 females). When a sample species is seldom seen in quantity, however, you may want to take advantage of hauls containing many specimens and collect more otoliths/scales on those days.

Plastic Form 9US

Running tally keeps track of what sexes and sizes have already been filled. It should not be erased until the end of the collection.

These four columns are transferred to the paper Form 9US and erased after every sample

Notice that the sexes are seperated.

Vial No.	Sex	Length	Weight	Hand select	Running Tally cm	M	F	cm	M	F	cm	M	F
65	M	32	.80		30			60			0		
66	M	40	.95		1			1			1		
67	M	35	.93		2			2			2		
68	M	34	.85		3			3			3		
69	M	34	.89		4			4			4		
70	M	42	.96		5			5			5		
71	M	44	.96		6			6			6		
72	M	33	.80		7			7			7		
73	M	35	.86		8			8			8		
74	M	34	.83		39			69			9		
75	F	34	.90		40			0			0		
76	F	35	.93		1			1			1		
77	F	33	.80		2			2			2		
78	F	43	.95		3			3			3		
79	F	34	.91		4			4			4		
80	F	45	1.05		5			5			5		
81	F	47	1.20		6			6			6		
82	F	43	.95		7			7			7		
83	F	34	.82		8			8			8		
84	F	38	.88		49			9			9		
					50			0			0		
					1			1					
					2			2					
					3			3					
					4			4					
					5			5					
					6			6					
					7			7					
					8			8					
					59			9					

Otoliths and Scales
Plastic Form 9
Haul/sample No. 101
Species Pollock

* GPO 1985 JACKET #594 409

The blank in the tens position of the length allows the observer to vary the size categories according to the species being used.

On special collection projects use the same otolith number to identify and label the additional structures taken (such as scales, vertebrae, fin rays, etc.). The numbers on those structures will then correspond to the sex, length, and weight information for that fish on Form 9US. There is no need to fill out an additional Form 9US unless instructed to do so.

SCALE SAMPLES

Salmon: For certain species of fish, the scale is the preferred structure for determining age; on some other species, otoliths are used. Scale samples should be taken from all salmonids in the incidence of prohibited species samples, or from a few of each species of salmon present in your sample. (See instructions for subsampling salmon under Biological Data Collected from Prohibited Species.) Do not collect scales from salmon that are not part of your samples for prohibited species unless they are tagged salmon.

As there is a high chance of obtaining regenerated scales from salmon, try to pluck samples from both sides of the fish to increase the chance of getting readable scales. A minimum of five, good, readable scales from each fish must be collected. Place salmon scale samples in small paper envelopes. Try to smear or spread-out the scales inside the envelope so that they will not clump together. Then, fill in the requested information in the spaces provided on the outside of the envelope. If you should run out of envelopes, make some with paper and tape. Number the scale samples sequentially, within each species group. Record their data on Form 9US on separate groups of pages, by species. Each cruise should start with salmon scale number one for each species of salmon.

Directions for collecting scales:

1. Rinse the fish off and/or lightly wipe the area to be sampled with a wet sponge, paper towel, or cloth. This is to minimize contamination of the sample with scales of other fish and to remove slime which can cause scales to rot.

2. Examine the fish and select zone A, B, or other. Record the zone on the envelope. "A" is the preferred zone, "B" is next in preference. Refer to the figures in the Appendix (Location of Preferred Scale Sampling Zones"). When there are no scales available in either zones A or B (on either side of the fish) then another area may be used.

3. Pluck salmon scales out with forceps so as to minimize the amount of accompanying mucus. For cod or sablefish, use a clean, thin-edged instrument (knife, scalpel, forceps), scrape within the zone in an anterior direction (toward the head).

4. Wipe off, inside the envelope or vial, 15 to 20 scales that adhere to the instrument. Collect a minimum of five scales. Ensure that samples are clearly labeled and all pertinent information is recorded on the plastic sheets, if necessary.

5. Remove excess scales from the instrument before sampling the next fish.

Cod and Sablefish: From Pacific cod and sablefish, scales as well as otoliths should be taken from a sample stratified by length and sex as explained in "Random Stratified Otolith Samples." Cod and sablefish scales should be put into the vials of alcohol with the otoliths instead of into scale envelopes. The primary reason for this is to prevent the scales from sticking together so they can be mounted easily for reading. Thus it is important to insert the scales into the alcohol solution or at least cover them with solution before they dry rather than add the alcohol later after they have stuck to the vial and to each other.

It is recognized that strict adherence to the methods will sometimes be impossible or impractical. Keep a record of the deviations from instructions so that the effect can be evaluated.

MARINE MAMMALS

FORM 10US - MARINE MAMMAL INCIDENTAL CATCH DATA

This form is for the recording of whether marine mammals were incidentally taken and for the recording of any attempts to deter marine mammals from preying upon the catch. As in the incidence of other prohibited species, resource managers need to calculate the animals caught per unit of effort, so this form must be filled out even if no marine mammals were seen. It is also important to make sure that you are checking a representative sample of the catch for marine mammals.

On stern trawlers, or on processing vessels receiving unsorted codends, decide in advance whether or not you are going to check the catch for marine mammals. Observers must watch the retrieval and dumping of nets that they plan to sample for species composition and prohibited species, so they would know whether or not a marine mammal was in the catch. Therefore, as a minimum, an entry should be made for every haul the observer samples for groundfish. In addition, some observers have to estimate the haul size for every codend that is brought on board to reliably estimate total catch size. In most cases the observer should watch those hauls being dumped so that additional entries can be made on Form 10US A and B. Marine mammals, such as sea lions, tend to congregate around codends being brought in, so watch for any signs of deterrence at that time (such as the use of "seal bombs"). Deterrence might also be used if the codend is brought up to make a turn, or while the codend is being set. You will not be expected to watch for signs of deterrence at every possible time it might be used if you have never seen or heard anything which makes you suspect that deterrence is ever used.

Observers aboard longline vessels should also record data on Form 10US. Although it is less likely in this fishery that marine mammals will become entangled in the gear (it has happened), the use of deterrence to protect the catch is more likely in this fishery than in trawl fisheries. Record whether or not any deterrence has been used for each set that you observed. Record the details of the use of deterrence in your logbook--what form of deterrence was used, how effective it was, and whether the marine mammals appeared to be injured by it.

Form 10US has two parts--10A for recording marine mammal interactions during hauls randomly selected for monitoring, and 10B (the back of 10A) for recording specimen data and remarks on any marine mammals subject to deterrence or taken in a catch. Form 10A is used only for randomly selected hauls monitored for marine mammals, while form 10B can be used for any marine mammal interaction, whether in a monitored haul or not.

Form 10A US

1. Fishery no. (col. 1-2) - Leave this code blank for the time being. (The fishery will be determined from the gear type, the area, and the depth fished (from 2US or 1US)).

2. Cruise no., vessel code, year (col. 3-13) - Fill in the cruise number (when known), vessel code and year in the heading; start a new sheet for each new vessel or cruise.

3. Date, haul/delivery/set number (col. 14-20) - Record the date and haul, delivery, or set number for each catch for which you know whether or not marine mammals were deterred or taken. Do **not** put a slash between your entries for month and day.

4. Marine mammal species - Write the common name of the marine mammal species involved. Write "None" if no marine mammals were taken or subjected to deterrence. If you are not sure of the identification, use the broader classification, such as unidentified pinniped or unidentified dolphin/porpoise. If more than one species of marine mammal was involved in the haul, set, or delivery, enter the second species on a separate line.

5. Marine mammal species code (col. 21-22) - Record the corresponding code (see attached table) for the marine mammal species you recorded in #4 above.

6. Number of marine mammals (col. 23-39) - Except for the deterred category, a marine mammal recorded in one of these categories should not appear in any of the other categories--the categories are mutually exclusive. It is possible that an animal that was earlier deterred (or at least subjected to deterrence) might later become entrapped or be lethally removed.

   a. Deterred: those animals not entrapped that were subjected to harassment such as seal bombs.

   b. Released or escaped alive (uninjured): those animals that are entrapped, but are released alive or escaped with no apparent injury (no bleeding, swam or dove strongly within a few seconds) and no fishing gear was attached to the animal.

   c. Released or escaped alive (injured): Those animals that are entrapped, but are released alive or escape with apparent injury (bleeding, obvious trauma, unusually sluggish movement upon release) and/or with fishing gear attached to the animal.

   d. Freshly dead (entangled or entrapped): Any <u>dead</u> animal brought onboard or released from the gear that is not obviously decomposed or gunshot. (The observers should not worry about <u>how</u> freshly dead the animal is.)

   e. Unknown condition: Those animals that are entangled or entrapped, but are lost or discarded before the observer is able to judge the animals' condition.

   f. Decomposed: The animal was entrapped, but it was obviously dead before contacting the fishing gear. Note smell, discoloration, bloating, or external trauma resulting from scavengers.

   g. Lethal removal (not entangled or entrapped): An animal that is killed (e.g. shot or clubbed) to prevent serious damage or loss of gear, catch or human life, but is not in direct contact with fishing gear.

h. Lethal removal (entangled or entrapped): An animal that is killed (e.g. shot or clubbed) to prevent serious damage or loss of gear, catch or human life, and is in direct contact with fishing gear.

7. Did you observe MM (Y/N)? (col. 40) - Record "Y" here if you actually saw the animal, and "N" if you did not.

8. Form 10B (Y/N)? (col. 41) - Record "Y" here if you have also filled out a Form 10B (the back of form 10A US) for this entry; record "N" if you had a marine mammal entry on this line and did not fill out a form 10B. Leave this blank if there was no marine mammal entry on this line.

9. Column 42 - Leave this column blank.

Form 10B US

Form 10B US (the back of Form 10A US) has space for specimen information and for remarks about entries on the front. Use this form whether or not you have a 10A entry (e.g., the animal comes from an unsampled haul). Fill out one Form 10B record (there is room for three records on the form) for every animal from which measurements or specimens were taken. You should also use the form for any comments about an incident. Use additional Form 10B's if you need more than three records to describe the Form 10A data.

Note that this is the place to record information on animals caught in catches not monitored for marine mammals.

1. Fishery no., cruise no., vessel code, year, date, haul/delivery/set number, marine mammal species code (col. 1-22) - Copy these data directly from the associated form 10A US (if there was a form 10A entry).

2. Haul sampled for fish (Y/N)? (col. 23) - Code "Y" here if the haul was sampled for fish, and "N" if it was not.

3. Did you observe the marine mammal (Y/N)? (col. 24) - Record "Y" here if you actually saw the marine mammal, and "N" if you did not.

4. Sex (M/F)? (col. 25) - Record the sex of the animal. Code "U" if the sex is unknown.

5. Lengths: curvilinear and/or standard (col. 26-31) - Record the animal's length (in cm) in the appropriate field.

6. Tooth collected (Y/N)? (col. 32) - Record "Y" if you collected a tooth; otherwise record "N". If "N", please indicate in the Remarks section why you did not take the snout or tooth.

7. Photo taken (Y/N)? (col. 33) - Record "Y" if you took photographs; otherwise, record "N".

8. Enter the latitude and longitude of each haul or set from which there are specimen data or remarks on marine mammals. Use the unmarked lines to the right of column 33 as shown on the following form example.

9. Remarks - Use this area to give features you used to identify the animals to species or species group. If the animal was subjected to a form of deterrent, document the particular circumstances, what deterrent was used, whether or not the animal was deterred, and whether or not the animal seemed to be injured. If the animal was released or escaped alive after being entangled or entrapped, document what happened, what part of the gear the animal was in, and what type of injury or symptoms the animal was displaying (if any) upon release. If the animal was lethally removed, make sure that you document the entire circumstances on these sheets or in your logbook as well as recording any biological data on Form 10B US. Record what you can about the circumstances concerning animals of unknown condition.

In addition, ask the captain to have reported to you all marine mammals that are taken in catches while you are aboard. If you are informed about a marine mammal in a catch which you did not intend to sample, do not enter these data on Form 10A US, but do fill out the Form 10B US. Indicate that these animals are not recorded on a Form 10A and give the reason why.

Common and Scientific Names and Species Codes for Marine Mammals
(NE indicates no equivalent)

Code	Common Name	Scientific Name
CU	Northern fur seal	Callorhinus ursinus
EJ	Northern (Steller) sea lion	Eumetopias jubatus
ZC	California sea lion	Zalophus californianus
UO	Unidentified otariid (fur seals and sea lions with visible ears)	
OR	Walrus	Odobenus rosmarus
PV	Harbor seal	Phoca vitulina
PL	Spotted seal; larga seal	Phoca largha
PH	Ringed seal	Phoca hispida
PF	Ribbon seal	Phoca fasciata
EB	Bearded seal	Erignathus barbatus
MA	Northern elephant seal	Mirounga angustirostris
US	Unidentified phocid (hair or true seals without visible, external ears)	
UP	Unidentified pinniped (the order which includes both otariids and phocids)	
EL	Sea otter	Enhydra lutris
PD	Dall's porpoise	Phocoenoides dalli: dalli type

PT	Dall's porpoise	Phocoenoides dalli: truei type
PB	Dall's porpoise	Phocoenoides dalli: black type
PX	Dall's porpoise	Phocoenoides dalli: type unknown
PP	Harbor porpoise	Phocoena phocoena
DD	Common dolphin	Delphinus delphis
LO	Pacific whiteside dolphin	Lagenorhynchus obliquidens
LB	Northern right whale dolphin	Lissodelphis borealis
SC	Striped dolphin	Stenella coeruleoalba
TT	Bottlenose dolphin	Tursiops truncatus
SB	Rough toothed dolphin	Steno bredanensis
GG	Risso's dolphin	Grampus griseus
SL	Spinner dolphin	Stenella longirostris
SA	Spotted dolphin (Central Pacific)	Stenella attenuata
SG	Spotted dolphin (Eastern Pacific)	Stenella attenuata
LH	Frasier's dolphin	Lagenodelphis hosei
UD	Unidentified dolphin/porpoise	NE
GM	Shortfin pilot whale	Globicelphala macrorhynchus
FA	Pygmy killer whale	Feresa attenuata
PC	False killer whale	Pseudorca crassidens
OO	Killer whale	Orcinus orca
DL	Belukha; beluga	Delphinapterus leucas
UX	Unidentified small whale	NE
PM	Sperm whale	Physeter macrocephalus
BE	Baird's beaked whale	Berardius bairdii
ZX	Goosebeak whale	Ziphius cavirostris
MS	Bering Sea beaked whale	Mesoplodon stejnegeri
ER	Gray whale	Eschrichtius robustus
MN	Humpback whale	Megaptera novaeangliae
BA	Minke whale	Balaenoptera acutorostrata
BX	Bryde whale	Balaenoptera edeni
BB	Sei whale	Balaenoptera borealis
BP	Fin whale	Balaenoptera physalus
BL	Blue whale	Balaenoptera musculus
BG	Black right whale	Balaena glacialis
BM	Bowhead whale	Balaena mysticetus
MM	Narwhal	Monodon monoceros
UZ	Unidentified large whale	NE
UW	Unidentified whale	NE
UM	Polar bear	Ursus maritimus

NU

Fishery no.			Cruise no.				Vessel code				Year	
1	2	3	4	5	6	7	8	9	10	11	12	13
											9	1

FORM 10A US - MARINE MAMMAL INCIDENTAL CATCH DATA

Date (MO/DAY)	Haul, delivery, or set number	Marine mammal species (if none observed, write none)	Marine mammal species code	Number of marine mammals: Deterred	Released or escaped alive (uninjured)	Released or escaped alive (injured)	Freshly dead (entangled or entrapped)	Unknown condition	Decomposed	Lethal removal (not entangled or entrapped)	Lethal removal (entangled or entrapped)	Did you observe MM(Y/N)?	Form 10B(Y/N)?	
14 15 16 17	18 19 20		21 22	23 24 25	26 27	28 29	30 31	32 33	34 35	36 37	38 39	40	41	42
0914	101	None												
	103													
	104													
0914	105													
0915	106	None												
0915	108	Northern Sealion	EJ						1			Y	Y	
0915	109	Northern Fur Seal	CU	1	1							Y	Y	

FORM 10 B US - SPECIMEN DATA AND REMARKS ON MARINE MAMMAL SUBJECT TO DETERRENCE OR TAKEN IN CATCH

Fishery no.		Cruise no.					Vessel code				Year	
1	2	3	4	5	6	7	8	9	10	11	12	13
											9	1

Describe features used in identification; circumstances and effects of deterrents; particulars of entrapment or entanglement; types and extent of injuries; etc.

Date (MO/DAY	Haul, delivery, or set number	Marine mammal species code	Haul sampled for fish (Y/N)?	Did you observe the MM (Y/N)?	Sex? (M/F)	Lengths: Curvilinear (cm)	Lengths: Standard (cm)	Tooth collected (Y/N)?	Photo taken (Y/N)?	
14 15 16 17	18 19 20	21 22	23	24	25	26 27 28	29 30 31	32	33	LATITUDE LONGITUDE
0915	108	EJ	Y	Y	M	212		Y	N	5826 W 17511

Remarks Over two meters long, with ears, light brown color. Dead Sealion found when codend dumped on the deck. Cancass obviously decomposed!

14 15 16 17	18 19 20	21 22	23	24	25	26 27 28	29 30 31	32	33	LATITUDE LONGITUDE
0915	109	CU	N	Y	U	140		Y	N	5826 W 17546

Remarks Dark brown w/o any markings, with ears, about four feet long. Went out on the deck to watch the retrieval after lunch. Seal bombs thrown at seal. Later apparently same seal came out of codend and ran down stern ramp.

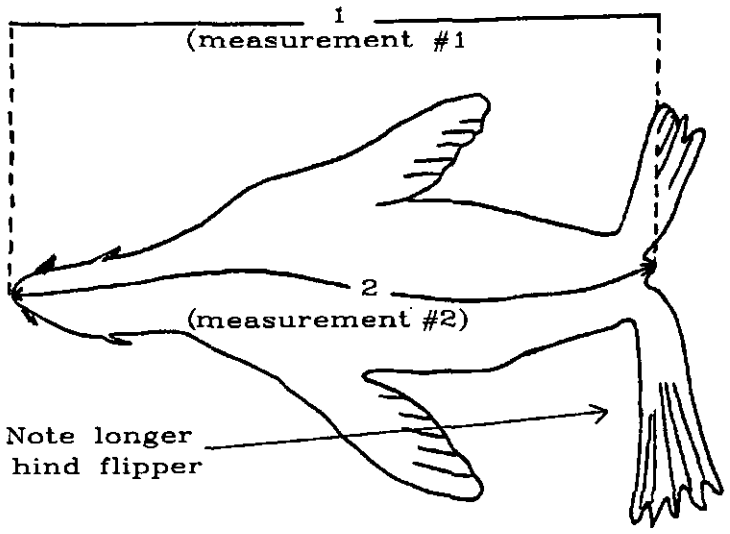
Stormy Seas

14 15 16 17	18 19 20	21 22	23	24	25	26 27 28	29 30 31	32	33	LATITUDE LONGITUDE
0914	103	EJ	Y	Y	U			N	N	5837 W 17607

Remarks Was having lunch when crew came in and told be that capt. was shooting at sea lions while I was sleeping. Cannot verify information

N

Length Measurements of Seals and Sea Lions

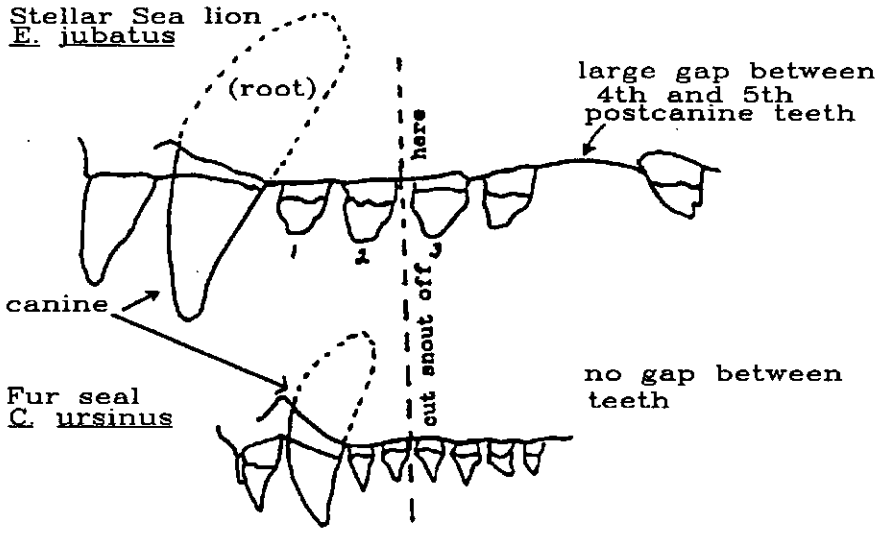


Upper half of the diagram is a Stellar Sea Lion, the lower half a Northern Fur Seal.

Standard Length (measurement #1) is the straight-line distance from the snout to the tip of the tail flesh on the unskinned body, belly up, ideally with the head and vertebral column on a straight line. If rigor has set in, then this measurement probably cannot be taken and measurement #2 should be taken.

Curvilinear Length (measurement #2) is taken when the seal cannot be stretched belly up, as when rigor sets in, or is too heavy to be moved. It is the shortest surface distance from the tip of the tail flesh along the back, belly, or side. Record the type of measurement taken. Seals and Sea Lions are usually measured with a flexible tape.

Collection of Sea Lion and Fur Seal Teeth



Outline of sea lion and fur seal teeth.

The procedure in collecting a tooth from a seal or a sea lion is as follows:

1. Skin and cut off the snout, taking care not to damage the root of the canine tooth.

2. To insure that the entire canine root is collected, the snout should be cut off between the 2nd and 3rd post canine teeth (see figure).

3. Methods of preservation: (use a or b)

a. Boil the snout until the tooth can be easily pulled and removed. Do not forcibly twist the tooth when removing; twisting will break the tooth.

b. Boil the snout until no more flesh remains on the jaws. The jaws can then be stored dry.

4. Do not preserve the snout in formaldehyde.

FORM 11(A) - MARINE MAMMAL SIGHTING FORM

This form is designed to gain information about marine mammals sighted, other than those subject to harassment or brought up in the fishing gear. Most marine mammal sighting data are valuable, whether or not you were deliberately looking for mammals. Thus, if a crew member points out a mammal to you, or if you merely glance up from your work and see a mammal, write it down, and record the information on the form.

We are interested in all species of marine mammals that you might encounter and will provide an identification guide to assist you in making identifications. If you are unable to positively identify an animal, then please indicate so on the form. Records of unidentified marine mammals tend to lend credence to those records that include identification. Please make a complete description with copious notes and illustrations as necessary, to fully describe any new species of marine mammal sighted. Records of species which are not fully documented and have not been previously encountered, will probably not be verifiable at a later date.

(* = Do not fill in boxes preceded by an asterisk except as noted.)

1. NAME: In the upper left hand corner of the form, write the observer's and vessel's or plant's names. In the upper right hand corner enter the cruise number and vessel code upon arrival in Seattle. In addition, enter the cruise number and vessel code in columns 65-72 at the bottom of the page.

2. DATE (7-12): Note proper sequence (yr./mo./day)

   TIME (13-16): Time of sighting is logged when the animal is first seen. Times may be logged in ALT and must be noted as such, crossing out the GMT notation printed on the form.

3. LATITUDE (18-23): To tenths of minutes, if possible.

4. LONGITUDE (24-30): To tenths of minutes, if possible. Place E or W in box 30, depending on which side of the 180th meridian the sighting occurs.

5. SPECIES: Write in both the common and scientific name of the animals. Do not enter a species name unless you are absolutely positive. If you are the least bit unsure of the animal's identity, enter as "unident. large whale", "unident. porpoise", etc. Remember that an erroneous identification is worse than none at all. If more than one species are sighted at the same time, note the association (if any) in the comments section and fill out a separate sighting form for each species.

Important things to look for and make notes on when attempting to make an identification are: (Make notes under "17. Comments" and circle the characteristics on back of the Sighting Form)

A. Shape and size of dorsal fin and its position on the body. If possible, also note size and shape of tail and flippers.

B. Length. Size is difficult to estimate at sea, so if it is convenient, compare unfamiliar animals with a species with which you are familiar. For example--"about size of female Stellar sea lion" or "slightly smaller than adult male killer whale."

C. General shape of body (slender or robust).

D. Shape and size of snout. Is it long or short (estimated length in inches)? Is there a definite break between snout and forehead? Is the forehead markedly bulbous?

E. Color pattern on fins and body (stripes, spots, patches, mottling).

F. Shape, location, and direction of spout. Is it single or double? Where is spout located on head? Does it lean forward or go straight up?

G. Scars and scratch marks

6. NUMBER SIGHTED (37-40): If unable to count the animals, estimate the number seen in terms of a range (e.g., 250 + or - 50). For Dall's porpoise, note if you see more roostertails than the actual number of animals that come to the boat. (There is evidence that schools may split up.)

7. BEHAVIOR: Record primary behavior observed. More detailed remarks on behavior can be made in the comments section. Example of frequently observed behaviors are as follows:

- No specific behavior other than in the water

- Following vessel
- Bow riding
- Porpoising
- Attracted by fish nets
- Feeding
- Avoidance
- Nonspecific contact/play
- Slow-rolling
- Riding stern wake
- Milling
- Approach vessel-veer away
- Slow roll-roostertail-slow roll
- Roostertailing

8. ANGLE FROM BOW (47-48): *Consider the ship a 360 degree circle when recording* sighting angle; dead ahead being 000 degrees and dead astern being 180 degrees.

9. INITIAL SIGHTING DISTANCE: *Note distance in nautical miles, yards, or meters* - whichever you are most comfortable with. Convert to 10's of meters and place in boxes 50-52. Remember that boxes 47-52 are right justified (e.g., 100 meters = 10 in boxes 51-52).

10. VISIBILITY: Note visibility in miles, if good weather, or in meters, if poor (e.g., fog).

11. WAVE HEIGHT: Record wave height in meters.

12. VIS CODE: Do not fill in (note asterisk).

13. WEATHER: Rain, fog, blue skies, overcast, etc. Also note wind strength. Wind coming X From

14. SURFACE WATER TEMPERATURE (54-56): Record the temperature in degrees Celsius rounded off to the nearest whole degree. If below freezing, place a "-" in box 54. If above freezing, place "+" in box 54. The temperature can be obtained by the ship's engineer from the engine inlet thermometer. (See the Table of Equivalents in the Appendix for Fahrenheit to Celsius conversion.)

15. PLATFORM CODE: Do not fill in (note asterisk).

16. TIME ZONE: Do not bother to fill this in (note asterisk).

17. IDENTIFICATION: This section is one of the most important parts of the observation. **Remember, if you identify the animal, say how you did it,** (e.g., Sperm whale - 35 ft., large square head, no snout, spout at end of head and leaning forward).

Everything that you observed about the animal and used to identify it should be entered. Be liberal with sketches! Use as much room as you need to get everything down (the back of the sheet, if necessary). In addition to details of the animal's appearance, note:

1. Kinds and numbers of other associated animals (fish, birds, squid, mammals, etc.) and their behavior.

2. Anything else you think might be of interest.

BEHAVIOR COMMENTS: Be generous with narrative of animal behavior. If there are several animals, are they in a tight school, a loose school, or scattered either singly or in small groups? Do the animals approach the vessel and ride the bow wave? Note their diving behavior. How many times do they blow when they come to the surface? Do they raise their tail flukes when they dive after their last blow? How long do they stay down between each series of blows? Do they leave "tracks" or swirls on the surface when they are submerged? Do they jump (breach) clear of the water? If so, do they jump in a smooth arc or do they sometimes belly-flop, somersault, or spin?

Note how close the animal approached the vessel.
Were the marine mammals attracted to the ship by the net retrieval? Were they feeding off discarded fish and fish parts? Are these mammals possibly the same ones that you have previously reported seeing?

18. Enter your cruise number and vessel code in columns 65 - 72 as well as at the top of the page.

FORM 11(A)

X FOREIGN FISHING OBSERVER
MARINE MAMMAL SIGHTING FORM
* DO NOT FILL IN BOXES PRECEDED BY AN ASTERISK

CRUISE NO. _____
VESSEL CODE _____

1. OBSERVER NAME Charlie Tuna
VESSEL NAME American Boat

RECORD ID * [ ][ ][ ][ ][ ][ ] (1 2 3 4 5 6)

2. DATE (Yr./Mo./Day) & TIME (GMT) OF SIGHTING — YR 8 9 / MO 1 0 / DAY 1 1 (7 8 9 10 11 12); TIME (GMT) 0 3 0 0 (13 14 15 16)

3. LATITUDE (degrees/minutes/10ths)–N/S — DEGREES 5 4 / MIN. 5 9 / 10ths 4 (18 19 20 21 22) * N (23)

4. LONGITUDE (degrees/minutes/10ths)–E/W — DEGREES 1 5 7 / MIN. 3 6 / 10ths 8 (24 25 26 27 28 29); E/W W (30)

5. SPECIES Unidentified Balenoptera Balenoides sp.
Common name / Scientific name
* [ ][ ] (33 34) TENTATIVE * [ ] (35)

6. NUMBER SIGHTED 7 ± 2 C.I. * [ ] (36) [ ][ ][ ]7 (37 38 39 40)

7. BEHAVIOR Appeared to be feeding; short shallow dives in a concentrated area * [ ][ ] (45 46)

8. ANGLE FROM BOW [ ]9 0 (47 48 49)

9. INITIAL SIGHTING DISTANCE 2 statute miles

10's of meters 3 2 2 (50 51 52)

10. VISIBILITY 5 statute miles 11. WAVE HEIGHT (meters) 1.5 m 12. VIS CODE * [ ] (53)

13. WEATHER (& WIND SPEED) Lt. Rain/Fog; Wind 10k @ 200° 14. SURFACE WATER TEMP. (° C) ± [+] (54) 0 9 (55 56)

15. PLATFORM CODE * 1 9 9 4 (57 58 59 60) 16. TIME ZONE * [ ] (61) * [ ]0 (62 63)

17. How did you identify animal(s)? Sketch and describe animal; associated organisms; behavior (include closest approach); comments.

Straight tall blows, very falcate dorsal fin. 7 ± 2 animals about 2 miles off starboard beam heading slowly away from ship. Observed blows followed by dorsal fin after blow disappeared. Chief officer pointed out on fish finder, a large concentration of plankton in the area.

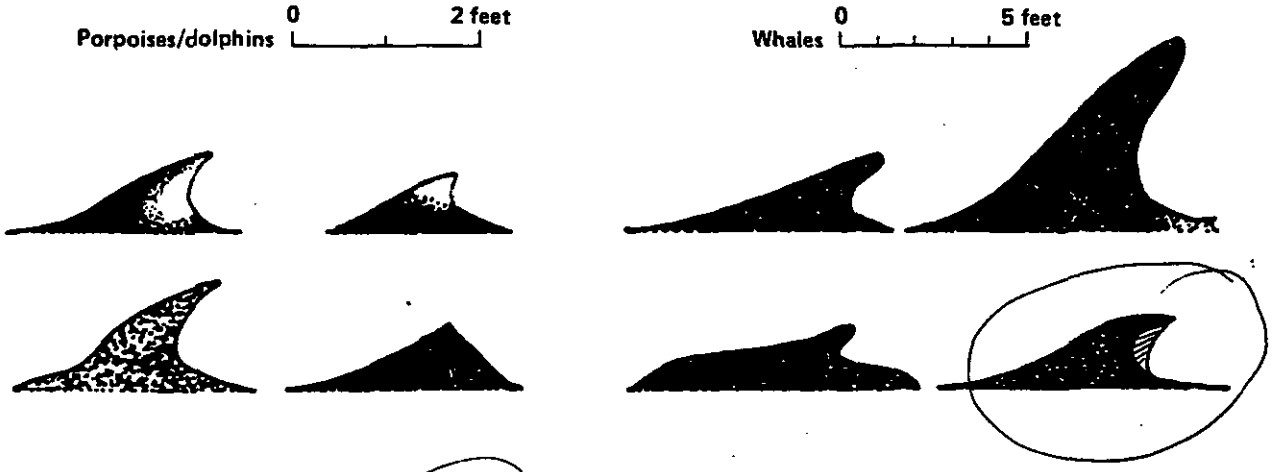
[ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ] (65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80)

To aid in your identification of whales and porpoises, circle the characteristics corresponding to the features you observed.

Body length (estimation): < 10 feet | (10–25 feet) | 25–50 feet | 50–80 feet

Dorsal fin? (Yes) | No

Shape of dorsal fin:

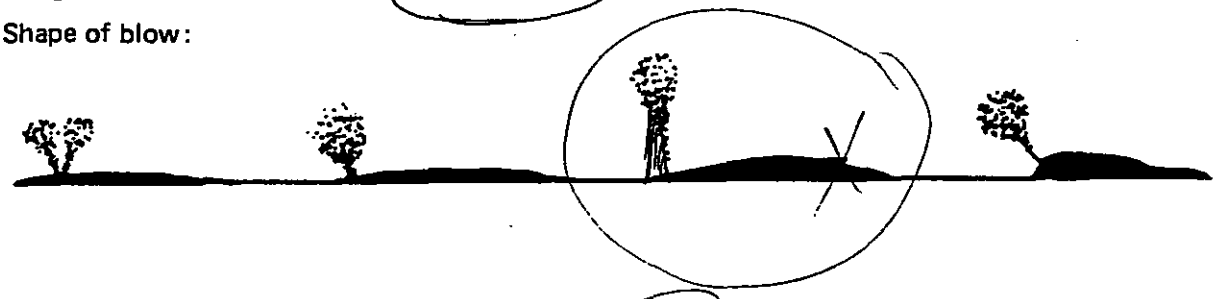


Prominent blow? (Yes) | No

Number of blows before a long dive: N/A | 1–3 | 4–7 | 8–15

Length of dive: (≤ 2 minutes) | 5–7 minutes | 10–20 minutes

Shape of blow:



Showed flukes upon dive? Yes | (No)

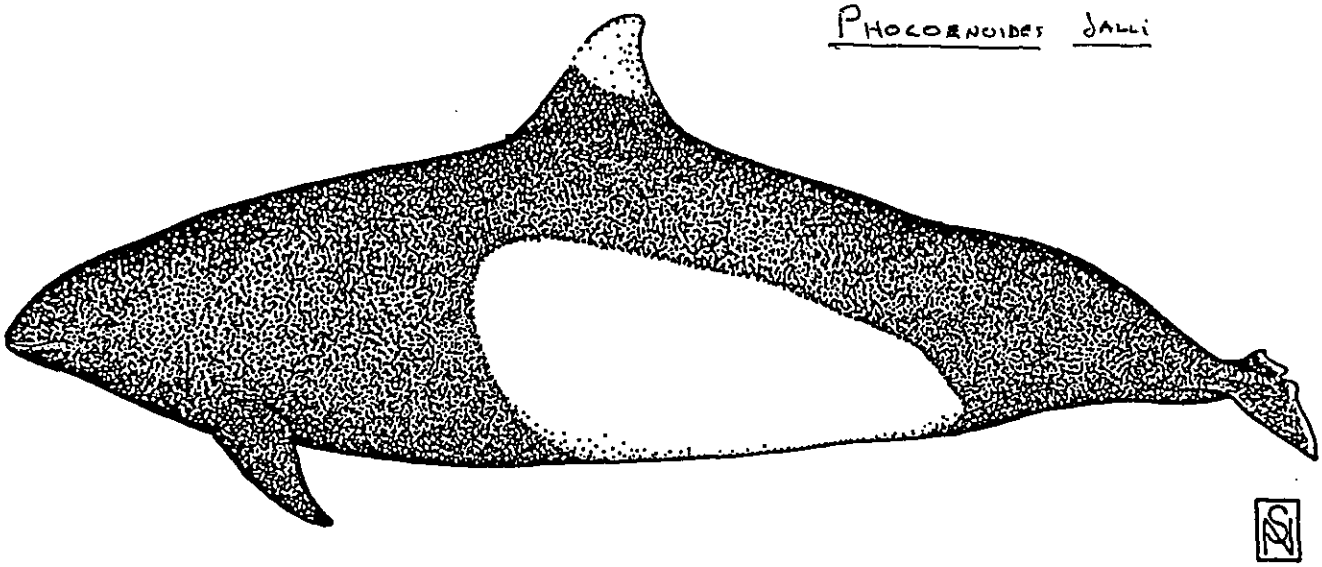
Other behavior characteristics:

No specific behavior | Bow riding
Following vessel | Slow rolling
Breaching | Porpoising
Stern riding | Other Feeding?

Distinctive markings (scarring, white patches, etc.): None observed

DALL'S PORPOISE

PHOCOENOIDES DALLI



LENGTH To 2.2 m. Newborns are approximately 1 m long.

BODY SHAPE Extremely robust body with tiny head and small flukes and flippers. The tail stock has a pronounced keel, exaggerated in adult males.

DORSAL FIN Variable in shape, basically low and triangular with a long base. Usually bicolored, dark on lower forward half and white on upper trailing half.

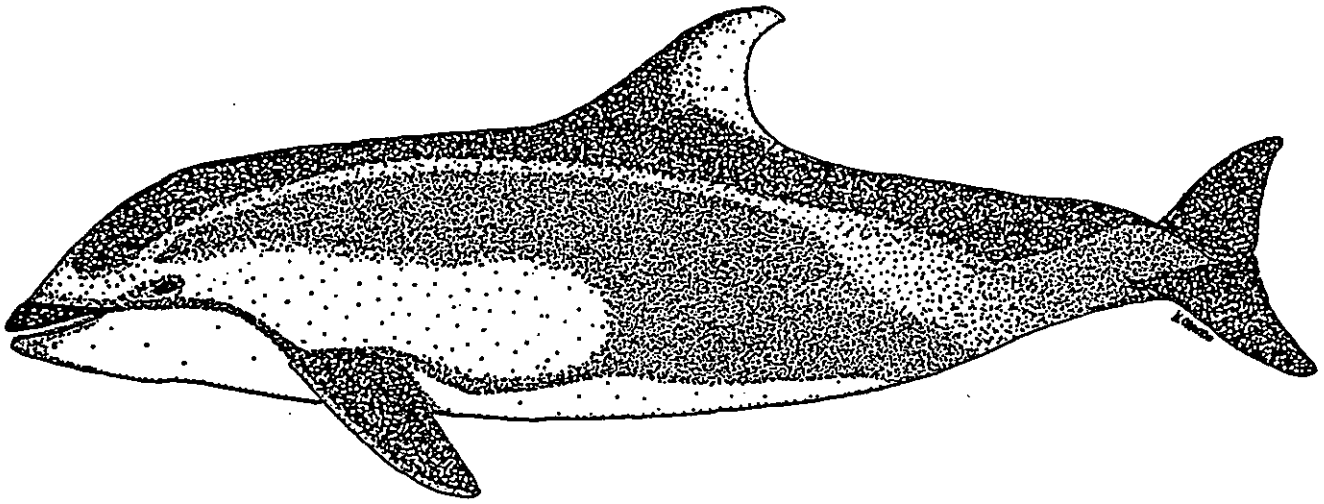
SNOUT/BEAK Forehead slopes steeply to a short poorly defined beak.

COLOR PATTERN Striking black and white pattern is very distinctive. Shiny black body with a large, conspicuous oval white patch at each side. White flank patch begins below dorsal fin in the dalli color type (pictured here), but extends anteriorly to the head in the truei color pattern. Some all black individuals have also been observed.

BEHAVIOR Small bands, usually with only 2-20. Sometimes seen with Pacific white-sided dolphins. Exhibit the distinctive "roostertail" -like splash when surfacing. Almost never porpoises.

PACIFIC WHITE-SIDED DOLPHIN

Lagenorhynchus obliquidens



LENGTH To at least 2.3 m. Length at birth is 80-95 cm.

BODY SHAPE Chunky, not as robust as Dall's porpoise but heavier-set than striped or common dolphins.

DORSAL FIN tall and strongly recurved, long base, located at mid-back. Dorsal fin has a dark leading edge, the latter 2/3 being white; gives the appearance of a "hook-fin".

SNOUT/BEAK Head tapers continuously and smoothly, dolphin has only a very abbreviated beak.

COLOR PATTERN Complex. Black back, light gray sides, and white belly. The black back is interrupted on each side of the dorsal fin by a light gray stripe beginning at forehead, curving up and over the head and back, then widening and curving down to the anal area. These stripes are known as "suspenders". The color pattern is highly variable.

BEHAVIOR extremely gregarious, occurring in herds up to several thousand. Groups of less than 200 are more common. A temperate water species.

NORTHERN RIGHT WHALE DOLPHIN

LISSODELPHIS BOREALIS

LENGTH Maximum length of adult males is 3.0 m, females to 2.3 m. At birth from 80-100 cm.

BODY SHAPE Long and slender, tapered anteriorly and posteriorly. The extremely narrow tail stock has no keel.

DORSAL FIN None--the only small cetacean in the North pacific without a dorsal fin.

SNOUT/BEAK Virtually no forehead or chin. Short beak is very indistinctly set off by a faint area above the mouth. Has a white tip on the end of the lower jaw.

COLOR PATTERN Body is all black on back and sides; variable white pattern ventrally. This white extends from the tail to the head, with a widening in the thoracic area. Calves are much lighter, cream to light gray.

BEHAVIOR Gregarious--seen in herds of more than 100 animals. Often mixes with Pacific white-sided dolphins. Not usually found in waters warmer than 19°C.

OBSERVING ON LONGLINE AND POT FISHING VESSELS

Longline boats may be the "catcher only" type that ice and deliver their fish to a shoreside plant or to a mothership for processing, or they may be catcher/processors. Pot fishing vessels usually deliver their catches to a plant and do not have freezer capacity. "Heading and gutting, **without freezing or additional preparation,** is not considered to be processing for purposes of reporting to NMFS. If your operation only heads, guts, or ices fish, or cools fish in a recirculation seawater system, NMFS does not consider your operation to be processing." If your vessel is not "processing," follow the report week instructions (in the catch message section) for catcher boats, i.e. all hauls are attributed to the week in which the **delivery** of catch is completed.

Longliners catch fish using a line with baited hooks attached to it (refer to the gear diagram). Hooks are each attached to the longline by a length of light line called "gangen." NMFS refers to longline gear as "hook & line" and defines it as, "A stationary, buoyed, and anchored line with hooks attached, or the taking of fish by means of such a device." The "long line" may be made up of sections of line called "skates" which, when on board, may be coiled into tubs or onto a skate bottom (a white fabric square with lines on the corners to tie it into a bundle), or the line may be wound onto an empty net reel. On vessels equipped with an auto-baiter system, coils of the line are hung on a rod, suspended by the hooks and gangen, much like coat hangers on a closet dowel. The length of line on one rod may be referred to as a "magazine". During retrieval of the line, the end of one skate, magazine, or half magazine and the start of the next may be flagged by a line marker, knot, or a weight attached to the line. The number of hooks per section of line is fairly uniform. Rather than count hooks, observers use line markers to count the number of sections, and thereby the number of hooks, sampled.

A longline is put out to fish or "set" from the stern of the vessel. Each end of the longline is anchored and marked with buoys. The set is then left to soak for a couple hours while the fishermen go to set or retrieve another line. Later the vessel returns and starts retrieval of the line over a roller onto the weather deck or into a cutout in the starboard side of the vessel called the "pit". On a longliner, the fish are removed from the hooks one at a time as line is retrieved and are immediately processed or put into the tanks. Longline fishing is labor-intensive but it produces a very high quality product. There are typically three sets made and retrieved each day, and the target groundfish species are sablefish (also called black cod), Pacific cod, or Greenland turbot. Halibut are primarily fished with longline gear also but as they are managed separately from groundfish species, observer coverage is not required during halibut season openings.

7x7

There are a various types of pots used by pot fishing vessels. Most vessels use king crab pots which are adapted for targeting on Pacific cod and excluding halibut. The big king crab pots are made up of a rectangular metal frame to which panels of webbing are tied; the frame sizes vary but typically measure about 8 x 8 x 3 feet. Funnel-shaped webbing in the side panels guide the fish into the pot through openings fitted with "triggers" which function as valves to let cod in and prevent them from swimming back out. Containers of bait are attached inside each pot to attract the fish. Usually a buoy line and marker float is attached to each pot and the pots are each set out and retrieved individually, that is, they are not strung together by a surface or ground line. In any case, NMFS defines a set as: a string of pots (or hook and line

gear) or a group of pots that are deployed in a similar location with a similar soak time.

Regarding the configuration of the gear, NMFS regulations state, "Pots used to fish for groundfish must be equipped with a biodegradable panel at least 18 inches in length that is parallel to and within 6 inches of, the bottom of the pot, and which is sewn up with untreated cotton thread no larger than #30. Each pot used to fish for groundfish must be equipped with rigid tunnel openings that are no wider than 9 inches and no higher than 9 inches, or soft tunnel openings with dimensions that are no wider than 9 inches. Pot and line means a stationary, buoyed line with a single pot attached, or the taking of fish by means of such a device. Pot and longline means a stationary, buoyed, and anchored line with two or more pots attached, or the taking of fish by means of such a device.

In retrieval, the buoy line is snagged, and the line hauler winch brings the pot to the railing. The pot is swung onto the "launcher", a platform attached to the rail. In heavy weather, a pot may swing wide before it can be set onto the launcher. Pots weigh hundreds of pounds and swinging and shifting pots, colliding with crewmen, have resulted in broken bones and backs. Observers must develop an awareness of this kinetic potential. When the pot is landed on the platform, a side panel of the pot is opened and the inboard side of the launching platform is lowered to tip the pot and allow the contents to spill into a waiting tote container. The pot is then re-baited, closed, and then the launching platform is raised to slide the heavy pot overboard. As the pot quickly sinks, loops of buoy line whip overboard. Loops of buoy line have lassoed crewmen and dragged them overboard and down before rescuers could grab them. Obviously observers should also stand well clear of the pots and buoy line during launching.

CATCH RATE ESTIMATES

Longline and pot catches are logged by set, and all sets are attributed to the day that the retrieval of that set was completed. Just as on the 2US form for trawlers, the only time a noon position is recorded on the Catch Summary Form 1US is on a non-fishing day. (Refer to the example Form 1US which follows.) The skipper's catch weight estimates are always based on deck tallies (counts) and/or production data. There are no deck or bin estimates of catch volume or weight. The skipper's catch estimates do not usually include bycatch or, if they do, it is a very rough estimate. On longline vessels, losses of target species which drop off the line would not usually be included in the skipper's catch estimate either. Therefore, on longline and pot fishing vessels, observers should normally use their catch estimates for the "Official" Total Catch. The observer's **independent** catch weight estimate is based on sample data, extrapolated to the whole set using the following proportion. (On some boats, observers frequently sample the whole set and then no extrapolation is necessary.)

$$\frac{\text{Weight sampled}}{\text{Hooks or pots sampled}} = \frac{\text{Estimated total catch wt.}}{\text{Total hooks or pots retrieved}}$$

If the observer's catch weight estimate is used as the official total catch weight, the observer should apply a summed ratio from sampled sets to the number of hooks or pots in each unsampled set. Catch composition, and therefore weight, will vary with depths and areas fished.

Use your judgement to apply ratios from sample data to "like" sets.

$$\frac{\Sigma \text{ sample wt. of sampled sets}}{\Sigma \text{ sampled hooks or pots in sampled sets}} = \frac{\text{Total catch wt. of an unsampled set}}{\text{No. of hooks or pots in an unsampled set}}$$

When the catch rate and/or composition varies along the line or from pot to pot, an observer may decide that the skipper's estimate of retained catch for the set plus an estimate of bycatch and longline drop-offs extrapolated from the observer's samples yields a more accurate estimate of total catch.

$$\frac{\text{Wt. of bycatch + drop-offs in sample}}{\text{No. of hooks or pots sampled}} = \frac{\text{Bycatch + drop-offs in set}}{\text{Total hooks or pots in set}}$$

then, Round wt. of retained catch + Bycatch + drop-offs in set = Official Total Catch

Or, as explained for sample data from trawlers:

$$\frac{\text{Total sample weight}}{\text{Weight of retained fish in sample}} = \frac{\text{Total catch weight}}{\text{Wt. of retained fish in set}}$$

$$\frac{\Sigma \text{ samp wts}}{\Sigma \text{ ret, in samps}} = \frac{\text{Tot samp OTC}}{\text{Ret of unsampled}}$$

Since an important variable in the equations for the official and observer's catch estimates are the number of hooks or pots per set, observers must periodically verify their number. This is much easier for observers on pot fishing vessels than for longline observers who must verify total hook count. During a trip, as snarled gear is cut out and sections of line are lost, the number of hooks per skate will be more variable and the number of skates or units of gear will probably be less. The skipper may be interested in knowing your hook counts also as this will allow him to better track his gear expenses. Some methods for longline observers to obtain accurate hook counts are as follows:

1. If your vessel has automatic baiters there are probably hook counters built into the machines. This may provide an accurate count of the number of hooks set, depending on whether broken hooks are also counted and whether their number is significant. If gear is subsequently lost however, an estimate of the number of hooks lost would have to be subtracted from the number set.

2. At least once per week, take time to actually count the hooks on all the skates if there is a set on board, or take sample counts on as many skates (or tubs) as you can and multiply the average number of hooks per skates times the total number of skates.

3. During retrieval, given that the rate of retrieval is constant, if you track the retrieval time per skate or tub, you will notice which units of line are shorter or longer than average and if those units were marked, later you could count hooks on those units of line and adjust the total hook count.

4. When there is only one, very long, set per day, even verifying the total number of skates can be difficult. Total number of skates can be checked by: overall timing of the setting of the line with a calculation of the average number of seconds to set one skate or a

conversion of miles of gear set to number of skates using the video course plotter and the average length per skate.

If some sections of line or some pots are set but not retrieved due to bad weather or gear conflicts, note this in your logbook and final report. Do not include catch estimations of this lost gear in the total catch estimation.

Cruise number					Vessel code				Year	
1	2	3	4	5	6	7	8	9	10	11
									9	1

Observer Name Olivia Observer

Vessel Name Swell

Page 1 of 3 for transmission

FORM 1US - CATCH SUMMARY FOR LONGLINE AND POT VESSELS

Page 1 of ____ for vessel

1. Leading zeros in columns 12, 14, and 33 to 36 only.
2. Skip a line after each day.
3. On days with no sets retrieved, enter date, noon position in columns 24 to 32 and set # = 0
4. Two digits are required in columns 63 + 64, 68 + 69, and 73 + 74.
5. For depth in column 41 use: M = meters and F = fathoms

Sets sampled	Date MO.	Date DAY	Set #	Gear type	Gear performance	Processing mode	Location code	End position of set: Latitude (N)	E or W	End position of set: Longitude (100)	Soak time hrs/min	Avg. bottom depth	M or F	# of skates in set or total # of pots in set	Skate length or pot set length (Fath)	# of hooks or pots per skate	Total hooks in the set	Retained Catch: round weight in metric tons	Official Total Catch in metric tons	Observer's Total Catch Estimate in metric tons	ADF&G statistical area
	12/13	14/15	16 - 18	19-20	21	22	23	24 - 27	28	29 - 32	33 - 36	37 - 40	41	42 - 44	45 - 48	49 - 52	56 - 60	61/62/63/64	65/66/67/68/69	70/71/72/73/74	75 - 80
✓	10	22	7	8	1	1	R	5534	W	6842	10/45	325	F	10	300	140	1400	1.62	2.80	2.80	685530
✓	↓	↓	8	↓	1	1	↓	5542	↓	6842	12/10	285	F	10	↓	↓	1400	.78	1.95	1.95	↓
✓	10	22	9	8	1	1	R	5528	W	6821	12/20	165	F	12			1680	1.57	3.64	3.64	685530
																		.	.	.	
✓	10	23	10	8	1	1	R	5456	W	6711	11/50	186	F	10			1400	1.53	2.80	2.80	675430
✓	10	23	11	8	1	1	R	5524	W	6802	13/20	127	F	12			1680	1.76	3.40	3.40	685500
																		.	.	.	
✓	10	24	12	8	1	1	R	5428	W	6702	10/20	215	F	10	↓	↓	1400	1.82	3.91	3.91	675430
✓	10	24	13	8	1	1	R	5445	W	6711	10/45	290	F	12	300	140	1680	1.51	3.88	3.88	675430
																				.	
																				.	
																				.	
																		.	.	.	
✓	12	10	57	6	1	3	R	5436	W	6710	12/40	124	F	20				3.84	5.10	5.10	675430
✓	12	10	58	6	1	3	R	5418	W	6520	06/35	130	F	20				4.00	4.80	4.80	655401
																		.	.	.	
	12	11	0				N	5420	W	6518	Arrived Best Seafoods—12:30 Delivery completed—16:00										655401
																		.	.	.	
✓	12	12	59	6	1	3	R	5418	W	6520	16/30	126	F	20				2.91	3.65	3.65	655401
✓	12	12	60	6	1	3	R	5417	W	6542	17/10	134	F	30				2.98	3.65	3.65	665409

Example of longline vessel

Example of vessel using pots

X

FORM 1US CATCH SUMMARY FOR LONGLINE AND POT VESSELS

This form is used to collect the fishing effort and total catch data for either longline or pot/trap vessels. Most of the form is filled out by observers on both longline or pot vessels, but there is a part of the form that is specific for each type of vessel. Points to note :

1. Collect Form 1US data for the entire period you are aboard. Make certain that you have all of the sets recorded for the days you begin and end sampling.

2. The identifying cruise number and vessel code will be assigned after you return and will be different for each vessel you are on. Keep the data for each cruise separate.

3. Place a check mark in the far left column to indicate which sets of longline or strings (sets) of pots you sampled.

4. A given set number should be used only once - no duplicates. The set numbers must be in numerical sequence (like haul numbers). Make sure that the set numbers do not exceed 3 digits. All sets must be recorded unless there was a gear malfunction resulting in a zero catch. A set number must be assigned to every set. If you reach set number 999, the next set should be "1", not "0." Set number "0" means that the vessel did not finish retrieving any set that day.

5. Enter the gear type:

    6 - pot or trap vessel
    8 - longline vessel

6. Enter the gear performance code:

    1 - no problem
    6 - gear conflict (groundline cut)
    7 - considerable predation of catch by sea lions
    8 - considerable predation of catch by killer whales (Orcinus orca)

7. Enter the processing mode: (Indicates where the utilized fish from that set are processed)

    1 - Most of the processing is done on board the catcher vessel (a catcher/processor). The products are placed in a freezer hold and the trip usually lasts more than a few days.

    3 - Retained catch is delivered to a processing plant (shorebased or "floater"). The catch is kept on ice or in RSW (refridgerated seawater) tanks, not frozen.

    5 - The fishing vessel sells the majority of their catch over-the-side to other fishing vessels who will utilize the fish for bait.

8. For the location code, enter R if the location in columns 25 - 33 is the location that the last of the set was retrieved or N if it is a noon position on a nonfishing day.

9. If no set retrieval is completed on a given day (due to bad weather, transfer of cargo, traveling, etc.), enter the noon position of the vessel in columns 24 - 32 and enter 0 in the set number column. In columns 33 - 74, comment on the reason there was no fishing. All days at sea must be accounted for in this manner.

When your vessel returns to port for a delivery or the completion of a trip, enter the time the vessel pulls up to the dock or processor and, if delivering catch, the processor delivered to and the delivery completion time on a line of Form 1US.

10. The location entered should be the latitude and longitude of the ship at the time the retrieval of the set was completed. This position determines the designated area of the set. Make sure that all positions are reasonable, i.e. 58°63' does not exist; double check positions that indicate large movements if you have not been aware of any. The first digit of longitude (1) is understood, so record only the following digits. Each longline or set of pots must have a position. On days in which no retrieval of a set is completed, record noon position in these columns.

Start → End
← pickup
∴ Start posit. = End position

11. Enter the soak time of the set - the time interval from the time the first part of the line was laid until the time the last of the set is brought in. If bad weather or killer whales prevent the crew from bringing in any of the line for a period of time, subtract the time spent waiting from the total elapsed time. The elapsed time should be entered in hours and minutes; the two digit hour designation (use leading zeros as necessary), should be entered in columns 33 and 34 to the left of the dashed line, and the minutes (use leading zeros again as necessary) should be entered in columns 35 and 36 to the right of the dashed line. For example, a soak time of 38 hours and 5 minutes would be entered as 38|05.

12. A set is assigned to a day according to the time the retrieval of the set is completed, which is not necessarily the same day that the set was begun to be laid or the day that you sample. Sets whose retrieval is completed before 0000 hours are attributed to the previous day, and sets whose retrieval is completed on or after 0000 hours are assigned to the next day.

13. The average bottom depth (cols 37 - 40) can be recorded in either fathoms (more likely) or meters, depending on the depth recording instruments that the vessel has, and in some cases, what units they are set at. Make sure that you indicate the units (fathoms or meters) with an "F" or an "M" in column 41 for every depth that you record.

14. **Longline vessels only:**
The number of skates (columns 42 - 44) should represent the number of units of longline that are retrieved from the set, not necessarily the number that are set. If possible, however, keep track of the number of skates that are lost and include that in your daily log and final report.

The skate length (columns 45 - 48) should represent the length of groundline that the average skate consists of. The length should be recorded in fathoms, not feet or meters, so convert the length to the proper units, if necessary (see Table of Equivalents). If the set consists of skates of different lengths, record the mean length (proportional average).

The average number of hooks per skate should be recorded in columns 49 - 52. This number usually remains constant throughout the cruise. Sometimes a line consists of alternating skates with different numbers of hooks - find out what the pattern is and note this in your final report.

Record the total number of hooks in the set in columns 56 - 60.

15. **Pot/trap vessels only:**
Record the number of pot/traps retrieved per set or string in columns 42 - 44. If pots are lost, then this will not be the same number as was set. If possible, keep track of the number of pots that are lost and include that in your daily log and final report. Do not include catch estimations of this lost gear in the total catch estimation.

If pots are attached to a groundline which connects them together in a string, record the total length of the groundline of the set in columns 45 - 48, otherwise leave this column blank. This length should be recorded in fathoms, not feet or meters, so convert the length to the proper units, if necessary (see Table of Equivalents).

16. Retained catch: this is the round or live weight of the catch retained on board the ship (in metric tons, not pounds or short tons--see Table of Equivalents). On catcher processors, the retained catch may be the total product weight converted to round weight using product recovery figures (expressed in metric tons). On catcher boats, the skipper may have a total count of the fish going into the hold for each set or the observer might use the delivery weight (converted to fresh weight if necessary) divided proportionately among the sets. Use your judgement as to how to obtain the most accurate data--this figure should always be filled in, even for nonsampled sets, and must be recorded to two decimal places. Give a complete description in your report of how these figures were obtained.

17. Official total catch (mt.): this will be the catch weight for the set reported in your weekly catch messages. This figure must always be filled in (record it to two decimal places). Note at the top of the first page of Form 1US the origin of the official total catch estimate. (The first sheet is sufficient unless it changes.) Give a complete description in your report of how these figures were obtained.

18. Observer's estimate: record your estimate of the sets that you sample. This will be an extrapolation of your sampling data for the skates/pots that you sampled to the total number of skates/pots in the set. (See the preceeding Catch Rate Estimates section for a more detailed description of the extrapolation.) Record it to two decimal places.

19. Enter the 6-digit ADF&G statistical area that the end position of set (cols 24 - 32) places each set in. Refer to the special supplement on the ADF&G statistical areas for

your determination of the correct area.

20. **Form formatting:** Leading zeros should be in the dates (cols 12 & 14) and the soak time (cols 33 - 35) only, as needed. Skip a line after each day, and any notes, or comments (other than notes for non-fishing days) should be placed in a part of the form that is not keypunched.

SPECIES COMPOSITION SAMPLING ON LONGLINERS

Unlike the situation on a trawler, all of the fish from a longline set are not dumped at once into a bin. On longliners, the catch comes up one fish at a time and the fish are usually processed as they come aboard. Observers frequently notice "patchiness" of fish on a longline set. Longline fishermen will often set their line at an angle, up or down a slope. From deeper water, sablefish, idiot fish (shortspine thornyhead), and rattails are commonly caught. Shallow water sets will yield more Pacific cod, arrowtooth flounder and halibut. The change in species composition in different portions of the set makes it important to get samples that are representative of the entire set. also, if the depth of the set is known to you, you can predict and therefore bias your samples. Thus, it is important to have a random sampling scheme in place prior to sampling a set. Try to get as large a sample size as possible, minimally 20% of the set, optimally, 30% - 50% or more. When three sets per day are retrieved, an observer might sample the first third of the skate on the first set, the middle third of the second set, and the last third of the last set. Some observers are able to sample whole sets routinely. Where composition of catch varies from set to set, reduce sample size as necessary in order to sample more sets.

The large size of the target fish makes basket sampling impractical since the sample baskets would fill up quickly and contain few fish. Tally sampling is the most practical method for observers on longliners. Determine which species dominates the catch at a given time--it may be sablefish, Pacific cod, or rattails. As this chosen species is brought aboard during your sampling period, tally the number of these fish using a thumb counter or a stroke-tally on a plastic sheet. (As you gain in proficiency, it may be possible to tally two species at once, such as sablefish and rattails.) Include in your count, tally fish that drop off at the roller and are missed by the gaffer. Place in your sample baskets everything else that comes up on the line--including those organisms that are normally not wanted and are usually knocked off the hooks so that they are not brought aboard (such as crabs, halibut, sea anemones, sea cucumbers, etc.). The observer has to get the cooperation of the roller man to land these fish and other organisms normally knocked off the line. Do not bother to include rocks, old fishing gear, etc. -- only organisms. On a plastic sheet record any non-tallied species that drop off the line. Note also how many units of gear were retrieved during the sampling period using a thumb counter or tally marks on a plastic sheet. At the end of a sampling period then, a longline observer should have a total count of the dominant species, counts of drop-offs, number of skates sampled and bycatch collected in baskets to sort, count and weigh.

Sort the samples by species, weigh each species group and count the individual organisms in each group as you would in any other form of basket sampling. As close as possible to your sampling period, randomly collect thirty of each of the tallied species, perhaps by taking every

other cod until a basket of them is obtained, so as not to interrupt the processing. Weigh and count the fish to obtain an average weight of the tallied species. (You may also be able to use these fish for your length frequency sample, if feasible.) Multiply the average weight of the tallied species times the number tallied to obtain the total weight of those fish brought aboard during your sampling period.

Many longline fishermen fish halibut during the short halibut season openings and are very protective of their halibut bycatch when fishing cod. They will be reluctant to bring them aboard for the observer to sample. The observer must get the rollerman to land some of the halibut for average weight, length measurements and viability and simply count the rest of them that occur during sampling. As halibut sizes can vary widely though, average weight may not be as accurate as individual visual length estimates made as the halibut come up against the side of the boat. Length estimates recorded on a plastic sheet can later be converted to weight with the halibut length/weight table (in reference section and appendix). To aid you in this, it would be very helpful to have measured marks on the side of the vessel next to the roller. Remember that estimated length data is never recorded on Form 7US.

Set Guideline Nos.

Some observers have found it convenient to make their tallies from the deck immediately above the longline pit, since it is less dangerous during rough weather and they were able to obtain a good view of the fish coming up on the line without getting in the way. Be aware that the back-up gaffer has a long gaff pole and can jab you in the face with the upper end of it when he pulls in a fish if you're not careful. Wherever you choose to stand, make sure that from your vantage point (whether above the pit or on the fishing deck) you can watch the crew place all of the non-tallied species in your baskets. Obviously, this method requires a good deal of cooperation and understanding on the part of the crew. The rollerman will have to allow the bycatch he normally knocks off the line to be landed and processing crew may have to sort these into your baskets for you. The observer program expects this amount of cooperation to be given you. If this cannot be worked out, contact one of our offices for advice and assistance as your ability to sample and data recording will be affected.

If you are unable to use the above sampling method, or for the first few days until you become familiar with the fish and fishing operation, you may wish to resort to the following easier sampling method. Simply place all of the catch in your sample baskets until they are filled. Note how many hooks it takes to fill the baskets. Take as many basket samples as possible to increase the sample weight. Weigh and count the species groups.

SPECIES COMPOSITION SAMPLING ABOARD POT FISHING VESSELS

Sampling on pot fishing vessels is very similar to the tally method described for longline vessel sampling. Please read or review the first three paragraphs of the longline sampling section above. When a pot is landed and opened, the contents are spilled into some sort of container. The crew then remove the desired species, usually just Pacific cod, and throw any other bycatch overboard. The observer should count the cod and take the rest of the bycatch aside for counting and weighing, thus relieving the crew of part of their work. After emptying, the pot has to be re-baited, closed, launched and the vessel proceeds to the next pot to begin hauling it. Consequently, there should be ample time for the observer to complete the sampling of one pot before the next is emptied. In order to gather 30 - 50 cod to determine average weight without seriously delaying the crew, take just a few cod from each pot, weigh them quickly and return them to the crew before dealing with the bycatch.

FORM 3US - SPECIES COMPOSITION FOR LONGLINE or POT VESSELS

Leading zeros in columns 12 and 14 only. Skip line between sample sizes when space permits.

Worksheet

Species:	Sablefish	Grenadier				
No. weighed:	50	60				
Wt. of above:	145.5	211.30				
Avg. weight:	2.910	3.5217				

Other calc.; comments: Sampled 7 out of 10 Skates (980 hooks). Tallied Sablefish and Grenadier.

Cruise no.					Vessel code				Year		Mo.		Day		Set no.		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
		3	2	1	A	5	5	5	9	1	1	0	2	2			9

ST = Sampling type
L = Longline
T = Trap/pot
V = Viability only

Check those seen:
- Halibut ☑
- Salmon ☐
- King crab ☑
- Tanner crab ☐

Species name	Sex	Species code	ST	Number	Weight (in kg. w/ decimal pt.)	No. of hooks or pots sampled	Viability: Number excellent	Viability: Number poor	Viability: Number dead
	19	20 21 22	23	24 25 26 27 28 29	30–40	41–51	52 53 54	55 56 57	58 59 60
(Keypunch check)		9 9 9		8 2 1	2551.40	Set wt. 3640.00	16	10	1
Halibut	U	101	L	3 3	99.12	980	16	10	1
Salmon, unident.	U	220		0	0.0				
Golden King Crab	M	8		1	1.70				
Tanner Crab	U	3		0	0.0				
Skate		90		8	20.74				
Sablefish		203		2 6 9	782.79				
Grenadier		80		4 2 6	1500.24				
Shortraker R.F.		326		1	2.70				
Arrowtooth Flounder		141		1 3	28.61				
Shortspine Thornyhead		350	↓	6 0	79.30	↓			
Pollock		201	L	1 0	36.20	980			

FORM 3US - INSTRUCTIONS FOR LONGLINE OR POT VESSELS

This form is very similar to the 3US form for trawlers - only some of the labels for the sampling type and column headings are different. In fact, if you do run out of longline/pot forms, you can substitute the trawler forms (and vice-versa), so long as you realize what ought to be recorded in the columns. Rather than reiterate column by column what should be recorded on this form, only the items that differ from the 3US trawler forms will be presented.

1. Column 23: note the sampling type code. Use an "L" for longline and a "T" for trap/pot vessel. **Do not use "P"** for pot sampling **or "V"** for viability only sampling. Sample for and record viability data only on sets sampled for composition. The halibut (and crab, if assigned) examined for viability may be those in your composition sample or they may be from a different portion of the sampled set.

2. Columns 41 - 51: Number of hooks or pots sampled: Longline and pot observers must have only one sample size (number of hooks or pots sampled) for all species (including target and prohibited species).

   Longline observers obtain the number of hooks sampled by multiplying the number of skates sampled times the average number of hooks per skate. On pot vessels, if you run into a large number of small individuals of a given species, weigh them all and obtain an estimate of their number by sub-sampling for average weight. Be sure to record sub-sample data in the worksheet part of the form.

3. A reminder: just as for the trawler form, it is necessary to indicate the sample size for halibut, salmon, king crab, and Tanner crab, even if you do not see individuals of those species in your samples. If no individuals of a given species group were observed, then the observer should enter that group name, species code (use codes 2, 3, 101, 220), sample type, number of hooks or pots monitored for that species group, 0 for the number, and 0.0 for the weight. Use the check-off boxes above the viability column to remind yourself to record those groups not seen.

OTHER SAMPLING REQUIREMENTS

The requested workload of taking lengths of approximately 150 of your sampling species each day may be too difficult on a longline or pot vessel if, 1) the fish are processed immediately upon landing, 2) slitting the belly to sex the fish would destroy the product, and/or 3) the fish are large and therefore more work to handle. You may find it necessary to reduce the number of length measurements taken each day to 70 - 100 fish.

If the cod are being headed and gutted, try working with one of the processing crewmen, taking a length measurement and then examining the viscera pulled out when the fish is gutted to determine the sex. Sexed lengths are much more useful to us and so these are preferred but if this is proving too difficult, try to sex some of the fish being measured (random subsample) and take un-sexed length measurements of the rest. If **this** is too difficult, un-sexed lengths are better than no length data - do what you can. **Remember that the length frequency**

sample does not have to be a sub-set of the composition sample and fish measured for length frequency may be taken from a set not sampled for composition.

Age structure collecting is a lower priority than length frequency measurements and so here again, do what you can. Remember that good composition data and biological data on the prohibited species found in your samples takes precedence over length measurements and special projects. For forms 7US and 9US, refer to the instructions included with the trawler forms.

Though a marine mammal would not be caught and landed on a longline or pot fishing vessel as on trawlers, in 1990 an elephant seal was entangled in the longline of a vessel with an observer aboard. Killer whales and sea lions in the vicinity of a longline vessel will strip fish from a line being retrieved. Therefore, "harassment" of these marine mammals by longline fishermen is common and observers on both longline and pot fishing vessels are asked to fill out form 10US. Predation on longline catches occurs without the fishermen retaliating too. Any sightings should be recorded on Form 11 but, particularly in the black cod longline fishery, predation information should also be recorded on this form. Watch for fish that have been bitten or scraped by teeth. Record how many black cod out of the total for the set (or at least the sample) were lost with evidence of loss. Do not include just empty hooks as loss! Sighting conditions, identification and individual identification of killer whales, circumstances and behavior take on added importance for predation information.

CATCH MESSAGE FORMS A AND B FOR LONGLINE AND POT VESSELS

Observers on longline and pot fishing vessels which ~~have the means (fax or telex) of transmitting~~ weekly catch messages ~~should send this information~~ on Tuesdays. Observers on vessels without ~~fax or telex machines can~~ wait until their boats come into port and transmit messages from there. The total sample weight for Species Composition Catch Message Form A will be the sum of the species weight. ~~Longline and pot vessel fishing effort is recorded on Form B rather than on Form A where trawler effort is recorded.~~ There is no marine mammal report in weekly catch reports from longline and pot vessel observers.

The sample weight is the same on CMB except that it is converted to metric tons.

sample does not have to be a sub-set of the composition sample and fish measured for length frequency may be taken from a set not sampled for composition.

Age structure collecting is a lower priority than length frequency measurements and so here again, do what you can. Remember that good composition data and biological data on the prohibited species found in your samples takes precedence over length measurements and special projects. For forms 7US and 9US, refer to the instructions included with the trawler forms.

Though a marine mammal would not be caught and landed on a longline or pot fishing vessel as on trawlers, in 1990 an elephant seal was entangled in the longline of a vessel with an observer aboard. Killer whales and sea lions in the vicinity of a longline vessel will strip fish from a line being retrieved. Therefore, "harassment" of these marine mammals by longline fishermen is common and observers on both longline and pot fishing vessels are asked to fill out form 10US. Predation on longline catches occurs without the fishermen retaliating too. Any sightings should be recorded on Form 11 but, particularly in the black cod longline fishery, predation information should also be recorded on this form. Watch for fish that have been bitten or scraped by teeth. Record how many black cod out of the total for the set (or at least the sample) were lost with evidence of loss. Do not include just empty hooks as loss! Sighting conditions, identification and individual identification of killer whales, circumstances and behavior take on added importance for predation information.

CATCH MESSAGE FORMS A AND B FOR LONGLINE AND POT VESSELS

Observers on longline and pot fishing vessels which freeze their catch must transmit their weekly catch messages on Tuesdays. Observers on vessels without freezers must wait until their boats come into port and will be transmitting messages from there. The total sample weight for Species Composition Catch Message Form A will be the sum of the species weight. The sample weight is the same on CMB except that it is converted to metric tons. There is no marine mammal report in weekly catch reports from longline and pot vessel observers.

Pelican Seafoods
Pelican & Sitka Seafoods
May 15th
48-72 hr.

PROCESSING PLANT OBSERVER INSTRUCTIONS

As a result of the implementation of amendments to the Fishery Management Plans for the Groundfish Fishery of the Gulf of Alaska and Bering Sea and Aleutian Islands Area, managers of processing plants that monthly receive 1,000 mt or more of groundfish are required to have an observer at the facility each day it receives groundfish. Also, managers of processing facilities that monthly receive between 500 mt and 1,000 mt of groundfish must have an observer present at the facility for 30 percent of the days it receives groundfish during that month. Some of these plants may also receive deliveries of crab, halibut or salmon. Observers are only to work on deliveries of groundfish. Individual observer assignments will vary; some observers may be stationed at only one 100% coverage plant, others may be expected to cover one 100% coverage plant and one or two 30% coverage plants, while others may cover two 100% coverage plants that are owned by the same company and are in close proximity to each other.

SAMPLING WORKLOAD

Collecting Delivery Information: The Form A Port Sample Summary Form corresponds to the Haul Form 2US or the Set Form 1US and completing it is the top priority for a plant observer. Information must be gathered and recorded for all groundfish deliveries to a plant whether or not those deliveries were sampled by the observer. All days of coverage must be accounted for on Form A, including days when no deliveries are made. The plant sampler is expected to contact the skipper of each vessel delivering groundfish to arrange for the collection of needed data from the observer aboard or the vessel logs.

Assisting Catcher Boat Observers With Sampling: Plant observers are expected to plan and schedule their time so as to be able to assist each vessel observer that samples at the plant. Plant observers should coordinate the assistance of the plant personnel and arrange for the set-up of totes, scales, etc. as needed. Plant observers might fill out a Form 3US, summarizing their delivery sampling for a vessel observer, but the responsibility for proportioning the data by haul, other data entries and catch messages rests with the vessel observer.

Length Frequencies: For 100% coverage plants--150-200/day; for 30% coverage plants--150-200/day on days that you work at the plant (you'll be working at this plant approximately 30% of the time). You should sample deliveries that come from vessels that do not have observers on board.

Age Structures: For 100% coverage plants--200/plant/mo; for 30% coverage plants--300/plant/3 mo. period. Remember that the fish you collect age structures from must be a sub-set of the fish sampled for length frequencies.

Special Projects: Observers are sometimes asked to collect special biological information such as pollock maturity or stomach samples. If you are assigned a special project, follow the directions that will be provided.

100/mo 100

200/3 mo 30%

FORM A - PORT SAMPLE SUMMARY FORM

Keep the data for each plant separate. Delivery information should be filled out by the plant observer from the NMFS ship logs or interview with the catcher boat observer and from observations of scale weights or scale readouts. ADF&G fish ticket and NMFS processing plant log entries should preferably not be used. If fish ticket data must be utilized, be very careful to interpret them correctly, researching the source points of their information and conducting at least spot-check verifications. (See the discussion of fish tickets under "Retained Catch Estimation Methods for Catcher-Only Vessels" in section two of this manual.)

1. Maintain a separate set of Form A's for each plant. At the top of each set of forms, enter your name and the name of the processing plant. You should make an entry for every delivery made to the plant, whether or not it was sampled. You must also have an entry for every day, with a note for days having no deliveries.

2. **Port sampler no. (col. 3-5) and Processing plant code (col. 6-9):** This information will be given to you by your contractor at the cruise end. On Forms 3US, 7US and 9US the Port sampler no. will substitute for the "Cruise no." and the Processing plant code will substitute for the "Vessel Code".

3. **Year (col. 13-14):** Enter the last two digits of the year.

4. Place a check mark in the far left column to indicate which deliveries you sampled. (Remember, you must enter one or more lines of data for each delivery and each day, not just the ones that you were able to sample.) Also place a check in the column labeled "Observer Onboard", if the delivered catch has been sampled by an onboard observer. This will enable staff at NMFS to easily know if the delivery had been previously sampled at sea.

5. **Delivery no. (col. 10-12):** Enter the delivery number which applies to the catch being delivered to the plant. Delivery numbers for each plant should be sequential and unique. A delivery number may be repeated on a second or third line if there are substantial amounts of more than one utilized species in one delivery. Do not split delivery data for any other reason. On Forms 7US and 9US the date and "Set/haul no." must correspond with the date and delivery number on Form A.

6. **Delivery date (col.15-18):** Enter the date of completion of each delivery to the processing plant i.e., if the catch is delivered over a period of two or more days, use the date when the transfer of fish to the plant is completed. It is the <u>delivery</u> date of the fish measured and sampled that you should use on Forms 7US and 9US. This will not necessarily be the date you sampled.

   The delivery date <u>should</u> coincide with the date that is used in the NMFS processing plant logs and on the ADF&G fish ticket. If a discrepency with their entries is minor, such as the starting-of-delivery date instead of the completion date, ignore it. If the discrepency is more than that, document **who's** responsible, **what** is being entered, **when** and **why**.

Vessel Name	ADF&G	Vessel Code
Auriga	56153	A044
StarLite	34931	A151
Arcturus	45978	A013
Resolute	17402	A208

FORM A – PORT SAMPLE SUMMARY FORM

Port Sampler No.	3	4	5	Processing Plant Code	6	7	8	9	Year	13	14
					D	H	1	5		9	1

Target

Shoreside Sampled	Observer Onboard	Delivery No.	Delivery Date: Month	Delivery Date: Day	Gear Type	NMFS Area Code	ADF&G Stat. Area	No. of Tows	Ave. Dur. (mins)	Total Wt. Delivered	LB / MT	Sample Sp. Code	Sorted Y/N	Wt. of Sample sp. Discarded at sea	Wt. of Sample sp. Delivered	LB / MT	Main Product	~~Abbreviation~~ of Delivering Vessel / ADF&G Permit No.
		10 - 12	15 16	17 18	19 - 20	21 - 23	24 - 29	30 31	32 - 35	36 - 42	43 44	45 - 47	48	49 - 55	56 - 62	63 64	65 - 66	67 - 81
✓		43	04	07	1	517	655430	5	249	187297	LB	202	N		187234	LB	23	45978
				08	NO	DELIVERIES												
		44		09	1	517		7	253	198127		202	N		198101		23	45978
✓	✓	45		10	↓	↓	665402	6	270	215639		201	N		192045		30	56153
✓	✓	45		10	↓	↓	665402	6	270	215639		202	Y	250	23580		23	56153
	✓	46		10	1	517	655430	12	258	165663		201	N		165324		30	34931
				11	NO	DELIVERIES												
✓		47		12	1	521	705600	9	132	258165		202	N		258093		23	45978
	✓	48		13	1	521	715600	5	143	264643		201	Y	10000	260218		30	56153
	✓	48	↓	13	1	521	715600	5	143	264643	↓	202	N		4387	↓	23	56153
✓	✓	49	04	14	8	515	665401	12	1440	8349	LB	202	N		8349	LB	23	17402
					EXAMPLE FROM PLANT THAT WEIGHS IN MT:													
✓		111	07	09	2	521	705600	4	252	98.7	MT	201	N		98.7	MT	30	34931
✓	✓	112	07	09	1	521	715600	6	290	87.3	MT	202	Y	5.2	86.5	MT	23	56153

SHORESIDE PROCESSING FACILITY DAILY CUMULATIVE PRODUCTION LOG

PAGE	YEAR–MON–DATE	PLANT NAME AND ADF&G PROC CODE	REPORTING AREA	GEAR TYPE	MANAGER'S SIGNATURE	OBSERVER PRESENT YES ____ NO ____	EMPLOYEE HOURS Processing: ___ Other: ___ Total: ___

ALASKA STATE FISH TICKET NO.	RECEIPT TIME	CATCHER VESSEL NAME AND ADF&G NO.	ESTIMATED CATCH RECEIPT WEIGHT (Circle lbs or mt)	COMMENTS

This is the format of the NMFS processing plant log. Notice the reporting requirement for discards by catcher boats as well as from the plant. Observers should never make entries in these logs nor should they implicitly trust the entries in them. Remember, you are an independent "observer" of their operations!

DISCARDED SPECIES

For groundfish and herring, record in lbs or 0.1 mt (circle which): For halibut, salmon, king crab, and Tanner crab, record in numbers

SPECIES CODE										
BALANCE FORWARD										
DAILY TOTAL REPORTED *BY CATCHER VESSELS*										
DAILY TOTAL IN PROCESSING OPERATIONS										
CUMULATIVE TOTAL FOR WEEKLY REPORTING PERIOD										

RETAINED PRODUCT INFORMATION: Circle lbs or mt (to at least the nearest 0.1 mt)

SPECIES CODE/ PRODUCT TYPE CODE										
BALANCE FORWARD										
DAILY TOTAL										
CUMULATIVE TOTAL FOR WEEKLY REPORTING PERIOD										

NOTE: For ancillary products, begin product type codes with 'A', e.g., A12

When vessels deliver to more than one plant: If you discover that a vessel is delivering fish caught in one trip to more than one plant, you should enter Form A information on only one set of Form A's, preferably the Form A's for the plant where most of the catch was delivered. Note on the back of Form A, or on an attached sheet, the amounts of fish delivered to each plant, but enter on the Form A the total amount delivered to all of the plants, the total amount of sample species delivered to all of the plants, and the total number of tows made during the trip. Additional guidelines for sampling these deliveries follows in the "Sampling Instructions" section.

7. **Gear type (col. 19-20):** Enter the appropriate code.

1 = non-pelagic trawl	6 = pot or trap gear
2 = pelagic trawl	7 = jigging vessel
3 = unknown or mixed trawl haul	8 = longline gear
4 = pair trawl	

If you are unsure of the gear type, take notes, leave this column blank for the time being, and discuss it with NMFS staff.

8. **NMFS area code:** This is the 3-digit code for the area in which the vessel fished (refer to the map in the catch message section of this manual). If the vessel fished in two or more areas for the catch delivered, record the area in which most of the fish was caught, but enter an asterisk (*) and note the areas fished on the back of Form A. Do not divide delivery data by area.

9. **ADF&G statistical area:** Refer to the ADF&G maps supplied during training. Plot the end position of haul or set from the NMFS Catcher Vessel log, using the more detailed map whenever possible, and record the 6-digit statistical area code for the area in which most of the fish were caught. If the vessel fished in two or more areas for the catch delivered, record the area in which most of the fish was caught, but enter an asterisk (*) and note on the back of Form A all of the areas where hauls were made.

10. **No. of tows:** record the number of tows that were made during the trip. If the vessel is a longliner or a pot vessel, record the number of sets. This information can be obtained from the NMFS ship logs.

11. **Average duration:** record the average duration of the tows in minutes. Get the actual length of each haul from the NMFS logbook, add up the durations and divide by the number of hauls to get the average duration. You can go up to 9999 minutes for the average length of soak for a longline or pot set.

12. **Total weight delivered (lbs or mt):** Record the total **round** weight of the catch delivered to the processing plant for that trip. Delivery weights reported in pounds must be recorded to the nearest whole pound; weights reported in metric tons must be recorded to the nearest tenth of a metric ton. When cut fish are delivered, divide the delivery weight of cut fish by the appropriate PRR to estimate the round weight of the fish before cutting. It is preferred that the observer be on hand to record the scale

readouts but if this is not possible, these data can be taken from the NMFS processing plant logs. (See the note above regarding how to handle cases in which a vessel delivers catch from a single trip to several different processing plants.) In most cases, this should be the same as the sum of the groups reported on the ADF&G fish ticket, but make sure that this includes all of the discards from the plant.

13. **Sample species code:** This is the three-digit code number for the species of fish referred to on the rest of this row. If you sampled this delivery, you must be sure to record the information on the species that you sampled, and in most cases, you will want to record on additional rows the other major species that were delivered. (Refer to the species code list in the reference section of your manual--use the NMFS species codes and not the ADF&G species codes.)

14. **Sorted? (Y or N):** this question refers to whether or not any of the individuals of the species in columns 43 - 45 were sorted out of the catch and discarded at sea. Fishermen might discard undersized individuals, or fish of a given sex. It is important to know this, because this might affect the length frequency data. This does not refer to any sorting and discarding of other species, such as prohibited species or some other unwanted species. Check the NMFS ship logs for this information but it would be best to ask the vessel's observer if any, or ask one of the crew.

15. **Weight of sample species discarded at sea:** If the species in question was sorted for size or sex (as indicated with a Y for "Yes" in no. 15, or if some of the catch was dumped because the holds were already full, the fish were too old, or for some other reason, indicate the approximate amount in lb or mt, consistent with delivery weight units, that was discarded at sea. This information might be in the NMFS ship log and thereby in the processing plant logs but is notoriously under-reported.

16. **Weight of sampling species delivered (lbs or mt):** This information should be on the ADF&G fish tickets and may be accurate unless the processor has cut a deal with the catcher boat to reduce the state tax on this amount. As possible, sum the scale weights yourself.

17. **Main product:** the code for the main product that is made by the plant from the species in question. If the plant is making surimi out of pollock and also taking roe from mature female pollock, list the main product as surimi. (Refer to the "List of Alaska Product Types" in the appendix of the manual or in the ship's logbooks.)

18. **Abbreviation of delivering vessel:** Presently we are substituting the ADF&G boat number of the delivering vessel into this column to differentiate vessels with the same name in the data base. You can find ADF&G boat numbers on the NMFS vessel and plant logbook pages.

SAMPLING INSTRUCTIONS

When sampling for composition at a plant, observers should be cautioned against relying on plant personnel to sort, save and or count fish for them. **Do not use weights of non-target species that are recorded in the ADF&G Fish Tickets or the "Alaska Groundfish Daily Cumulative Production Logbook" for species composition.** These logs can be useful for comparison of figures, but they cannot be used as a substitute for an observers sampling effort.

There is a handout for marine mammal watches. Refer to it for more detailed instructions.

Length Frequency Sampling:

Presorted del.

Collect lengths from the main utilized species being delivered to the plantby boats that don't have observers on board. If more than one target species is being delivered to the plant you may collect length frequencies from more than one species, however, you must collect 150-200 lengths from each species that you collect lengths from on that day. It is important to strive for random, unbiased sampling; therefore select fish from several samples spaced throughout the delivery. If you are sampling at a plant that requires 100% observer coverage, you should strive to collect 150-200 lengths per day. When you are sampling at a plant that requires 30% observer coverage, you should collect at least 150-200 lengths for each day that you work at that plant. Since, the plant only requires approximately one-third of the sampling effort, it will most likely be sampled only every third day or so. Follow the instructions given for Form A regarding dates and delivery number entries on Form 7US.

When a vessel delivers to more than one plant, you may sample the catch from more than one of the deliveries (in fact, it might be a good idea, because you would be apt to sample catch from different parts of the hold), but enter the data on the Form 7's and 9's corresponding to the entry you made on the Form A. Note what you did on a non-keypunched portion of the forms. The two or more length frequency samples from the different plants may be kept as separate length frequencies on the Form 7's--the computer can add them together if necessary, or they may be analyzed separately for variance. Make sure that you do not have any overlapping otolith numbers when you reassign the otoliths to the same plant.

Age Structure Collection:

Observers are asked to collect 200-300 age structures per plant per month, when working at a plant that requires 100% observer coverage. When sampling at plants that require only 30% observer coverage, the observer should collect 300 age structures per plant per three month period. Since most observers are hired for 2-3 months, they will be expected to complete one collection of about 300 age structures, for each plant requiring 30% observer coverage, during their tour of duty.

Age structure collections should be stratified/random collections (5 per cm. per sex) of a single species per month unless otherwise instructed. When you start a second collection at a plant (second month at a 100% coverage plant), continue the numbering of the vials from where you left off, because you can't have duplicate age structure numbers for the same port

sampler/processing plant code. You may change the length and otolith sample species to another target species when you begin a new month.

The "roundfish" species of the highest priority for age structure collections are: Pollock, Pacific cod and all rockfish species including thornyheads (Sebastalobus spp.). The flatfish species of most importance are listed below in order of priority:

Bering Sea	Gulf of Alaska
Yellowfin sole	Rock sole
Rock sole	Flathead sole
Flathead sole	Rex sole
Alaska plaice	Dover sole

If you have collected lengths from more than one species in a month, do not split your age structure collection between the two species. Collections are of most value if they consist of about 200 age structures for any one species. If you begin an age structure collection and then find out that the species that you are collecting lengths and age structures from is no longer going to be delivered, you have a decision to make concerning whether or not to keep the partially completed age structure collection. The rule of thumb to use in making this decision is: if the collection contains more than 50 age structures, go ahead and keep it, and use the remaining empty vials from that collection for another species; conversely, if the collection contains less than 50 age structures, dump it and use the entire collection of vials for a new species.

PLANT OBSERVER WEEKLY CATCH MESSAGES

Messages from processing plant observers do not follow the same format as those from vessel observers. Messages should include the following for each plant that the observer worked at during the week:

Observer Name: _____

Plant Name: , location _____

~~Processor Code:~~ _____ Fax/telex#: _____

Week Ending Date: _____

Dates of Observer Coverage: _____
(list each date)

Vessels delivering to plant: w/or w/out obs _____

_____

# of del.

DOMESTIC OBSERVER PLANT REPORT

Introduction: Describe the type of plant, it's location, targeted species utilized, dates worked at the plant, etc.

Description of the Plant: Discuss the aspects and operation of the plant. Be specific. Provide detailed information on delivery systems. Diagrams are most useful.

Gathering Form A Information: Describe how delivery weights, bycatch information, trawl data from the delivery vessels, etc. were obtained.

Sampling Procedures: ~~Summarize your observations for marine mammal~~s. Where did you observe from and at what time of day? Discuss how lengths, otoliths or special project data were obtained. Include pertinent diagrams. Were any product recovery tests performed or was density information gathered? Summarize any other special project assignment you had. Where was your sampling area and what was it like? What equipment or facilities were available to you that you found useful for your work?

Living Conditions: Describe in detail where you lived, roommates, bathroom facilities, galley food and anything important the next observer should know. If transportation was needed to and from the plant, what was the arrangement for it?

Interaction With Plant Personnel: List the management structure of the plant, who you had to deal with to do your work or gather information. Discuss any problems with plant workers. Discuss safety considerations, hazardous areas in and outside the plant.

Problems Encountered: Describe any problems associated with you and your work, and any other problem encountered while working there.

Comments/Conclusion: Discuss working relations with delivery vessel observers. Report any innovative plant designs or processing machinery. Discuss your feelings about working there and anything else the next observer should know.

TELEPHONE, RAPIDFAX, TELEX NUMBERS, ETC.

Alaska Fisheries Science Center (for sending or phoning catch messages; for between-trip debriefing or sampling questions) :

Telex: 329422 callback=NWASC-SEA
(backup telex in Bldg.#1 at NWAFC = 9104442786)

Fax: (206) 526-4066 or 526-4207, backup faxes: 526-6723 and 526-4004

Phones: **Toll free line: 1 (800) 437-9092.** Marine operators will not place 1-800 calls, however, program staff members will accept collect calls: For catch messages - Cindy Davis, Julie Ross, or the recorder **(206) 526-4205.** On the recorder, leave a message even if only to tell us you are trying to reach us. You can leave up to a 5-minute message. **Be sure to back up catch messages by phone by immediately mailing us copies of your catch message forms.**
Sampling questions: Karen Teig, Mike Brown, or Sheryl Corey (206) 526-4191 or Heather Weikart, (206) 526-4213
Debriefing, (206) 526-4192
Bob Maier, Program manager, (206) 526-6695

Address: Domestic Observer Program, F/AKS2
Alaska Fisheries Science Center
7600 Sand Point Way NE
BIN C15700, Bldg. 4
Seattle, WA 98115-0070

Alaska Regional Office

Telex: 62296000 callback = NMFS AKR JNU
Fax: (907) 586-7131
Phone: (907) 586-7229
Address: Dave Cormany
National Marine Fisheries Service, F/AKR
P.O. Box 21668
Juneau, AK 99802 - 1668

Observer Program Field Offices

Kodiak: 5 M-F 8-5 8:30-5 Sa
Martin Loefflad & Rob Markle
1211 Gibson Cove Road, Suite B
Kodiak, AK 99615
Phone: 907-486-6920
Fax: 907-486-6028
SSB Call Sign: WYH (Whiskey, Yankee, Hotel)
4125.0 ~~MHz:~~ KHz Tu & Th 0800 - 1630, ev. day 8-12
MWF 1000 - 1630, Sat 1030 - 1630, then,

~~4147.4, 8295.4, 12354.4, and 16529.4 MHz:~~
~~MWF 0800 - 1000, Sat 0830 - 1030~~

650 @ 6125, 850 @ 8291, 1250 @ 12290
Noon - 1630

Dutch Harbor: Charlie Yustin & Carolyn Griffin
P.O. Box 638
Dutch Harbor, AK 99692
Phone: 907-581-2060, or -2063
Fax: 907-581-2066
VHF Channel 6, M - Sat, 0800 - 1600

Alaska Department of Fish & Game (ADF&G) in Kodiak

Phone: (907) 486-4791 (Leslie Watson)
Address: 211 Mission Road, Kodiak AK 99615

if 10-12 day trips or 1 trip lag
tell us that in the beginning
So we know when to expect your message

INSTRUCTIONS FOR WEEKLY CATCH MESSAGES

One of the primary tasks of the Observer Program is the estimation of the catch of groundfish and prohibited species throughout the year to insure that these catches remain within the quotas established by the management councils. In order that the observer's data may be utilized before returning from sea, each observer must send a catch message each week to the Alaska Fisheries Science Center summarizing the week's fishing activity and sampling data. The first page of the message will be the Form 1US or 2US to provide the fishing area, gear type, effort, catch etc. The Catch Message Form A will give the species composition data for each sampled haul, and the Catch Message Form B will provide data specifically on the samples for prohibited species, and for trawlers, a marine mammal catch report.

For Alaskan waters, the report week is always **MONDAY through SUNDAY, Alaska Local Time and date** regardless of the date the message is actually sent. (If your vessel goes into the Washington, Oregon, and California coastal area to fish, observers must obtain a packet of instructions for that area.) Which hauls or sets to attribute to a report week varies by vessel type. Observers must refer to the following section for explanation. **Observers on catcher/processor trawlers will send their messages on Monday. Observers on motherships, c/p longline and pot vessels and plant observers will send their messages on Tuesday. Observers on catcher-only vessels may lag one trip, or at the most, one week behind in sending their messages and their transmissions are made from the processor. Catch messages are critical and must be sent on time. Therefore, when messages are not being received from a vessel, that observer's certification may be suspended and a vessel without observer coverage may not legally continue to fish.** If your catch messages are due, do not start new samples or trips until the catch message has been sent. If there is no data for a week, the catch message is not ready, there is a difficulty in transmission, or other problem, call or send us a message informing us of that. We want to hear from each observer every week. When asked to repeat a message, please do so immediately and do not wait until the end of the week.

If you are at sea on a catcher/processor, prepare a catch message each week for transmission from the vessel. It can normally be sent to NMFS in Seattle by telex, rapidfax or satellite telephone. When preparing a message for fax transmission, write your message in larger print than normal, and with block print, **dark,** lettering. The appropriate page(s) of Form 1US or 2US and Catch Message Forms A and B are faxed as your weekly data transmission. For other messages or questions sent via rapidfax, use **unlined** white paper. Observers who must transmit data via telex must refer to the telex formatting instructions following the catch message forms A and B in this section. If your messages are not getting through to our office, try sending your messages to the other numbers listed on the previous page -- four fax and two telex lines are available. If your messages are not being acknowledged as being received, send a question to us through their company office. We will probably be able to clear up the problem from this end. If they can send messages to their office, they should be able to send your messages directly to our offices as well. Catch message data is not to be routed through the company office. Call or transmit a message to our Seattle or Kodiak offices for our assistance and support if you are having difficulties.

If aboard a freezer trawler, for instance, the fax machine is broken and there is no telex

or satellite telephone, it will at least be possible to phone in your weekly message via a ship-to-shore, collect, radio telephone call to Seattle using the single sideband (SSB) radio and the marine operator (in Alaska this is KMI). Atmospheric conditions will sometimes interfere with these transmissions. Simply try your call again later. The ship must pay for the call if it is only possible to get a call through at night. Whenever catch (or any other) information is being relayed by radio telephone, anyone can listen, and you must remember that the conversation is public. As catch information must be kept confidential, radio telephone catch messages must be coded according to instructions. Do not voice the fishing information, catch weights, species names and sampling data. Using codes would also be appropriate if it is necessary to make daily reports to a lead observer or to relay catch information for one vessel after transferring to another vessel; data from all vessels must be sent to Seattle without delay.

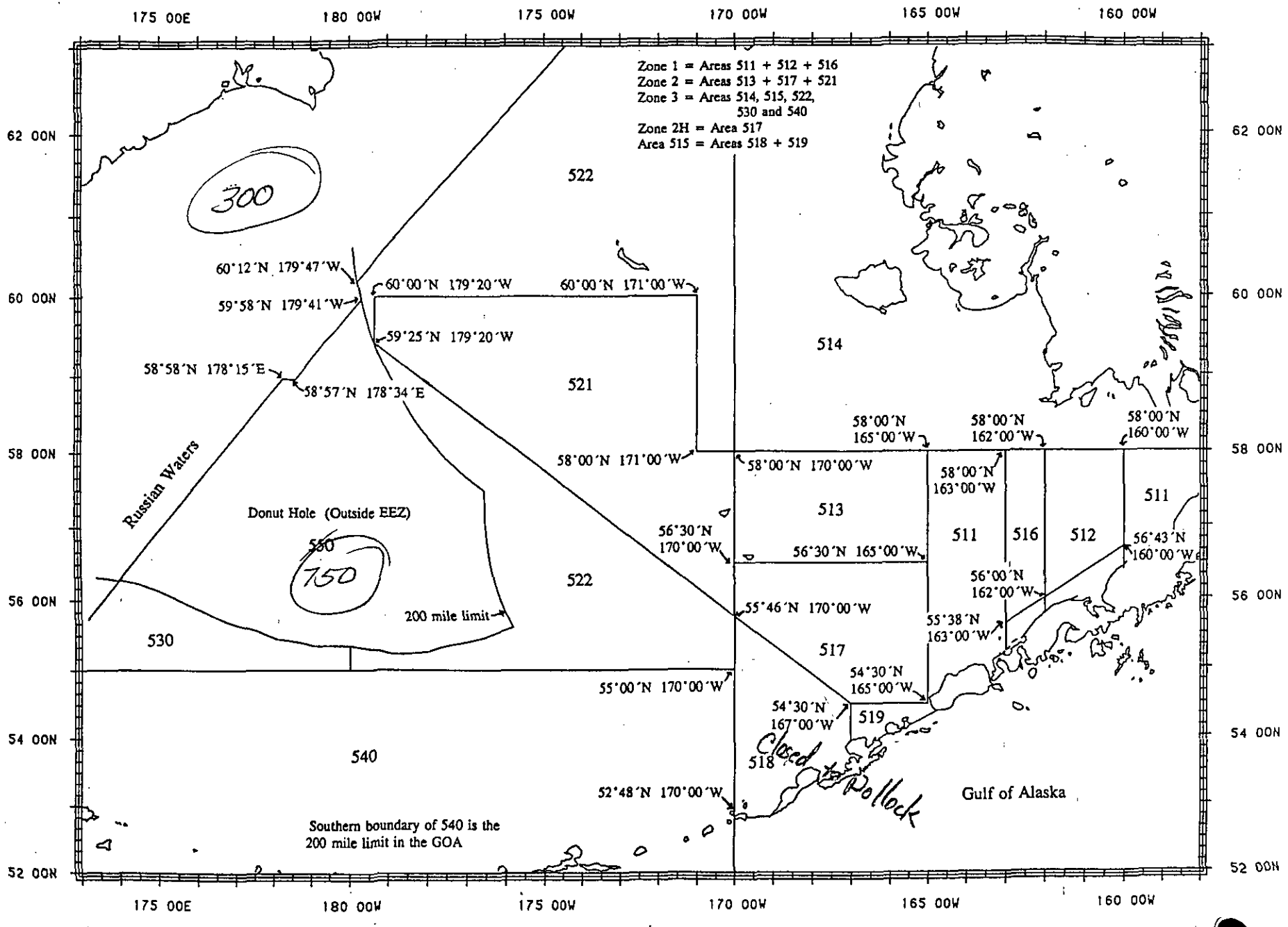
In the unlikely event that you cannot transmit any messages from a catcher/processor, or if you are aboard a vessel for a week or less, (as is commonly the case with shoreside delivery vessels), or you have just gotten off a vessel and have the last few day's data to send in, fax or phone in your catch message as soon as you have returned to port. In port, transmission of catch data by fax is preferred but if that is not available, call our logistics office toll-free at 1-800-437-9092. Whenever you phone in a catch message you must back up your call by mailing a copy of your message forms to Seattle. Keep a copy of all data and messages sent and messages received.

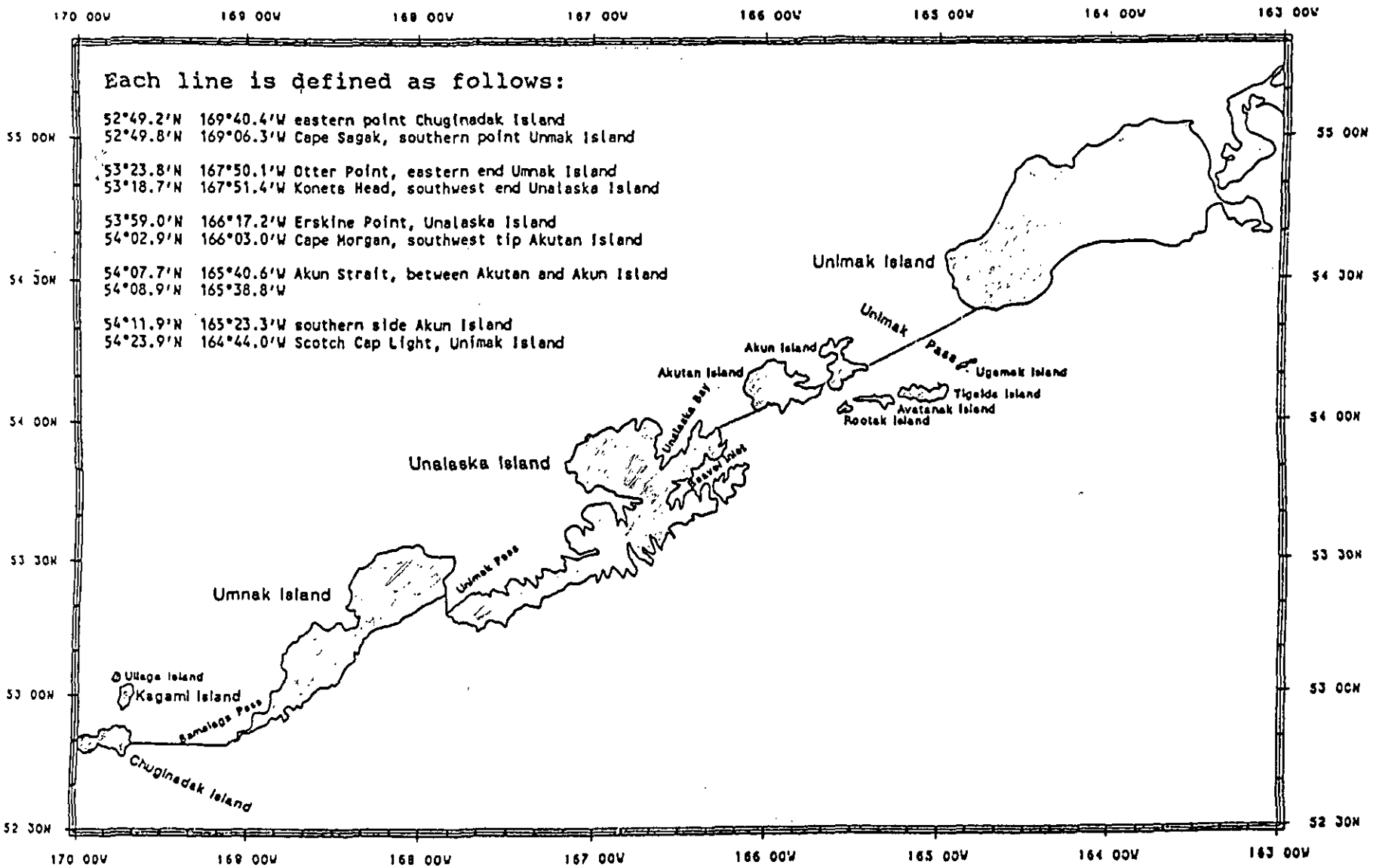
Along with catch reports observers can include any questions or information relating to observer work. For example, observers on 30% coverage vessels need to include a note about which of their assigned vessels they did and did not sample on that week. If there is no catch report for a week, send us a message about that. Questions about observer sampling or responsibilities, information about health problems, or logistical information are common along with catch messages. To help us understand your situation, include parameters such as average catch size, composition, and the sources for your estimates when asking sampling questions. A question or information should be written carefully so it is clear, not too wordy, appropriate and professional. Realize that you may not receive an answer immediately even though answering your questions is a top priority for us. We commonly have a hundred or more observers at sea at any one time. It takes time for messages to be received and for replies to be formulated and sent.

If you are transferred to a new ship during a report week, you must report the catch and effort data for the period spent on each ship separately. Preferably, you will be able to pass the catch information to us from port before boarding your next vessel. If this is not possible, and your next port call is more than a week away, you must transmit the haul summary data, report group codes and sampling information by code via the single sideband radio (as fax or telex transmissions are not usually available on these vessels).

Notes for Observers Aboard "Floaters"

Observers aboard floating processors may choose to coordinate the transmission of catch messages from observers on the catcher boat fleet by collecting all messages and sending them at the same time with their own message from the floater. This sort of arrangement may be the easiest and most efficient for all parties concerned.


175 00E
180 00W
175 00W
170 00W
165 00W
160 00W
62 00N
60 00N
58 00N
56 00N
54 00N
52 00N
Zone 1 = Areas 511 + 512 + 516
Zone 2 = Areas 513 + 517 + 521
Zone 3 = Areas 514, 515, 522, 530 and 540
Zone 2H = Area 517
Area 515 = Areas 518 + 519
522
514
521
513
511
516
512
517
519
518
530
540
300
750
560
60°12'N 179°47'W
60°00'N 179°20'W
60°00'N 171°00'W
59°58'N 179°41'W
59°25'N 179°20'W
58°58'N 178°15'E
58°57'N 178°34'E
58°00'N 165°00'W
58°00'N 162°00'W
58°00'N 160°00'W
58°00'N 171°00'W
58°00'N 170°00'W
58°00'N 163°00'W
56°30'N 170°00'W
56°30'N 165°00'W
56°43'N 160°00'W
56°00'N 162°00'W
55°46'N 170°00'W
55°38'N 163°00'W
54°30'N 165°00'W
54°30'N 167°00'W
55°00'N 170°00'W
52°48'N 170°00'W
Russian Waters
Donut Hole (Outside EEZ)
200 mile limit
Closed to Pollock
Gulf of Alaska
Southern boundary of 540 is the 200 mile limit in the GOA

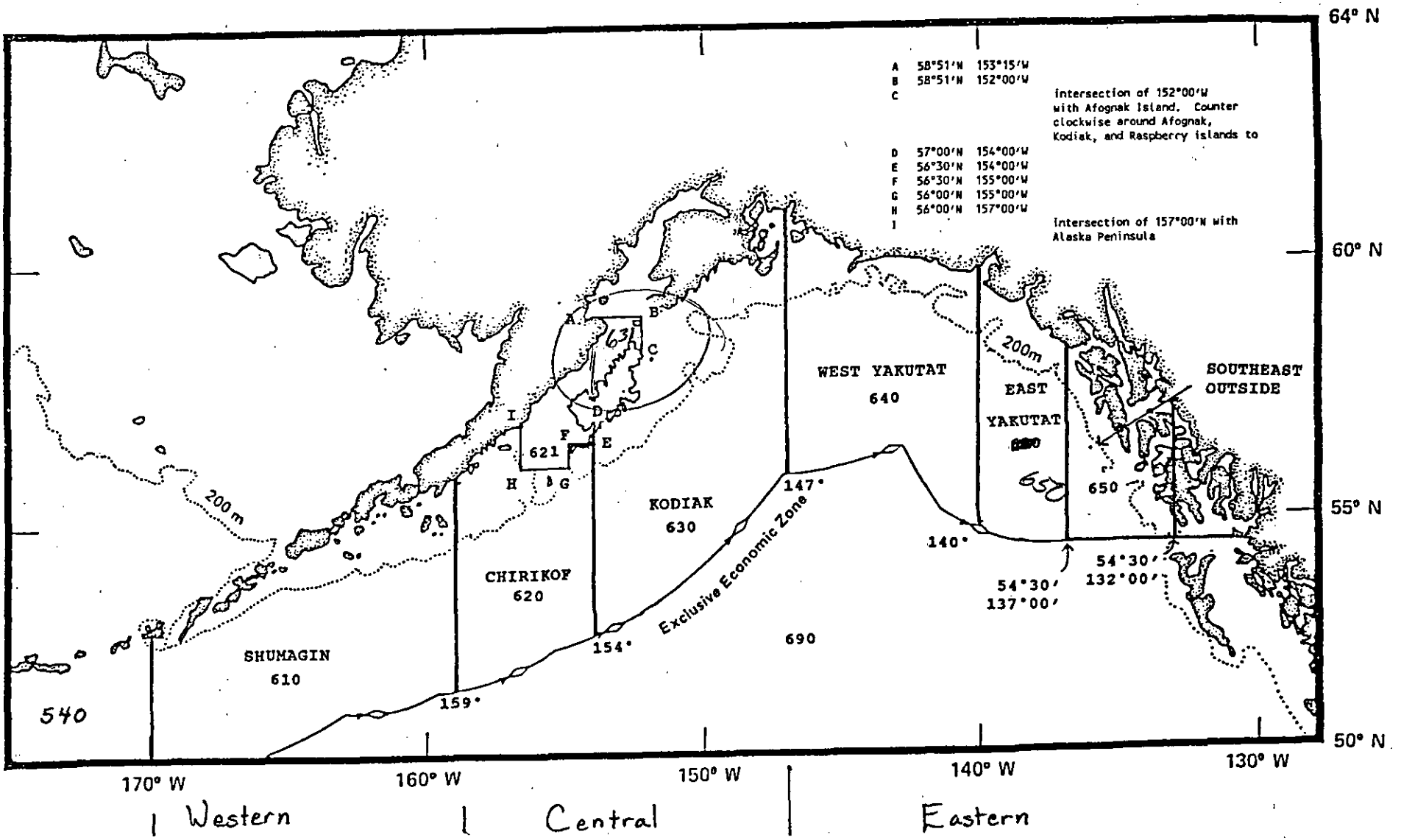

Each line is defined as follows:
52°49.2'N 169°40.4'W eastern point Chuginadak Island
52°49.8'N 169°06.3'W Cape Sagak, southern point Umnak Island
53°23.8'N 167°50.1'W Otter Point, eastern end Umnak Island
53°18.7'N 167°51.4'W Konets Head, southwest end Unalaska Island
53°59.0'N 166°17.2'W Erskine Point, Unalaska Island
54°02.9'N 166°03.0'W Cape Morgan, southwest tip Akutan Island
54°07.7'N 165°40.6'W Akun Strait, between Akutan and Akun Island
54°08.9'N 165°38.8'W
54°11.9'N 165°23.3'W southern side Akun Island
54°23.9'N 164°44.0'W Scotch Cap Light, Unimak Island
170 00W
169 00W
168 00W
167 00W
166 00W
165 00W
164 00W
163 00W
55 00N
54 30N
54 00N
53 30N
53 00N
52 30N
Unimak Island
Unimak Pass
Akun Island
Akutan Island
Ugamak Island
Tigalda Island
Avatanak Island
Rootak Island
Unalaska Bay
Unalaska Island
Beaver Inlet
Umnak Island
Ulaga Island
Kagami Island
Samalga Pass
Chuginadak Island

REPORT GROUPS AND CODES FOR CATCH MESSAGES

Bering Sea/Aleutians (Areas 510 - 550)

Species Group	Report Group	Abbreviation	Code
Squid	Squid	squ	875
Yellowfin sole	Yellowfin sole	yell	127
Rock sole	Rock sole	rsole	123
Greenland turbot	Greenland turbot	turb	134
Arrowtooth flounder Kamchatka flounder	Arrowtooth flounder	arrow	121
Other flatfish (except halibut)	Other flatfish	oflat	120
Pollock	Pollock	poll	270
Pacific cod	Pacific cod	cod	110
Sablefish	Sablefish	sab	710
Atka mackerel	Atka mackerel	atka	193
Pacific ocean perch	POP	pop	141
Shortraker rockfish Rougheye rockfish	Deepwater rockfish	deep rf	171
Northern rockfish Sharpchin rockfish	Northern-sharpchin	no chin	172
All other rockfish (Sebastes and Sebastolobus spp.)	Other rockfish	orock	139
Sharks, skates, sculpins, eulachon, smelts, capelin and octopus **only**	Other fish *	oth	100
All remaining fish spp. Invertebrates (except squid and octopus) Miscellaneous items	Non-allocated *	non	999
Prohibited spp.	Prohibited species	prohib	900

* The reporting requirement for these two groups (Other and Non-allocated) is different in the ship's and plant's logbooks than for the observer's weekly messages. For the "Other" report group, vessels and plants are required to report each of the species groups (sharks, skates, etc.) separately. Instead of the observer's "Non-allocated" group, vessels and plants report only lingcod and grenadiers. ("All remaining fish species" are not reported by vessels and plants.)



Regulatory and reporting areas of the Gulf of Alaska.

Gulf of Alaska (Areas 610 - 680)

Species Group	Report Group	Abbreviation	Code
Rex sole Dover sole Greenland Turbot	Deep-water flatfish	dflt	118
Flathead sole	Flathead sole	flat	122
Arrowtooth flounder	Arrowtooth flounder	arrow	121
Rock sole Yellowfin sole Butter sole Starry flounder All other flatfish (except halibut)	Shallow-water flatfish	sflt	119
Pollock	Pollock	poll	270
Pacific cod	Pacific cod	cod	110
Sablefish	Sablefish	sab	710
Pacific ocean perch (S. alutus)	POP	pop	141
Rougheye rockfish (S. aleutianus) Shortraker rockfish (S. borealis)	Deep-water rockfish	deep rf	171
Northern rockfish (S. polyspinus) Sharpchin rockfish (S. zacentrus) Aurora rockfish (Sebastes aurora) Blackgill rockfish (S. melanostomus) Chilipepper rockfish (S. goodei) Darkblotched rockfish (S. crameri) Greenstriped rockfish (S. elongatus) Harlequin rockfish (S. variegatus) Pygmy rockfish (S. wilsoni) Bocaccio (S. paucispinus) Shortbelly rockfish (S. jordani) Splitnose rockfish (S. diploproa) Stripetail rockfish (S. saxicola) Vermilion rockfish (S. miniatus) Yellowmouth rockfish (S. reedi) Redstripe rockfish (S. proriger) Silvergray rockfish (S. brevispinus)	Slope Rockfish	slprf	144

Gulf of Alaska (Areas 610 - 680) cont.

Species Group	Report Group	Abbreviation	Code
Red banded rockfish (S. babcocki) Canary rockfish (S. pinniger) China rockfish (S. nebulosus) Copper rockfish (S. caurinus) Quillback rockfish (S. maliger) Rosethorn rockfish (S. helvomaculatus) Tiger rockfish (S. nigrochinctus) Yelloweye rockfish (S. ruberrimus)	Demersal Shelf Rockfish	demrf	168
Black rockfish (Sebastes melanops) Blue rockfish (S. mystinus) Dusky rockfish (S. ciliatus) Widow rockfish (S. entomelas) Yellowtail rockfish (S. flavidus)	Pelagic Shelf Rockfish	pelrf	169
Longspine thornyhead (Sebastolobus altivelis) Shortspine thornyhead (Sebastolobus alascanus)	Thornyhead Rockfish	thrn	143
Report group specifically for: sharks, skates sculpins, squid, Atka mackerel, eulachon, smelts, capelin and octopus.	Other fish *	oth	100
All remaining fish spp. Invertebrates (except squid and octopus) Miscellaneous items	Non-allocated *	non	999
Prohibited spp.	Prohibited species *	prohib	900

* The reporting requirement for these two groups (Other and Non-allocated) is different in the ship's and plant's logbooks than for the observer's weekly messages. For the "Other" report group, vessels and plants are required to report each of the species groups (sharks, skates, etc.) separately. Instead of the observer's "Non-allocated" group, vessels and plants report only lingcod and grenadiers. ("All remaining fish species" are not reported by vessels and plants.)

CMA - SPECIES COMPOSITION

Observer Name Jane Observer | Page 2 of 3 for transmission | (Weekly Message) or Resubmission of Message | Page _____ of _____ for vessel

Vessel Name Sea Gull | Fax /Telex # 482-9356 | ORC 221

Week Ending Date 9/15 | Observer coverage Days 2 | Date message was submitted 9/16

Office Use Only Cruise # Permit # Proc. Code

Check one of the following boxes or fill in name of shoreside plant or floating processor:

Aboard a catcher/processor? ☐

Aboard a mothership? ☐

Catcher boat? Delivering to: Best Seafoods

GROUP ABBREVIATIONS		PROHIB	ARROW	OFLAT	POLL	COD	POP	SCOM	OROCK	OTH	NON	SQU	SAB	YELL	RSOLE		
SPECIES GROUP CODES		900	121	120	270	110	141	173	139	100	999	875	710	127	123		
HAUL NUMBER	TOTAL SAMPLE WEIGHT IN KG	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE
101	16000.0	115.92	5.00	11.85	9287.65	6450.98	4.90	21.90	4.5	92.3	1.4	3.60	0	0	0		
101	% of group retained	0	100	47	98	100	100	100	0	0	0	100	0	0	0		
103	398.0	121.2	3.5	7.1	40.8	214.1	.8	0	0	0	0	0	10.5	0	0		
103	% of group retained	0	100	0	97	100	100	0	0	0	0	0	0	0	0		
104	537.1	27.8	89.1	176.9	0	0	0	0	0	16.4	0	0	0	200.5	26.4		
104	% of group retained	0	100	100	0	0	0	0	0	0	0	0	0	100	15		
105	510.6	2.21	0	0	478.93	21.40	1.49	3.44	1.04	0	.86	1.23	0	0	0		
105	% of group retained	0	0	0	100	100	100	100	100	0	0	100	0	0	0		
	% of group retained																
	% of group retained																
	% of group retained																

revised11/91

SPECIES COMPOSITION CATCH MESSAGE FORM A - INSTRUCTIONS

Determination of Report Week of Catch for Catch Messages

The way in which an observer attributes catch to a particular week varies according to vessel type. Domestic processors group and report their products in the NMFS daily cumulative production log based on the date the catch was made into product. We have attempted to approximate this by grouping the observer's data on Catch Message Forms A and B according to the following rules. Below are the options for catcher boats, motherships, or catcher/processors. **(This grouping is not used for the observer's 2US or 3US forms. On these forms the haul information is grouped by using the net retrieval time.)**

1) **Observers on catcher/processor trawlers** attribute catch according to when the retrieval of the net begins. (example - if a catcher/processor sets a net on Sunday at 2300 ALT, but does not start retrieving the net until 0300 ALT on Monday the catch would be attributed to the next week ending date.) Observers on catcher/processor longline or pot vessels attribute catch to the report week in which the retrieval of each set is completed.

2) **Observers on motherships** that are receiving unsorted catch from catcher boats attribute catch according to the date that the codend was received, i.e. the delivery date. (example - the catcher boat's net arrived at and left the fishing depth on Sunday, but the codend was not delivered until Monday. The mothership's observer would attribute the haul to the next week ending date.) Thus the delivery date and report week of a catch may not necessarily match the haul date (according to retrieval time) on Form 2US.

3) **Observers on all catcher boats (trawl, longline or pot)** attribute catch according to when the final delivery of catch is completed. All of the hauls made during a trip are treated as one unit and this hold of fish from one trip is attributed to the week in which the last delivery of that trip's catch was completed. (Examples: A catcher boat makes tows on Thursday, Friday, and Saturday but does not finish making it's delivery to a shoreside plant until Monday. Another catcher boat make tows on Saturday, and Sunday, and Monday and completes it's delivery to a floating processor on the same Monday. The observers on both of these vessels would attribute all of the catch to the next week ending date. Another possibility might be that a catcher boat delivers part of it's catch to Plant A on Sunday, but delivers the remainder of the catch to Plant B on Monday. In this case, the catcher boat's observer would attribute all of the catch to the next week ending date and Plant B.)

In addition, the catch of each vessel is reported by its' processor. Therefore, observers on catcher boats must attribute the catches of each trip to one processor. If the fish from one trip is sold in part to one processor and the remainder to another, the catch of the entire trip is attributed to the last processor delivered to. **If a catcher boat fishes and completes delivery of two trips within one week, and each delivery was made to a different processor, two sets of Catch Message Forms A and B will have to be made.** Normally, subsequent trips are delivered to the same processor and data for a second trip delivered in the same report week can be continued on the same set of CMA and CMB forms.

A catch message is composed of the pertinent pages of Form 1US or 2US, and data from the Form 3US which is reformatted onto CMA and CMB for transmission. The following instructions for CMA pertain to the data you have collected on the overall species composition of the catch and your estimates of retained catch by report group. Two lines of information will be entered for each haul sampled on the Species Composition Catch Message Form.

1. Enter your name.

2. In the "PAGE ____ OF __ FOR THE TRANSMISSION" section, enter the total number of pages that you have for that transmission, starting with the haul or set forms and including the catch message forms CMA and CMB. This will allow us to be sure that we have received all the pages you intended to send.

3. Circle WEEKLY MESSAGE or RESUBMISSION OF MESSAGE to indicate which kind of message you are sending. On each resubmission, please circle each change you made.

4. "Page ____ of ____ for vessel" is a consecutive numbering of all the CMA and CMB forms together for that boat, in the same sequence in which the forms were transmitted, all weeks combined.

5. On the next line, enter the name of your vessel.

6. Enter the fax or telex number of your vessel or plant. If you are on a shoreside delivery vessel enter the fax or telex number of the plant where you can be reached.

7. Enter the ORC (Observer Routing Code) number. The ORC is a three-digit security code entry which will be explained to you in training.

8. Next, the "Week Ending" or Sunday date of the report week should be entered. Each report week is referenced by the week's ending date even if, for example, you were only reporting data for Monday and Tuesday of that week. Dates should have a slash between the month and the day. Leading zeros are not required. January 25th would be written as 1/25.

9. Enter the number of "Observer Coverage Days" for that report week as a whole number. (Any part-day of coverage is reported as one day.) For vessels, the observer coverage begins the first day the boat sets their gear and ends when the vessel returns to port. A shoreside vessel that makes their first tow on Wednesday and returns to Dutch Harbor on Saturday evening; the observer should report four (4) Observer Coverage Days. For shoreside plants, the number of Observer Coverage Days is the actual number of days that the observer sampled (that is, filled out the Plant Delivery Form) at the plant during that week. This figure does not have to be divided by area, gear type or delivery. Enter Coverage Days on each of the Catch Message Form A's for the transmission.

Wrong form Name

Port Sample Summary Form

10. "Date message was submitted" is the date (and time if you can fit it in) you gave your catch message to the communications person on your ship to transmit or the date you transmitted the message if you were the one to send it.

11. In the box to the right check your vessel type or, if your ship is a catcher-only vessel, enter the name of the plant or floating processor your vessel delivered to. If your vessel delivers the catch of one trip to more than one buyer, enter the name of the last processor delivered to. Longline and pot vessel observers must also check catcher/processor or list their processor name.

12. If the hauls or sets of a report week were fished in both the Bering Sea and the Gulf of Alaska, two sets of catch message forms would have to be made, by region. Determine which region your hauls or sets were made in (if necessary) by plotting their positions from Form 1US or 2US on the maps preceding this section. Select the appropriate list of report groups by region. For each species recorded on 3US, refer to this list and find the corresponding report group and it's code.

    Write the species report group abbreviations and codes across the tops of the columns on the Form CMA for Species Composition. For subsequent samples, additional report groups may need to be added. **For each transmission, all pages of Form CMA must have the same report groups, in the same order.** Be sure to "zero fill" as necessary, refer to items 15 and 16 below.

13. Lines of entries must be made for each **sampled** haul or set. No lines of entry are needed for hauls or sets not sampled. Days of no fishing or sampling are accounted for on the Forms 1US or 2US. For each haul sampled, enter the haul (or set) number in the first column.

14. Enter the sample weight of your species composition sample, in kilograms, from Form 3US. **If some or all of the prohibited species groups have a different, larger sample weight, those data are not entered on a Catch Message Form A, but will be on the Prohibited Species Catch Message Form B instead.**

15. Enter the weight for each species, or weight sum for each species group, in kilograms, from the sample data on Form 3US. If no members of a particular report group were seen, you must enter a zero in that column, that is, fill in all empty data cells with zeros ("zero fill"). (See manual example.)

    Add the report group weights across the line. The sum of these weights must equal your species composition sample weight exactly.

16. On the second line for each sampled haul, enter the haul (or set) number again in the first column. Then enter the percentage of each species or species group retained. The percentage should be listed as a whole number. A figure of 100 indicates that all of the fish from that entire species group were retained for that haul. A figure of 0 indicates that the entire species group was discarded. If there is no entry for a report group for a sample, enter a zero in the percentage retained line as well (zero fill).

The percentage of each species or species group that is retained needs to be reported in the species composition section of the catch report. Observers should attempt to their best ability to independently estimate the amount of whole fish that are retained and the whole fish discarded, and then report those estimates as the percentage retained in their catch message to the nearest whole number. If you consider your independent estimates to be less accurate than the ship's estimates, use the ship's estimate in your catch message. However, continue to work to develop a more accurate technique of estimation, so that you can report your own estimates of the percentage retained in the catch report. (On the other hand, a higher priority must be given to good species composition and prohibited species sampling.)

Remember, if any part of the fish is retained then the entire fish is counted as retained. On catcher/processors, fish offal from processing which goes overboard is not counted as discard. However, if quantities of fish are dropping off of the processing line, and though they may be mangled, no parts of them are being retained as product, those should be considered discard. Technically, if a product such as headed and gutted fish are produced where the offal goes overboard and later that product is also thrown overboard in preference for another product, those discarded headed and gutted fish should also be classified as discard. The inconsistency of discarding on catcher/processors begs the conclusion that it would be much more defendable to calculate the round weight of retained catch, by species group, and divide it by total catch of that group to estimate the percentage retained.

Round weight of retained:

$$\frac{\text{product wt. of report group "Q"}}{\text{product recovery rate}} = \text{round wt. of retained report group "Q"}$$

Estimated total catch weight of report group:

$$\frac{\text{wt. of report group "Q" in sample}}{\text{sample weight}} \times \text{total catch, or OTC} = \text{total wt. of report group "Q"}$$

Percent retained of report group:

$$\frac{\text{round wt. of retained report group "Q"}}{\text{total wt. of report group "Q"}} = \%\ \text{retained of report group "Q"}$$

CMB - PROHIBITED SPECIES Page 3 of 3 for transmission Weekly Message or Resubmission of Message Page _____ of _____ for vessel

Observer Name Jane Observer

Vessel Name Sea Gull

Week Ending date 9/15

Office Use Only Cruise # Permit # Proc. Code

HAUL NUMBER	SAMPLE WEIGHT IN MT	RED KING CRAB		OTHER KING CRAB		SAMPLE WEIGHT IN MT	HERRING	SAMPLE WEIGHT IN MT	BAIRDI TANNER		OTHER TANNER		SAMPLE WEIGHT IN MT	PACIFIC HALIBUT		SAMPLE WEIGHT IN MT	CHINOOK SALMON		OTHER SALMON		Marine Mammals	
		NUMBER	WEIGHT KG	NUMBER	WEIGHT KG		WEIGHT KG		NUMBER	WEIGHT KG	NUMBER	WEIGHT KG		NUMBER	WEIGHT KG		NUMBER	WEIGHT KG	NUMBER	WEIGHT KG	code	#
101	16.00	0	0	0	0	16.00	0	16.00	629	100.0	28	4.24	16.00	2	6.2	16.00	3	5.48	0	0	N	
103	20.00	0	0	0	0	.398	0	.398	312	121.2	0	0	20.00	11	55.0	20.00	7	21.9	1	1.9	N	
104	.537	20	6.8	0	0	.537	0	.537	28	2.1	187	15.3	.537	1	3.6	.537	0	0	0	0	N	
105	18.62	0	0	0	0	.511	0	.511	7	2.21	0	0	18.62	24	247.0	18.62	0	0	0	0	N	

revised 11/0

PROHIBITED SPECIES CATCH MESSAGE FORM B - INSTRUCTIONS

The following instructions pertain only to the data you have collected on the incidental catch of prohibited species (king crab, Tanner crab, halibut, salmon, and herring) and freshly dead or "lethally removed" marine mammals that are landed and their inclusion in the weekly catch message. Entry of data on Catch Message Form B for Prohibited Species will be made for every haul or set you sample, **even if no prohibited species are found in your samples.**

1. Enter your name and the name of your vessel in the appropriate blanks.

2. Then enter the "Week Ending" or Sunday date of the report week just as on Form CMA. Each report week is referenced by the week's ending date even if, for example, you were only reporting data for Monday and Tuesday of that week. Dates should have a slash between the month and the day. Leading zeros are not required. January 25th would be written as 1/25.

3. On the top line, in the "PAGE ____ OF ___ FOR THE TRANSMISSION" continue your entry of the number of pages that you have for that transmission, starting with the haul or set forms and including the catch message forms CMA and CMB. This will allow us to be sure that we have received all the pages you intended to send.

4. Circle WEEKLY MESSAGE or RESUBMISSION OF MESSAGE to indicate which kind of message you are sending. On each resubmission, please circle each change you made.

5. "Page ____ of ____ for vessel" is a consecutive numbering of all the CMA and CMB forms together for that boat, in the same sequence in which the forms were transmitted, all weeks combined.

6. Just as on the CMA form, entries are made only for each **sampled** haul or set. No lines of entry are needed for hauls or sets not sampled. For each haul sampled, enter the haul (or set) number in the first column.

7. Enter the weight of groundfish catch sampled (i.e., sample weight from 3US) for each of the prohibited species report groups in metric tons to the nearest .001 mt. On the Prohibited Species Catch Message Form we use the following report groups.

Discuss

Report Groups	Meaning
RED KING CRAB	Red King Crab
OTHER KING CRAB	Blue, Golden & Couesi King Crab
HERRING	Pacific Herring
BAIRDI TANNER	Bairdi Tanner Crab
OTHER TANNER	Opilio, Hybrid, Angulatus, & Tanneri Tanner Crab
PACIFIC HALIBUT	Pacific Halibut
CHINOOK SALMON	Chinook Salmon
OTHER SALMON	the other species of salmon including steelhead

Be careful with the sample weight for herring! On Form 3US, halibut, crab and salmon may have a larger sample weight than the target and other bycatch species. Herring will always have the **same** sample weight as target and other bycatch species. Make sure that the sample weight for herring is the same as the sample weight listed for this haul on CMA. It may often have a different sample weight than the rest of the report groups on CMB.

8. Enter the number of prohibited species found in your prohibited species samples for each of the prohibited species report group and their weight. (For Herring just report the weight.)

If you subsampled a prohibited species group, you need to extrapolate the data up to the total number in the sample for each report group before entering the results on the worksheet. For example: you entered 1000 Tanner crab on Form 3US but you subsampled 100 for their species composition, sex and viability, obtaining 25 bairdi, 50 opilio, and 25 angulatus. On the Prohibited Species Catch Message Form you would enter 250 Bairdi and 750 other Tanner crab. Similarly, proportion the weight based on the percentages in the subsample.

9. **If no members of a particular prohibited species report group are seen, then enter a zero (0) in the number and weight columns.**

10. **Observers on trawlers** must report the incidental catch of marine mammals in monitored hauls. If none were caught, it is important to record that there were none. **Only freshly dead or "lethally removed" mammals that are landed in monitored hauls (hauls randomly chosen) are to be listed.** For these catches of marine mammals, designate the species with the two letter species code given in the instructions for Form 10US. In the last column, report the number of these mammals. These data must correspond to the monitored hauls as indicated on Form 2US and to the monitored hauls listed on Form 10A. If no marine mammals were caught in monitored hauls, write an "N" (for "None") in the marine mammal code column and leave the # column blank. (This is for trawl catches only. Observers on longline and pot fishing vessels must leave these columns blank.)

Hauls not sampled but monitored not entered

Hauls sampled & monitored NU

Haul sampled & Not monitored NU

Caught, Not sampled comp. = 000, EJ

2sp caught code | #

blank line code | #

FORMAT FOR WEEKLY TELEX MESSAGES

If your vessel does not have a FAX machine for sending weekly catch messages to NMFS, it may have Telex equipment you can use. In order that all the Telex catch messages are keypunched the same way, formats for converting catch message forms A and B and forms 1US and 2US are included here. Follow the instructions and the examples before converting each week's catch message.

There are many types of Telex machines. We cannot generalize here the instructions for how to operate the Telex on your vessel. You will first need to find the instruction booklet or ask the Telex operator aboard before typing your catch message.

Telex Format for Form 1US and 2US

Enter only the data in the white columns and not data in the grey columns of the form 1US and 2US on the Telex version of the form. Type in a single space between each word, abbreviation or phrase. If you are on a longliner or pot vessel, type in the 1US Telex heading **EXACTLY** as it is shown here:

Your name Vessel name
MTH DAY SET GT LATT ? LONG HR/MIN SKTS TOTALHKS CATCH

For observers on trawlers, type the heading **EXACTLY** as follows:

Your name Vessel name
MM MTH DAY HAUL GT LATT ? LONG MINS CATCH BOAT#

Next, set tab stops for easy typing of the data columns. Delete any previous tabs stops. **Set a tab** under the first letter of each word, phrase or abbreviation. You may be able to see the set tabs on the bottom of the Telex screen.

To type the data, type in the number off the 1US or 2US for the appropriate column, hit the [TAB] key and type in the next number in that row of data. Enter a row of data, hit [RETURN] and type in the next row. Do not worry about right or left justifying your numbers in the columns; do not use leading or trailing zeros except where instructed on the 1US form. Simply type your number directly where the tab stops the cursor. OTC should always have a decimal and two digits behind the decimal. The "?" between "LATT" and "LONG" is to designate East or West longitude.

If your heading and tabs are set properly, every column should line up. Check the appearance of the data before sending the message. Any notes on non-fishing or delivery days **must** also be typed on the Telex transmission of a 1US or 2US with the corresponding dates.

Observer Name Olivia Observer

Vessel Name Swell

Page 1 of 3 for transmission

FORM 1US - CATCH SUMMARY FOR LONGLINE AND POT VESSELS

Page 1 of ____ for vessel

1. Leading zeros in columns 12, 14, and 33 to 36 only.
2. Skip a line after each day.
3. On days with no sets retrieved, enter date, noon position in columns 24 to 32 and set # = 0
4. Two digits are required in columns 63 + 64, 68 + 69, and 73 + 74.
5. For depth in column 41 use: M = meters and F = fathoms

Cruise number: 1 2 3 4 5 | Vessel code: 6 7 8 9 | Year: 10 11 = 91

Sets sampled	Date MO.	Date DAY	Set #	Gear Type	Gear performance	Process/grade	Location code	Beg position of set Latitude (N)	E or W	Longitude (100)	Soak time hrs/min	Avg. bottom depth	M or F	# of skates in set or total # of pots in set	Skate length or pot set length	# of hooks or pots per skate	Total hooks in the set	Retained Catch; round weight in metric tons	Official Total Catch in metric tons	Observer's Total Catch Estimate in metric tons	ADF&G statistical area
12|13	14|15	16 - 18	19-20	21	22	23	24 - 27	28	29 - 32	33 - 36	37 - 40	41	42 - 44	45 - 48	49 - 52	53 - 60	61|62|63|64	65|66|67|68|69	70|71|72|73|74	75 - 80
✓	10	22	7	8	1	1	R	5534	W	6842	10|45	325	F	10	300	140	1400	1.62	2.80	2.80	685530
✓	↓	↓	8	↓	1	1	↓	5542	↓	6842	12|10	285	F	10	↓	↓	1400	.98	1.95	1.95	↓
✓	10	22	9	8	1	1	R	5528	W	6821	12|20	165	F	12			1680	1.57	3.64	3.64	685530
											|										
✓	10	23	10	8	1	1	R	5456	W	6711	11|50	186	F	10			1400	1.53	2.80	2.80	675430
✓	10	23	11	8	1	1	R	5524	W	6802	13|20	127	F	12			1680	1.76	3.40	3.40	685500
											|										
✓	10	24	12	8	1	1	R	5428	W	6702	10|20	215	F	10			1400	1.82	3.91	3.91	675430
✓	10	24	13	8	1	1	R	5415	W	6711	10|45	290	F	12	300	140	1680	1.51	3.88	3.88	675430
			Example of longline vessel ↑												Example of vessel using pots ↓						
✓	12	10	57	6	1	3	R	5436	W	6710	12|40	124	F	20				3.84	5.10	5.10	675430
✓	12	10	58	6	1	3	R	5418	W	6520	6|35	130	F	20				4.00	4.80	4.80	655401
											|										
	12	11	0			N		5420	W	6518	Arrived Best Sea				Poods – 12:30 Delivery completed –				16:00		655401
											|										
✓	12	12	59	6	1	3	R	5418	W	6520	16|30	126	F	20				2.91	3.65	3.65	655401
✓	12	12	60	6	1	3	R	5417	W	6542	17|10	134	F	30				2.98	3.65	3.65	665409

Form 1US appearance in Telex format:

Olivia Observer Swell
MTH DAY SET GT LATT ? LONG HR/MIN SKTS TOTALHKS CATCH
10 22 7 8 5534 W 6842 10/45 10 1400 2.80
10 22 8 8 5542 W 6842 12/10 10 1400 1.95
10 22 9 8 5528 W 6821 12/20 12 1680 3.64
10 23 10 8 5456 W 6711 11/50 10 1400 2.80

Soak time should be entered: hours, slash, minutes.

Form 2US appearance in Telex format:

Jane Observer Sea Gull
MM MTH DAY HAUL GT LATT ? LONG MINS CATCH BOAT#
Y 09 14 101 1 5838 W 7624 340 16.00
N 09 14 102 1 5837 W 7630 190 8.25
Y 09 14 103 1 5837 W 7607 260 20.00
Y 09 14 104 1 5838 W 7647 200 12.00
Y 09 14 105 1 5838 W 7654 235 18.62

The column for "BOAT#" will only be filled in by observers on motherships.

Telex Format For Catch Message Form A

CMA - SPECIES COMPOSITION
Observer Name Jane Observer Page 2 of 3 for transmission (Weekly Message) or Resubmission of Message Page ____ of ____ for vessel
Vessel Name Sea Gull Fax /Telex # 482-9356 ORC 221
Week Ending Date 9/15 Observer coverage Days 2 Date message was submitted 9/16
Check one of the following boxes or fill in name of shoreside plant or floating processor:
Aboard a catcher/processor? ☐
Aboard a mothership? ☐
Catcher boat? Delivering to: Best Seafoods
(Office Use Only: Cruise / Vessel / Form # / Processor Code)

GROUP ABBREVIATIONS		PROHIB	ARROW	OFLAT	POLL	COD	POP	SCOM	OROCK	OTH	NON	SQU	SAB	YELL	RSOLE		
SPECIES GROUP CODES		900	121	120	270	110	141	173	139	100	999	875	710	127	123		
HAUL NUMBER	TOTAL SAMPLE WEIGHT IN KG	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE
101	16000.0	115.92	5.00	11.85	9287.65	6450.98	4.90	21.90	4.5	92.3	1.4	3.60	0	0	0		
101	% of group retained	0	100	47	98	100	100	100	0	0	0	100	0	0	0		
103	398.0	121.2	3.5	7.1	40.8	214.1	.8	0	0	0	0	0	10.5	0	0		
103	% of group retained	0	100	0	97	100	100	0	0	0	0	0	0	0	0		
104	537.1	27.8	89.1	176.9	0	0	0	0	0	16.4	0	0	0	200.5	26.4		
104	% of group retained	0	100	100	0	0	0	0	0	0	0	0	0	100	15		
105	510.6	2.21	0	0	478.93	21.40	1.49	3.44	1.04	0	.86	1.23	0	0	0		
105	% of group retained	0	0	0	100	100	100	100	100	0	0	100	0	0	0		
	% of group retained																
	% of group retained																
	% of group retained																

(1)JANE OBSERVER(2)SEA GULL(3)482-9356(4)221(5)9/15(6)2(7)9/16 (8)BEST SEAFOODS
900/121/120/270/110/141/173/139/100/999/875/710/127/123/
101/16000.0/115.92/5.00/11.85/9287.65/6450.98/4.90/21.90/4.5/92.3/1.4/3.60/0/0/0
101/0/100/47/98/100/100/100/0/0/0/100/0/0/0
103/398.0/121.2/3.5/7.1/40.8/214.1/.8/0/0/0/0/0/10.5/0/0
103/0/100/0/97/100/100/0/0/0/0/0/0/0/0
104/537.1/27.8/89.1/176.9/0/0/0/0/0/16.4/0/0/0/200.5/26.4
104/0/100/100/0/0/0/0/0/0/0/0/0/100/15
105/510.6/2.21/0/0/478.93/21.40/1.49/3.44/1.04/0/.86/1.23/0/0/0
105/0/0/0/100/100/100/100/100/0/0/100/0/0/0

When transmitting your weekly messages by Telex, the order should be the 1US or 2US first, and then the catch message forms A and B. Note that the data lines look like the actual CMA and CMB form but with slashes to separate the columns.

The information in the heading of each form has been sequentially numbered as shown in the previous example. For instance, (5) represents "Week Ending Date" and the entry is (5)9/15 for this example. Type the numbers in parentheses before each heading item. The CMA heading will begin with the observer's name and end with: "(8)CP" if you are on a catcher processor, "(8)MS" if you are on a mothership, or (8) and the name of the processor your vessel delivered to. Type in the week ending date and the date the message was submitted for transmission with a slash between the month and day. Make sure that you are providing the Telex number where we can contact you and not our Telex number. Remember, type in the numbers in parentheses before each heading item to identify the entry.

Report group codes are typed in the line following the heading. The abbreviations for the report group names do not get entered on the Telex message but the report group codes are listed, one after the other, with slashes in between. Enter these as a separate line from the species weight data.

The next series of lines have the: haul number, species composition sample weight (with a decimal point and one or two decimal places, no "kg" typed), and the individual species groups weights, separated by slashes. No preceeding zeros are typed for species group weights when less than 1 kg. No slashes are required at the end of the line. Each line of data on the form should be a separate line on the Telex as well. The line of data underneath each line of species weights is the percentage retained for each species report group listed, with slashes between each entry.

Telex Format for Catch Message Form B

CMB - PROHIBITED SPECIES Page 3 of 3 for transmission Weekly Message or Resubmission of Message Page ____ of ____ for vessel

① Observer Name Jane Observer

② Vessel Name Sea Gull

③ Week Ending date 9/15

Optional Only: Date Time Format Port Code

HAUL NUMBER	SAMPLE WEIGHT IN MT	RED KING CRAB NUMBER	RED KING CRAB WEIGHT KG	OTHER KING CRAB NUMBER	OTHER KING CRAB WEIGHT KG	SAMPLE WEIGHT IN MT	HERRING WEIGHT KG	SAMPLE WEIGHT IN MT	BAIRDI TANNER NUMBER	BAIRDI TANNER WEIGHT KG	OTHER TANNER NUMBER	OTHER TANNER WEIGHT KG	SABLEFISH WEIGHT KG	PACIFIC HALIBUT NUMBER	PACIFIC HALIBUT WEIGHT KG	SAMPLE WEIGHT KG	CHINOOK SALMON NUMBER	CHINOOK SALMON WEIGHT KG	OTHER SALMON NUMBER	OTHER SALMON WEIGHT KG	Marine Mammals code	Marine Mammals F
101	16.00	0	0	0	0	16.00	0	16.00	629	100.0	28	4.24	16.000	22	6.22	16.000	3	5.488	0	0	N	
103	20.00	0	0	0	0	.398	0	.398	312	121.2	0	0	20.000	11	5.55	20.000	7	2.19	1	1.19	N	
104	.537	20	6.8	0	0	.537	0	.537	28	2.1	187	15.3	.537	1	3.6	.537	0	0	0	0	N	
105	18.62	0	0	0	0	.511	0	.511	7	2.21	0	0	18.622	24	247.00	18.622	0	0	0	0	N	

(1)JANE OBSERVER(2)SEA GULL(3)9/15
101/16.00/0/0/0/0/16.00/0/16.00/629/100.0/28/4.24/16.000/22/6.22/16.000/3/5.488/0/0/N
103/20.00/0/0/0/0/.398/0/.398/312/121.2/0/0/20.000/11/5.55/20.000/7/2.19/1/1.19/N
104/.537/20/6.8/0/0/.537/0/.537/28/2.1/187/15.3/.537/1/3.6/.537/0/0/0/0/N
105/18.62/0/0/0/0/.511/0/.511/2.21/0/0/18.622/24/247.00/18.622/0/0/0/0/N

Sequentially number the heading information and type in the number in parentheses with the entry for that line. Typing in form page numbers is not required. Type a slash between the month and day of week ending date.

For the body of the form, type in the lines of data separately, with slashes wherever there is a column line on the original form (between all column numbers). Then list the haul weight, slash, sample weight, another slash, and the individual prohibited species group weights with slashes between them.

SPECIAL PROBLEMS

If Your Ship Fishes Outside of the EEZ

Continue to sample and send catch reports for any catches taken outside the EEZ. In the Bering Sea report the catch as coming from Area 550. Outside the EEZ in the Gulf of Alaska is Area 690. Outside the EEZ along the Washington-Oregon coast is Area 750. (Refer to the charts on previous pages.)

Lack of Sampling Data from an Area or Gear Type for a Day Fished

If you did **not sample at all** for a given **fishing day** due to illness, severe weather problems, or other reasons, make sure that it is indicated in your weekly catch messages. Similarly, include a line of information in your catch messages if the ship fished two gear types or two or more areas on a day you sampled but you were unable to sample the catch for all the gear types or areas. In your weekly catch message, include the date and the weight of all hauls for that day, gear type or area not sampled in a day, and reason for not sampling on a single line on both the Prohibited Species and the Species Composition Catch Message forms. **All days must be accounted for from the time the vessel leaves the dock until it returns.** The date and the day's weight should still appear in the heading of the Prohibited Species Catch Message form.

Two Distinct Types of Fishing Strategy within a Day

In those cases where the vessel uses two distinct fishing strategies during the day to target on two different types of fish (i.e. flatfish during the day and rockfish at night), the observer must sample both types of catches proportionately each day. If 30% of the tonnage each day is flatfish caught during the day, then 30% of the observer's sampling should be done on the flatfish hauls.

Catch Message Directions for Observers at Processing Plants

Messages from processing plant observers do not follow the same format as those from observers aboard domestic vessels. Refer to the instructions in the plant sampling section of this manual. Messages should include the following (at a minimum) for each plant that the observer worked at during the week:

Observer name, plant name, processor code, fax/telex #, week ending date, dates of observer coverage (list each date), and names of all vessels delivering to plant.

DAILY CATCH MESSAGES

While you are out at sea, you may receive a message that asks you to begin sending daily catch messages. This is most apt to occur when a prohibited species is approaching its Prohibited Species Cap (PSC). These messages are to be sent in addition to your normal weekly messages, and are sent on a daily basis. Daily messages should not be sent to the Seattle Observer Program office. Instead send them to Dave Cormany, NMFS Regional Office, (address and phone number is on the first page of the Catch Message section. **Remember: send daily messages to Juneau and weekly messages to Seattle.**

Daily messages must be sent to Juneau office by the following day. Observers may find this difficult if they are using ship's production figures or plant's ADF&G fish ticket data for Official Total Catch. (The needed information may not appear until well after the catch has been landed.) In this situation, the observer should use his own estimate of total catch or the ship's hail estimate for the Official Total Catch in the daily messages. Later, when the weekly message is sent, the production figures can be used.

The message requesting daily catch information will indicate a particular species group from the prohibited species or species composition samples. Summarize the information from the CMA and CMB and complete the CMD - Daily Catch Message Form with the following information:

1. The month and day of the data being sent.
2. The appropriate NMFS area and gear type; unlike the weekly messages, the daily messages must be separated by area and gear type.
3. The total of the OTC estimates for the day, from sampled and unsampled hauls.
4. The total of the OTC estimates for the hauls that were sampled.
5. The species code for the requested species.
6. The total of the sample weights for the groups requested.
7. For prohibited species enter the total number of the requested prohibited in the samples and their weight for the day. For species found in the species composition sample, enter only the weight of the requested species found in the samples of the day.

WEEKLY SUMMARY MESSAGES

There are a few boats that do not have a Fax or telex and remain at sea three to four weeks at a time. These boats are mainly small longline catcher/processors. Observers in this situation will have to transmit their catch messages via the single sideband radio to our Kodiak office or though the marine operator to our Seattle office. Observers will report a coded weekly summary, the CMV form, rather than read their haul form, CMA, and CMB over the radio. In addition, the CMA and CMB forms must be summarized by NMFS area and gear type. The totals for each area and gear type are transferred to the shaded boxes on the CMV. The information in the shaded boxes is then translated using the number-to-letter code given out in class and written in the adjacent unshaded boxes. The observer then enters the remaining data in the unshaded boxes. Finally, all of the information in the unshaded boxes is transmitted to our Seattle office via the SSB radio and marine operator or to our Kodiak office via the SSB radio.

CMD - DAILY CATCH MESSAGE FORM

VESSEL NAME _____

NMFS PERMIT # _____

OBSERVER NAME _____

ORC _____

To: Alaska Regional Office
Inseason Management Branch
Juneau, AK

Via FAX: (907) 586-7131
Via TELEX: 62296000
Via Operator: (907) 586-7228

- Red King Crab
- Other King Crab
- Herring
- Bairdi Tanner Crab
- Opilio Tanner Crab
- Pacific Halibut
- Chinook Salmon
- Other Salmon

Date		NMFS area	Gear type	Total daily weight in metric tons	Total weight of hauls sampled in metric tons	Species Report Group Code	For requested prohibited species			Species Report Group Code	For requested species group	
Month	Day						Total of sample weights in kilograms	Total number of prohibited species in samples	Total weight of prohibited species in kilograms		Total of species comp. sample weights in kilograms	Total of weight species group in kilograms

created 10/91

CM V - Weekly Catch Message Form for Voice Communication

Observer Name | NMFS Area

Vessel Name | Gear type

Week Ending Date | Observer Coverage Days

Office Use Only | Cruise # | Permit # | Proc. Code

Check one of the following boxes or fill in name of shoreside plant or floating processor:

Aboard a catcher/processor? ☐

Aboard a mothership? ☐

Catcher boat? Delivering to: _____

Page _____ of _____

0	1	2	3	4	5	6	7	8	9

SPECIES GROUP CODES																	
Total catch for the week in mt.	Total of sp. comp. sample weights in kg.	Total kilograms in samples	Total kilograms in samples	Total kilograms in samples	Total kilograms in samples	Total kilograms in samples	Total kilograms in samples	Total kilograms in samples	Total kilograms in samples	Total kilograms in samples	Total kilograms in samples	Total kilograms in samples	Total kilograms in samples	Total kilograms in samples	Total kilograms in samples	Total kilograms in samples	Total kilograms in samples

Total of prohibited sample wt. in mt.	RED KING CRAB		OTHER KING CRAB		Total prohibited sample wt. in mt.	HERRING	Total prohibited sample wt. in mt.	BAIRDI TANNER		OTHER TANNER		Total prohibited sample wt. in mt.	PACIFIC HALIBUT		Total prohibited sample wt. in mt.	CHINOOK SALMON		OTHER SALMON		Marine Mammals	
	NUMBER	WEIGHT KG	NUMBER	WEIGHT KG		WEIGHT KG		NUMBER	WEIGHT KG	NUMBER	WEIGHT KG		NUMBER	WEIGHT KG		NUMBER	WEIGHT KG	NUMBER	WEIGHT KG	Code	Number

1. Summarize data for the week from CM-A and CM-B by area and gear type.
2. Transfer totals to the shaded boxes on CM-V.
3. Translate all information in the shaded boxes using codes and enter in adjacent white boxes.
4. Transmit all information in white boxes via radio and/or the marine operator.

revised 12/91

DIAGONAL BOUNDARY LINE TABLES FOR THE BERING SEA

When you are given a position that is close to the diagonal boundary lines that separate areas 517 and 515 or areas 521 and 522, it may be difficult to determine exactly which area the catch should be attributed to. These tables will aid you in that determination.

The 1st table: Table 1, is a plot of the line intersecting areas 517 and 515. The line gives the corresponding latitude position for each minute of longitude.

The 2nd table: Table 2, is a plot of the line intersecting areas 521 and 522.

How To Use The Tables

First find the longitude of your retrieval position in Column B of the table. The corresponding latitude in Column A marks the point on the line which intersects the two areas. If the latitude of your retrieval position is greater than the table latitude, your position falls in the area to the north of the line. If the latitude of your retrieval position is less than the table latitude then your position falls in the area to the south of the line.

Special Cases

For retrieval positions that fall exactly on the line, or if the retrieval position falls on "Four Corners", the intersecting point of 55-46 N 170-00 W, use the trawl data you have for the haul or set to decide which area the fish were caught in and assign the catch to that area.

Example of Use

To demonstrate the use of the tables: suppose your ship had received a codend and records the retrieval position as 54-39 N 68-07 W. Determine what area this retrieval position falls in.

1. First, find longitude 168-07 W in Column B of the tables:
   (longitude 168-07 is found in Table 1)

Col. A	Col.B	
5457. 72	16805. 00	
5458. 15	16806. 00	
5458. 57	16807. 00	<----- retrieval longitude
5458. 99	16808. 00	
5459. 42	16809. 00	

2. Read the corresponding latitude from Column A:

	Col. A	Col. B
	5457. 72	16805. 00
	5458. 15	16806. 00
----->	5458. 57	16807. 00
	5458. 99	16808. 00
	5459. 42	16809. 00

3. Determine whether your retrieval latitude is greater than or less than the latitude in Column A:

   retrieval latitude 54-39 (5439. 00) is lower than Intersecting latitude 5458. 57

4. Determine the area:
   Remember that Table 1, where the retrieval longitude was found, represents points on the line between areas 517 and 515. Table B represents points on the line between areas 521 and 522. Since the retrieval latitude was lower than the line latitude, the retrieval position falls into area 515, the area south of the line.

Summary Table

	Table 1	Table 2
Retrieval latitude less than line latitude	AREA 515	AREA 522
Retrieval latitude greater than line latitude	AREA 517	AREA 521

LAT COL. A	LONG COL. B
5430.00	16700.00
5430.43	16701.00
5430.86	16702.00
5431.29	16703.00
5431.72	16704.00
5432.14	16705.00
5432.57	16706.00
5433.00	16707.00
5433.43	16708.00
5433.86	16709.00
5434.29	16710.00
5434.71	16711.00
5435.14	16712.00
5435.57	16713.00
5436.00	16714.00
5436.43	16715.00
5436.85	16716.00
5437.28	16717.00
5437.71	16718.00
5438.14	16719.00
5438.56	16720.00
5438.99	16721.00
5439.42	16722.00
5439.85	16723.00
5440.27	16724.00
5440.70	16725.00
5441.13	16726.00
5441.55	16727.00
5441.98	16728.00
5442.41	16729.00
5442.83	16730.00
5443.26	16731.00
5443.69	16732.00
5444.11	16733.00
5444.54	16734.00
5444.97	16735.00
5445.39	16736.00
5445.82	16737.00
5446.25	16738.00
5446.67	16739.00
5447.10	16740.00
5447.52	16741.00
5447.95	16742.00
5448.38	16743.00
5448.80	16744.00
5449.23	16745.00
5449.65	16746.00
5450.08	16747.00
5450.50	16748.00
5450.93	16749.00
5451.35	16750.00
5451.78	16751.00
5452.20	16752.00
5452.63	16753.00
5453.05	16754.00
5453.48	16755.00
5453.90	16756.00

LAT COL. A	LONG COL. B
5454.75	16758.00
5455.18	16759.00
5455.60	16800.00
5456.03	16801.00
5456.45	16802.00
5456.87	16803.00
5457.30	16804.00
5457.72	16805.00
5458.15	16806.00
5458.57	16807.00
5458.99	16808.00
5459.42	16809.00
5459.84	16810.00
5500.27	16811.00
5500.69	16812.00
5501.11	16813.00
5501.54	16814.00
5501.96	16815.00
5502.38	16816.00
5502.81	16817.00
5503.23	16818.00
5503.65	16819.00
5504.08	16820.00
5504.50	16821.00
5504.92	16822.00
5505.34	16823.00
5505.77	16824.00
5506.19	16825.00
5506.61	16826.00
5507.03	16827.00
5507.46	16828.00
5507.88	16829.00
5508.30	16830.00
5508.72	16831.00
5509.15	16832.00
5509.57	16833.00
5509.99	16834.00
5510.41	16835.00
5510.83	16836.00
5511.26	16837.00
5511.68	16838.00
5512.10	16839.00
5512.52	16840.00
5512.94	16841.00
5513.36	16842.00
5513.78	16843.00
5514.21	16844.00
5514.63	16845.00
5515.05	16846.00
5515.47	16847.00
5515.89	16848.00
5516.31	16849.00
5516.73	16850.00
5517.15	16851.00
5517.57	16852.00
5517.99	16853.00
5518.41	16854.00
5518.83	16855.00
5519.25	16856.00

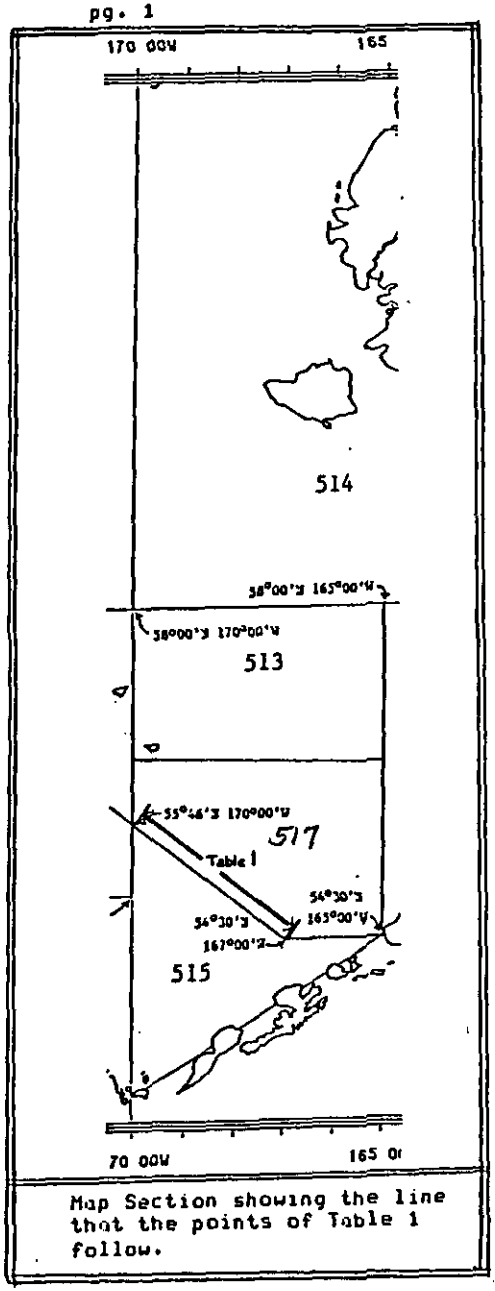
LAT COL. A	LONG COL. B
5520.09	16858.00
5520.51	16859.00
5520.93	16900.00
5521.35	16901.00
5521.77	16902.00
5522.19	16903.00
5522.61	16904.00
5523.03	16905.00
5523.45	16906.00
5523.87	16907.00
5524.29	16908.00
5524.71	16909.00
5525.13	16910.00
5525.55	16911.00
5525.97	16912.00
5526.39	16913.00
5526.81	16914.00
5527.23	16915.00
5527.64	16916.00
5528.06	16917.00
5528.48	16918.00
5528.90	16919.00
5529.32	16920.00
5529.74	16921.00
5530.16	16922.00
5530.57	16923.00
5530.99	16924.00
5531.41	16925.00
5531.83	16926.00
5532.25	16927.00
5532.66	16928.00
5533.08	16929.00
5533.50	16930.00
5533.92	16931.00
5534.34	16932.00
5534.75	16933.00
5535.17	16934.00
5535.59	16935.00
5536.01	16936.00
5536.42	16937.00
5536.84	16938.00
5537.26	16939.00
5537.67	16940.00
5538.09	16941.00
5538.51	16942.00
5538.93	16943.00
5539.34	16944.00
5539.76	16945.00
5540.18	16946.00
5540.59	16947.00
5541.01	16948.00
5541.42	16949.00
5541.84	16950.00
5542.26	16951.00
5542.67	16952.00
5543.09	16953.00
5543.51	16954.00
5543.92	16955.00
5544.34	16956.00
5544.75	16957.00

LAT COL. A	LONG COL. B
5545.17	16958.00
5545.58	16959.00
5546.00	17000.00

TABLE 1

plot of the points on the line intersecting between subareas 513 and 515.

pg. 1



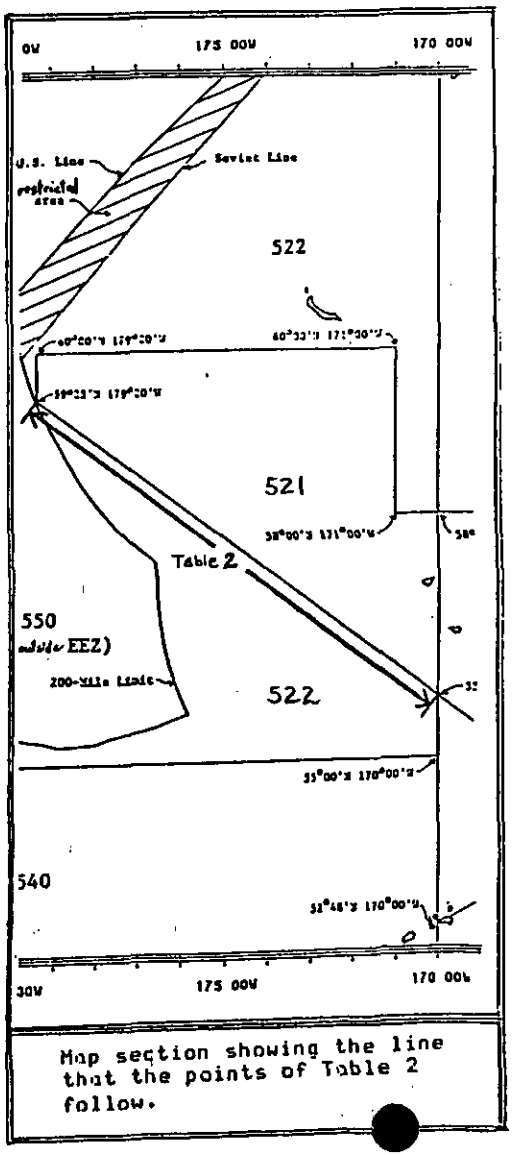
Map Section showing the line that the points of Table 1 follow.

LAT COL. A	LONG COL. B
5546.41	17001.00
5546.82	17002.00
5547.23	17003.00
5547.64	17004.00
5548.05	17005.00
5548.46	17006.00
5548.87	17007.00
5549.28	17008.00
5549.70	17009.00
5550.11	17010.00
5550.52	17011.00
5550.93	17012.00
5551.34	17013.00
5551.75	17014.00
5552.16	17015.00
5552.57	17016.00
5552.97	17017.00
5553.38	17018.00
5553.79	17019.00
5554.20	17020.00
5554.61	17021.00
5555.02	17022.00
5555.43	17023.00
5555.84	17024.00
5556.25	17025.00
5556.66	17026.00
5557.07	17027.00
5557.48	17028.00
5557.89	17029.00
5558.29	17030.00
5558.70	17031.00
5559.11	17032.00
5559.52	17033.00
5559.93	17034.00
5600.34	17035.00
5600.75	17036.00
5601.15	17037.00
5601.56	17038.00
5601.97	17039.00
5602.38	17040.00
5602.79	17041.00
5603.19	17042.00
5603.60	17043.00
5604.01	17044.00
5604.42	17045.00
5604.83	17046.00
5605.23	17047.00
5605.64	17048.00
5606.05	17049.00
5606.46	17050.00
5606.86	17051.00
5607.27	17052.00
5607.68	17053.00
5608.08	17054.00
5608.49	17055.00
5608.90	17056.00
5609.30	17057.00
5609.71	17058.00
5610.12	17059.00
5610.52	17100.00
5610.93	17101.00
5611.34	17102.00
5611.74	17103.00
5612.15	17104.00
5612.56	17105.00
5612.96	17106.00
5613.37	17107.00
5613.78	17108.00
5614.18	17109.00
5614.59	17110.00
5614.99	17111.00
5615.40	17112.00
5615.80	17113.00
5616.21	17114.00
5616.62	17115.00
5617.02	17116.00
5617.43	17117.00
5617.83	17118.00
5618.24	17119.00
5618.64	17120.00
5619.05	17121.00
5619.45	17122.00
5619.86	17123.00
5620.26	17124.00
5620.67	17125.00
5621.07	17126.00
5621.48	17127.00
5621.88	17128.00
5622.29	17129.00
5622.69	17130.00
5623.09	17131.00
5623.50	17132.00
5623.90	17133.00
5624.31	17134.00
5624.71	17135.00
5625.12	17136.00
5625.52	17137.00
5625.92	17138.00
5626.33	17139.00
5626.73	17140.00
5627.13	17141.00
5627.54	17142.00
5627.94	17143.00
5628.35	17144.00
5628.75	17145.00
5629.15	17146.00
5629.56	17147.00
5629.96	17148.00
5630.36	17149.00
5630.76	17150.00
5631.17	17151.00
5631.57	17152.00
5631.97	17153.00
5632.38	17154.00
5632.78	17155.00
5633.18	17156.00
5633.58	17157.00
5633.99	17158.00
5634.39	17159.00
5634.79	17200.00
5635.19	17201.00
5635.60	17202.00
5636.00	17203.00
5636.40	17204.00
5636.80	17205.00
5637.20	17206.00
5637.61	17207.00
5638.01	17208.00
5638.41	17209.00
5638.81	17210.00
5639.21	17211.00
5639.61	17212.00
5640.01	17213.00
5640.42	17214.00
5640.82	17215.00
5641.22	17216.00
5641.62	17217.00
5642.02	17218.00
5642.42	17219.00
5642.82	17220.00
5643.22	17221.00
5643.62	17222.00
5644.02	17223.00
5644.43	17224.00
5644.83	17225.00
5645.23	17226.00
5645.63	17227.00
5646.03	17228.00
5646.43	17229.00
5646.83	17230.00
5647.23	17231.00
5647.63	17232.00
5648.03	17233.00
5648.43	17234.00
5648.83	17235.00
5649.23	17236.00
5649.63	17237.00
5650.03	17238.00
5650.43	17239.00
5650.83	17240.00
5651.23	17241.00
5651.62	17242.00
5652.02	17243.00
5652.42	17244.00
5652.82	17245.00
5653.22	17246.00
5653.62	17247.00
5654.02	17248.00
5654.42	17249.00
5654.82	17250.00
5655.22	17251.00
5655.61	17252.00
5656.01	17253.00
5656.41	17254.00
5656.81	17255.00
5657.21	17256.00
5657.61	17257.00
5658.00	17258.00
5658.40	17259.00
5658.80	17300.00
5659.20	17301.00
5659.60	17302.00
5659.99	17303.00
5700.39	17304.00
5700.79	17305.00
5701.19	17306.00
5701.59	17307.00
5701.98	17308.00
5702.38	17309.00
5702.78	17310.00
5703.17	17311.00
5703.57	17312.00
5703.97	17313.00
5704.37	17314.00
5704.76	17315.00
5705.16	17316.00
5705.56	17317.00
5705.95	17318.00
5706.35	17319.00
5706.75	17320.00
5707.14	17321.00
5707.54	17322.00
5707.94	17323.00
5708.33	17324.00
5708.73	17325.00
5709.13	17326.00
5709.52	17327.00
5709.92	17328.00
5710.31	17329.00
5710.71	17330.00
5711.11	17331.00
5711.50	17332.00
5711.90	17333.00
5712.29	17334.00
5712.69	17335.00
5713.08	17336.00
5713.48	17337.00
5713.87	17338.00
5714.27	17339.00
5714.67	17340.00
5715.06	17341.00
5715.46	17342.00
5715.85	17343.00
5716.25	17344.00
5716.64	17345.00
5717.03	17346.00
5717.43	17347.00
5717.82	17348.00
5718.22	17349.00
5718.61	17350.00
5719.01	17351.00
5719.40	17352.00
5719.80	17353.00
5720.19	17354.00
5720.59	17355.00
5720.98	17356.00
5721.37	17357.00
5721.77	17358.00
5722.16	17359.00
5722.55	17400.00
5722.95	17401.00
5723.34	17402.00
5723.74	17403.00
5724.13	17404.00
5724.52	17405.00
5724.92	17406.00
5725.31	17407.00
5725.70	17408.00
5726.10	17409.00
5726.49	17410.00
5726.88	17411.00
5727.28	17412.00
5727.67	17413.00
5728.06	17414.00
5728.45	17415.00
5728.85	17416.00
5729.24	17417.00
5729.63	17418.00
5730.02	17419.00
5730.42	17420.00
5730.81	17421.00
5731.20	17422.00
5731.59	17423.00
5731.99	17424.00
5732.38	17425.00
5732.77	17426.00
5733.16	17427.00
5733.55	17428.00
5733.95	17429.00
5734.34	17430.00
5734.73	17431.00
5735.12	17432.00
5735.51	17433.00
5735.90	17434.00
5736.29	17435.00
5736.69	17436.00
5737.08	17437.00
5737.47	17438.00
5737.86	17439.00
5738.25	17440.00
5738.64	17441.00
5739.03	17442.00
5739.42	17443.00
5739.81	17444.00
5740.20	17445.00
5740.59	17446.00
5740.99	17447.00
5741.38	17448.00
5741.77	17449.00
5742.16	17450.00
5742.55	17451.00
5742.94	17452.00
5743.33	17453.00
5743.72	17454.00
5744.11	17455.00
5744.50	17456.00
5744.89	17457.00

TABLE 2

Plot of the points on the line intersecting between subareas 521 and 522.

pgs. 2-3



Map section showing the line that the points of Table 2 follow.

LAT COL. A	LONG COL. B
5745.28	17458.00
5745.67	17459.00
5746.06	17500.00
5746.44	17501.00
5746.83	17502.00
5747.22	17503.00
5747.61	17504.00
5748.00	17505.00
5748.39	17506.00
5748.78	17507.00
5749.17	17508.00
5749.56	17509.00
5749.95	17510.00
5750.34	17511.00
5750.73	17512.00
5751.11	17513.00
5751.50	17514.00
5751.89	17515.00
5752.28	17516.00
5752.67	17517.00
5753.06	17518.00
5753.44	17519.00
5753.83	17520.00
5754.22	17521.00
5754.61	17522.00
5755.00	17523.00
5755.38	17524.00
5755.77	17525.00
5756.16	17526.00
5756.55	17527.00
5756.94	17528.00
5757.32	17529.00
5757.71	17530.00
5758.10	17531.00
5758.49	17532.00
5758.87	17533.00
5759.26	17534.00
5759.65	17535.00
5800.03	17536.00
5800.42	17537.00
5800.81	17538.00
5801.20	17539.00
5801.58	17540.00
5801.97	17541.00
5802.36	17542.00
5802.74	17543.00
5803.13	17544.00
5803.52	17545.00
5803.90	17546.00
5804.29	17547.00
5804.67	17548.00
5805.06	17549.00
5805.45	17550.00
5805.83	17551.00
5806.22	17552.00
5806.60	17553.00
5806.99	17554.00
5807.38	17555.00
5807.76	17556.00

LAT COL. A	LONG COL. B
5808.53	17558.00
5808.92	17559.00
5809.30	17600.00
5809.69	17601.00
5810.07	17602.00
5810.46	17603.00
5810.84	17604.00
5811.23	17605.00
5811.61	17606.00
5812.00	17607.00
5812.38	17608.00
5812.77	17609.00
5813.15	17610.00
5813.54	17611.00
5813.92	17612.00
5814.31	17613.00
5814.69	17614.00
5815.08	17615.00
5815.46	17616.00
5815.85	17617.00
5816.23	17618.00
5816.61	17619.00
5817.00	17620.00
5817.38	17621.00
5817.77	17622.00
5818.15	17623.00
5818.53	17624.00
5818.92	17625.00
5819.30	17626.00
5819.68	17627.00
5820.07	17628.00
5820.45	17629.00
5820.83	17630.00
5821.22	17631.00
5821.60	17632.00
5821.98	17633.00
5822.37	17634.00
5822.75	17635.00
5823.13	17636.00
5823.52	17637.00
5823.90	17638.00
5824.28	17639.00
5824.66	17640.00
5825.05	17641.00
5825.43	17642.00
5825.81	17643.00
5826.19	17644.00
5826.58	17645.00
5826.96	17646.00
5827.34	17647.00
5827.72	17648.00
5828.10	17649.00
5828.49	17650.00
5828.87	17651.00
5829.25	17652.00
5829.63	17653.00
5830.01	17654.00
5830.40	17655.00
5830.78	17656.00

LAT COL. A	LONG COL. B
5831.54	17658.00
5831.92	17659.00
5832.30	17700.00
5832.68	17701.00
5833.06	17702.00
5833.45	17703.00
5833.83	17704.00
5834.21	17705.00
5834.59	17706.00
5834.97	17707.00
5835.35	17708.00
5835.73	17709.00
5836.11	17710.00
5836.49	17711.00
5836.87	17712.00
5837.25	17713.00
5837.63	17714.00
5838.01	17715.00
5838.39	17716.00
5838.77	17717.00
5839.15	17718.00
5839.53	17719.00
5839.91	17720.00
5840.29	17721.00
5840.67	17722.00
5841.05	17723.00
5841.43	17724.00
5841.81	17725.00
5842.19	17726.00
5842.57	17727.00
5842.95	17728.00
5843.33	17729.00
5843.71	17730.00
5844.09	17731.00
5844.47	17732.00
5844.84	17733.00
5845.22	17734.00
5845.60	17735.00
5845.98	17736.00
5846.36	17737.00
5846.74	17738.00
5847.12	17739.00
5847.50	17740.00
5847.87	17741.00
5848.25	17742.00
5848.63	17743.00
5849.01	17744.00
5849.39	17745.00
5849.77	17746.00
5850.14	17747.00
5850.52	17748.00
5850.90	17749.00
5851.28	17750.00
5851.65	17751.00
5852.03	17752.00
5852.41	17753.00
5852.79	17754.00
5853.17	17755.00
5853.54	17756.00
5853.92	17757.00

LAT COL. A	LONG COL. B
5854.30	17758.00
5854.67	17759.00
5855.05	17800.00
5855.43	17801.00
5855.81	17802.00
5856.18	17803.00
5856.56	17804.00
5856.94	17805.00
5857.31	17806.00
5857.69	17807.00
5858.07	17808.00
5858.44	17809.00
5858.82	17810.00
5859.20	17811.00
5859.57	17812.00
5859.95	17813.00
5900.32	17814.00
5900.70	17815.00
5901.08	17816.00
5901.45	17817.00
5901.83	17818.00
5902.20	17819.00
5902.58	17820.00
5902.96	17821.00
5903.33	17822.00
5903.71	17823.00
5904.08	17824.00
5904.46	17825.00
5904.83	17826.00
5905.21	17827.00
5905.58	17828.00
5905.96	17829.00
5906.33	17830.00
5906.71	17831.00
5907.08	17832.00
5907.46	17833.00
5907.83	17834.00
5908.21	17835.00
5908.58	17836.00
5908.96	17837.00
5909.33	17838.00
5909.71	17839.00
5910.08	17840.00
5910.45	17841.00
5910.83	17842.00
5911.20	17843.00
5911.58	17844.00
5911.95	17845.00
5912.33	17846.00
5912.70	17847.00
5913.07	17848.00
5913.45	17849.00
5913.82	17850.00
5914.19	17851.00
5914.57	17852.00
5914.94	17853.00
5915.31	17854.00
5915.69	17855.00
5916.06	17856.00
5916.43	17857.00

LAT COL. A	LONG COL. B
5916.81	17858.00
5917.18	17859.00
5917.55	17900.00
5917.93	17901.00
5918.30	17902.00
5918.67	17903.00
5919.05	17904.00
5919.42	17905.00
5919.79	17906.00
5920.16	17907.00
5920.54	17908.00
5920.91	17909.00
5921.28	17910.00
5921.65	17911.00
5922.02	17912.00
5922.40	17913.00
5922.77	17914.00
5923.14	17915.00
5923.51	17916.00
5923.88	17917.00
5924.26	17918.00
5924.63	17919.00
5925.00	17920.00

LOGBOOK ENTRIES

The observer logbook is not to be used as a personal diary but as a record book for notes and data not included on the forms, and a place to document circumstances and information concerning any possible violations of fishing regulations. Record in your logbook your catch volume measurements and calcultions and density sampling data. From observation and conversations you learn what issues and concerns are driving the decisions on fishing strategy and schedules. Notes from conversations can provide valuable insight. Include in the logbook anything that you may later want to include or summarize in your final report; anything unusual that occurs on the cruise; or anything else that you feel may be of interest. Appropriate entries include:

what situations dictated your choice of a sampling method,
any changes in sampling procedure,
sampling problems,
calculation of codend or bin dimensions and densities and any other calculations for total catch weight.
Descriptions of how catch estimates were obtained should be recorded here.
If you use the captain's deck estimates any time as OTC weight, you should make an ongoing table his deck estimates and yours.
It is also a good place to keep the copies of all messages sent and received.
Short comments on hauls sampled can go in the "comments" section of Form 3US, but additional explanations on anything unusual, such as a high percentage of rockfish in a tow, or comments on hauls not sampled, can be entered in the logbook.
Note details on factory processing, or
observations on the biology of the target species.

It is important to document carefully any suspected violations in the logbook as soon after the occurrence as possible. You cannot rely on your memory of details of events, it is important that these be written down as soon as possible. Although a complete report may be written upon your return, the original notes may be needed as evidence. If a correction must be made, draw a line through the incorrect word(s) instead of erasing or blackening them out. All logbook entries should be in ink, and any events that are recorded should be in chronological order. Please put your name, vessel name(s) and dates aboard each vessel on the first page inside the logbook.

If the vessel you are on is charged with a violation, all parties concerned, will have a legal right to inspect your logbook or any other evidence known to exist. It is thus important to make your entries factual and to avoid unfounded personal opinions. Do not use your logbook to "blow off steam". Statements such as "the captain acts and dresses like a slob" are irrelevant and detrimental to your statement.

Your logbook entries are not to be viewed by vessel personnel. Keep your logbook secured with your personal belongings.

DOMESTIC OBSERVER VESSEL REPORT

OBSERVER NAME_____ CRUISE #_____

VESSEL NAME_____ VCODE_____

CAPTAIN_____

FISHING MASTER/DECK BOSS_____

FACTORY MANAGER_____

#DAYS FISHED_____ #TOWS/SETS MADE_____ #TOWS/SETS SAMPLED_____

VESSEL LENGTH (FT)_____

For each of the following questions, circle the letters of **all** answers that apply. Multiple answers are allowed.

1. What was the total ship's complement?
   a. 5 or less
   b. 6-10
   c. 11-15
   d. 16-20
   e. 21-30
   f. >30

2. How many people at a time were assigned to your room with you?
   a. none
   b. 1-2
   c. 3-4
   d. 5-6
   e. 7 or more

3. What was the approximate average haul/set weight (MT)?
   a. <5
   b. 5-20
   c. 21-50
   d. 51-100
   e. >100

4. In which area(s) did this vessel fish?
   a. Bering Sea/Aleutian Islands
   b. Gulf of Alaska
   c. Washington/Oregon/California coast

d. "Donut Hole" - outside U.S. EEZ in Bering Sea
e. any other area inside U.S. EEZ not listed
f. any area outside U.S. EEZ other than the "Donut Hole"

5. Which gear type(s) was (were) used?
a. bottom trawl (nonpelagic trawl)
b. pelagic trawl
c. hook-and-line (longline) with j-hooks
d. hook-and-line with circle hooks
e. pot
f. pair trawl
g. jig
h. other _____

6. If this vessel fished with hook-and-line gear, were "soft" (Mustad) hooks used? (These hooks are designed to unbend under heavy strain.)
a. yes
b. no
c. don't know

7. How were the fish caught by this vessel processed? Circle all that apply.
a. fish partially processed delivered to shorebased plant
b. fish partially processed delivered to floating processor
c. sorted catch delivered to shorebased plant
d. sorted catch delivered to floating processor
e. unsorted catch delivered to shorebased plant
f. unsorted catch delivered to floating processor
g. some or all of catch sold as bait
h. codend delivered to mothership
i. catch processed on board

Use the following key to answer questions 8-15:
a. pollock
b. Pacific cod
c. sablefish
d. Atka mackerel
e. hake
f. rock sole
g. Greenland turbot
h. yellowfin sole
i. other flatfish
j. rockfish (any species)
k. no species

8. Catcher boat only: which species were target species?
a. b. c. d. e. f. g. h. i. j.

Catcher/processor observers only: circle the letter(s) of the fish species utilized for each processing method. If a particular processing method wasn't employed, circle "k" for no species used.

9.	frozen whole	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.
10.	headed	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.
11.	head and gut	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.
12.	fillet	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.
13.	surimi	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.
14.	roe	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.
15.	fish meal	a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.

CATCH ESTIMATES

16. How was observer estimate of total catch obtained?
    a. codend measurement
    b. bin volume measurement
    c. tally of fish on longline or pot
    d. reading scale at plant
    e. very few or none obtained

17. Which of the following were used for official total catch?
    a. captain's estimate/hail weight
    b. backcalculation from production data
    c. proportion from delivery weight
    d. adjustment factor applied to captain's estimate
    e. adjustment factor applied to retained weight
    f. observer estimate

18. How was retained catch obtained?
    a. application of PRR's to production data
    b. proportioned weights from delivery information
    c. skipper tally of target species
    d. observer sampling data applied to official total catch
    e. observer tallies on longline or pot vessel
    f. actual weights from whole haul sample

PROHIBITED SPECIES AND SPECIES COMPOSITION SAMPLING

Use the following key to answer questions 19-22:
    a. whole haul sampling
    b. partial whole haul sampling
    c. basket sampling
    d. longline/pot sample

What was the **predominant** sampling method you used for each prohibited species group?

19. salmon a. b. c. d.
20. halibut a. b. c. d.
21. king crab a. b. c. d.
22. tanner crab a. b. c. d.

23. Where did you sample for prohibited species?
    a. on weather deck
    b. in ship's factory
    c. at plant/floating processor delivered to

24. Where did you obtain prohibited species viability estimates?
    a. on weather deck
    b. in ship's factory
    c. at plant/floating processor delivered to
    d. none obtained

25. What sampling method or methods did you use for species composition sampling?
    a. whole haul sampling
    b. partial whole haul sampling
    c. basket (weighed) sampling
    d. longline/pot sample

26. Where did you sample for species composition?
    a. on weather deck
    b. in the ship's factory
    c. at the plant/processor delivered to
    d. tally on deck, weigh & measure in factory

27. What was your special project?
    a. target otoliths
    b. other otoliths
    c. stomachs
    d. crab length, viability and molting
    e. product recovery rates
    f. density
    g. hake ovaries
    h. marine debris
    i. fish collection
    j. other; describe_____
    k. none

SAFETY

Did you see the following safety equipment on this vessel? If so, please comment on its **latest** condition, using this key:

a. not present
b. presence unknown
c. present - functional
d. present - not functional
e. present - condition unknown

28.	General alarm:	a.	b.	c.	d.	e.
29.	406 EPIRB:	a.	b.	c.	d.	e.
30.	Survival suits for all crew:	a.	b.	c.	d.	e.
31.	Life preservers for all crew:	a.	b.	c.	d.	e.
32.	Life rafts for all aboard:	a.	b.	c.	d.	e.
33.	Fire extinguishers:	a.	b.	c.	d.	e.
34.	First aid equipment:	a.	b.	c.	d.	e.
35.	Life rings/buoys:	a.	b.	c.	d.	e.
36.	Flares; smoke or dye markers:	a.	b.	c.	d.	e.
37.	Radio:	a.	b.	c.	d.	e.

38. Were you given a tour of the safety equipment on this vessel?
    a. yes
    b. no

39. If yes, who gave you the tour?
    a. captain
    b. mate
    c. crewmember
    d. NMFS personnel
    e. contractor
    f. other_____

40. Were you shown what to do on this vessel in case of an emergency?
    a. yes
    b. no

41. If yes, who showed you?
    a. captain
    b. mate
    c. crewmember
    d. NMFS personnel
    e. contractor
    f. other_____

42. How many safety drills were held while you were on board?
a. none
b. 1-2
c. 3-4
d. 5-6
e. >6

43. If safety drills were held, which of the following emergency situations were addressed?
a. man overboard
b. fire
c. collision or grounding
d. vessel flooding
e. loss of power
f. abandon ship

44. Were alcohol and/or drugs used by vessel personnel to a degree that you felt your safety was compromised?
a. yes
b. no

45. Were there any accidents aboard this vessel during your deployment which required emergency medical treatment or a medevac?
a. yes
b. no

46. How many crewmembers required emergency treatment or medevac during your deployment?
a. none
b. 1-2
c. 3-4
d. 5-6
e. >6

47. If emergency medical treatment was required, who performed it?
a. captain
b. mate
c. ship doctor or EMT
d. crewmember
e. observer
f. Coast Guard doctor or medic
g. other_____

48. Did you incur an injury while working on this vessel that required, or will require, a doctor's attention or medevac?
a. yes
b. no

49. Were there any accidents on this vessel during your deployment that resulted in a fatality?
    a. yes
    b. no

For the following questions circle the appropriate answer or answers. Some responses will require a written explanation in your logbook. If you have already dealt with NMFS Enforcement regarding any of these questions, note that in lieu of a detailed response.

50. Were you ever offered any monetary or other type of inducement to alter your data or routine?
    a. yes
    b. no

51. If yes, was it from vessel, plant or fishing company personnel or your contractor?
    a. vessel/plant/company
    b. contractor

Please document the details in your logbook.

52. What types of impediments were you subject to during your time on this vessel?
    a. verbal harassment
    b. physical harassment
    c. sexual harassment
    d. interference with sampling
    e. denial of access to equipment, personnel, vessel areas
    f. intimidation, threats, coercion
    g. biasing of samples
    h. refusal of reasonable assistance
    i. refusal to notify observer of haulback
    j. destruction/theft of property
    k. no impediments encountered

Please document details in your logbook.

53. How were your weekly catch messages transmitted?
    a. FAX from ship
    b. telex from ship
    c. radio to Kodiak Observer office
    d. radiotelephone (ship to shore)
    e. FAX from port
    e. telephone from port
    f. other_____

54. If you did not transmit your catch messages yourself, was there any difficulty in having them transmitted in a timely manner?
    a. yes
    b. no

Please document catch message transmission difficulties in your logbook.

55. Did the vessel maintain the Daily Cumulative Logbook or Daily Fishing Logbook in an accurate and timely manner?
    a. yes
    b. no
    c. don't know, didn't inspect

56. How did this vessel obtain their estimates of prohibited species discards?
    a. skipper/vessel personnel visual estimate
    b. skipper/vessel personnel actual counts/weights
    c. observer data
    d. none obtained

57. Were you asked to maintain any part of the vessel's Logbook?
    a. yes
    b. no

58. Did you maintain any part of the vessel's Logbook?
    a. yes
    b. no

59. Did you notice discrepancies between the vessel's Logbook and your own observations?
    a. yes
    b. no

60. If you noticed any discrepancies, did you try to find out the reason(s) for any differences?
    a. yes
    b. no

61. Were you ever denied access to the vessel Logbook?
    a. yes
    b. no

Please document in your logbook difficulties with the vessel Logbook, including discrepancies noticed and reasons for them.

62. Did you ever weigh sample units of product?
    a. yes
    b. no
    c. not applicable

63. If you used the ship's scales for your own weights, or for unit weights, did you check the calibration?
    a. yes
    b. no

Describe in your logbook any unit weight and/or scale comparisons.

64. Were you able to observe the normal handling of prohibited species when you weren't sampling?
    a. yes
    b. no

65. If you answered yes, how were prohibited species handled relative to when you were sampling?
    a. same (viability not changed)
    b. better (viability improved)
    c. worse (viability adversely affected)

66. How were prohibited species discarded?
    a. discarded at roller (hook-and-line vessel)
    b. discarded from trawl/fishing deck
    c. discarded whole from factory or sorting area
    d. discarded cut up from factory or sorting area

67. If this vessel delivered its catch, how were prohibited species sorted?
    a. all prohibited species sorted at sea
    b. partial sorting of prohibited species with some delivered
    c. no sorting prior to delivery

68. If this vessel delivered its catch, how did the processing plant or vessel dispose of prohibited species which were part of the delivery?
    a. returned to catcher vessel
    b. discarded into water by processor (plant or floater)
    c. disposition unknown
    d. prohibited species sorted out before delivery

Trawler observers only:

69. Were the holding bins flooded with enough water to enhance viability of prohibited species?
    a. yes
    b. no

70. How long, on average, were prohibited species held on board or in bins before being discarded?
    a. less than 15 minutes
    b. 15-30 minutes
    c. more than 30 minutes

Use this key for questions 71-74:
    a. never presorted
    b. presorted only when observer present
    c. presorted only when observer not sampling
    d. only prominent or large individuals presorted
    e. majority of prohibited species presorted
    f. presorting never observed

How much presorting of prohibited species occurred on deck as the net was being dumped? Circle all letters that apply.

71.	king crab	a.	b.	c.	d.	e.	f.
72.	tanner crab	a.	b.	c.	d.	e.	f.
73.	halibut	a.	b.	c.	d.	e.	f.
74.	salmon	a.	b.	c.	d.	e.	f.

75. Did you observe halibut being handled with pews/gaffs?
    a. yes
    b. no

Hook-and-line vessel observers only:

76. To remove halibut from the line, did the vessel utilize any hook stripping device ("crucifier")?
    a. yes
    b. no

77. If a gaff was used to remove halibut from the line, what method was most often employed?
    a. hook removed from fish with little or no damage
    b. gaff used as a crucifier - damage to mouth
    c. gaff used to pierce heads or flesh of fish

78. **All vessels:** did you observe large halibut being hoisted by a line tied around the caudal peduncle?
    a. yes
    b. no

79. Did you observe any retention or consumption of prohibited species caught by this vessel?
a. yes
b. no

Describe any additional information on prohibited species handling in your logbook.

80. Which of the following fisheries violations did you observe?
a. dumping netting or other plastics at sea
b. discharge of oil into the water
c. intentional taking of marine mammals
d. intentional killing of seabirds
e. none of the above

81. Did you advise any personnel about any fisheries violations or inform them of any observed fisheries violations?
a. yes
b. no

Please document in your logbook details of any observed violations and any actions you took.

Please write the answers to the following questions in your logbook.

1. Explain your choice for official total catch. If PRR's were used, explain how and why you chose them If observer estimate was used, how did you obtain an estimate for unsampled hauls or sets? Explain any formulas used.

2. Describe in detail how the observer estimate was made. What formulas were used? What densities were used? If no observer estimate was obtained, explain.

3. Describe in detail how retained weight was obtained. How was discard of the target species determined? If PRR's were used, explain your choice(s).

4. Why did you choose your particular sampling method(s)? Describe your sampling area and methods used to obtain data, including length frequencies. Describe any difficulties you had in trying to sample. How were discards treated? If you had a special project, explain how you completed it.

5. Summarize any safety concerns you had regarding this vessel. Be sure to include details from questions 28-49. Describe any injuries you or other crewmembers incurred, including fatalities.

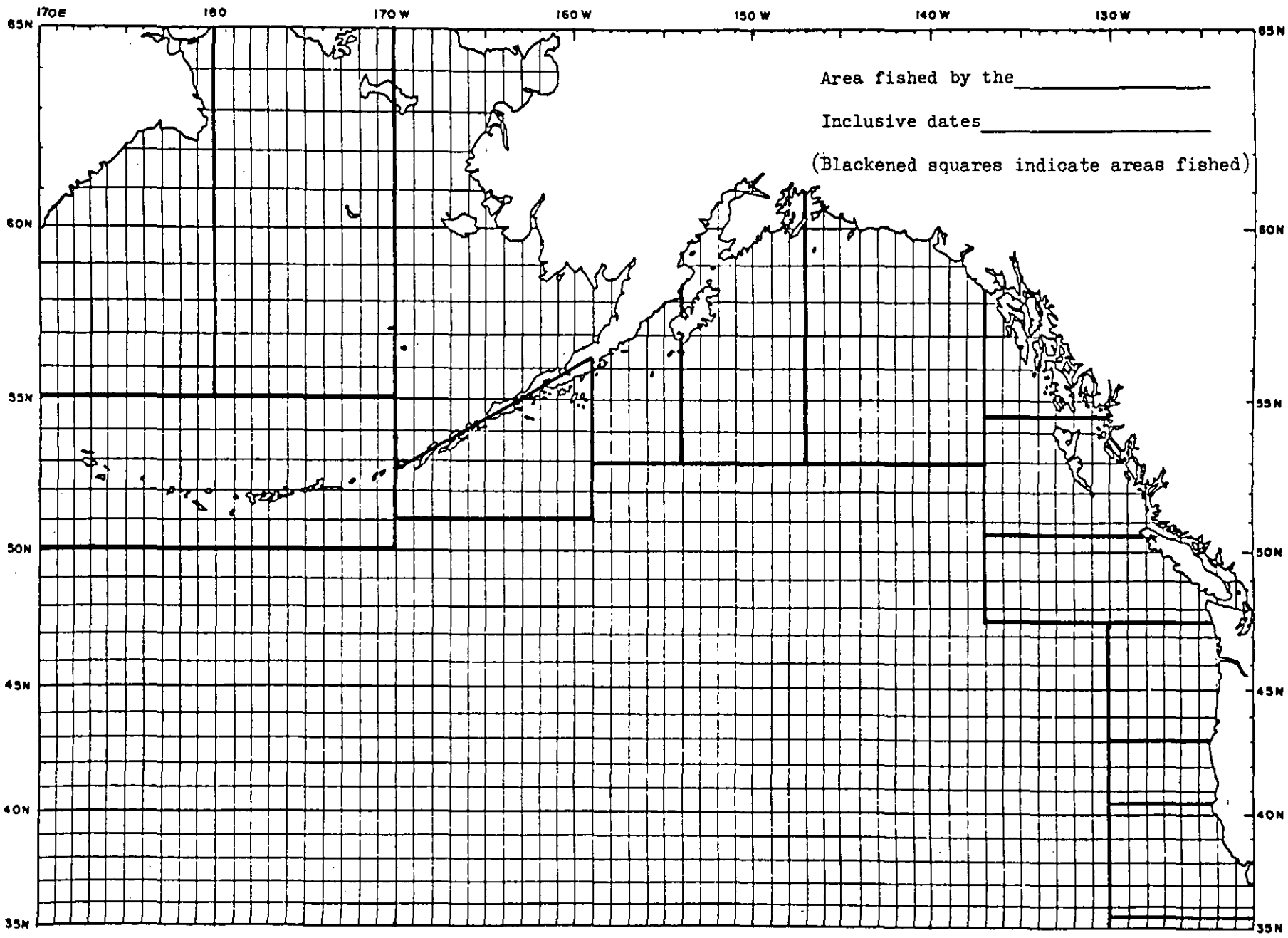
6. Describe anything unusual regarding the catches.

7. If this vessel fished in the Donut Hole or in any other areas outside the U.S. 200 mile limit, describe the amount of fishing activity, products, incidental catches of salmon, herring or marine mammals, etc.

8. Comment on the living conditions of this vessel such as general cleanliness, toilet and bathing facilities, availability and quality of food, or other unusual positive or negative aspect of life aboard.

9. What did you do, if anything specific, to help build good working relationships with the captain/crew? How were you treated? What were your quarters like? Indicate the numbers, ship status and sex of those with whom you shared quarters. Where did you do your paperwork? Were there any women in the crew?

10. Report anything you feel the Observer Program or NMFS Enforcement should know about this vessel. Were there any noteworthy comments or opinions (regarding the fishery, observers, NMFS, ADF&G, etc.) given by the captain/crew that you feel we should know?


170E
180
170 W
160 W
150 W
140 W
130 W
65N
60N
55N
50N
45N
40N
35N
Area fished by the_____
Inclusive dates_____
(Blackened squares indicate areas fished)

Bottom Trawl **Net Dimensions And Characteristics**

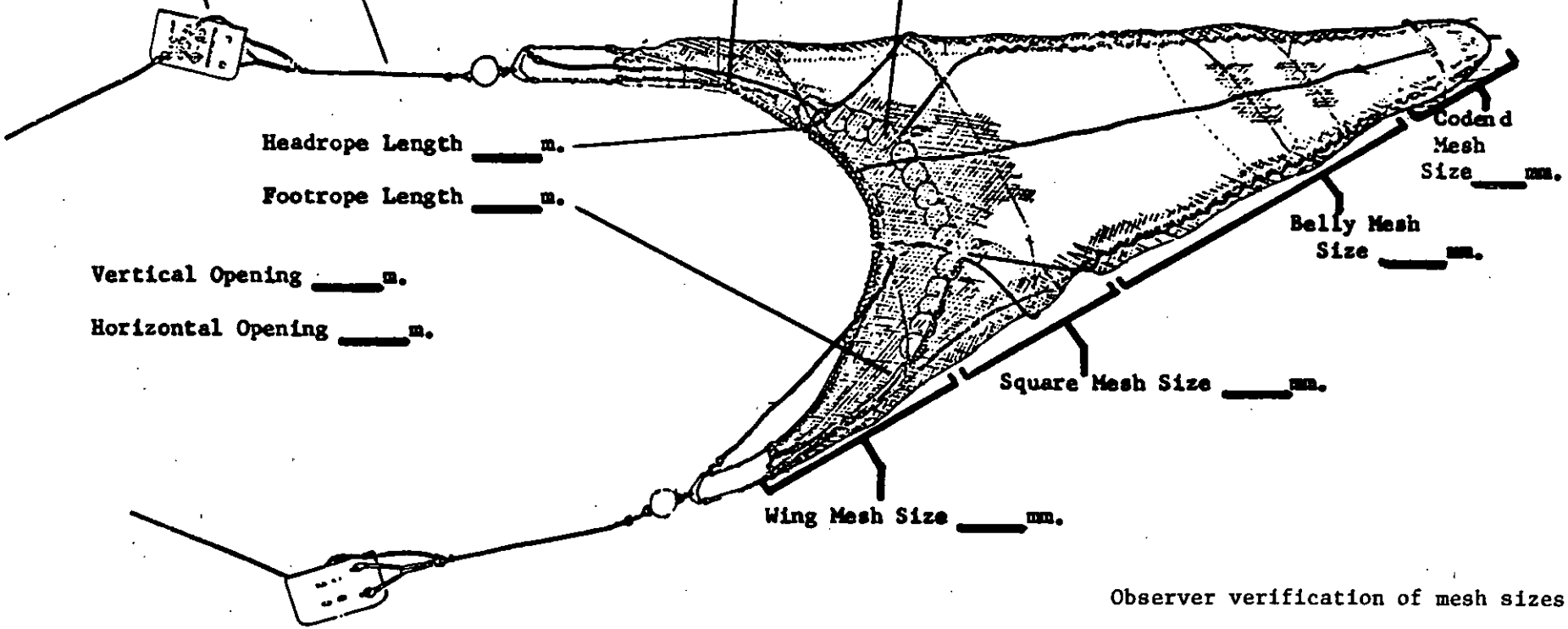
Vessel Type _____ Observation Period _____

Trawl Doors: Shape _____
Material _____
Dimensions _____m. x _____m.
Weight _____ kg

Dandyline Length _____ m.

Floats: Number _____
Size _____cm.
Material _____
Shape _____

Bobbins: Number _____
Size _____cm.
Material _____
Shape _____



Headrope Length _____m.

Footrope Length _____m.

Vertical Opening _____m.

Horizontal Opening _____m.

Codend Mesh Size _____mm.

Belly Mesh Size _____mm.

Square Mesh Size _____mm.

Wing Mesh Size _____mm.

Observer verification of mesh sizes

Yes_____ No_____

Fish Finder
Name _____
Model Number _____
Frequency _____kc.
Paper Type (wet or dry)
Speed of Advance _____

Net Recorder
Name _____
Model Number _____
Frequency _____kc.

PELAGIC TRAWL NET DIMENSIONS AND CHARACTERISTICS

Vessel Type _____

Observation Period _____

Wing section was composed of: (circle one)

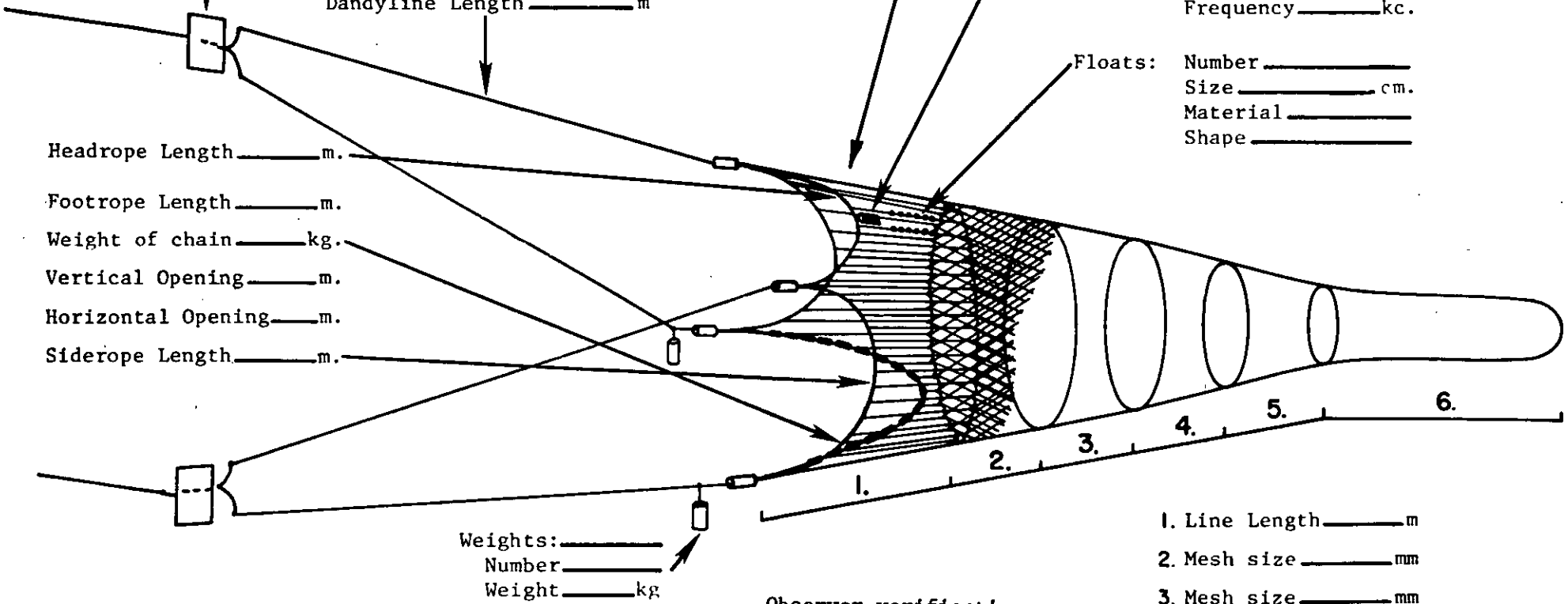
Trawl Doors: Shape _____
Material _____
Dimensions ____m. x ____m.
Weight _____kg.

Dandyline Length _____m

Rope lines (as illustrated)
Large mesh

Net Recorder: Name _____
Model Number _____
Frequency _____kc.

Floats: Number _____
Size _____cm.
Material _____
Shape _____



1. Line Length ____m
2. Mesh size ____mm
3. Mesh size ____mm
4. Mesh size ____mm
5. Mesh size ____mm
6. Codend mesh size ____mm

Net Length ____m.

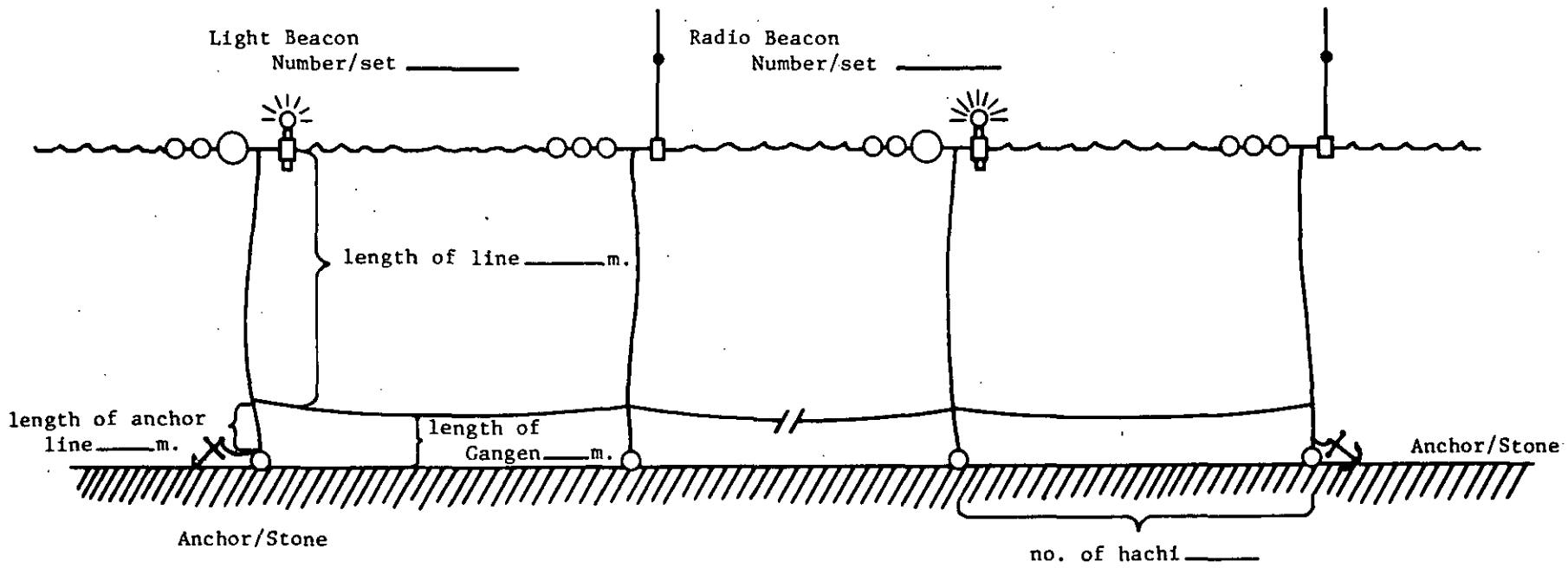
Fish Finder
Name _____
Model No. _____
Frequency _____kc.
Paper type: wet or dry
Speed of Paper Advance _____

Observer verification of mesh sizes:

Yes _____ Date _____
No _____

16

LONGLINE DIMENSIONS



Hachi Length _____

Average set Length _____ km.

Breaking strength of gangen _____

Average number hachi/set _____

Average number hooks/hachi _____

Hook size _____

HOW TO SURVIVE DEBRIEFING

Debriefing is a process, not a single event. It is as important to your job as the work you do at sea. It is the process during which your work is converted to data which is usable by the computer. It begins with an interview with a debriefer, which can last anywhere from 1 to 4 hours. During your interview, the debriefer will glance through your forms for obvious errors. If any are detected they must be fixed before you turn in your data. Once you have turned in your data it will be checked on a first come, first served, basis. The debriefers then look at each entry, each number, on each form. The forms will be sent to keypunchers whose job it is to enter numbers. Their job is NOT interpreting data. Because the data will be used in a computer the forms have a specific format and must be filled in correctly. If you try to be creative with your forms the computer will not be able to read the data properly and you may render your hard work worthless.

After a debriefer has pre-keypunch checked your data it will be returned to you along with a list of needed corrections. When you have made the corrections, resubmit your data and it will be double checked. The catch messages will be separated from the other forms and sent to the data entry people who will keypunch the entire set and run them through a computer program for comparison against the data you originally sent. This process takes about half of a working day. You have to return to debriefing after the comparison program is finished as it will indicate changes and errors that you need to correct. You are the only one who can make these corrections, as you were the only one out there taking the data. If the debriefer is satisfied with your corrections and you have checked in your gear, you have finished your job.

Why does debriefing take so long? Several factors contribute to the length of the debriefing process. These include, but are not limited to:

1. Observer preparedness
2. Number of vessels/plants sampled
3. Length of deployment
4. Number of other observers in debriefing
5. Amount of corrections to be made
6. How diligently and systematically you go through your data and make the corrections

In general the less experienced an observer, the more corrections are needed, especially over a long deployment. No promises will be made as to the length of your debriefing period. Be prepared to stay as long as it takes to get your data as close to perfect as possible.

PREPARATION

The most common complaints debriefers hear are, "No one told me I had to do this", and, "I thought I'd be done in five days". This information has been prepared to assist you before you get bogged down in post-cruise error corrections. If you use this section while at sea and review it as you check your data before a debriefing appointment, most of your problems will be solved. The most important thing for you to do is maintain a tolerant attitude

for all this that seems to you so "nitt-picky" but is essential for good data going into the NMFS data base.

1. While you are at sea, check your work on a regular basis. The cleaner your work is when you return the faster you will be finished with the debriefing process. Your manual should be your constant companion while you are doing paperwork. Do not assume that just because you did well in class that you remember everything that was taught. Consult your manual and be sure that you are right.

2. Use your logbook. In it you will want to keep notes, records, calculations, diagrams, etc. You can get a head start on your reports this way, and should questions arise during debriefing you will have a reference. When you first get on your ship look over the list of questions that you will need to answer in the reports. This way the questions will be fresh in your mind when you are doing the things that you will be describing later in your reports.

3. Your last catch message must have been received before an appointment for debriefing can be made at NMFS. The last catch message, if not sent from the ship should be sent before departing your port if you are returning to Seattle. Then, you will need these forms and reports completed when you come in for debriefing:

   For trawlers:
   Form 2US, 3US, 7US, and 10US, catch message forms A and B.
   Other forms you may have include:
   Any special project forms, 8 (PRR), 9US, and 11A.

   For longliners and pot vessels:
   Form 1US, 3US, 7US, and 10US, catch message forms A and B.
   Other forms you may have include:
   Any special project forms, 8 (PRR), 9US, and 11A.

   For plant samplers:
   Form A, 7US, 9US and 11A.
   Other forms you may have include:
   8 (PRR), 9US, or other plant observer special project forms.

   <u>All observers need to have:</u>
   Logbook: Inside the front cover (in ink) you need to put your name, your ship's and/or plant names (for all the ships and/or plants that you worked on), cruise number and vessel or plant code for each ship or plant, the dates you were aboard each ship or sampling at each plant, and your contractor's name. Do not write on the outside of the logbook.

   Reports, which need to include:
   Answers to the multiple choice and written Report Questions. Written answers must be typed or written neatly and legibly in ink (or if done in pencil, then a a clear, good phototcopy may be submitted). Proper English

grammer must be used, with complete sentences, and no undefined abbreviations or misspellings. All questions must be answered completely and in detail.

Map of areas fished
Gear diagrams
Factory/deck diagrams, sampling area diagrams.

Catch message information including:
All Catch Message Forms A and B

Species Identification forms
And, if applicable:
Salmon scale samples
Otolith collections
Specimen collection forms
Tagged fish forms

With the exception of the tagged fish form, and the final draft of your reports, all of these forms can be filled out while you are at sea. Keeping up with your work at sea becomes especially important if you are deployed on more than one vessel or plant. The speed with which you complete debriefing depends largely on your preparedness.

Data Preparation
(or how to make debriefing go faster and easier)

Going through your data is one of the most time consuming and tedious tasks that you will need to do but the following preparation will make processing your data much easier and will get you out more quickly. This is a list of things to do and to look for.

Check everything over carefully. If you make one correction be sure to think about what other data might be affected by the change and carry the correction through to the end. Some corrections have a ripple effect from form to form. One thing that often helps is to check your forms over in a new direction from the way in which you filled them out. In other words, check a set of data forms from back to front and check pages from the bottom to the top, rather than always starting at the beginning and from the top of the page. Doing this helps you see things in a different pattern and will help you see what you skipped over previously.

Be actively concentrating when you check over your data. If you get into a somewhat hypnotic state, which is very easy to do, you will miss mistakes. Take short, frequent breaks and do something else to relieve the boredom. Get familiar with the manual list of the most common mistakes. If you watch for these errors it will save you a lot of trouble. Be sure to consult your manual to find the answers to your questions. The debriefers are also available to answer questions.

Remember that if you were on more than one ship and/or plant that the data from each will need to be kept separate. Do not mix the data together; number the pages in sequence for each vessel/plant--NOT for your entire trip. In addition, changing over to a new year requires a

new cruise number, new page numbering, etc., even if you remain on the same vessel.

All Forms:

Put your name and ship's name on the first page of each type of form for each ship or plant.

Make sure the pages are numbered properly with no skipped numbers and no duplicate numbers. If you have a page with data on one side and blank on the other the blank page may have a page number or not at your discretion.

Every page needs to have a cruise number and a vessel code. Cruise numbers should be adjusted to the right and have no leading zeros.

Leading zeros should be present only for dates, times, and haul weights of zero weight (recorded as 0.00 on 2US) and prohibited species weights when that group was not found in the sample (record number as 0 and weight as 0.0 on 3US). No other numbers or weights should have a leading zero.

Every time there is a decimal point printed on the page there should be two decimal places written in behind it (the exception to this is the fishing speed on form 2US). If there is no decimal point printed on the page then you can put one or two decimal places at your discretion. Remember that every weight must have a decimal place and no numbers of fish can have a decimal place.

All arrows should be present and have the same number at the top and the bottom of the arrow.

Be sure that your handwriting is clear and readable. The data is punched by people who do not have any idea how the data is used and what should be on each form. They will, and often do, punch whatever they think they see.

One thing that will speed your trip through debriefing is for you to make notes on your forms. Notes should be made any time you have something that is a little bit odd or that might need some explaining. There is space on the top, bottom, and edges of the forms to make notes, so use it. The one thing to remember is to not put notes in data areas where they will get punched. These notes will enable the person checking your data, and people dealing with your data after you are gone, to read your note and understand what your data means without having to talk to you and have you explain it. Notes may include, but are certainly not limited to sub-samples, long fishing times, missing data that you could not obtain, and other items.

Form 1US & 2US:

The haul forms are often the ones with the most problems. Look them over carefully. Question anything that seems incorrect with the ships officers while at sea. Check Form 1US or 2US for:

An entry for every day, whether fishing or not. For non-fishing days at sea, make a note after the noon position giving the reason why the ship is not fishing. If the ship is in port, no noon position is required but do list the in-port days as well as the at-sea days. Record deliveries even if, due to a quick turn around, a vessel is able to fish, deliver and get back to fishing within one or two days and no coverage days are lost. These entries are the only cases where you may write notes within a keypunch area of a form.

No duplicate haul numbers.
Haul numbers in consecutive order. Haul number zero for all non-fishing days.
No missing data in a line, except possibly speed or observer total catch.
No decimals except those printed on the page. The exception is the average speed where you may write in a decimal. Depths must be rounded to whole numbers.
Positions for all hauls or non-fishing days.
No impossibly large changes in positions within small amounts of travel time.
No recorded minutes larger than 59.
No overlapping nets down and nets retrieved times.
Fishing durations greater than 100 hours must be recorded in the keypunch columns as 99 hours and 59 minutes with a note recording the real duration in the margin.
Retrieval times of 0000 are attributed to the next day.
Retained weights and official total catches recorded for every haul. Retained weight cannot be greater than official total catch.
An F or M for every depth recorded.
ADF&G areas for all hauls and any noon positions not in port.
Column 79-82 "Catcher boat's ADF&G boat #" and "catcher boat name" at the top is only to be filled in if your vessel was a mothership.

Form A Plant Sampling Summary:

Make sure that you have all mandatory information on the form. Check for durations, number of tows, all weights, positions or areas. Be sure to list the ADF&G boat numbers for your catcher boats. The main product should be listed on the front, other products on the back. All dates should be dates of delivery. If delivery dates do not coincide with plant logs and ADF&G fish tickets, make a note of the specifics in your log. The column for "Sorted Y/N" applies only to the sorting at sea of the targeted species, not to the discarding of unwanted or prohibited species. If there is sorting of the target species at sea, there should be an entry under "weight of sample species discarded at sea". The weight of the sample species delivered should be the weight of the delivered catch, not whatever arises on the fish ticket.

Form 3US:

Be sure that there are:

Species names which match your species codes. Codes are not the catch message species report group codes.
No duplicate species codes unless used in designating female and male prohibited species.
Sex designations for all of the prohibited species, and for no other species.
Entries for each of the prohibited species groups, Tanner crab, king crab, Pacific halibut, and salmon, for every sample whether they were seen or not.
Weights for every number of fish and a number of fish for every weight listed. The only time zeros should be recorded for either is when a prohibited species group was not found in your sampled haul.
A "1" in the number column for miscellaneous items, species code 900, no matter what the weight.
Sample types in descending order of size listed for every species.

At least one decimal place behind a distinct decimal point for every weight.
Haul weights in kg, sample and species weights in kg.
Necessary calculations and sub-sample data recorded at the top of the page.
Keypunch check sums at the column tops.
Viability data for halibut when seen, never salmon, crab viability only when assigned. No zeros in viabilities or viability totals.
Form 4 (molting crab special project form):

Form 4 is for crab molt only. Do not use this form for any other reason. Be sure to include a note explaining what criteria you used to determine hard and soft shelled crabs on the first page. If you checked crab molt for any species other than Red King crabs and Bairdi Tanner crabs, cross it out but don't erase the data--it might be usable sometime in the future.

Form 7US:

On this form there must be:
Matching species codes to species names.
Species name, species code and haul number for every line of data.
No species with a greater total number listed than is on the 3US form in whole haul sampled data.
No decimal places in lengths.
Keypunch checks summing each number on the line.
Lengths recorded in ascending order. No lengths with a frequency of zero.
All crab units of measurement ending in a "3" or an "8".
Sex codes recorded for every species, every line. Halibut always have a sex code of "U".
Dates matching haul retrieval dates for all vessel observer data. Dates match delivery dates for all plant observer data.

Form 9:

Check for:
Specimen type, sampling system entries in the heading line.
Only one area per page.
No comments or numbers in "total no. of specimens" or "catalogue date" or "remarks" section. These are for otolith or scale readers only.
Weights and lengths that make sense in relation to each other.
All specimens have a haul number, a specimen number, a sex, a length, and a weight.
Each species must be grouped separately with separate page sequences (1 through whatever, for each species). No pages with one species on the front and another on the page back.
No duplicate specimen numbers for the same species.
Lengths must also be recorded on the 7US.

Form 10US:

Form 10US is mandatory for all cruises except plants. Be sure to have one filled out for each vessel before you hand in your data. Be sure that the dates match up to the hauls on

your 1US or 2US and that the data you have entered is correct. If a marine mammal was caught, lethally removed or deterred, be sure to write a species description that is complete and can be used to identify the animal. You need to add as much information as you can gather. Form 10US should only be used for marine mammals that are harrassed or caught in the fishing operation. All sightings of marine mammals should be on form 11A, not on the 10US.

Form 11A:

Again make sure that you have filled in all of the pertinent information. On this form type, note that:

Boxes without an asterisk in front of them must be filled in. Usually missed are the estimated numbers and the tens of meters boxes.

Time system on form may be ALT or GMT. Make a notation defining the time system you used.

Write very detailed descriptions of the characteristics you used to identify the animal on every page of 11A. These pages may be separated so one good description is not sufficient. Descriptions of behavior, color patterns, size and age, and drawings (however rough) are all essential to verify your mammal identifications.

Catch Message Forms A and B:

Almost everyone forgets to go back and recheck their catch messages, and they are consistently one of the main areas of problems for people in debriefing. Read the instructions carefully and follow them. Check for these potential errors:

Page numbers per week and total pages are correct. Pages are numbered per week by how many pages are sent per transmission. Total pages in the upper right corner are consecutive numbers of all the pages of CMA and CMB together for the entire cruise on that vessel (not separated by region, processor delivered to, or form type).

All columns of entry are "zero filled".

Week ending dates are always Sunday dates.

You have re-read the definition of "coverage days" while at sea, and if you observed aboard a catcher boat, you have checked your coverage days entries with a NMFS staff member.

CMA Form Check:

Species are grouped correctly, correct groups for the region are used.

Species weights are transcribed correctly from the 3US and correctly summed for groups with more than one species in them.

Prohibited species groups are listed on Form CMA ONLY if they appeared in the species composition sample. This occurs only when there is one sample type for all species in the haul.

Coverage days are whole numbers only and not separated by region or processor delivered to. Arrival into port is one whole day of coverage even if arrival time was early in the day. Coverage days might be greater than 7 if the vessel is a shoreside delivery ship. Midnight to midnight twenty four hour periods sitting in port or tied to a processor are not coverage days.

Percentage retained is entered for every species group found, for each haul.
The sum of the species group weights exactly matches the sample weight.
Multiple pages of a report week for the same region fished and processor delivered to have the same heading for species groups and group codes.

CMB Form Check:

ALL prohibited species groups must have entries of sample weight and then data or zeros on each line of the CMB form. Zeros are listed under the number and/or weight columns if fish or crabs are not seen.
Sample weights are listed for each separate group.
Species groups weights should not have more than two places behind the decimal.
Sample weight in kg. for each prohib. group should be to three decimal places.
"MM CODE" cannot be left blank if the vessel is a trawler or mothership and the haul was monitored for marine mammals (as indicated on the 2US). This column must have an "N" entered in it if none were found. Longliners or pot vessels do not fill out this section.

Write in the page number totals per form type in the upper right corner. Put all changes and corrections to the CMA and CMB forms in RED with an asterisk or circled in red.

Cross Checking:

A very important part of doing your data is cross checking one form to other forms that have the same data. Often we find problems with hauls listed on different days on some forms than they are on the haul forms. The haul date must match up to the day when it was brought on board the ship (for normal vessel data) or when it was delivered to the plant (for plant observer data), not necessarily on the day when you did the work. Observers on motherships: 1) have all of their forms EXCEPT the catch message forms by retrieval date. 2) Catch message forms A and B are grouped by delivery dates. 3) If you kept two sets of 2US forms while at sea, grouping hauls the two ways, turn in both sets to your debriefer.

If you have salmon you will need to match the weight data on the 9US to the weights on the 3US. There should be no salmon taken from outside your sample. The lengths on your form 9US should match lengths on your form 7US for the same species in the same haul. You might have more salmon or otolith species on your form 7US, but all of the lengths on form 9US should be present on the 7US.

If you took otoliths be sure that the haul numbers for the otolith collection correspond to the hauls from which you took lengths on your 7US. If you took your otoliths from outside your length frequency sample you will need to talk to a debriefer about how it should be handled. Do not mix species or areas on a page.

Reports:

Reports are a written synopsis of your activities at sea. They should be complete with good detail and be easy to follow. Remember that one of the main reasons for the reports is for first time observers, or observers who have never been on your boat, to read. Your reports

should contain enough detail such that any person, even somebody who has never seen a fishing ship in action, can follow what you are saying and understand how you did your work on your ship or in your plant.

The questions that you should answer are in the preceding manual section: Domestic Observer Reports. If one of the questions does not apply to your situation, state that in a complete sentence. All pages of the reports including diagrams, maps, and other pages need to be in ink or photocopied. Pencil is not acceptable as it tends to disappear over time.

THE DEBRIEFING PROCESS

When your last catch message has been turned in and you have all your data and reports completed let your contractor know so that your debriefing interview can be scheduled. DO NOT schedule debriefing before these are completed; it will NOT save time. On the contrary, it sometimes means a longer debriefing period. Upon arriving in the city in which you will debrief (Seattle, Kodiak, or Dutch Harbor), the following items must be taken care of:

1. Sign up in the debriefing office for a gear check-in appointment. Your gear must be cleaned (for a white glove test) and all gear which is still usable must be repaired and oiled if necessary **before** the check-in appointment time. If you have any questions about what is still usable ask a gear person (your debriefer can put you in touch with them).

2. If you have had an injury at sea, inform your contractor and a debriefer who will direct you to fill out an Injury Report. Even if you think that the injury is fairly minor this is something that you must do in order that we have a record verifying that your injury occurred while you were on the job. Without this record your contractor will not pay the doctor and you will end up paying for the bills out of your own pocket.

3. Any catch messages not sent should be submitted as soon as possible. Turn them in at NMFS in Seattle.

4. Fill out a cover slip for salmon scale samples. You will need one slip for each species. Up to 6 of each of the non-Chinook samples (zone A) and 3-4 of the Chinook samples need to be mounted in re-sealable plastic bags with the scale envelope attached to the outside of each bag. Scales must be separated, not clumped in the plastic, for identification. In Seattle you can ask your debriefer for the instructions and mounting materials.

5. Make sure otoliths or other special projects are in order. Otolith vials need to have enough solution in them to cover the otoliths. Vials need to be grouped in groups of ten vials (1-10, 11-20, etc.) and the end of the box marked properly. Instructions can be obtained from the debriefing staff.

6. Complete all tagged fish and specimen collection forms.

IF YOU HAVE QUESTIONS REGARDING ANYTHING, ASK A DEBRIEFER!

Gear Check-In

In Seattle, the gear check-in procedure occurs two or three times each week. Check the sign up in the debriefing office to find a day that will work for you. You should arrive at least three hours before, or the day before, the check-in time to begin cleaning your gear. Wear work clothes. Gear check-in can be an all day process.

It is expected that all gear be clean and laid out on the black counter in the Wet Lab (Rm. 1067) for inspection at the scheduled time. Failure to meet this expectation will result in delay of your gear check-in to the next scheduled time. Even if the gear was cleaned in the field, it will still need to be re-cleaned before check-in. Gear becomes dirty from airplane rides, storage on vessels, and in other ways.

Because of the large amount of equipment stored in the gear room, it doesn't take many fish scales etc. to make the gear room and surrounding areas very smelly. One of the most difficult items to clean are the baskets. These will be scrutinized very closely and therefore will require a good deal of scrubbing. Corners and crevices should be given special attention. Rain gear will go to the laundry after it has been checked so it will only require minor cleaning. Be sure to read the instruction posters on the wall in the Wet Lab for other specifics about cleaning gear. Improperly cleaned gear will result in frustration and additional cleaning so it is best to do a thorough job the first time.

Once checked, all observers who checked in gear that day are responsible for cleaning the Wet Lab thoroughly including all counters, cabinet doors and the floor. This will also include cleaning the metal scrub table and includes drying it with a squeegee. Any questions that may come up about this procedure can be asked of the Gear Manager.

The Interview

During your interview the debriefer will ask questions about everything you did during your deployment. The most important aspects of the interview are honesty and a willingness to discuss problems and difficulties. We want your data to be perfect, but if you withhold information that is not possible. We also need to know the feasibility of sampling on the various vessels and plants. Observers are our only sources for this kind of information. If you don't feel that you were able to sample adequately don't cover up the fact; tell us so that we can help the next observer.

Affidavits

Observers who witness fisheries violations will be instructed during debriefing in how to write affidavits. These are formal legal statements, so if you encounter violations they must be well documented in your logbook and supported by your data. If you are required to write an affidavit remember to write it in formal language and add precise details. The most typical error in writing affidavits is not adding the necessary details that are required. You may or may not be contacted at a later date regarding your affidavits.

Decertification

Decertification is something most observers need not worry about. It is reserved for extreme cases, and each case is considered individually. Decertification may be based on a single incident or on a combination of many factors. Conduct, attitude, professionalism, and even common sense all come into the picture when decertification is a possibility. If you conduct yourself in a professional manner, make an honest effort, and remember that you are hired to do biological sampling, decertification is not something that should be a concern to you.

Final Note:

Remember that the amount of time spent in debriefing depends largely on you. If you don't take the time to check your data carefully it will cost you more time later in the process than you saved initially. If you take the time before turning in your data to make sure it is neat, complete and correct, you will save everyone time later on. The people who are done the quickest and with the least pain are the ones who go through their data carefully and methodically the first time so that they have fewer errors to correct later. The debriefers have a given set of criteria that they try to meet with each set of data, and your debriefing will not be finished until your data meets those criteria. Debriefing involves a lot of work, but it is necessary in order that your hard work at sea is translated into useful data.

APPENDIX

THE 43 MOST COMMON MISTAKES ON DATA FORMS 2
TABLE OF EQUIVALENTS 4
Conversion of Pounds to Kilograms 4
HALIBUT LENGTH TO WEIGHT TABLE 5
OBTAINING INFORMATION ON PRODUCT RECOVERY RATES 7
Worksheet For Product Recovery Rate and Unit Weight Tests 9
FORM 8US - PRODUCT RECOVERY RATES 10
LIST OF ALASKA PRODUCT TYPES 12
NMFS PRODUCT RECOVERY RATES 13
NMFS REPORT GROUP CODES FOR LOGBOOKS AND CATCH MESSAGES 14
TAGGED FISH AND CRAB 15
HOW TO SEX FISH 17
LENGTH MEASUREMENTS FOR VARIOUS SPECIES 20
OTOLITH AND SCALE COLLECTION FOR SELECT SPECIES 22
LOCATION OF PREFERRED SCALE SAMPLING ZONES 24
HOW TO COLLECT FISH 25
Specimens Needed For Teaching Collection 26
Specimen Collection Form 27
MARINE MAMMAL SPECIMEN COLLECION PERMIT 33
HOW TO MEASURE MESH SIZE 36
HOOK SIZE CHART FOR LONGLINERS 37
ADVICE TO WOMEN GOING TO SEA 38
RADIO COMMUNICATIONS 41
MEDICAL DIAGNOSTIC CHART (MDC) 46
CPR INSTRUCTION SHEET 52
HELICOPTER EVACUATION SHEET 53
PREVENTING BACK INJURIES 54
MAP OF NOAA WESTERN REGIONAL CENTER 55
MAP OF OBSERVER PROGRAM FACILITIES 56
CHARTS OF ALASKAN PORTS 57
Dutch Harbor 57
Kodiak 58
Seward 59
GLOSSARY 60

THE 43 MOST COMMON MISTAKES ON DATA FORMS

Form 1US, or 2US:

1. Latitude, longitude, or on/off bottom time recorded with greater than 60 minutes.
2. Using 2400 for time instead of 0000.
3. A haul retrieved at 0000 attributed to the previous day.
4. Not putting the noon position under "Trawl Position" on non-fishing days.
5. Overlapping haul times; overlapping on and off bottom times of one haul or between hauls.
6. Recording catch weight to more or less than two decimal places.
7. Positions that are too far from the previous position to be plausible during the time recorded--the ship could not travel that fast.
8. Leaving haul number blank on non-fishing days is incorrect; enter a zero.
9. Missing ADF&G area codes on non-fishing days.
10. Location I.D. omitted.
11. No location listed at all -- you should go back to the fishing log and look up the position, or if it's too late for that, interpolate one from the positions before and after the missing one.
12. Fishing depth and/or bottom depth listed without the accompanying F/M identifier and fishing depths deeper than bottom depths.

Form 3US:

13. Numbers and/or weights don't add up correctly, do check your math!
14. Species code listed without data accompanying it.
15. Species code doesn't match written name.
16. Species code 900 with a quantity greater than 1.
17. A species listed under more than one sample type.
18. Decimal point not included in every weight figure.
19. A weight listed without a number.
20. Not having each of the four prohibited groups represented for each sampled haul/set.
21. Recording weights to > two decimal places--the computer won't accept them.
22. Viability entries not summed on the 999 line.
23. Haul number doesn't match the date (as listed on Haul Form).
24. Whole-haul sample weight doesn't equal 2US figure for OTC.
25. Not skipping a line between sample types.
26. Recording a fish species that is out of it's normal range or normal depth. (Bring back a specimen for verification if this is the case.)

Form 7US:

27. Data by haul not entered in haul number order.
28. Summations incorrect! (Recheck and double-check your math!)
29. Reversing the size group and the frequency.
30. Haul numbers and dates don't match the haul form.
31. Putting estimated lengths on Form 7.
32. Lengths off by 10 cm. (Write in the 10's values on the plastic strip!)
33. Crab measurements not to nearest 5 mm, size group entries do not end with digit 3 or 8.

34. Not writing weights out to two decimal places. Do include trailing zeros!
35. Not grouping sexes together.
36. Numbering pages by area instead of by species.
37. Not separating the otolith collections taken on different boats. (See "General Instructions for Data Forms" section in your manual.)
38. Duplicate otolith or scale number within one species collection.
39. An otolith or scale number is skipped without any note as to why.

Form 10US:

40. Not filling them out.
41. Not filling them out for each haul monitored or viewed.
42. Writing in hauls not actually sampled--using crew information to fill out the form. (The entries on the front of Form 10 should only be of hauls the observer actually viewed or sampled.)

For All Forms:

43. Haul and/or set numbers not matching dates.

TABLE OF EQUIVALENTS

metric ton = 1000 kg = 2204.6 lb
meter = 100 cm = 1000 mm = 3.2808 ft = .54681 fathoms
foot = .3048 meter = .1667 fathoms, 6 feet = 1 fathom = 1.829 meters
1 inch = 2.54 centimeters, 10 millimeters = 1 centimeter = 0.3937 inches
nautical mile = 1.15078 miles (statute mile) = 1 minute of latitude
statute mile = 5280 ft = 1.609 km
1000 meters = 1 km
1 liter = 1.0567 U.S. quarts
$F^{\circ} = (1.8 \times C^{\circ}) + 32$, $C^{\circ} = 5/9(F^{\circ} - 32)$

Conversion of Pounds to Kilograms (0.5 - 100 lb.)

lb	kg	lb	kg	lb	kg	lb	kg
.5	.2	19.0	8.6	47.0	21.3	75.0	34.1
1.0	.5	20.0	9.1	48.0	21.8	76.0	34.5
1.5	.7	21.0	9.5	49.0	22.2	77.0	35.0
2.0	.9	22.0	10.0	50.0	22.7	78.0	35.4
2.5	1.1	23.0	10.4	51.0	23.2	79.0	35.9
3.0	1.4	24.0	10.9	52.0	23.6	80.0	36.3
3.5	1.6	25.0	11.4	53.0	24.1	81.0	36.8
4.0	1.8	26.0	11.8	54.0	24.5	82.0	37.2
4.5	2.0	27.0	12.3	55.0	25.0	83.0	37.7
5.0	2.3	28.0	12.7	56.0	25.4	84.0	38.1
5.5	2.5	29.0	13.2	57.0	25.9	85.0	38.6
6.0	2.7	30.0	13.6	58.0	26.3	86.0	39.0
6.5	3.0	31.0	14.1	59.0	26.8	87.0	39.5
7.0	3.2	32.0	14.5	60.0	27.2	88.0	40.0
7.5	3.4	33.0	15.0	61.0	27.7	89.0	40.4
8.0	3.6	34.0	15.4	62.0	28.1	90.0	40.9
8.5	3.9	35.0	15.9	63.0	28.6	91.0	41.4
9.0	4.1	36.0	16.3	64.0	29.1	92.0	41.8
9.5	4.3	37.0	16.8	65.0	29.5	93.0	42.3
10.0	4.5	38.0	17.3	66.0	30.0	94.0	42.7
11.0	5.0	39.0	17.7	67.0	30.4	95.0	43.2
12.0	5.4	40.0	18.2	68.0	30.9	96.0	43.6
13.0	5.9	41.0	18.6	69.0	31.3	97.0	44.1
14.0	6.4	42.0	19.1	70.0	31.8	98.0	44.5
15.0	6.8	43.0	19.5	71.0	32.2	99.0	45.0
16.0	7.3	44.0	20.0	72.0	32.7	100.0	45.5
17.0	7.7	45.0	20.4	73.0	33.1		
18.0	8.2	46.0	20.9	74.0	33.6		

HALIBUT LENGTH TO WEIGHT TABLE

Length (cm)	Kilograms	Length (cm)	Kilograms	Length (cm)	Kilograms
10	.007	55	1.821	100	12.635
11	.010	56	1.930	101	13.049
12	.013	57	2.045	102	13.472
13	.017	58	2.163	103	13.905
14	.022	59	2.286	104	14.347
15	.027	60	2.414	105	14.799
16	.033	61	2.547	106	15.260
17	.040	62	2.685	107	15.731
18	.049	63	2.828	108	16.213
19	.058	64	2.976	109	16.705
20	.069	65	3.129	110	17.206
21	.080	66	3.288	111	17.718
22	.094	67	3.452	112	18.240
23	.108	68	3.621	113	18.773
24	.124	69	3.801	114	19.317
25	.141	70	3.978	115	19.871
26	.161	71	4.165	116	20.437
27	.182	72	4.358	117	21.013
28	.205	73	4.558	118	21.600
29	.229	74	4.763	119	22.200
30	.255	75	4.975	120	22.810
31	.284	76	5.193	121	23.431
32	.315	77	5.417	122	24.065
33	.348	78	5.649	123	24.710
34	.383	79	5.887	124	25.366
35	.421	80	6.132	125	26.035
36	.461	81	6.384	126	26.716
37	.504	82	6.642	127	27.409
38	.550	83	6.909	128	28.115
39	.598	84	7.182	129	28.832
40	.649	85	7.463	130	29.563
41	.715	86	7.751	131	30.306
42	.760	87	8.046	132	31.062
43	.820	88	8.350	133	31.831
44	.884	89	8.661	134	32.613
45	.950	90	8.981	135	33.408
46	1.021	91	9.307	136	34.216
47	1.095	92	9.644	137	35.038
48	1.172	93	9.987	138	35.874
49	1.253	94	10.340	139	36.723
50	1.337	95	10.700	140	37.586
51	1.426	96	11.070	141	38.463
52	1.519	97	11.447	142	39.354
53	1.615	98	11.834	143	40.259
54	1.716	99	12.230	144	41.178
				145	42.111

HALIBUT LENGTH TO WEIGHT TABLE

Length (cm)	Kilograms	Length (cm)	Kilograms	Length (cm)	Kilograms
146	43.060	188	97.388	230	187.745
147	44.023	189	99.109	231	190.402
148	45.000	190	101.095	232	193.085
149	45.993	191	102.829	233	195.795
150	47.001	192	104.576	234	198.531
151	48.024	193	106.359	235	201.293
152	49.062	194	108.155	236	204.081
153	50.115	195	109.972	237	206.897
154	51.184	196	111.810	238	209.739
155	52.269	197	113.668	239	212.607
156	53.370	198	116.003	240	215.503
157	54.486	199	117.450	241	218.426
158	55.618	200	119.373	242	221.376
159	56.767	201	121.318	243	224.354
160	57.932	202	123.284	244	227.359
161	59.113	203	125.273	245	230.392
162	60.311	204	127.283	246	233.452
163	61.526	205	129.316	247	236.541
164	62.757	206	131.371	248	239.658
165	64.005	207	133.448	249	242.803
166	65.271	208	135.548	250	245.977
167	66.553	209	137.671		
168	67.830	210	139.817		
169	69.170	211	141.985		
170	70.505	212	144.177		
171	71.858	213	146.392		
172	73.229	214	148.631		
173	74.617	215	150.893		
174	76.024	216	153.179		
175	77.448	217	155.489		
176	78.891	218	157.822		
177	80.353	219	160.180		
178	81.833	220	162.562		
179	83.332	221	164.968		
180	84.850	222	167.399		
181	86.387	223	169.854		
182	87.943	224	172.334		
183	89.518	225	174.840		
184	91.113	226	177.370		
185	92.727	227	179.925		
186	94.360	228	182.506		
187	96.014	229	185.112		

OBTAINING INFORMATION ON PRODUCT RECOVERY RATES

A recovery rate represents the proportion of the organism that is used in the factory products. The recovery rate is also referred to as the "product recovery rate (PRR)" or the "recovery ratio". Recovery rates can be used in estimating the weight of a catch from the tonnage of products produced from that catch by using the following equation and then adding discard weight, if any.

$$\frac{\text{Product Weight}}{\text{Recovery Rate}} = \text{Whole Weight (before processing)}$$

Recovery rates are commonly expressed as a percent or as a ratio. Headed and gutted cod may have a recovery ratio of .62 to 1, or 62% recovery, while fish frozen whole would have a recovery ratio of 1.00 to 1, or 100% recovery. A **conversion factor** is a number which can be multiplied times the product weight to obtain the round weight (whole weight of the fish). A conversion factor **is always greater than 1** (for example, the conversion factor of surimi weight to pollock weight may be 4.5). To convert a conversion factor to a recovery rate, divide the number 1 by the conversion factor.

A wide range of recovery rates are used to describe the utilization of different species in a variety of products. The type of processing, the size of the fish, the area and season of the year, the experience of the processing crew, and the vessel type may all have a bearing on the recovery rate of a particular species. Since there is a need to update the recovery rates currently being used by data managers, observers are asked to record the rates used on their vessels, and if possible, to run tests to determine recovery rates on their own.

To determine your own recovery rates for particular products, you must observe the following procedures: First of all, you would obtain a sample of the fish that are waiting to be processed. **They should be sorted to species and be of the size and condition of those that are normally processed in one particular way.** For example, in order to obtain the recovery rate for roe from pollock, select a basket of roe-bearing, female pollock of the sizes normally used. However, within any species/size category, your sample should be taken at random. Weigh the sample of whole fish before processing, this would be called the "whole weight", "fresh weight" or "round weight". Have these fish processed by the factory crew as usual, then weigh the resulting product. The weight of the product divided by the weight of the fish before processing is the recovery ratio.

$$\frac{\text{Product Weight}}{\text{Fresh Weight}} = \text{Product Recovery Rate}$$

Actually there are two sampling approaches possible. In method A, as explained above, the observer collects a sample of fish, has those same fish processed and weighs the resultant product of those fish. This method is preferred over method B, particularly where the number of samples and the sample size (number of fish per sample) is limited. In method B, the observer weighs a sample of fish waiting to be processed for a particular product as before. The observer then collects products from the same **number** of fish but not necessarily the **same** fish. For example, if you weighed 60 fish in the round, destined for fillets, 120 fillets would need to be weighed. (The products weighed should be from the same catch of fish.) Method

B approaches the accuracy of method A when samples are large and there are several repetitions. Method B has the advantage of being easier to perform (less interference with the processing line) and as product to be sampled cannot be predicted by the processors, intentional bias can be avoided. There is one acceptable variation on either Method A or B. In many factories, the factory manager will conduct their own product recovery testing. If they follow the same procedures described here, and you can witness (or assist with) the entire procedure and record the weights for yourself, this is an acceptable method of obtaining your data.

It would be very difficult for an observer to determine the PRR of such products as surimi and fish meal, so it is not expected. However, if the observer were able to run a test on the recovery rate of surimi, it would be very important to fully document the procedure in the logbook. The guidelines for conducting PRR tests are outlined on the worksheet below. Record only the "lowest" PRR test value and the "highest" PRR test value and the lowest and highest unit weight test values on the Form 8 itself. This will provide a range of PRR and unit weight values for each product by area/month/vessel-type designation. (For more complete information, refer to the Form 8 instructions that follow.)

Worksheet For Product Recovery Rate and Unit Weight Tests

Product Recovery Rate Tests:

1. Run PRR tests primarily on target species
2. Run PRR tests on secondary products as possible
3. Each PRR test will consist of three replications of 50 fish each.

Species: _____ Product: _____

Sorting Criteria: _____

Date: ____/____/____/ Haul No.: _____
Mo. Day Yr.

Test #	No. of fish	Product wt.	÷	Whole wt.	=	PRR

Date: ____/____/____/ Haul No.: _____
Mo. Day Yr.

Test #	No. of fish	Product wt.	÷	Whole wt.	=	PRR

Date: ____/____/____/ Haul No.: _____
Mo. Day Yr.

Test #	No. of fish	Product wt.	÷	Whole wt.	=	PRR

UNIT WEIGHT TESTS:

1. Run unit weight tests at least twice per cruise for the major products and once per cruise for minor products.
2. Each test should consist of weighing at least 10 units.

Unit Type	No.of Units Sampled	Total Wt.	-	Container Wt.	=	Unit Wt.

Average =

FORM 8US - PRODUCT RECOVERY RATES

This form is to be filled out with the product recovery rates that the ship or processing plant personnel are using, and the recovery rates that the observer has obtained through their own tests. Points to note about Form 8:

1. Enter the year and month (columns 10 - 13) in which the information was obtained and for which the data applied.

2. Likewise, enter the code for the area in which you collected your own recovery data and the area for which the vessel data applies.

3. Use a separate sheet for each area, month, vessel or plant sampled.

4. Write the name of the species or species group which is processed and its appropriate code (columns 17 - 19) from the species code list used for Form 3US. Observer-determined recovery data should be listed by each particular species, but figures supplied by vessel personnel are often applied to a group of species. "Unidentified fish" (code 901) may be used for the categories of fish and fish waste turned into fish meal and fish oil. Other possibly useful codes are flatfish unidentified (code 100), turbot unidentified (143), and rockfish unidentified (300).

5. Describe the product and enter the matching product code in columns 20 - 21 (see "List of Alaska Product Types" on a following page.) If in doubt of the appropriate code, draw a picture and take detailed notes describing the product. Discuss the unidentified product with the debriefer upon your return. Record only those products which were actually produced while you were aboard.

6. Indicate in column 22 whether the rates were determined by sampling Method A (products from the **same** fish are weighed after processing), or Method B (products from the same **number** of fish are weighed after processing).

7. Columns 23 - 29 are for the fresh weight of your sample fish before processing, to two decimal places, for each test you do. This weight can be in either pounds (LB) or kilograms (KG) which is indicated in columns 30 - 31.

8. Columns 32 - 38 are for the product weight, to two decimal places, for each test you do. This weight can be in either pounds (LB) or kilograms (KG) which is indicated in columns 39 - 40.

9. Enter, to two decimal places, the recovery ratio you calculate in columns 41 - 43 and the ratio used by the vessel or plant personnel in columns 44 - 46. If the vessel or plant personnel uses different values based on area, time, size of fish, etc. then use the value they are using at the time you do PRR testing or data gathering.

FORM 8US - PRODUCT RECOVERY RATES

PAGE _____ OF _____

CRUISE NUMBER	1	2	3	4	5

VESSEL CODE	6	7	8	9

YEAR	10	11

MONTH	12	13

AREA	14	15	16

1. Leading zeros in columns 12 only
2. List sample weights and product weights to nearest hundreth of a kilogram (example 48.30).
3. List % recovery (PRR) as decimal to the hundreths place (example .45).

SPECIES NAME	SPECIES CODE			DESCRIPTION OF PRODUCT	PRODUCT CODE		OBSERVER DATA						VESSEL DATA
							A/B	SAMPLE WEIGHT	LB/(KG)	PRODUCT WEIGHT	LB/KG	%RECOVERY	%RECOVERY
	17	18	19		20	21	22	23 - 29	30 - 31	32 - 38	39 - 40	41 - 43	44 - 46

LIST OF ALASKA PRODUCT TYPES

Product Type Codes	Description
1	Whole fish/food fish (PRR = 1.00)
2	Whole bait (PRR = 1.00)
3	Bled only (throat, or isthmus, slit to allow blood to drain)
4	Gutted only
5	Headed and gutted (H & G)
6	H & G, with roe
7	H & G, Western cut (head removed in front of pectoral girdle)
8	H & G, Eastern cut (head removed behind pectoral girdle)
9	H & G, with pectoral girdle
10	H & G, tail removed
11	Kirimi (head, gut and tail removed by cuts perpendicular to spine)
12	Salted and split
13	"Wings" (On skates, side fins are cut off next to body)
14	Roe only (eggs, either loose or in sacs, or skeins)
15	Pectoral girdle only
16	Heads
17	Cheeks (opercular bone and muscles) or chins (lower jaw, muscles, flesh)
18	Chins (lower jaw, muscles and flesh)
19	Belly flaps (flesh in region of pelvic and pectoral fins)
20	Fillets with skin and ribs
21	Fillets with skin, no ribs
22	Fillets, with ribs, no skin
23	Fillets, no skin or ribs
30	Surimi (paste from any of the fish flesh and additives)
31	Minced fish
32	Fish meal
33	Fish oil
34	Milt (in sacs, or testes)
35	Stomachs (includes all internal organs)
36	Octopus/squid mantles (flesh after removal of viscera and legs)
37	Split, no backbone (head removed, fillets still attached)
39	Bones
96	Decomposed fish (PRR 0.0)
97	Other - specify
99	Discard (whole groundfish and PSC species only; PRR = 1.00)

NMFS PRODUCT RECOVERY RATES

Species code	Product Codes 3	4	6	7	8	10	11	12	13	14	15	16	17	18	19	20	21	22	23	30	31	32	33	36	37
110	.98	.85	.63	.60	.58	.50	-	.45	-	.05	.05	-	.05	-	.10	.45	.35	.25	.25	-	.50	.17	-	-	.43
118	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
119	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
120	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
121	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
123	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
127	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
134	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
139	.98	.88	-	.60	.50	-	-	-	-	-	-	.15	.05	.05	.10	.40	.30	.35	.25	-	-	.17	-	-	-
141	.98	.88	-	.65	.50	-	-	-	-	-	-	.15	.05	.05	.10	.40	.30	.35	.25	-	-	.17	-	-	-
143	.98	.88	-	.60	.55	-	-	-	-	-	-	.20	.05	.05	.10	.40	.30	.35	.25	-	-	.17	-	-	-
144	.98	.88	-	.60	.50	-	-	-	-	-	-	.15	.05	.05	.10	.40	.30	.35	.25	-	-	.17	-	-	-
161	.98	.88	-	.50	.40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.17	-	-	-
168	.98	.88	-	.65	.50	-	-	-	-	-	-	.15	.05	.05	.10	.40	.30	.35	.25	-	-	.17	-	-	-
169	.98	.88	-	.65	.50	-	-	-	-	-	-	.15	.05	.05	.10	.40	.30	.35	.25	-	-	.17	-	-	-
193	.98	.87	-	.61	.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.17	-	-	-
270	.98	.80	.70	.65	.56	.50	-	-	-	.14	-	.15	-	-	-	.35	.30	.30	.25	.15	.34	.17	-	-	-
510	.98	.82	-	.71	-	-	-	-	-	-	-	-	-	-	-	-	.38	-	-	-	-	.22	-	-	-
511	.98	.82	-	.71	-	-	-	-	-	-	-	-	-	-	-	-	.38	-	-	-	-	.22	-	-	-
516	.98	.89	-	.78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.22	-	-	-
689	.98	.83	-	.72	-	-	-	-	-	-	-	-	-	-	-	-	.30	.30	.25	-	-	.17	-	-	-
700	.98	.90	-	-	.39	-	-	-	.32	-	-	-	-	-	-	-	-	-	-	-	-	.17	-	-	-
710	.98	.89	-	.68	.63	.50	-	-	-	-	-	-	.05	-	-	.35	.30	.30	.25	-	-	.22	-	-	-
870	.98	.80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.17	-	.85	-
875	.98	.69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.17	-	.75	-

NMFS REPORT GROUP CODES FOR LOGBOOKS AND CATCH MESSAGES

Sp. group codes	Mgmt Areas	Species Common Names
110	all	Pacific cod
118	GOA	Deep water flatfish (rex sole, Dover sole, Greenland turbot)
119	GOA	Shallow water flatfish (flatfish other than deepwater flatfish, flathead sole or arrowtooth flounder
120	BSAI	Other flatfish (flathead sole, Alaska plaice, rex sole, Dover sole, starry flounder, longhead dab, butter sole, and all Pleuronectiformes not specifically defined) for the BSAI
121	all	Arrowtooth flounder (Arrowtooth flounder and Kamchatka flounder)
122	GOA	Flathead sole
123	BSAI	Rock sole
127	all	Yellowfin sole
130	all	Ling cod (non-allocated)
134	BSAI	Greenland turbot
139	BSAI	Other rockfish (all Sebastes and Sebastolobus except POP, Sebastes alutus)
141	all	Pacific Ocean Perch (Sebasted alutus)
143	GOA	Thornyhead rockfish (Sebastolobus)
144	GOA	Slope rockfish (Northern, Sharpchin, Aurora, Blackgill, Chilipepper, Darkblotch, Greenstriped, Harlequin, Pygmy, Shortbelly, Splitnose, Stripetail, Vermillion, Yellowmouth, Bocaccio, Silvergrey, and Redstripe.
161	all	Sculpins
168	GOA	Demersal shelf rockfish (China, Copper, Quillback, Rosethorn, Tiger, Yelloweye, Canary and Redbanded
169	GOA	Pelagic shelf rockfish (black, blue, dusky, widow and yellowtail)
171	GOA	Deepwater rockfish (shortraker and rougheye)
173	BSAI	Shortraker complex (shortraker, rougheye, sharpchin, and northern)
193	all	Atka mackerel
213	all	Grenadier (non-allocated)
270	all	Pollock
510	all	Smelt
511	all	Eulachon
516	all	Capelin
689	all	Sharks
700	all	Skates
710	all	Sablefish
870	all	Octopus
875	all	Squid

Species Prohibited in Groundfish Fisheries

000	all	Salmon, unspecified	920	all	Crab, unspecified king
001	all	Crab, unspecified	921	all	Crab, red king
200	all	Pacific halibut	922	all	Crab, blue king
235	all	Pacific herring	923	all	Crab, golden/brown king
410	all	Salmon, chinook	930	all	Crab, unspecified tanner
420	all	Salmon, sockeye	931	all	Crab, bairdi tanner
430	all	Salmon, coho	932	all	Crab, opilio
440	all	Salmon, pink			
450	all	Salmon, chum			
540	all	Trout, steelhead			

TAGGED FISH AND CRAB

If you should find a tagged fish or crab while you are sampling, or if a crew member brings you a tagged fish or crab, return the tag, along with all pertinent information, to the debriefers at the end of your cruise. Such information should normally include the date, location, and circumstances of capture, and the length, weight, sex, and stage of maturity of the fish. Tags from yellowfin sole, halibut, cod, pollock, and other fish will be forwarded to the appropriate tagging agency. Otoliths and scales are often also very useful to the tagging agency.

The Pacific Biological Station at Nanaimo, B.C. injected a number of sablefish with a bone-marking chemical and tagged them with a small, plastic tube implanted just below the first dorsal fin. Be sure to record the tag prefix as well as the number. Obtain the otoliths from all tagged sablefish except those from the pink AG series tags which are used for growth studies and should not be exposed to light. Store the otoliths in ethyl alcohol and water, if you have it, or dry in an envelope. AG tags are labeled with "GROWTH STUDY REWARD FOR WHOLE FISH". AG fishes' heads should be cut off and frozen with the tag number enclosed in a plastic bag. (A salmon snout bag may be used for this.) Heads should be cut between the operculum and the pelvic fin to insure that the otoliths are not exposed to light and are contained within the snout. Be sure to get the information listed below for any tagged fish. These samples, along with the accompanying data on date, position of capture, etc. will be forwarded to the Nanaimo laboratory after your return.

Ellen Varosi (907) 789-6059 Auke Bay validation on juveniles

Tags are usually located on the dorsal surface of the fish, or on the gill cover. Tags can be of the anchor, spaghetti, or modified disk variety. Some fish may be tagged twice. NMFS will pay a $2 reward to the captain of the ship from which a sablefish tag is returned (the observer cannot be paid). To expedite the sending of the reward, include the captain's name and address with the data.

The International Pacific Halibut Commission has tagged halibut with orange, yellow and pink spaghetti tags. These tags are attached to the cheek on the eyed side of the halibut and have a five or six digit number printed on the side. All tags from halibut should be brought in. If possible, the otolith should be collected as well, as this information is very helpful for age and growth studies. Do not collect a scale sample and the fish weight is not required. The IPHC rewards fishermen for the return of tags with $5.00 or a baseball cap so the skipper's complete address is needed. IPHC has no way of handling data from halibut that are re-released with the tag attached. ~~If it is best to release the fish alive, please remove the tag and record the other~~ information including length.

Sex hbt ?

Some agencies tag salmon by inserting a coded wire into the snout of fingerling salmon. These wire-tagged salmon are marked by clipping their adipose fins. If you find a salmon missing an adipose fin, check to see whether it is missing any other fins, collect a scale sample, record the usual data, and in addition, weigh the gonads. Remove the snout by cutting well behind the eye, salt the snout, attach the completed data tag to the snout, and seal it in one of the provided plastic bags. After a few days, drain off any accumulated liquid and resalt the snout. Repeat the draining and resalting as needed. The tag should be filled out in pencil and the scale sample number written on the top.

The Alaska Department of Fish and Game along with other agencies have tagged crab with bright yellow or orange plastic, "spaghetti" tags. If one of these tagged crabs are found, record the needed information and measure the crab as best you can to the nearest millimeter, even if you were not assigned calipers or dividers to measure crab. (Refer to "Length Measurements For Various Species" in Appendix). Sometimes tagged crabs that have been caught are alive and in good condition. If this is the case, record the pertinent information along with the tag number and release the crab as quickly as possible.

Collecting and returning tags is an important way to help fishery research. Please remember to bring back tags with as much of the following information as possible:

1. Tag or tag serial number.
2. Scale and/or otoliths for aging.
3. Fish length (in mm if possible).
4. Fish weight (in gm if possible).
5. Sex and maturity of gonads (immature, mature, spawning).
6. General appearance (poor body condition, good body condition).
7. Condition of tagging wound (healthy healed tissue, open wound, etc.).
8. Time and date of capture.
9. Capture location (latitude and longitude).
10. Capture depth.

HOW TO SEX FISH

During training you will have been shown the differences in the appearances of gonads of various species and given an opportunity to practice determining the sex of several fish species. Due to lack of availability of specimens of certain species for dissection purposes, you may not have been able to practice on your particular sampling species, but you should be able to determine the sex of fish on your own with practice. In determining sex, it is generally easiest to start with large, mature fish and work down in size to small, immature specimens. Thoroughly dissect a few fish and identify the various internal structures so that you know what you are looking for.

The Japanese have a way of telling the sex of pollock without cutting them open. This method uses the relative size and shape of the pelvic fins to distinguish male from female. Since this method requires a fair amount of judgment and works consistently only for the larger specimens, observers are not to use this method. Pollock can be more accurately sexed by splitting the belly and inspecting the gonads, and with practice this can be accomplished very rapidly.

Halibut should not be sexed, but all other pertinent data should be obtained before releasing the fish. Most salmon have a very poor chance of surviving after being caught in a trawl net, especially if many scales have been lost, so identify the species, look for tags and obtain the individual lengths, weights, scale samples, and cut them to determine their sex before discarding the fish over-board. For most of the fish species observers must sex, the following information should be of help.

Gadidae

Where to look:

The gonads of all cods and pollock are found directly above the vent near the top of the visceral cavity. An easy way to find the gonads of gadids (with a little practice) is to slit the stomach open near the vent, then use your thumb to scoop the viscera out of the visceral cavity. With a little practice, the gonads can be exposed for examination on your thumbnail.

What to see:

The ovaries are paired bags or sacs which are typically pink or orange in color and slightly translucent. When immature the sacs may be clear but they can be distinguished by shape and position. When the ovaries are mature they tend to be bright orange will often nearly fill the entire posterior end of the visceral cavity and you should be able to see the eggs inside the ovaries. The skein, or ovary sac, may or may not have black and white blotches on it. Sometimes the ovary of a fully mature female cod will be entirely black in color.

The testes look very different from the ovaries. They are always opaque. They are in the same location as the ovaries but when immature, they will only be a thin filament with a tiny ruffled edge that is attached to the vent. In this stage, the testes are very small and must be looked for very carefully. As an immature male gadid begins to develop, the lower side of

the filament can be seen to have very small and fine convolutions. When immature, the testes will be dark pink due to the ample blood supply. Then, their color turns to cream tinged with pink as milt develops. The lower edge of the testes then fills with milt as the fish matures and the convolutions finally will be thick, opaque and white; filling the inside of the fish.

Sablefish

Where to look:

The gonads of sablefish are lateral lobes that run the entire length of the visceral cavity just beneath the backbone. Usually they appear as fleshy filaments and are tan or cream colored to slightly pink. In immature fish the lobes are more soft and fragile, but when mature the gonad may look like liver tissue.

What to see:

There is no difference in the texture, and no reliable difference in color between the ovaries and the testes of sablefish. The only difference is that the testes have four lobes and the ovaries have two lobes. The ovaries may have a partial fold through each of their two lobes, giving a false four-lobed appearance. If the fish is immature it may be very difficult to determine how many lobes are present. If this is the case you must examine the gonads carefully so that you can see if the divisions between the lobes are complete or partial. Teasing the gonad surface with the tip of your scalpel blade will help.

Flatfish

Where to look:

The gonads of flatfish are found posterior to the visceral cavity and especially in females they extend underneath the flesh of the body. To find the gonads it is usually easiest to cut back the skin from the visceral cavity and then extending the cut ventrally (just above the anal fin) back towards the tail, following the curvature of the body. Testes will be found only in the area directly posterior to the viscera, while the ovaries will extend away from the viscera in an elongated triangular shape.

What to see:

Females have ovaries that extend into and through the fillet meat in an elongated triangle. This triangle is consistently at least three times as long as it is wide and often much longer. The ovaries when they are immature are typically translucent and pink in color. Ovaries that are mature are very elongate, pink or orange in color, often with black spotting. Developing ovaries are more granular in texture and finally, eggs can be seen inside them.

Male testes are either found right next to the visceral cavity or when mature, extend into the flesh as a short wide triangle which is about as wide as it is long. They are consistently grey/white and opaque. Immature testes are slight crescents that are found along the posterior edge of the visceral cavity, on each side of the fish, parallel to the bone that supports the visceral cavity and becomes the anal spine. The crescent of male gonad tissue can be very small; it may look like fat tissue and therefore be difficult to differentiate or locate.

Rockfish

Where to look:

Rockfish gonads are found at the top of the visceral cavity directly above the vent. They are anteriorly slanted. When there is fatty tissue around the viscera, extra time and care will be needed to probe through the fat to locate the gonads.

What to see:

The ovaries are sac shaped and will be filled with eggs and then live young (rockfish bear developed young, not eggs). These bags are soft and flaccid, and generally are clear, but may be pink, orange or yellow color. Small round eggs can often be seen in very immature individuals. Rockfish ovaries are about two or three times as long as they are wide.

Testes are rod-like, they feel firm and are opaque. They are often colored with tan on one side of the testes which fades into a clearer grey on the other side. Some fish may have the tan tinged with yellow or pink color instead of grey. They are more elongate than ovaries; often about five times as long as they are wide - although this is variable, they will get longer as they approach maturity.

Atka Mackerel

Where to look:

Like rockfish, Atka mackerel gonads are found at the top of the visceral cavity directly above the vent. Atka Mackerel show sex-linked external coloring where the light colored vertical bars are tinged with yellow.

What to see:

Ovaries are clear bags filled with small round eggs that are various shades of olive green, brown, tan,and when hydrated, clear. Atka Mackerel spawn in spurts so eggs in the ovaries will be a mix of different sizes and different stages of development.

Atka mackerel testes are similar to rockfish, described above.

Salmon

Where to look:

The gonads of salmon are thin, clear filaments which are found along the top of the visceral cavity just below the backbone. Salmon gonads, unlike other fish, will be found near the anterior (head) end of the visceral cavity.

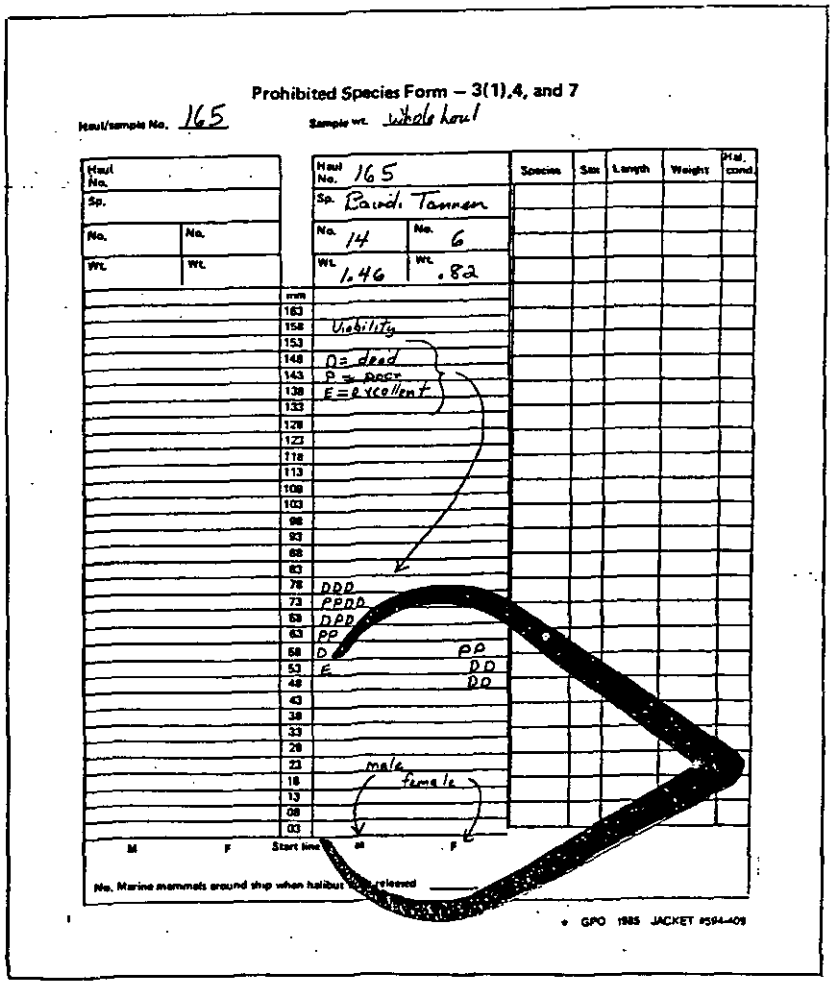
What to see:

Sexing salmon is relatively easy. Even very young females produce eggs. To sex the fish find the clear tissue of the gonad and look for the presence or absence of the relatively large, round, orange eggs. If eggs are present then the fish is a female. If eggs are absent then the fish is a male.

LENGTH MEASUREMENTS FOR VARIOUS SPECIES

Observers given the special project of measuring king and tanner crab will be provided with dividers to use in conjunction with a measurement scale on a plastic form. Spread the dividers across the width of Tanner crab carapaces at their widest points, excluding spines. Without moving the arms of the instrument, lay one arm of the divider on the "start line" at the bottom of the plastic form and, when placed perpendicular to the start line, where the tip of the other arm lands, record the measurement with a tally mark on the 5 mm space. Measurements are grouped in 5 mm increments starting at 3 mm. For example, crabs 41 to 45 mm in size are recorded as 43 mm; crabs 46 to 50 mm are recorded as 48 mm. Thus, check your entries on Form 7US to see that all records of crab measurements end in the digits three or eight.

The carapace length of king crab should be measured. Measure from the right eye socket to the midpoint of the posterior margin of the carapace. Be careful not to let the tip of the divider arm slip **into** the eye socket below the carapace surface; keep the instrument on the **rim** of the carapace socket at it's deepest point. Record the length to the nearest 5 mm size group as explained for Tanner crab above. (Refer to the illustration below.)

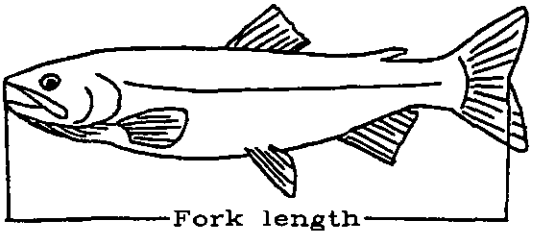


7-20

Fork Length Measurement Used For:

Roundfish
Rockfish
Salmon

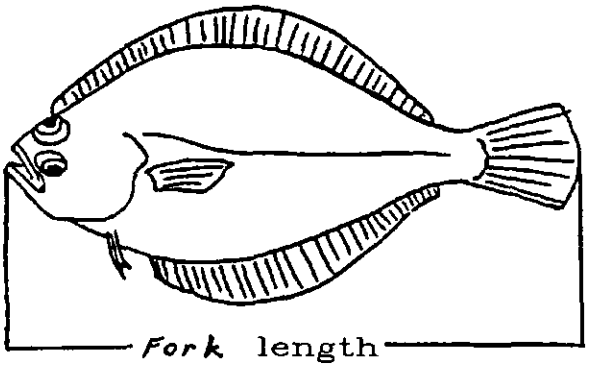
Measured from the tip of snout to the center of the fork in tail.



Fork Length Used For:

Flatfish

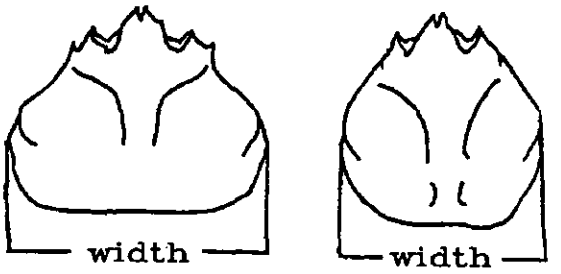
Measured from the tip of the snout to the middle of the tail.



Carapace Width Used For:

Tanner (Snow) Crab

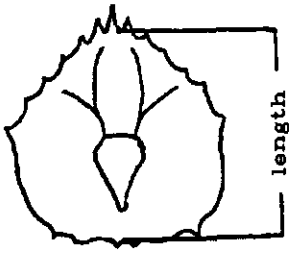
Measured from the widest points, excluding spines, to the nearest 5 mm.



Carapace Length Used For:

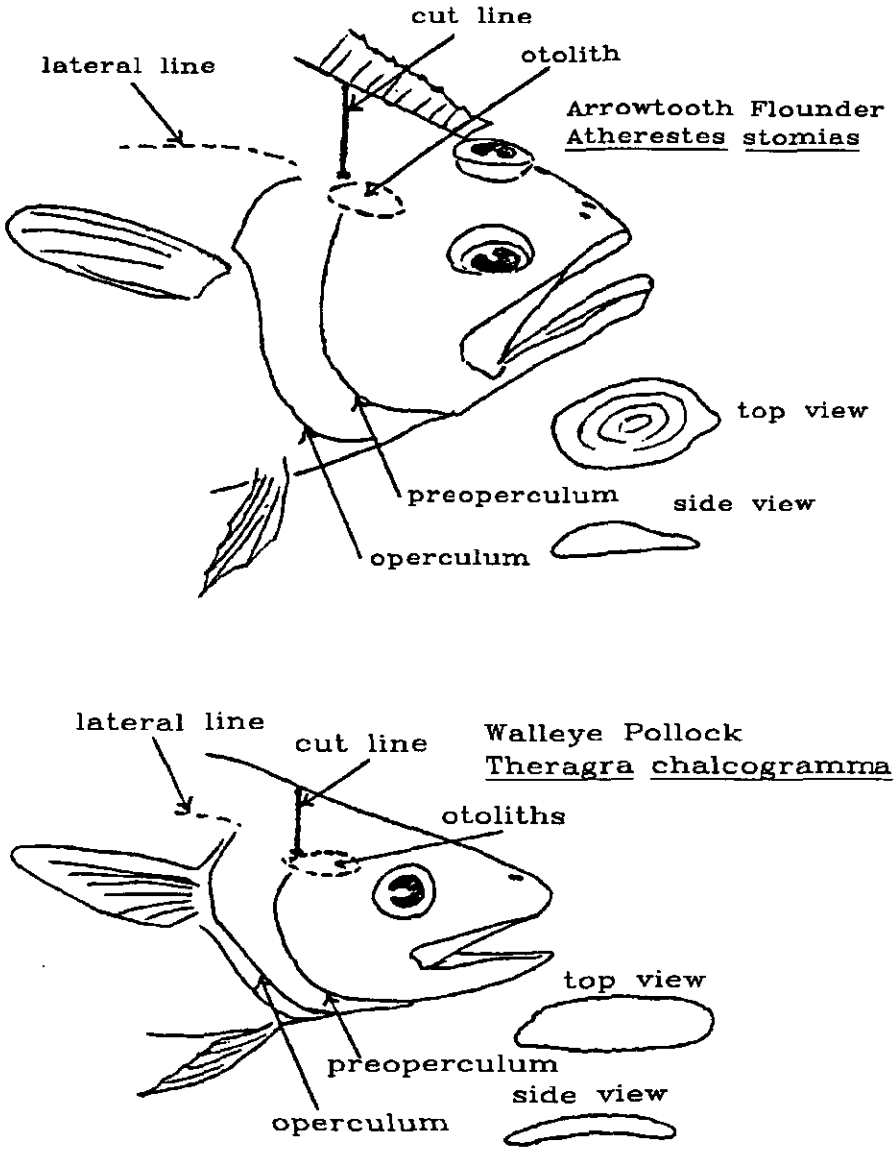
King Crab

Measured from right eye socket to the middle of the posterior margin of the carapace.



OTOLITH AND SCALE COLLECTION FOR SELECT SPECIES

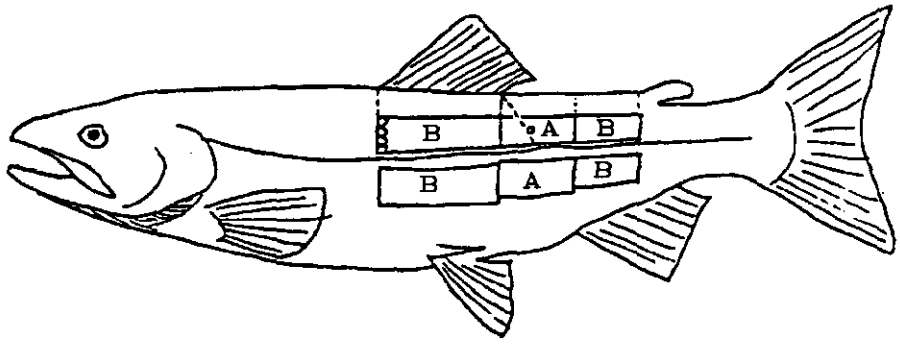
Species	Sample Type	Storage Container	Storage Media
Walleye pollock	Otolith	Plastic vial	50% alcohol 50% water
Yellowfin sole (or other flatfish)	Otolith	Plastic vial	Glycerol/Thymol Solution
Atka mackerel	Otolith	Plastic vial	50% alcohol 50% water
Pacific cod	Otolith & Scale (both in same vial)	Plastic vial	50% alcohol 50% water
Pacific hake	Otolith	Plastic vial	50% alcohol 50% water
Jack mackerel	Otolith	Plastic vial	Dry
Sablefish	Otolith & Scale (both in same vial)	Plastic vial	50% alcohol 50% water
Salmon	Scale	Paper envelope	Dry
Rockfish	Otolith	Plastic vial	50% alcohol 50% water



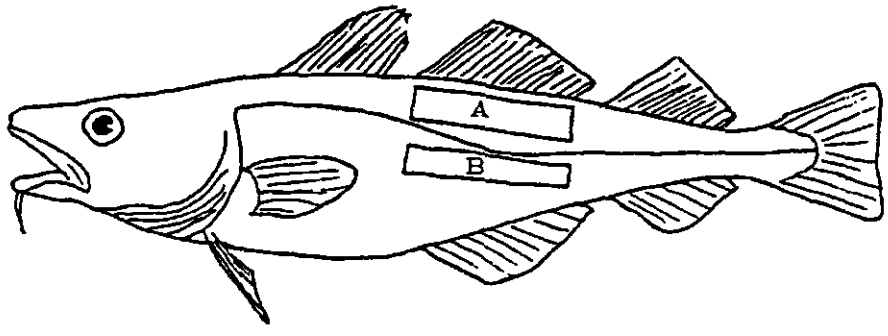
Approximate location of the otoliths (sagittal) and the cut for the removal of otoliths from flatfish and roundfish.

LOCATION OF PREFERRED SCALE SAMPLING ZONES

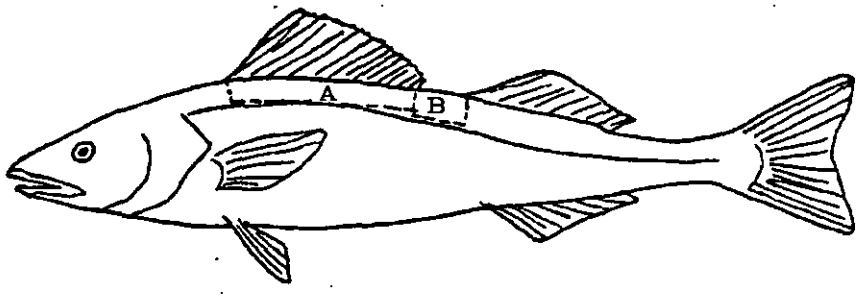
(Do not take lateral line scales)



SALMON - Follow the diagonal scale row from the posterior insertion of the dorsal fin to the lateral line of either side. Two scale rows up from the lateral line (on the diagonal) are the preferred scales



PACIFIC COD - Scrape along either side of the back directly below the second dorsal fin.



SABLEFISH (BLACK COD) - <u>If assigned to collect scales</u>, scrape the scales from the dorsal surface directly below the first dorsal fin.

HOW TO COLLECT FISH

Keep in mind that a large frozen specimen or a specimen collection becomes a piece of luggage so limit the size to what you can handle. Freeze the fish quickly after deciding to collect it. Lay the fish flat and straight to freeze it. Make an identifying label and put it with (in) the fish before freezing. Fill out a Specimen Collection Form and keep that with your paperwork. When the fish is frozen, glaze and reglaze it a couple times. When debarkation is near, pad and package it well. While in transit do your best to keep it frozen.

You can:

A) In Dutch Harbor let your contact person, if any, know you have a frozen specimen to maintain. Maybe your place of lodging will hold it for you in their kitchen freezers.

B) Tell the airlines at check-in that you have a package to keep frozen.

C) In Seattle on a weekend, take it to the Seattle Aquarium if you can't keep it at your lodgings. Their weekend, daytime phone number is: 625-5018 or 625-5019 and their 24-hour phone number is: 625-4359. Tell the aquarium staff you are a NMFS observer, get directions and ask them to hold it for you until Monday. On weekdays bring frozen specimens into our freezer in the wetlab. Tell your debriefer you have a specimen and turn in your form.

Specimens Needed For Teaching Collection
(small (20-35 cm) specimens preferred)

I. Gadidae

Pacific Cod, Gadus macrocephalus

II. Flatfishes

Rough-scale Sole, Clidoderma asperrimum
Alaska Plaice, Pleuronectes quadrituberculatus
Longhead Dab, Limanda proboscidea
Rex Sole, Glyptocephalus zachirus
Curlfin Sole, Pleuronichthys decurrens *
C-O Sole, Pleuronichthys coenosus
Greenland Turbot, Reinhardtius hippoglossoides
Arrowtooth Flounder, Atheresthes stomias
Kamchatka Flounder, Atheresthes evermanni
Deepsea Sole, Embassichthys bathybius *
Dover Sole, Microstomus pacificus
Hybrid Sole, Inopsetta ischyra
English Sole, Parophrys vetulus
Butter Sole, Isopsetta isolepis
Slender Sole, Lyopsetta exilis
Petrale Sole, Eopsetta jordani
Flathead Sole, Hippoglossoides elassodon
Bering Flounder, Hippoglossoides robustus *
Arctic Flounder, Liopsetta gracialis *

III. Rockfishes

Longspine Thornyhead, Sebastolobus alascanus *
Darkblotched Rockfish, Sebastes crameri
Harlequin Rockfish, Sebastes variegatus
Redstripe Rockfish, Sebastes proriger
Shortraker Rockfish, Sebastes borealis *
Northern Rockfish, Sebastes polyspinus
Redbanded Rockfish, Sebastes babcocki
Silvergray Rockfish, Sebastes brevispinis
Dusky Rockfish, Sebastes ciliatus
Black Rockfish, Sebastes melanops
Blue Rockfish, Sebastes mystinus

IV. Incidentals

1. Any unusual fish
2. Look especially for:

Dragon poacher, Percis japonicus
Bering Wolffish, Anarhichas orientalis
Sablefish, Anoplopoma fimbria
Flathead Pomfret, Taractes asper
Giant Wrymouth, Delolepis gigantea
Atka Mackerel, Pleurogrammus monopterygius
Oxeye Oreo, Allocyttus folletti
Capelin, Mallotus villosus
Eulachon, Thaleichthys pacificus
Pacific Sandfish, Trichodon trichodon
Prowfish, Zaprora silenus

* = collect any size

Specimen Collection Form

Collector:_____ Cruise No.:_____ Vessel Code:_____

Date:_____ Vessel Name:_____

Haul No.:_____ Lat. & Long.: _____

Depth:_____(meters) Water Temp.: _____(degrees C.)

Collector's Identification: _____

Length: _____(cm) Weight:_____(kg)

Notes on in vivo coloration, unusual scale patterns or spines:_____

_____

_____

_____

Sketch if necessary:

When completed, return this form to a debriefer.

Identification confirmed by:_____ Date:_____

Common Name:_____

Scientific Name:_____

Comments:_____

_____

_____

Specimen Collection Form

Collector:_____ Cruise No.:_____ Vessel Code:_____

Date:_____ Vessel Name:_____

Haul No.:_____ Lat. & Long.: _____

Depth:_____(meters) Water Temp.: _____(degrees C.)

Collector's Identification: _____

Length: _____(cm) Weight:_____(kg)

Notes on in vivo coloration, unusual scale patterns or spines:_____

_____

_____

_____

Sketch if necessary:

When completed, return this form to a debriefer.

Identification confirmed by:_____ Date:_____

Common Name:_____

Scientific Name:_____

Comments:_____

_____

_____

Specimen Collection Form

Collector:_____ Cruise No.:_____ Vessel Code:_____

Date:_____ Vessel Name:_____

Haul No.:_____ Lat. & Long.: _____

Depth:_____(meters) Water Temp.: _____(degrees C.)

Collector's Identification: _____

Length: _____(cm) Weight:_____(kg)

Notes on in vivo coloration, unusual scale patterns or spines:_____

_____

_____

_____

Sketch if necessary:

When completed, return this form to a debriefer.

Identification confirmed by:_____ Date:_____

Common Name:_____

Scientific Name:_____

Comments:_____

_____

_____

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE

Permit to Import Marine Mammals and Endangered Species
Permit No. 578

The National Marine Mammal Laboratory, Northwest and Alaska Fisheries Center, National Marine Fisheries Service, 7600 Sand Point Way, N.E. BIN C15700, Seattle, Washington 98115, is hereby authorized to import marine mammal specimens, including material from species listed as threatened or endangered, for scientific research and scientific purposes as cited in the Permit Holder's application and subject to the provisions of the Marine Mammal Protection Act of 1972 (16 U.S.C. 1361-1407), the Regulations Governing the Taking and Importing of Marine Mammals (50 CFR Part 216), the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), the regulations governing endangered species permits (50 CFR Parts 217-222), and the Conditions hereinafter set out.

A. Number and Kind of Marine Mammals:

An unspecified number of specimen materials may be imported from:

1. All Cetacean species
2. All Pinnipedia species, except walrus (Odobenus rosmarus)

B. Special Conditions:

1. The specimen material may be imported from anywhere in the world. The material shall have been collected from animals:

   a) Taken in fisheries for such animals in situations where such taking is legal;

   b) killed incidental to fishing or other operations;

   c) found dead floating at sea or beached; or

d) that have died of natural causes.

2. All specimen materials collected under the authority of this Permit shall be maintained according to accepted curatorial standards in bona-fide scientific collections. In the event that fluid tissue specimens are disposed of upon completion of a project, the disposal shall be reported as required by Section B.

3. The Holder must coordinate activities within the United States with appropriate Federal, state and local resource management agencies.

4. The Holder shall submit written notification to the Protected Species Division and the appropriate Regional Director(s) of names of designated agents and the dates which their designation is valid at least two weeks prior to their activity under the Permit. An annually updated list of agents and NMFS personnel authorized to operate under this Permit shall be provided to the Protected Species Division and appropriate Regional Directors.

5. The Holder shall notify the appropriate Regional Director(s) sufficiently in advance of importation or transfer of specimen material. This notification shall include the destination of the specimen materials.

6. The Holder shall submit a report within 30 days of the importation authorized herein listing the items imported and the dates of importation.

7. The Holder shall submit an annual report by December 31 of each year the Permit is valid. The report shall include but is not limitted to, a description of each animal from which a specimen was taken including its species, age, size, sex, reproductive condition; date and location of collection; circumstances causing death if known; the date and location of each importation; and the name and location of each institution maintaining specimen materials collected under this Permit.

8. The Holder shall submit a final report within 90 days of the expiration date of the Permit which includes a summary describing the materials that have been imported and their dispostion. All reports shall be submitted to the Office of Protected Species and Habitat Conservation, National Marine Fisheries Service, U.S. Department of Commerce, Washington, D.C. 20235.

9. The provisions of this permit may be amended upon reasonable notice by the Assistant Administrator for Fisheries depending upon the species and circumstances involved.

10. This Permit does not relieve the Holder from the requirement of full compliance with all provisions of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). For those species listed on any of the Appendices to CITES valid and appropriate permit(s) authorizing import must be obtained prior to shipment.

11. The authority to collect and import this material shall extend from the date of issuance through December 31, 1991. The terms and conditions of this permit (Sections B and C) shall remain in effect as long as the material imported hereunder is maintained under the authority and responsibility of the Permit Holder.

C. All General Conditions attached as Section C shall apply and are made a part hereof.

William E. Evans
Assistant Administrator for Fisheries
National Marine Fisheries Service

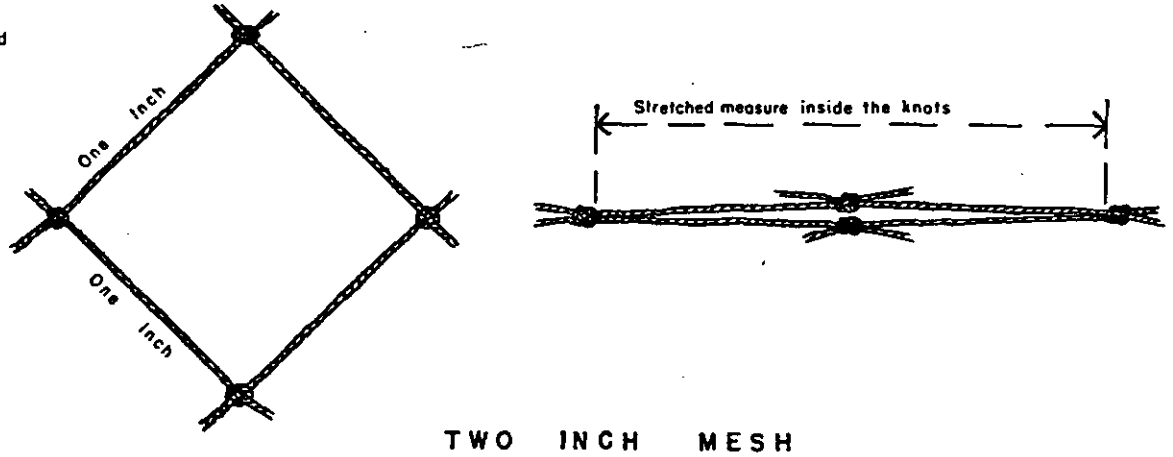
11/6/87
Date

HOW TO MEASURE MESH SIZE

The mesh size measurement requested on the gear diagram is the stretched measure, that is, the distance between two diagonal knots when the mesh is tightly stretched (see second diagram below). In order to obtain this measurement, the net must be empty and the mesh pulled tightly enough so that two opposite knots of the mesh square meet and all four knots are in the same plane; measure the distance inside the two most distant knots in the mesh square.

An easier way of obtaining the same measurement (the net does not have to be empty) is to measure the distance between two adjacent knots in a mesh square (the side of a square) and multiply by two. Check several meshes in each part of the net.

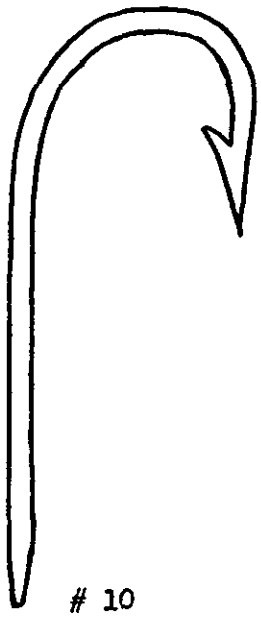
W. L. Scofield



TWO INCH MESH

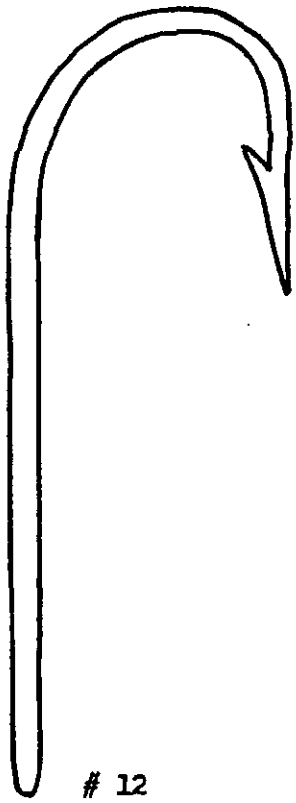
A two-inch mesh, open (left) and stretched. This points up variables inherent in web measure and consequent difficulties. Common yardstick is "stretch measure."

HOOK SIZE CHART FOR LONGLINERS



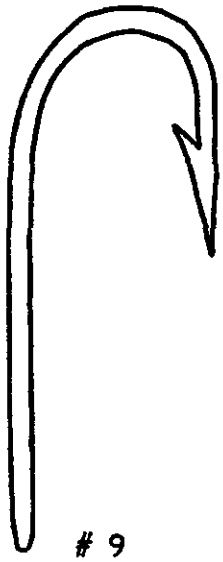
10

11

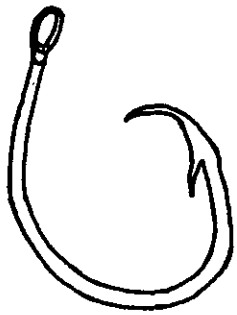


12

8



9



CIRCLE HOOK

ADVICE TO WOMEN GOING TO SEA

[Note: This has been adapted from the original version of "Advice" which was prepared by Connie Sancetta and colleagues at Lamont-Doherty Geological Observatory following the rape of a female student on one of Scripp's ships. We believe "Advise" is a balanced statement of potential problems and realistic responses to them that should be helpful to seagoing scientists.]

Sexual harassment occurs at sea, from verbal harassment to assault and rape. Such incidents are frequently not reported, for reasons ranging from a desire to be a good sport in minor cases, to embarrassment in more serious cases. This document is intended to alert you to the different nature of social conditions at sea, and to suggest some actions you should take if you feel uncomfortable or harassed.

Social conditions are different from those on land. Privacy is greatly reduced, and as a result interactions can become more intense, and feelings of intimacy are more quickly established. Small incidents, both pleasant and unpleasant, can quickly take on exaggerated importance, due to the close quarters, the prevalence of gossip, and the sense of isolation from "the real world" back on shore.

Furthermore, staffing on a ship brings together people with very diverse backgrounds and value systems. While some of the men are used to the concept of women as professionals, other are familiar with more traditional views of women, For some men, sexual remarks or actions may be considered an acceptable mode of behavior. Also, the value systems of many men change somewhat during the period of time that they are at sea.

The crew of a ship have usually established a workable interaction among themselves, while scientists, who come on board for a single cruise, are not part of that system. Scientists are therefore particularly apt to draw attention, comment, and speculation.

Sexual awareness and tensions can be heightened at sea, due to the unusual social closeness and deprivation of normal outlets. Behavior and attire that are acceptable on shore can be viewed as provocative at sea and close relationships between people of opposite sexes can strongly affect the atmosphere in which everyone must work and live. The result often is that a woman on board is subject to far more attention than she would be on shore. While some of the attention may be pleasant and even flattering, some of it is not.

In consequence, it is necessary to be aware of the different social situation and to modify your normal behavior if necessary. At the very least, you should consider the possible consequences on some situations so that you can react appropriately. Below are some examples of the sort of actions you might adopt or avoid:

1) Strictly obey the rules regarding drinking, which can lead to poor judgement, lack of control and alertness, and hasty actions. At sea you must be prepared for any emergency. Consider yourself on duty 24 hours a day.

2) Refrain from wearing potentially provocative clothing such as halter and tank tops, shorts, and tight clothing such as lycra.

3) Be aware that if you show more attention to one man than others, it may be misinterpreted by him or by others.

4) Do not invite a man to your cabin if you are alone, or accept an invitation to be alone with him, ("a friendly chat," "a little drink"). Leave the cabin door open or go to a public area if a man comes to talk to you without your invitation.

5) Activities such as flirting, joking about sex, or touching may be misinterpreted by the persons involved or by others. Unwanted approaches such as these should be responded to politely but very firmly. You yourself should avoid flirtatious behavior.

6) Do not engage in sexual affairs. Such affairs will distract you and your partner from doing your work, can breed resentment and jealousy and will subject other women to increased sexual pressure, both on your cruise and on subsequent cruises. Remember, you are at sea to work, not to amuse yourself. Remember, physical or emotional involvement with vessel or shoreside processing plant personnel is grounds for de-certification.

7) Make it clear that your interests in male companionship are elsewhere, (some women wear wedding rings), or that you are "not available."

8) If you are experiencing unwelcome advances or are in any tense situations, do not stand around on deck or other deserted areas alone at night.

9) In general, be very sensitive to the altered social conditions and their possible implications. Be very conservative. Use your common sense.

An assault often occurs with warning signs of milder behavior. If you act firmly and decisively during the early stages, you may reduce the chances of future harassment. Some warning signs to watch for are:

1) A man makes frequent attempts to detain you, to be in your company, or to visit you in your cabin.

2) Mild or casual sexual remarks become more frequent, pointed and/or objectionable.

3) A man attempts any physical contact, even if it appears innocent.

4) Other people warn you about a man who begins to harass you.

5) A man whom you have repeatedly attempted to discourage continues or escalates his advances.

The definition of harassment is subjective, making it difficult to identify. Federal law defines sexual harassment as "unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature." Thus, it is your decision at what point you will draw the line.

Many women feel uncomfortable with milder forms of harassment, but tolerate it, not wanting to cause trouble, or appear to be oversensitive or bad sports. The unfortunate result of this passivity is that harassment may continue or increase until it becomes serious. At that point, the woman is open to the charge that she allowed (i.e., encouraged) the previous actions. It is best to take action at the time that you first feel uncomfortable. There are a variety of actions you may adopt, which must depend on your judgement. In general, the best sequence to follow is:

1) Indicate to the harasser that you do not enjoy or appreciate his actions. Do not make a joke of his behavior. Speak firmly and coldly, or pointedly avoid him. Do not make the mistake of pretending to ignore it; this invites continuation at a higher level. Losing your temper may be effective in some cases but usually is not, and may even encourage the harasser.

2) Discuss the problem with someone, preferably an officer, but at least a friendly crewperson. Ask for his/her opinion and advice as to handling it. If appropriate, you might ask the person to speak to the harasser, warning him off.

3) If the problem continues or worsens to the point that you feel upset or threatened, report it to the skipper immediately. Tell him the full story, explain that it is affecting your work, and request that he take steps to end the problem.

4) If the harassment advances to the point of assault, it becomes a felony. You should immediately report the offense to your employer and the captain, who are required by law to take certain actions. Have your contractor make arrangements for you to leave the vessel immediately or get yourself off of the vessel and inform your contractor of your actions. Make sure the incident is reported and is not swept under the rug. Failure to report a felony can itself be punishable under law.

Sexual assault and rape have occurred on fishing vessels at sea. These serious offenses might be prevented if appropriate action is taken in the early stages. Never believe that the problem is trivial or that you are over-reacting. If you feel harassed, then it has gone too far. It is your right to complain and even your obligation. By reporting harassment, you are protecting others as well as yourself. The skipper does not want trouble on his boat, and if you indicate to him that trouble may be brewing, he should take appropriate action.

RADIO COMMUNICATIONS

The radios that you will encounter most often are VHF-FM (Very High Frequency Modulation), used for short-range vessel-to-vessel and vessel-to-shore communication, and HF-SSB (High Frequency-Single Side Band), used for communication when the stations are out of VHF range with each other. Both types offer certain special advantages, and each requires a specific operating procedure.

VHF-FM Radios

In the United States, the VHF Band is broken up into 71 channels, with a frequency range of from 156.000 to 163.000 MHz, including six WX (Weather) channels. By law, all operating VHF stations are required to have at least three of these channels: channel 6, channel 16, and at least one other working channel.

Channel 6 (156.300 MHz) is the Intership Safety Channel, used for intership safety purposes, search-and-rescue (SAR) communications with ships and aircraft of the U.S. Coast Guard, and vessel movement reporting within ports and inland waterways. This channel must not be used for non-safety communications.

Channel 16 (156.800 MHz) is the International Distress, Safety, and Calling Channel (Intership and Ship-to-Coast). This channel must be monitored at all times the station is in operation (except when actually communicating on another channel). This channel is also monitored by the U.S. Coast Guard, Public Coastal Stations, and many Limited Coastal Stations. Calls to vessels are normally initiated on this channel. Then, except in an emergency, you must switch to a working channel. It is against FCC regulations to conduct business on this channel. In addition, vessels calling must use their assigned call sign at the beginning and end of each transmission.

Channel 22A (157.100 MHz) is the U.S. Coast Guard Liaison Channel. This channel is used for communications with U.S. Coast Guard ships, aircraft, and coastal stations after first establishing contact on channel 16. Navigational warnings and, where not available on WX channels, Marine Weather forecasts are also broadcast on this frequency.

Channels 24, 25, 26, 27 and 28 (also 84, 85, 86 and 87) are the Public Correspondence channels (ship-to-coast). These are available to all vessels to communicate with Public Coastal stations (Marine Operator). Channels 26 and 28 are the primary public correspondence channels.

Channels 1, 3, 5, 12, 13, 14, 15, 17, 65, 66, 73, 74, 77, 81, 82 and 83 are channels with special designations (port traffic communications, U.S. government communications, locks and bridges, environmental, etc.), and their use close to shore or to ports should be minimized.

Channels 7, 8, 9, 10, 11, 18, 19, 67, 68, 69, 70, 71, 72, 78, 79, 80 and 88 are commercial and non-commercial working channels that are available for conducting business. The abbreviated format (no call signs) is acceptable on these frequencies. It should be noted that some of these channels may be locally restricted (off the Washington Coast, for example, channel 11 is Tofino Coast Guard Traffic Control for the entry into Juan deFuca Strait, used for reporting ship locations), in which case their use for business should be avoided.

HF-SSB Radios

Single Side Band radio is a special version of AM (Amplitude Modulation) radio specifically intended for long-range communication. As a consequence of the "skip" phenomenon (the tendency of a transmitted signal to reflect off the barrier created by the ionosphere), High Frequency skywaves can reach stations up to several thousand kilometers away (depending on ionospheric conditions and other environmental factors). The very nature of the transmitted skywave, however, means a signal very much poorer in quality than a typical VHF or UHF (Ultra High Frequency) signal, and one that is very susceptible to slight atmospheric shifts. HF propagation can vary with time of day, month of the year, sunspot activity, etc., so it becomes extremely important to use more than one frequency to ensure communications under differing conditions.

A number of specific characteristics must be considered when discussing skywaves in an HF-SSB system. One of the most important is the operating frequency of the system. In general, the lower frequencies are used for medium distances, and the higher frequencies for greater distances. As a general rule of thumb for daytime operations, multiply the frequency in MHz by 100 to obtain the approximate skywave coverage distance in miles: 4 MHz equals 400 miles, and 12 MHz equals 1200 miles. At night, these ranges are from 2 to 3 times greater. The nature of the ionosphere is such that its effective position varies with the time of day, tending to move higher up after sundown. This means that the same frequency will reach farther at night, and it is therefore common practice to use lower frequency at night for coverage of the same distance.

Radio Procedure

Inasmuch as the airwaves are in the public domain, it is the responsibility of the radio station operator to conduct business according to established guidelines and procedures. While on the air, the operator should follow the following format outline:

1. Listen before beginning transmission in order to ensure that you are not interfering with other stations or with emergency radio traffic.

2. Identify your station when calling. On the SSB, a calling station must limit the duration of the hail to not more than 30 seconds. If there is no reply, the hail may be repeated at 2 minute intervals up to a maximum of three times, at which time the calling station must sign off and wait a minimum of 15 minutes before making another attempt. This requirement does not apply in emergency situations.

3. Keep transmissions short and concise, giving the other station a chance to respond, ask questions, or reconfirm an unclear message. A long, complicated message can best be effected in short segments, with breaks in between to ensure that the receiving station has copied each portion of the message correctly.

4. Follow correct radio procedure while on the air. The phonetic alphabet should be learned and used -- spelling unclear words with an extemporaneous phonetic alphabet can lead to misunderstood messages. You should also know and use the radio "punctuation" words ("over","clear","out","roger","words twice","say again","standing by", and "break"). Since most radio communication is only one way at a time, these words can be invaluable for signaling your intentions to the receiving station. Make sure to speak directly into the microphone; speaking loudly, slowly, and distinctly -- but not shouting -- can significantly improve the legibility of radio broadcasts. The use of profanity on the public airwaves is strictly forbidden.

5. Upon completing a transmission, you must sign off by identifying your station and using the words "clear" or "out" (or, if you expect to soon resume contact with the same station, by using the phrase "standing by").

Radio Telephone Procedure - Continued

1. Radios are different from telephones in that they cannot transmit and receive simultaneously. Therefore when you have temporarily finished talking and are ready to listen, say "over," and release the button on your microphone. When the other party is ready to listen they will say "over." At the end of your entire message, say "out" rather than "over." Keep in mind that people on other ships can overhear your conversation, so watch what you say.

2. Sounds are easily garbled on marine radios so the phonetic alphabet is used when sailors want to spell something. Here are the words that the Coast Guard will recognize as letters:

A - alpha	N - November
B - bravo	O - Oscar
C - Charlie	P - papa
D - delta	Q - Quebec
E - echo	R - Romeo
F - foxtrot	S - Sierra
G - gulf	T - tango
H - hotel	U - uniform
I - India	V - victor
J - Juliet	W - whiskey
K - kilo (keeloes)	X - x-ray
L - Lima (Leema)	Y - Yankee
M - mike	Z - Zulu

3. Every ship and all Coast Guard stations continually listen to the emergency frequencies. Therefore when you want to talk to someone, call on an emergency frequency. As soon as you contact them, arrange to switch to another channel. It is illegal, impolite, unfair, and dangerous to talk on emergency channels. Sometimes atmospheric conditions are such that the emergency frequencies are the only ones that work. At those times you simply cannot communicate via radio except to report emergencies.

   Emergency frequencies are:

   FM Channel 16, international distress
   FM Channel 13, for ships to use to avoid collisions. You can contact other ships on 13, but not Coast Guard shore stations.
   AM 2182, international distress

   (Almost certainly as an observer you will only be using FM frequencies.)

4. When you initially contact another station make sure you state what channel you are broadcasting on, since all ships and stations constantly listen to several.

5. Speak in normal tones, using normal conversational pauses and emphasis.

6. Ensure that your messages are brief and businesslike. No chatter.

7. When trying to establish communications repeat the other station's name, and your name, at least twice. A typical message may be as follows:

You - "Coast Guard Station Kodiak, Coast Guard Station Kodiak; this is the fishing vessel Starry Flounder, Whiskey Tango Zulu 4190; this is the fishing vessel Starry Flounder, Whiskey Tango Zulu 4190; on channel 16, over."

C.G.- "Fishing vessel Starry Flounder this is Coast Guard Station Kodiak, shift and answer on channel 11, out."

You - "Coast Guard Station Kodiak, Coast Guard Station Kodiak, this is the Starry Flounder on channel 11, over."

C.G.- "Fishing vessel Starry Flounder, this is Coast Guard Station Kodiak, send your traffic, over."

You - "Kodiak, this is the Starry Flounder, I am an observer talking for the captain. A crewman has a badly crushed arm and needs hospitalization. Can you evacuate the crewman? Over."

C.G. - "Vessel Starry Flounder, this is Kodiak. Affirmative. What is your current position? Over."

You - "Kodiak this is the Starry Flounder. Position 55 degrees 50 minutes north, 157 degrees, 24 minutes west, over." etc.

MEDICAL DIAGNOSTIC CHART (MDC)

One of the most important functions an observer can perform during a medical emergency is the collection and maintenance of a medical history. This history and its communication to the Coast Guard is essential to the further treatment of an injured person.

There are two histories to be aware of. The first deals with the patient's bodily make-up and past medical concerns. The second history is a record of the accident or illness and how it is affecting the patient over time. These two pieces of information will give doctors and corpsmen, hundreds of miles away, a greater diagnostic tool of what's happening inside the patient's body and what complications may lie ahead.

The patient's past medical history is the "framework" for which you will later fill in the "details". This medical history (refer to "MDC RADIO WORKSHEET AND FLOW CHART", items 7 - 13), is simple, basic, and vital. For example: 30 yr. old /male/145 lbs./ 5 ft. 7 in. / medium build/ no allergies/ no medications///. [Please note that what is underlined would be in your radio message.] This "framework" information is just as important as the details you are about to fill in.

Without previous training and using what is available, you can observe and record the nature of the accident and the patient's vital signs. On the worksheet, items 14 - 18 are observation questions of "what's happened" (#'s 7-13 are to whom), and 19 - 25 are the observation questions of "what's happening now". An example of what's happened might be:

Injured by a broken cable on jan. 24 at 2300/ Patient has sustained a head injury/ Complains of severe pain in the upper left quadrant of abdomen/ Compound fracture to right hand/ Possible fracture to left arm below elbow/ Possible internal bleeding in the abdomen, area hard and tight, some blood in urine/ Right hand and left arm splinted, external bleeding controlled///

"What's happening now" is information on the vital signs: level of consciousness, eye reactions, pulse, blood pressure, respiration, skin condition and body temperature. Here is an example of what's happening now:

VITAL SIGNS:/ LOC, alert/ EYES, E-R/ PULSE, 64 steady but weak/ B-P unavailable, distal pulse present, cap refill good/ LUNGS, clear and equal/ RESP, 30 and shallow/ SKIN PERSPIRATION, normal; COLOR, normal; TEMPERATURE, normal/ BODY TEMPERATURE, 102.2///

Don't forget to have ready the patient's name, the vessel name and the vessel owner's name and address. All of this extra information is necessary to expedite patient care and transport if necessary, and to inform family members. The procedure and interpretation of the worksheet is as follows:

(1 - 3) The "address" of the message.

(4) (Is not necessary for domestic vessels.)

(5) Self-explanatory.

(6) The patient's name is very important, don't forget to include it.

(7 - 11) Age, sex, height and weight can be estimated when there is a lack of specific information.

(12 - 13) Build and allergies information is critical and must be exact!

(14) (Self-explanatory.)

(15) Type of injuries should be self-explanatory, however there are three things to be aware of: 1) the definition of a soft tissue injury; 2) trying to localize abdominal pain; and 3) the various types of bleeding. Soft tissue injuries are injuries related to the organs (i.e. eyes, kidneys, testes, etc.). Whenever possible, locate the abdominal pain using the navel as the center point. This will give the doctors and corpsmen a better idea of which organs are traumatized.

(16) Fill type of bleeding out carefully. Bleeding is not only an injury, but also an indicator of further problems and therefore must be observed in greater detail. Identify the type of bleeding as: profuse, shallow, pulsating, steady, and/or internal. Internal bleeding is difficult to identify but can be suspected, if an area such as the abdomen which is normally soft, is now hard and rigid; if that area or another is tender, swollen and/or has a bruised appearance to it. Look for the presence of blood in the eyes, ears, mouth, vomit and urine. Blood in the vomit needs specific identification as to its consistency and color (i.e. is the blood fluid-like in appearance or does it appear clumped together like coffee grounds, is it dark red or bright red?). All of these observations are necessary to determine the nature and origin of the bleeding.

(17 - 18) Self-explanatory, rely on basic observations.

(19 - 25) The vital signs are indicators of the patient's present physiology. To record the vital signs, all you need other than your good judgment is a watch with a second hand and a flashlight. Item (19), a patient's Level Of Consciousness (LOC) is generally described in terms of Alert, Vocal, Pain or Unconscious. Use the following standard criteria to determine a patient's LOC. The method used to determine Alertness is "Time, Date, Place Orientation." A person is considered Alert if they can answer simple questions, "What is your name, where are we, what is today's date?" **Do not ask** questions like, "How many fingers do I have up?"; *number skills involve an entirely different set of motor functions in the brain.* A person who is incoherent, semi-conscious, or mumbling without direction is considered Vocal. When a patient is unconscious but responsive to Pain (a thin pinch on the bottom of the foot or under the armpit should suffice) then this should be noted differently than the state of Unconscious, since it denotes a higher state of consciousness.

(20) Eyes: you will need a flashlight for this one. Open both of the victim's eyes, shine the light into one eye **from the side of the face** (not directly in from the front of the face), and look into the other eye. Both pupils should constrict equally, quickly, and simultaneously. If you have any doubts, have someone else repeat this procedure and compare your results.

(21) Pulse is counted at beats per 30 seconds times 2, and rated per minute. The pulse is best taken at the wrist (follow the thumb down to the beating area...) or at the throat (off to either side of the windpipe, under the jaw). Again, if in doubt, compare. A description of the pulse should follow: strong, weak, bounding, etc.

(22) Without a blood pressure cuff, accurate B-P information is unavailable. However, the other data you are collecting, the qualitative information on the pulse and skin conditions, will assist in a general qualitative assessment of the B-P. With that, there are two other direct indicators of B-P quality, they are: Distal Pulse and Capillary Refill. Distal pulse is a pulse taken at a location distant from the heart. The two most common places to take distal pulse are: 1) below and behind the ankle and, 2) top center of the foot. The presence and quality of this pulse is your data. (NOTE: these pulses are difficult to find on a healthy person and if you are unable to find them on your patient, try to find them first on yourself or on someone around you). Capillary refill is your other index of quality. Pinch a little bit of skin on the fore finger and toe. Note how quickly color is lost and then returns. That speed in which skin color returns is your indicator. Capillary refill is diminished by cold.

(23) The information requested on lungs and respirations should be self-explanatory. In the event that you don't have a stethoscope, place your ear on the patient's chest, both sides, high and low. With a stethoscope, check the lungs high, middle and low on the chest, and high and low on the back. Respirations should be timed and qualified the same way as the pulse is. One word of caution, don't let the patient know that you are monitoring their breath, they will breath differently.

(24) Skin perspiration, color and temperature is monitored by sight and touch. This should not present any problems, but do not confuse skin temperature with body temperature.

(25) Place a thermometer in the patient's mouth or armpit and record your findings. To convert Celsius to fahrenheit use the equation given on the worksheet.

The flow chart on the back of the MDC is simply an update of items 19 - 25, every 15 or 30 minutes as necessary. For the first half hour it is good to monitor your patient every 10 minutes, every 15 minutes for the next hour and a half, and every half hour after that. An example of your first radio message should read something like the following, with subsequent radio messages updating the patients condition as necessary.

TO: Coast Guard, Kodiak
FROM: *your name, vessel name, vessel permit number, present lat. and long.,time & date*

Request medical assistance/ Crewman Joe Misfortunate/ 30 yr./ male/ 145 lbs./ 5 FT. 7 IN./ medium build/ no allergies/ no medications///

Injured by a broken cable on Jan. 24 at 2300/ Patient has sustained a head injury/ Complains of severe pain in the upper left quadrant of abdomen/ Compound fracture to the right hand/ Possible fracture to the left arm below elbow/ Possible internal bleeding in the abdomen, area hare and tight, some blood in urine/ right hand and left arm splinted, external bleeding controlled///

VITAL SIGNS/ LOC, alert/ EYES, E-R/ PULSE 64 steady but weak/ B-P unavailable, DISTAL PULSE present, CAPILLARY REFILL good/ LUNGS clear and equal /RESPIRATIONS 30 and shallow/ SKIN: PERSPIRATION, normal; COLOR, normal; TEMPERATURE, normal/ BODY TEMPERATURE 102.2///

VESSEL OWNER/ Joe Smith/ Homer/ 907 123-4567///Please advise best course of action///

MDC RADIO WORKSHEET AND FLOW CHART

(1) VESSEL'S NAME & CALL SIGN _____

(2) VESSEL'S LAT. & LONG. _____ (3) TIME & DATE _____

(4) VESSEL AGENT'S U.S. NAME & ADDRESS _____

(5) VESSEL OWNER'S NAME & ADDRESS _____

(6) PATIENT'S NAME _____ (7) AGE _____ (8) SEX _____

(9) HT. ___ ' ___ " (10) WT. _____ # (11) BUILD _____ (12) ALLERGIES _____

(13) PRESENTLY ON MEDICATIONS Y/N _____ WHAT _____

(14) DATE, TIME & NATURE OF INJURY _____

(15) TYPE OF INJURIES OR ILLNESS

___ Airway	___ Abdominal Pain (general)	___ Fracture	___ Swelling
___ Cardiac Arrest	___ Upper Left Quadrant	___ Burn	___ Bleeding
___ Head	___ Upper Right Quadrant	___ Poisoning	___ Alcohol On Breath
___ Soft Tissue	___ Lower Left Quadrant	___ Seizure	___ Other _____
___ Chest Pain	___ Lower Right Quadrant	___ Psychiatric	_____

(16) TYPE OF BLEEDING

___ Profuse ___ Internal

___ Shallow

___ Pulsating

___ Steady

Blood in the:

___ Eyes ___ Ears ___ Vomit

___ Nose ___ Mouth ___ Urine

(17) LOCATION OF INJURIES

___ Head/Face	___ Upper Extremities
___ Neck/Spine	___ Abdomen
___ Chest	___ Pelvis
___ Back	___ Lower Extremities

(18) TREATMENT

___ Cleared Airway	___ Wound Care
___ Oxygen	___ Splint
___ CPR	___ Neck/Spine Immobilized
___ Controlled Bleeding	___ Other _____

VITAL SIGNS

(19) LEVEL OF CONSCIOUSNESS

___ Alert

___ Vocal (but not alert)

___ Pain (responsive to)

___ Unconscious

(20) EYES

___ Pupils EQUAL & REACTIVE

___ UNEQUAL but reactive

___ Sluggish

___ Dialated (Enlarged)

___ Constricted (Small)

___ NON-REACTIVE

(21) PULSE (#'s & quality)

___ XX Beats per minute

___ Strong

___ Steady

___ Bounding

___ Weak

___ Thready

___ Irregular

(22) BLOOD PRESSURE (B-P)

#'s this/that

B-P Cuff Only

Distal Pulse Present Y/N____

Capillary Refill Quality ____ Good ____ Poor

____ Fair ____ Unavailable

(23) LUNGS & RESPIRATIONS

Lung sounds are:

____ Clear ____ Equal

____ Congested ____ Unequal

____ Raspy

Respirations are:

____ XX per minute ____ Short

____ Deep ____ Irregular

____ Shallow ____ Strained

____ Weak

(24) SKIN (perspiration, color & temperature)

PERSPIRATION	COLOR	TEMPERATURE
____ Very Dry	____ Flushed	____ Hot
____ Normal	____ Normal	____ Normal
____ Sweating	____ Pale/Ashened	____ Cool/Cold
	____ Cyanotic (blue)	

(25) BODY TEMPERATURE

____

°F = °C x 1.8 + 32

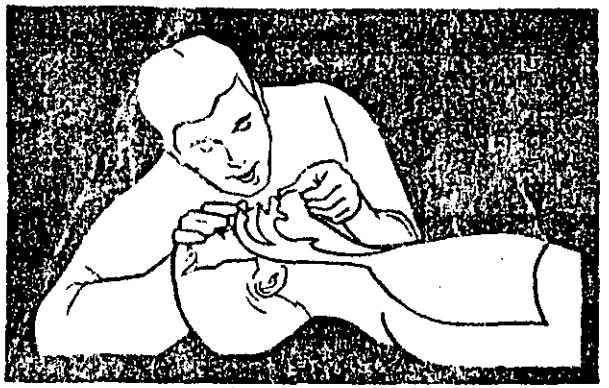
FLOW CHART FLOW CHART FLOW CHART

TIME (GMT)	19 LOC	20 EYES	21 PULSE & qual	22 B/P	23 RESP (# & qual)	24 SKIN (p-c-t)	25 BODY TEMP	OTHER

Cardiopulmonary Resuscitation (CPR)

SHAKE OR SHOUT TO DETERMINE UNCONSCIOUSNESS

Airway



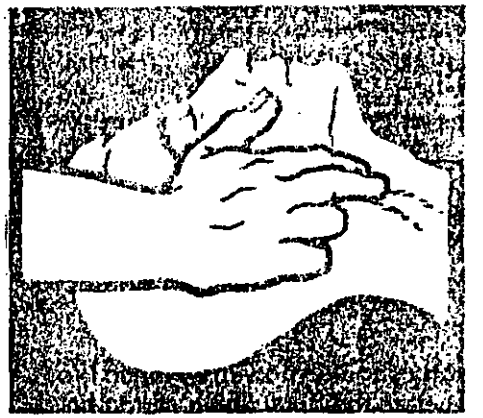
If no response:

TILT head and **LIFT** chin to clear airway of tongue.
LOOK, LISTEN, and **FEEL.**
Look to see if chest is rising and falling.
Listen and Feel at mouth with your ear to determine breathing.

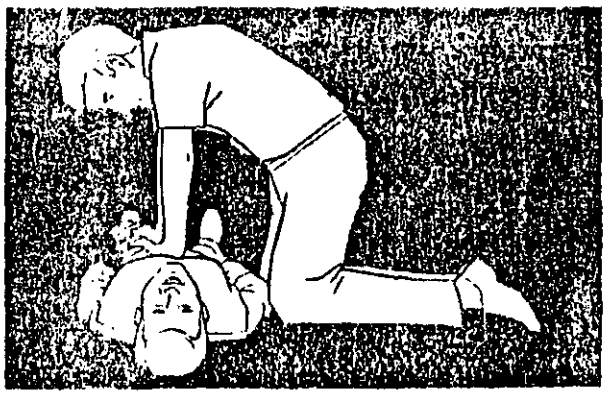
Breathing

If no breathing:

PINCH nostrils.
OPEN your mouth.
TAKE a deep breath.
SEAL patient's mouth with yours.
BLOW four quick, full breaths.
CHECK neck pulse on the side nearest you.
If pulse is present, continue breathing 12 times per minute (1 each 5 seconds).
Child/Infant rate - 20 times per minute (1 each 3 seconds)

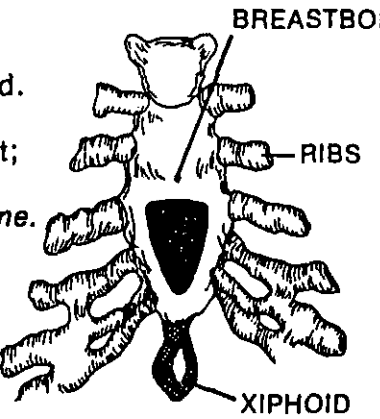


Circulation



If no pulse:

REMOVE obstructive clothing from chest.
FEEL for lower end of breastbone with 2 or 3 fingers on xiphoid.
PLACE heel of one hand just above fingers so that you are on lower one-half of breastbone, **PLACE** other hand on top of first;
KEEP arms straight.
Small child — use heel of one hand at midpoint of breastbone.
Infant — use 2 fingers at midpoint of breast bone.
COMPRESS breastbone straight down 1½ to 2 inches . . .
Child — ¾ to 1½ inches
Infant — ½ to ¾ inch
. . . at a **RATE** of 60-80 times per minute.
Child/Infant 80-100 times per minute.



ONE PERSON — give 2 BREATHS after 15 CHEST COMPRESSIONS. Chest compressions are done at a rate of 80 times per minute.

TWO PERSONS — Give 1 BREATH during the upstroke of each **5th CHEST COMPRESSION.** Chest compressions are done at a rate of 60 times per minute.

Call for Help.

HELICOPTER EVACUATION

Helicopter evacuation is a hazardous operation and should only be attempted in a life or death situation. The following information provides the capabilities and requirements of the Coast Guard for evacuation at sea.

RANGE:
Helicopters can operate only 100 to 150 *miles* offshore weather conditions permitting.

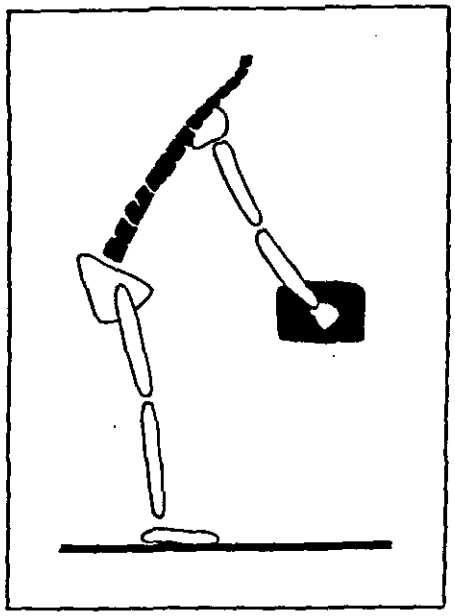
REQUEST FOR ASSISTANCE:
▲ Determine patients condition and call the nearest Coast Guard station listed on *NMFS Medical Assistance Placard.*
▲ Give position, course, speed, weather conditions, type and characteristics of vessel.
▲ *Conserve time by heading towards* rendezvous point.

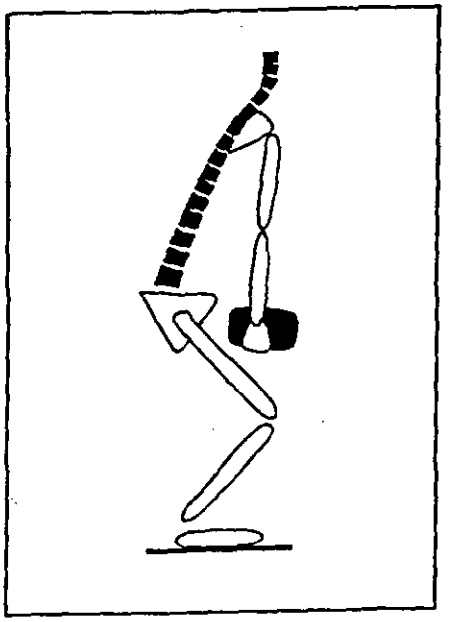
PREPARE FOR ARRIVAL:
▲ Stand by on 2182 kHz or specified alternate if not available.
▲ Display distress signal.
▲ Clear hoist area, preferably aft, with maximum horizontal clearance. If area is mid-ships lower antenna and secure running gear.
▲ At night, light area, DO NOT shine lights on helicopter.

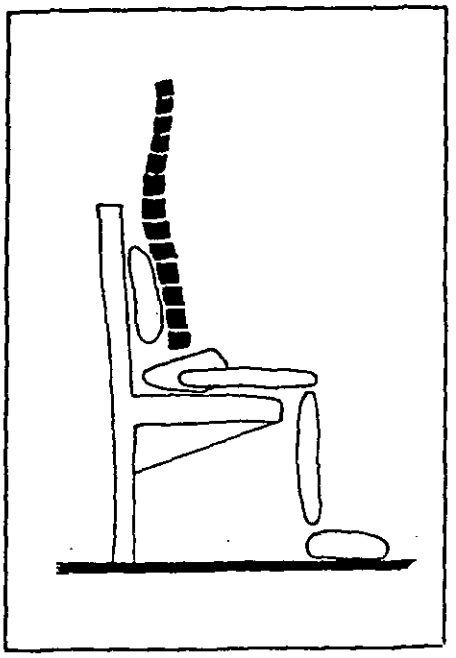
HOISTING:
▲ Tag patient, indicate medication given and conditions doctor should be aware.
Keep vessel into wind or with wind about 20° on port bow at 10 to 15 knots.
▲ Hoist instructions will be given by pilot. *Allow stretcher or basket to touch deck* to discharge static electricity. Wear dry cotton or rubber gloves.
▲ If stretcher is needed it will be equipped *with a hoisting bridle.*
▲ Conditions permitting, have patient in life jacket, strapped in, face up, and hands clear of sides.
▲ DO NOT secure hoist cable to vessel or attempt to move stretcher without first unhooking cable.
▲ With patient strapped in signal pilot to lower hoist. Steady stretcher.
▲ *Use trail line to steady* stretcher. Make sure line is clear of rigging and crew.

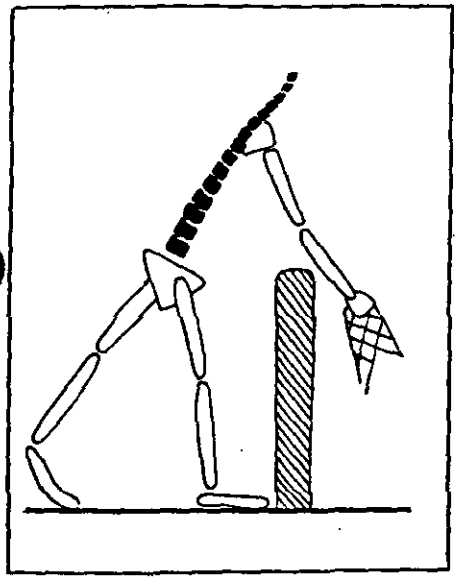
U.S. Department of Commerce, National Oceanic and Atmospheric Administration
National Marine Fisheries Service, Fisheries Extention Service, Northeast Region, Gloucester, Massachusetts

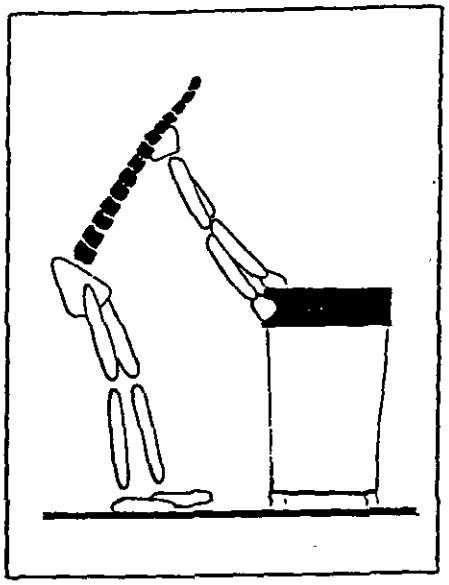
PREVENTING BACK INJURIES

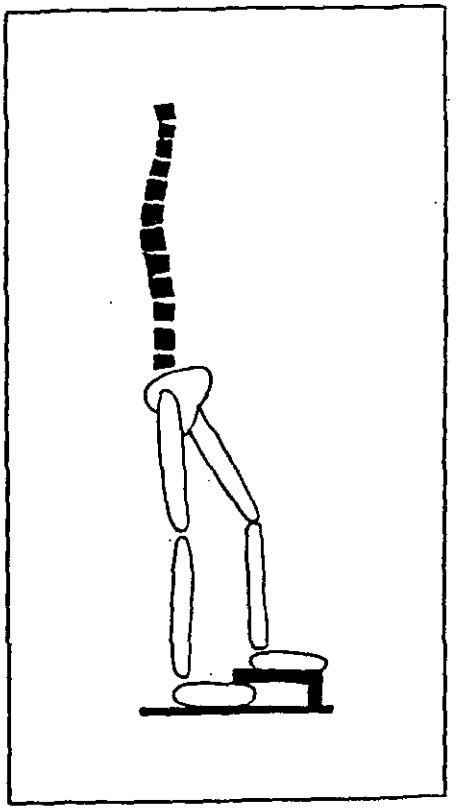












1. The stress on the back is increased when the work is too far away from the body.

2. Taking the time to get a load directly in front of and close to you will reduce the chance of hurting your back. Always bend your knees and lift with a straight back.

3. If you have to sit for a long period, make sure the seat supports the lower back. If it doesn't, put a rolled-up sweater or towel behind your waist.

4. If you have to reach over something to do a job, put your weight on one leg and stretch the other leg straight out behind.

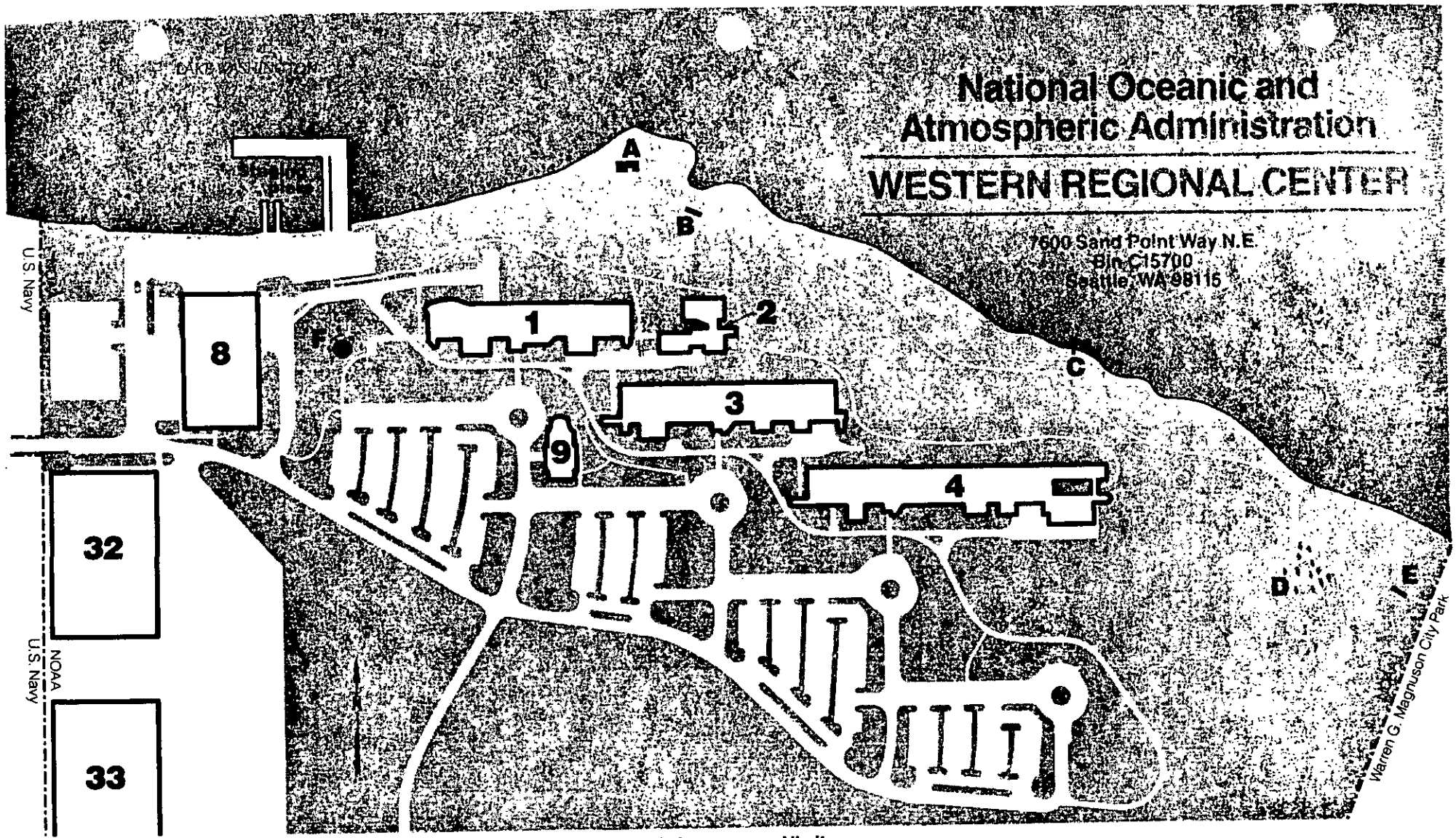
5. If you have to pull or push an object, take the extra step to get it straight in front of you.

6. If you must stand for a long period, put one foot up on a low ledge or rail.

National Oceanic and Atmospheric Administration

WESTERN REGIONAL CENTER

7600 Sand Point Way N.E.
Bin C15700
Seattle, WA 98115



For safety sake—use sidewalks and paths, and observe speed limits

Building 32
NMFS Resource Assessment and Conservation Engineering

Building 33
Warehouse

Building 8
Pacific Tide Party, PMC.
Western Regional Diving Facility.
Shops.
Warehous

Building 1
NW Regional Office, NMFS.
NW Regional Counsel.
NW Ocean Service Center.
Public Affairs.
Office for Civil Rights.
National Weather Service Forecast Office.
Western Administrative Support Center.

Building 2
Cafeteria.
Health care facility.

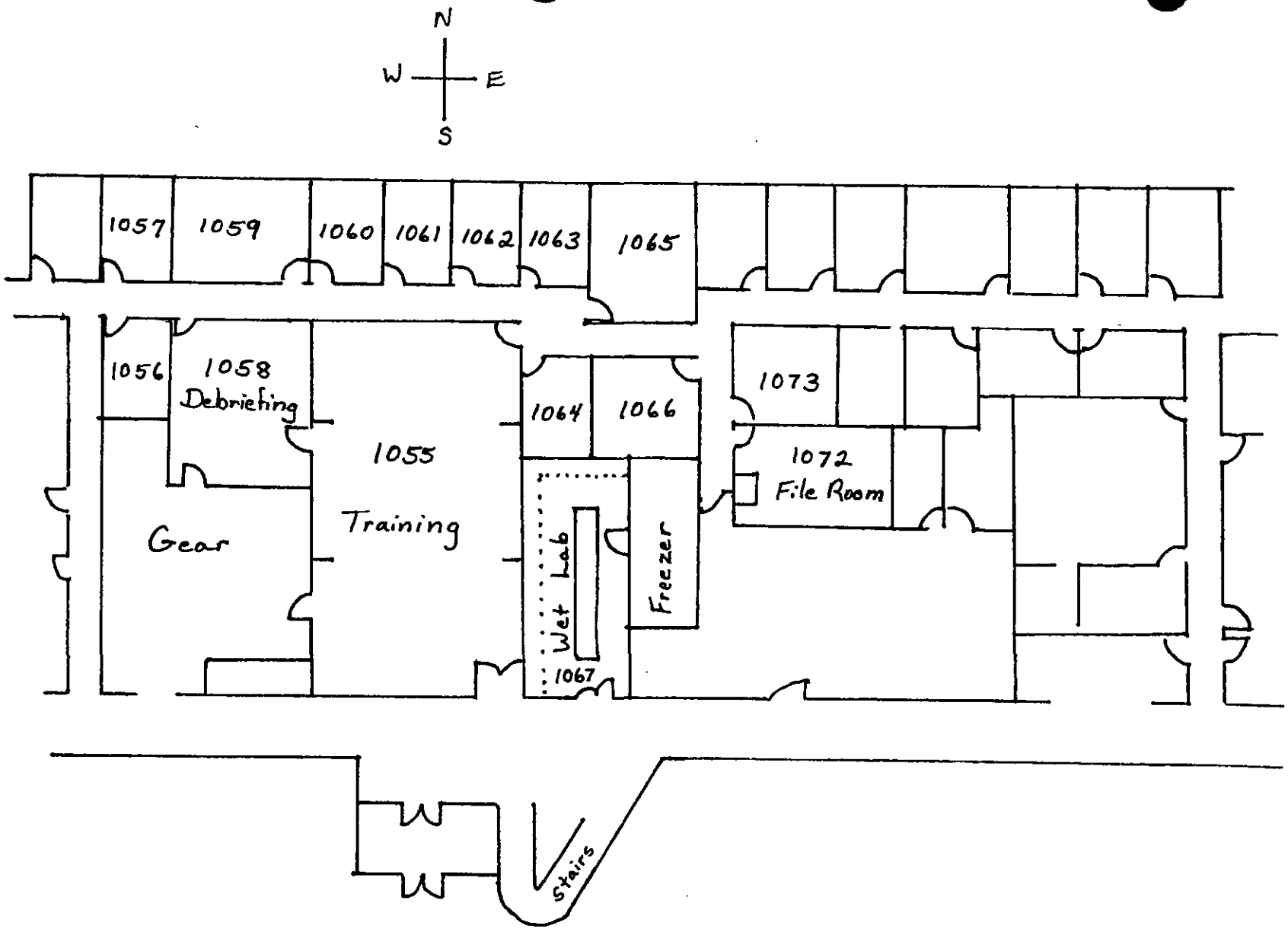
Building 3
Pacific Marine Environmental Laboratory.
Nautical Chart Branch, PMC.
Library & Information Services Division.
Ocean Assessments Division, NOS.

Building 4
Northwest & Alaska Fisheries Center, NMFS

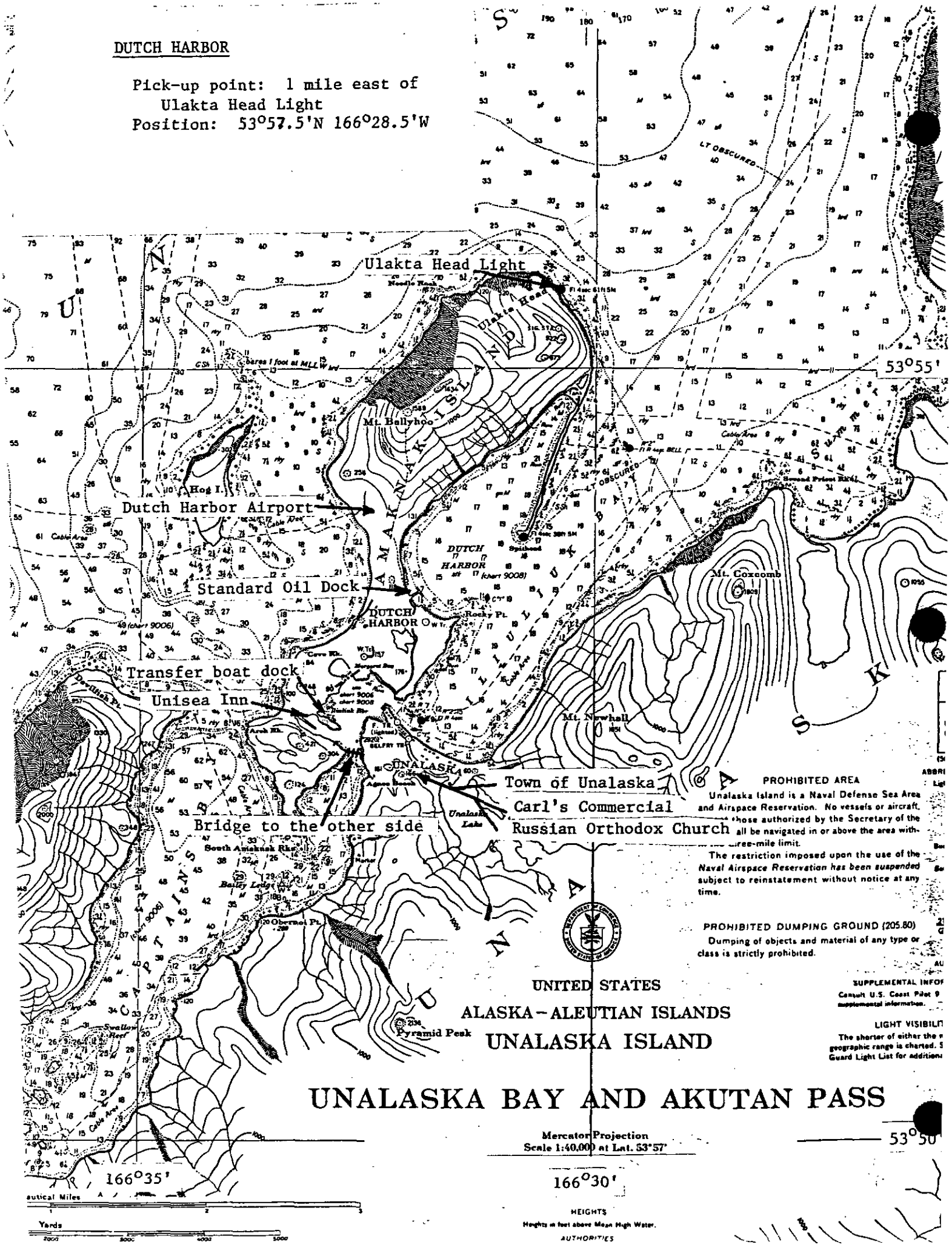
Building 9
Auditorium and seminar rooms

Artworks

- **A** Viewpoint
- **B** NOAA Bridge
- **C** Berth Haven
- **D** A Sound Garden
- **E** NOAA Bridge
- **F** Kn[illegible]or NOAA

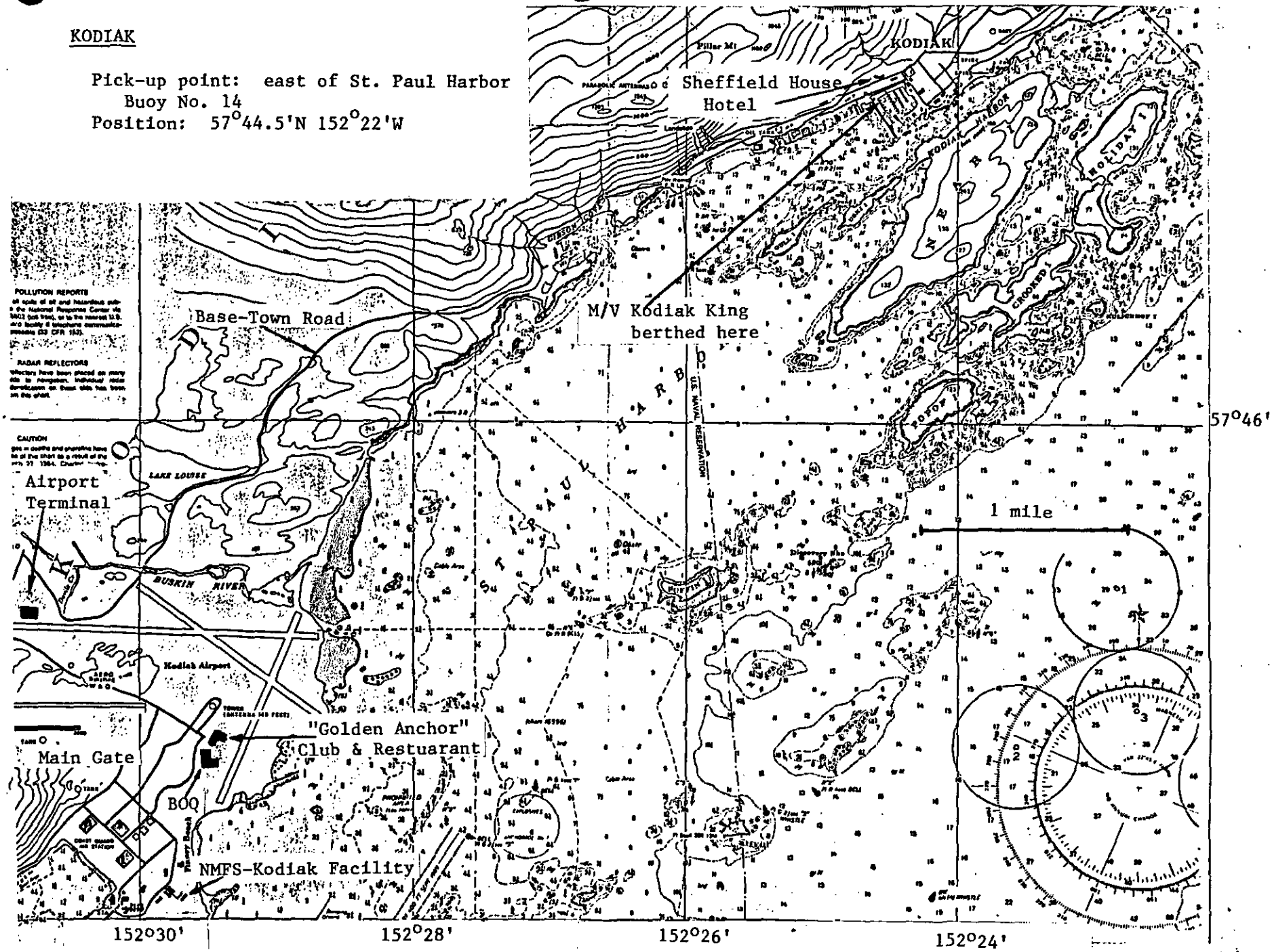


Observer Program Facilities, Building 4 ground floor


DUTCH HARBOR
Pick-up point: 1 mile east of
Ulakta Head Light
Position: 53°57.5'N 166°28.5'W
Ulakta Head Light
Dutch Harbor Airport
Standard Oil Dock
Transfer boat dock
Unisea Inn
Bridge to the other side
Town of Unalaska
Carl's Commercial
Russian Orthodox Church
Mt. Ballyhoo
Mt. Coxcomb
Mt. Newhall
Pyramid Peak
Hog I.
DUTCH HARBOR
UNALASKA
Unalaska Lake
Rocky Pt.
Dutch Harbor Pt.
Ulakta Head
Amaknak Island
Unalaska Island
53°55'
53°50'
166°35'
166°30'
PROHIBITED AREA
Unalaska Island is a Naval Defense Sea Area and Airspace Reservation. No vessels or aircraft, except those authorized by the Secretary of the Navy, shall be navigated in or above the area within three-mile limit.
The restriction imposed upon the use of the Naval Airspace Reservation has been suspended subject to reinstatement without notice at any time.
PROHIBITED DUMPING GROUND (205.80)
Dumping of objects and material of any type or class is strictly prohibited.
UNITED STATES
ALASKA-ALEUTIAN ISLANDS
UNALASKA ISLAND
UNALASKA BAY AND AKUTAN PASS
Mercator Projection
Scale 1:40,000 at Lat. 53°57'
HEIGHTS
Heights in feet above Mean High Water.
AUTHORITIES
Nautical Miles
Yards

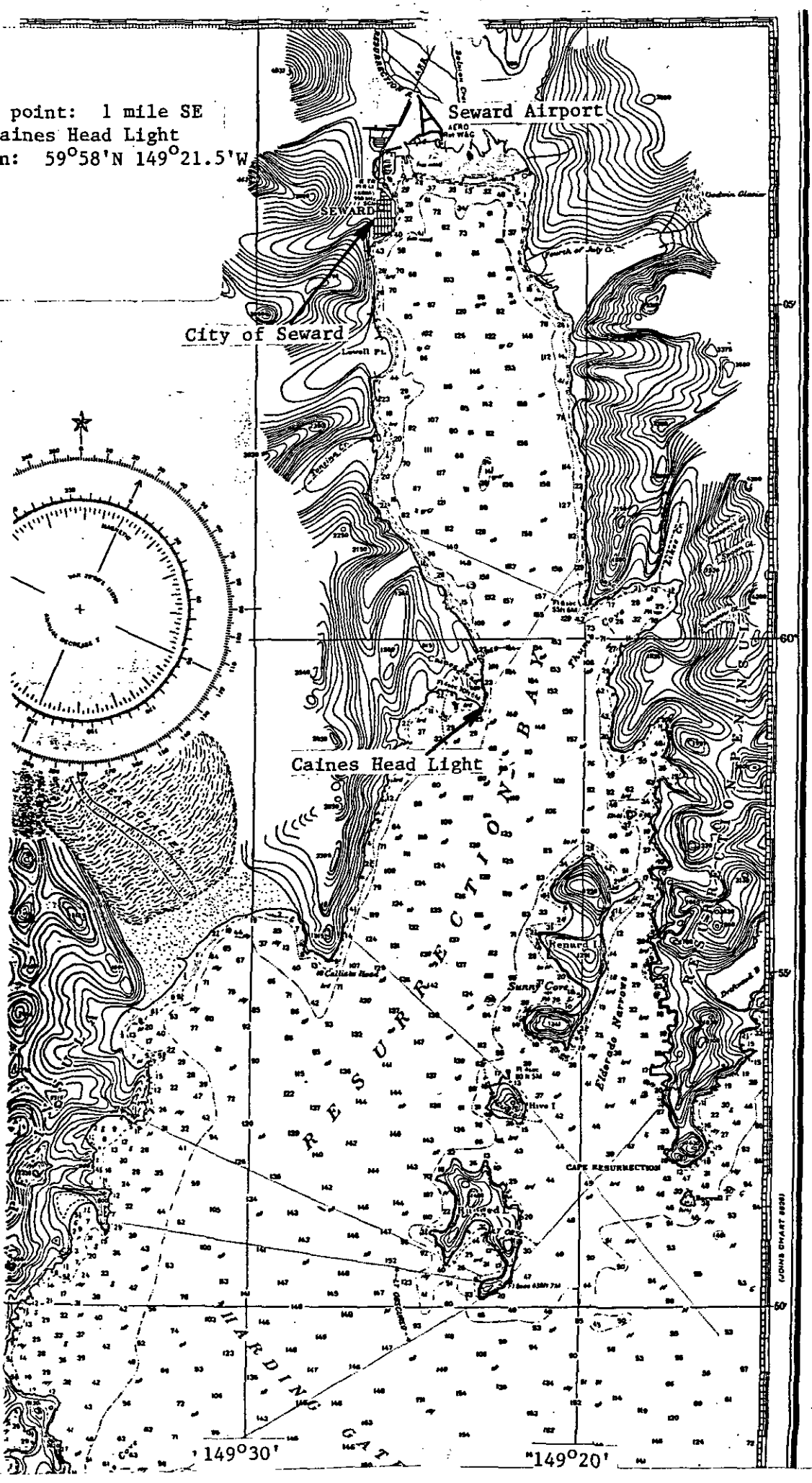
KODIAK

Pick-up point: east of St. Paul Harbor
Buoy No. 14
Position: 57°44.5'N 152°22'W



SEWARD

Pick-up point: 1 mile SE
of Caines Head Light
Position: 59°58'N 149°21.5'W



GLOSSARY

ABC - Acceptable Biological Catch is an annual harvest level for each species besed only on biological considerations.

Aft - towards the stern of a vessel

Amidships - midway between the bow and stern of a ship, or on the centerline.

Athwartships - side-to-side across a ship, perpendicular to the centerline.

Bag - the codend.

Beam - width of a ship.

Benthic - living in direct relation with the bottom

Bight - a loop or turn in a line.

Bin - a large compartment built into a ship for holding fish. Also called live tank, refridgerated seawater tank (RSW tank), lobby.

Block - a pulley or system of pulleys in a frame, with a hook.

Boat Share - The percentage of the gross which goes to the vessel owner.

Bobbin - a round, rubber or steel roller used in the footrope of a bottom net to protect the net from damage

Bosun - chief of the deck crew

Bottom - 1) ocean floor, or 2) fishing depth, or 3) a ship hull. Which meaning to apply must be taken from context.

Bow - the forward end of a ship.

Bow line - a mooring line attached to the bow of a ship.

Bowline - a type of knot used to form an eye in the end of a rope.

Breech - a behavioral characteristic of some marine mammals such as humpback whales, where they rise vertically out of the water, and then with most of their body above the surface, they fall to their back or side.

Bridge - the control center of a ship.

Bridle - Wire attached to the headrope, footrope or side panel of a net, by which the net is towed.

Bulkhead - a wall separating compartments of a ship.

Bulwarks - the upper section of the side plating of a ship, which extends above and around the upper deck.

Capstan (gypsy) - an upright, spool-shaped, power rotational cylinder around which cables or hawsers are wound for hoisting anchors, or other weights.

Chaffing gear - protective carpeting (or strands of nylon forming a carpet pile) on the outer, underside of the trawl net to keep it from catching and ripping on obstacles on the bottom.

Chief - The engineer, the man responsible for care of engines and deck machinery.

Choker, chokestrap - a loop of wire or rope used to cinch off the net or codend.

Cleat - a heavy piece of wood or metal having two horns around which ropes may be made fast or belayed, usually secured to a fixed object such a dock or the deck.

Codend - the end "bag" of a trawl net where the majority of the fish are collected and held.

Combing - a low partition that separates the trawl deck from the side pockets.

Companionway - Entrance/stairway from deck to fo'c'sle and engine room.

Compliance - in accordance with the fishing regulations.

Cookie (disc) - a flat, round piece of rubber with a hole in the center strung on a wire rope or chain to protect it from abrasion and to stir up a mud cloud.

DAP - Domestic Annual Processed catch by U.S. fishing vessels delivering to U.S. processors and by U.S. catcher/processors.

Demersal - being or living near the seabed.

Directed fishing - targeting or fishing for a species quota.

Disembark - to get off a vessel.

Door - a large steel or alloy structure attached to each main wire (in front of the net) to spread the net horizontally by means of hydrodynamic and friction forces.

Draft - vertical distance from keel to waterline of a ship.

Drum - a metal spool or cylinder around which cable, etc. is wound.

Drumhead - the top of a capstan, into which bars are inserted for leverage in turning it.

Ebb tide - outgoing tide.

EEZ - Exclusive Economic Zone. This is the term for the 200 mile jurisdiction zone formerly called the FCZ.

Embarkation - to board a vessel.

EPIRB - Emergency Position Indicator Radio Beacon.

Expansion straps (container lines) - A series of lines running around the circumference of a codend to provide strength and help maintain the shape of the bag.

Expenses - All costs of making the trip: fuel, groceries, ice, bait, lost gear. Some expenses may be gross-stock expenses, that is, costs levied against the gross stock before any shares are deducted. Crew expenses are those trip costs levied against the crew's share, shich is that amount left after deduction of boat share and gross-stock expense.

Fathom - a measure of length or depth equal to six feet.

Fishfinder - an electronic device for locating schools of fish under a vessel.

Fishing line - a length of chain or wire in the bottom fromt end of a net between the footrope and the bolsh line.

Flatfish - fish which are laterally compressed and who orient themselves in the water with their lateral surfaces or sides towards the surface and bottom.

Flatlink - a piece of cut or cast hardware, generally oblong in shape, with leg diameter smaller in certain areas to allow attachment of a G-hook; used where wires must be conenected and disconnected frequently.

Flood tide - incoming tide.

Fo'c'sle (from: forecastle) - the forward part of a ship where sailor's quarters are located.

Footrope - a series of bobbins, tires or discs strung on chain or wire rope attached to the bottom front of a bottom net to protect the net from damage. On a midwater net, the rope or wire running along the front, bottom edge of the net.

Forward - towards the bow of a vessel.

Freezer trawler - a large, catcher/processor vessel whose products are whole fish or parts of fish frozen into blocks.

Fresh weight - the weight of the whole fish (or animal) as it was when alive. Also called round

weight, whole weight.

FUS - Fully Utilized Species. FUS is a designation given to bycatch species whose quota has been taken but the fishery was permitted to continue. Fully Utilized Species must be discarded from the catch like prohibited species.

Galley - Ship's kitchen and/or mess hall.

Gallows - structure from which trawl blocks are hung; separate units port and starboard.

Gangen - the leader line, about a meter in length, tied into a longline with a hook tied to it's free end.

Gantry - a continuous structure athwartship used for towing and gear handling.

Gas bladder - a sac filled with air or similar gases in the body cavity. May or may not be attached to the throat by a duct.

G-hook - a piece of cut or cast iron hardware in the shape of a "G", used with a flatlink where wires must be connected and disconnected frequently.

Gill rakers - bony toothlike structures on the anterior edges of the gill arches. For protection or straining out food.

Gilson - a single hookline (as distinguished form a multiple block) used to assist in setting, hauling and moving gear on deck.

Gunnel or Gunwale - the upper edge of the side of a boat.

Gurdy - Special winch for hauling of longlines or trolling lines.

Gypsyhead - A metal drum with a smooth concave surface, usually mounted on a winch. Several wraps of line around the gypsy provide enough friction while it is turning to raise heavy loads smoothly because the line slips and is easily controlled, like the friction on a clutch plate.

Hatch - an opening in a deck or bulkhead of a ship.

Haul - a catch of fish from one tow of a net

Hawser - any large rope (generally five inches or more in circumference) used primarily for towing, mooring or hauling.

I-beam - a steel beam shaped like an "I" in cross section.

Incidental catch or species - catch taken while fishing for the primary purpose of catching a different species.

Intermediate - a gradually tapered section, generally of small mesh, between the back body of a trawl and the codend.

Joint Venture - a cooperative fishing/processing effort between vessels of different nationalities.

Knot - A measure of time multiplied by distance, equalling speed. One knot equals one nautical mile (6080 feet) in one hour.

Lay - the direction in which the strands of a rope are twisted (right or left) or the degree of tightness with which they are twisted (soft, medium, hard, etc.)

Lee, Leeward - the side protected from the wind,opposite the "windward" side

Lobby - another name for a fish bin on a catcher/processor.

Master - fishing master and/or captain.

Mothership - a processing vessel at-sea (under way) whose fish come from catcher boat's deliveries.

MSY - Maximum Sustainable Yield is an estimate of the largest average annual catch or yield that can be taken over a significant period of time from each stock under prevailing ecological and environmental conditions. Since MSY is a long term average, it need not be specified annually.

Net reel - a hydraulic drum on the deck on which the net and most of the rigging are wound.

Otterboard - Another name for a trawl door; Refer to net diagram.

Otter trawl - The type of net gear used on stern trawlers; Refer to net diagram.

OY - a range within which summed TAC's must fall.

Pelagic - midwater

Peritoneum - the lining of the gut cavity

Pew, Pew stick, Pewing - a sharp-ended pole which is used to skewer fish and toss them to another location.

Pod - a group of marine mammals traveling in association

Pond - see "bin", the Koreans use this term for a fish bin.

Porthole - a window in the hull or the outside bulkhead of a ship.

PSC - Prohibited Species Catch is a harvest limit usually placed on halibut, salmon and crabs or other species which must be discarded in the groundfish fisheries.

Radio Call Sign - four letters and/or numbers which are an international identifier of a vessel. The International Radio Call Sign (IRCS) is painted in large letters on the side of each vessel and on the deck of the flying bridge.

R.D.F. - Radio direction finder.

Regenerated scale - a fish scale which has grown in to replace one that was lost. Regenerated scales are useless for aging the fish.

Reserve - a portion of quota set aside at the beginning of the fishing year to allow for uncertainties in preseason estimates of DAP catch.

Riblines - heavy lines or chains that run down the length of the trawl net to strengthen it.

Rostrum - a pointed, calcareous, median extension on the anterior end of crab carapaces.

Roundfish - fish that orient themselves in the water with the dorsal side towards the surface and ventral side towards the bottom.

Round weight - the weight of the whole fish (or animal) as it was when alive, synonymous with fresh weight.

RSW - Refridgerated sea water, usually referring to a tank for holding fish.

Scupper - a hole in the bulwarks which allows water to drain from the deck.

Sheave - a wheel with a grooved rim, such as is mounted in a pulley block to guide the rope or cable.

Skate - a length of longline gear, usually 100 fathoms or 600 feet long.

Skate bottom - a white fabric square with lines on the corners to tie it into a bundle once a longline "skate" has been coiled onto it.

Spring line - a mooring line attached amidships.

SSB - Single Side Band radio used for long distance contact.

Starboard - the right side of a ship (when one is looking forward).

Stern - the aft or back end of a vessel.

Stern ramp (slip) - a sloping ramp in the stern of a trawler between the deck and the water line, through which the net is set and hauled.

Stern trawler - any of various sized fishing vessels which trawl a conical shaped mesh net through the water, haul it up a ramp through the stern of the ship, empty, and process the catch to make a wholesale fish product. These vessels may fish for a month or more at sea without support.

Surimi - minced fish meat paste usually produced from pollock.

TAC - Total Allowable Catches are annual harvest levels based on biological, economic and social factors

Taper - to cut webbing according to a given formula for fitting into a trawl.

Trawl - A cone shaped net, towed through the water to catch fish.

Under way - Vessel in forward motion, running. According to Coast Guard regulation, a vessel is under way if it is not at anchor or at dock, so a vessel adrift is technically under way.

Vessel Code - A code used only by the observer program to identify a ship.

Warp (main wire) - the cables on a trawler which run from the main winches to the trawl doors on the net.

Wing - the sides off a trawl net near the opening, usually with larger mesh than the rest off the net.

Wrister - A coated cloth tube worn on the arm, extending from the elbow and covering the wrists. Keeps arms warm. Fish blood and slime are more easilly washed out from these than from shirt sleeves. Most fishermen cut off workshirt sleeves, generally about halfway between elbow and wrist.

Zipper - an area of the codend which may be opened to remove fish, a seam connecting two parts of the net which may be opened by pulling on the zipper line.

Zulu - another name for GMT.