

UNITED STATES DEPT. OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
NORTHWEST AND ALASKA FISHERIES CENTER
SEATTLE, WASHINGTON

Manual for Biologists
Aboard Domestic Groundfish Vessels

1988

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TABLE OF CONTENTS

Page

Preface.....

The Role of the Observer in the Domestic Fisheries Observer Program
The Domestic Observer Program.....
Observer Duties and Priorities.....

Preparation and Departure
Communications.....
Training.....
Observer Clothing and Equipment.....
 Personal Items Supplied by Observer.....
 Sampling Gear Provided by NMFS.....
 Preparation and Care of Sampling Equipment.....
Travel to the Home Port or Ship
 Shipment of Gear.....
 Expenses Incurred While Traveling.....
 Transport to the Ship.....
 Safety in Transfers.....

Making Vessel Arrangements.....
 Finding Vessels in Port
 Contact APTA
 Contracts
 Insurance

Arrival Aboard the Ship
 Living Conditions Aboard the Ship.....
 Safety Aboard the Vessels.....
 First Day on Board.....

Interaction with Vessel Personnel Concerning Sampling.....

SECTION I: SAMPLING PROCEDURES

Observer Objectives.....

Observer Work Schedules and Workload.....

General Instructions for Data Forms.....
 Cruise Numbers and Vessel Codes.....
 Page Numbering.....
 Calculation Guidelines.....
 Greenwich Mean Time.....

STERN TRAWLERS

Catch Rates

- Observer Estimates of Catch Rates.....
- Retained Catch Weight.....
- Official Total Catch Weight.....
- Form 2US.....

Species Composition and Incidence of Crab, Halibut, and Salmon.....

- Methods of Species Composition.....
- Methods of Incidence Sampling
- Biological Data Collected from Prohibited Species
 - Collecting Data from Salmon and Steelhead.....
 - Collecting Data from King and Tanner Crab.....
 - Collecting Data from Halibut.....
 - Viability of Halibut, King Crab, and Tanner Crab.....
- Objectives and Priorities.....
- Mixing Hauls.....
- Form 3US.....
- Species Code List.....

Length Frequencies

- Selection of Sampling Species.....
- Sampling Method.....
- Length Frequencies of Prohibited Species.....
- Form 7US.....

Scale Samples and Otolith Samples

- Random Stratified Otolith Samples.....
- Random Otolith Samples.....
- Scale Samples.....
- Form 9US.....

DOMESTIC JOINT VENTURE.....

LONGLINERS.....

- Observer Estimates of Catch Rates.....
- Retained Catch Weight.....
- Official Total Catch Weight.....
- Form 1US.....

Species Composition and Incidence of Crab, Halibut, and Salmon.....

- Methods of Species Composition.....
- Methods of Incidence Sampling
- Biological Data Collected from Prohibited Species
 - Collecting Data from Salmon and Steelhead.....
 - Collecting Data from King and Tanner Crab.....
 - Collecting Data from Halibut.....
 - Viability of Halibut, King Crab, and Tanner Crab.....
- Objectives and Priorities.....
- Mixing Hauls.....
- Form 3US For Longliners.....

RADIO MESSAGES.....

Instructions for Sending Weekly Radio Messages.....

Instructions for Making Weekly Species Composition Catch Reports
 Paragraph 1.....
 Reporting Groups.....
 Form RM for Stern Trawlers and Motherships.....
 Form RM for Longliners.....
 Form RM-1 for All Vessel Classes.....
 Special Problems.....

Instructions for Making Weekly Prohibited Species Catch Reports
 Paragraph 2.....
 Reporting Groups.....
 Form RM-3 for All Vessel Types.....

General Directions for Writing Radio Messages.....
 Radio Message Examples.....

Instructions for Forms RM-2 and RM-4.....

SECTION II: ADDITIONAL DUTIES AND INFORMATION

Obtaining Information on Product Recovery Rates and Unit Weights....

Adjusting the Ship's Estimate.....

Observations of Marine Mammals.....
 Form 11A - Marine Mammal Sighting Record.....
~~Black Cod - Killer Whale Interaction Form.....~~

Tagged Fish and Crab.....

Logbook Entries.....

Form 12 - Vessel Data Form.....

Obtaining Information on Fishing Gear.....

Cruise Reports.....

Observer Return and Completion of Duty.....

Observer Evaluation??

APPENDIX

Sampling Flow Chart.....
 Complete Listing of Sampling Duties.....

Conversion Table - Pounds to Kilograms.....
 List of Conversion Factors.....

Relationship of Pacific Halibut Lengths (cms) to Weights (kgs).....

Sexing Fish.....

Length Measurement for Various Species.....

Otolith and Scale Collection for Select Species.....

Approximate Location of the Otoliths and the Cuts for Removal.....

How to Sex and Remove Otoliths from Jack Mackerel.....

Location of Preferred Scale Sampling Zones.....

How to Collect Fish.....

 Specimens Needed for Teaching Collection.....

 Specimen Collection Forms.....

Permit for Marine Mammal Parts.....

Commonly Observed Gear Dimensions.....

How to Measure Mesh Size.....

Hook Size Chart for Longliners.....

Radio Communications.....

 Radio Telephone Procedure.....

The XX Most Common Mistakes on Data Forms.....

Medical Diagnostic Chart (MDC).....

Cardiopulmonary Resuscitation (CPR).....

Directions for Helicopter Evacuation.....

Map of NOAA Western Regional Center and
Observer Program Facilities.....

Glossary.....

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 Gulf of Alaska. This manual plus a training session 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.

THE ROLE OF THE OBSERVER IN THE DOMESTIC FISHERIES OBSERVER PROGRAM

THE DOMESTIC OBSERVER PROGRAM

The domestic pilot observer program began in September 1987. The voluntary program was designed to provide biological data to replace that lost as the foreign fisheries observer program disappears. The pilot observer program was also an experiment in seeing if the fishermen would cooperate in a voluntary program.



THE POTENTIAL USES OF PILOT PROGRAM OBSERVER DATA IN FISHERIES MANAGEMENT

As Americanization of the fisheries proceed, the amount of data from the Foreign Fisheries Observer Program will diminish, and certain types of data will no longer be available unless a viable domestic observer program is instituted. The potential uses of data collected by observers from the North Pacific Fishery Management Council's (NPFMC) Pilot Domestic Observer Program aboard U.S. fishing vessels would be much the same as the present uses of data collected by observers in foreign and joint venture fishery operations. These include: 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 ^ostocks. Length frequencies and age structure collections of 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 will be diminished. Resulting decisions on allowable catches will be based on a higher degree of uncertainty and thus may be more conservative. At present, there is little joint venture fishing in the Gulf of Alaska, and no joint venture fishing on certain species in the Bering Sea, so the domestic fishery is the only potential source of commercial catch data for those fisheries.

Another main 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 in ways of reducing that impact. As a step in that direction, the prohibited species management proposals developed by the 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. These data do not currently exist for most domestic groundfish fisheries and data from some other source such as joint venture catch rates will have to be used to determine DAP bycatch needs and to set the bycatch caps by which those DAP fisheries will be managed. Bycatch data collected by the pilot domestic observer program will be beneficial to both the industry and fishery managers in determining realistic DAP bycatch needs.

Data obtained by pilot program 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 situation in which pilot program observers may play a part is the study 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 the 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 United States is so dependent upon the data obtained by observers in order to assess the impact of various fisheries upon the stocks, the necessity for accuracy in data collections, accurate determinations of species, and complete fulfillment of the sampling plan cannot be overstressed. Data forms must be carefully completed and checked. The sample forms in this manual serve as guidelines^e. (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 NMFS.)

This manual, along with the training session, 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 session or manual. 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 that we ask you to obtain.

OBSERVER DUTIES AND PRIORITIES

~~Primarily, the observer's duties and priorities consist of determining haul weight estimates, sampling for species composition and the incidence of king crab, tanner crab, halibut and salmon in the catch, and collecting biological data on various species.~~

The primary objectives of the observers are to:
obtain daily total catch rates; obtain daily retained
catch weights; determine species composition;
gather data on species, size, and age compositions; and
determine incidence of Pacific halibut, salmon,
king crab and Tanner crab in the landings.

~~Because the United States is fully dependent upon
the data obtained by observers in order to assess
the impact of ^{american} fisheries upon the stocks, the
necessity for accuracy in data collections, accurate
determination~~

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. Determine or record total official catch, retained catch, and observer estimate of total catch for each haul or set.
2. Determine the species composition of the catch according to specified instructions.
3. Record the numbers and weights of certain "prohibited species" in the catch as per instructions. These species include king crab, tanner crab, halibut and salmon.
4. Send a summary of this information by radio message or telephone to Seattle weekly.
5. 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.
6. Obtain factory production information from the vessel.

SPECIAL CAUTION ON DEPARTMENT

As a guest of the vessel:

1. Fisheries observers have been treated fairly well, and in turn you should show some respect to the vessel and the crew.
2. Observers should make a conscious effort to remain clean and neat, particularly at mealtimes, while aboard vessels.
3. Accomodations may or may not be available on your boat. Women may find themselves sharing staterooms with male crewmen. Meals are generally good, but some vessels lack a cook, and others have meals served when the cook feels like it rather than on a schedule. Adaptable observers with an easygoing attitude in these regards are apt to receive more consideration than those who constantly criticize and make demands.

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 person who is causing the problem or talking with the factory foreman or deck boss. If this doesn't help, you might want to talk to the captain and ask him to help you, don't demand. If talking fails, you might have to change your sampling system.
3. You will be ask questions about fishing regulations. If you know the answer, then answer the question with a qualifying statement like "I think...". If you are not sure, admit it and send the captain to get his CFR ^{Code of Federal Regulation} book. *Federal Register*
4. Maintain a friendly demeanor to vessel personnel. ^{USC, US Code} You will probably observe a few violations or a waste of fish, but remember that compliance is not your job. Before acting in any given situation, be mindful of the diplomatic nature and sensitivity of your position.
5. Many American fishing vessels are dry, that is no alcohol is permitted aboard. [If you plan to take alcohol out with you, check first with the captain.] Consumption of alcoholic beverages should be kept at a very low level. Drinking wine or beer with a meal or having one or two drinks while relaxing during off hours is permissable. ?
6. An obvious point (but one of extreme importance) is the

prohibition of any sexual activity between observers and crew members. Since ships are often coed, this applies to the male as well as the female observers. In addition, the use of illegal drugs (such as marijuana) is strictly prohibited. New laws make it possible for a ship to be confiscated if drugs or drug residues are found onboard.

7. As an American observer, you should abide by all the rules and regulations relating to the conduct of the host vessel. You should not utilize, for any purpose other than obtaining required data, any species which is prohibited for the vessel. This includes eating crab, halibut, or salmon in the ship's mess. This also means no keeping shrimp, scallops, sponges, corals, or other species which the vessel is not specifically permitted to retain. No marine mammal parts should be retained.
8. 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. Domestic observers are not to monitor their vessels for compliance, and they should not discuss the vessel or its catch with Coast Guard personnel or NMFS enforcement agents. If there is a problem and the Coast Guard wants your data or comments, they are required to subpoena you. Do not volunteer information.
9. Once you are aboard your sampling ship, you probably won't have many opportunities to visit 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 particularly important if your vessel is in an area where observers are required.

10. If your ship comes into port mid-cruise to refuel or get supplies, you can get off. It is your responsibility to be back aboard when the ship is ready to sail. Departure times are often uncertain, so do not risk being left behind by disembarking for any length of time. If the ship is scheduled to be in port for several days, call your contractor for advise^c. It may be best to take all your gear with you to a hotel.

11. Consider safety first in everything you do.

PREPARATION AND DEPARTURE

COMMUNICATIONS

Observers will not receive mail while on board domestic groundfish vessels. For observers working out of Dutch Harbor, mail can be sent general delivery and the post office will hold it for up to 30 days. If you are staying at the Royal Dutch Inn, they may allow you to use their address. Use one of the addresses listed below:

Your Name
General Delivery
Dutch Harbor, AK
99692

Your Name
C/O Royal Dutch Inn
P.O. Box 712
Dutch Harbor, AK
99692
(907) 581-9981 lobby phone

Observers working out of Kodiak can have their mail sent general delivery or care of the Kodiak Bed & Breakfast. Use one of the addresses listed below:

Your Name
General Delivery
Kodiak, AK
99615

Your Name
c/o Kodiak Bed & Breakfast *Mary Monroe*
~~P.O. Box XXXX~~ 308 Cope Street
Kodiak, AK 99615
(907) 486-5367

On occasion, observers whose host vessel is boarded by the Coast Gaurd have been able to have the Coast Gaurd boarding personnel mail letters for them, if the letters were stamped and ready for mailing.

The following list of addresses and phone numbers is supplied for your reference:

Contract Agency:

University of Alaska, Fairbanks
Alaska Sea Grant College Program
590 University Avenue, Suite 102
Fairbanks, Alaska ~~9XXXX~~ 99701
Brenda Melteff (907) 474-6701

Observer Program Staff in Seattle:

Janet Wall (206) 526-4195
Janet Wall (home phone) (206) 283-1690
Russ Nelson (206) 526-4195
Gear Office, Debriefing Room (206) 526-4212

Recorder Phone (206) 526-4205
to leave catch messages or non-urgent messages on weekends or nights, you can leave up to a 5-minute message.

Telex: 329422 callback=NWAPC-SEA
Rapidfax: (206) 526-4004

Address: Janet Wall
Northwest and Alaska Fisheries Center
7600 Sand Point Way NE
Bin C15700, Bldg. 4
Seattle, WA 98115-0070

Alaska Regional Office, NMFS

Telex: 45377 callback=NMFS AKR JNU
Rapidfax: (907) 586-7131
Address: Janet Smoker
National Marine Fisheries Service, FAK
P.O. Box 1668
Juneau, AK 99801

National Marine Fisheries Service, Kodiak Laboratory
(to store, or obtain access to stored gear)
Phone: (907) 487-4961
Address: P.O. Box 1638
Kodiak, AK 99615
on Coast Guard base

Alaska Department of Fish & Game (ADF&G)
ADF&G in Kodiak
Phone: (907) 486-4791
Address: 211 Mission Road
Kodiak, AK 99615
ADF&G in Dutch Harbor (to obtain extra supplies)
Phone: (907) 581-1239 Ken Griffin
Phone: (907) 581-1529 Carolyn Griffin

FITC Office
Phone: (907) 486-6034
Address:

University of Alaska, Sea Grant
Calling Card Number: 49202280047375

Aleutian Truck Rental, Dutch Harbor
Phone: (907) 581-1576

TRAINING

Observers are currently hired based on their foreign fisheries observer experience. It is assumed that you understand the basics of sampling, and that you know how to identify fish. The domestic observer program uses slightly different forms, so a one day training session is held before observers go out to sea. Vessel and observer schedule arrangements are a difficult task. Though you may express a preference for a home port or vessel type, an observer must be willing and able to accept any assignment.

After completing their trip at sea, the observers return to Seattle and are required to work with Janet Wall until their data

forms have been properly completed and their cruise reports have been accepted. The number of days on payroll after an observer returns to Seattle will be based on the number of ships and the amount of work which needs to be done. Refer to the "Observer Return and Completion of Duty" section in the manual for a more complete list of responsibilities.

OBSERVER CLOTHING AND EQUIPMENT

NMFS will provide the scientific observers with adequate rainproof clothing, boots, and a sleeping bag. All equipment necessary for the collection of biological data will be similarly provided. The sampling gear will be brought aboard the vessel by the observer, and at the end of the trip, all equipment and supplies will be returned by the observer.

The observer will provide his own personal clothing, warm work clothes for wearing under raingear, toilet articles, and other items of a personal nature.

The vessel upon which the observer is to be stationed will provide a mat^tress or a place on the deck for the observer to lay out his sleeping bag. When bunks are available, observers will be sharing staterooms with 1 to 7 other people. Rooms may be coed. Meals will be provided by the vessel. It is hoped that the vessel captain will allow the observer an adequate and safe space in which to carry out his duties.

The following pages are lists covering the clothing and equipment necessary to perform 60 days sampling aboard a domestic fishing vessel.

LIST OF GEAR TO BE PROVIDED BY JANET WALL

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 sampling gear will be brought aboard the vessel by the observer, and at the end of the trip all equipment and supplies will be returned by the observer.

The observer will provide his own personal clothing, warm work clothes for wearing under raingear, toilet articles, and other items of a personal nature.

Unless otherwise informed, the vessel upon which the observer is to be stationed will be expected to provide adequate quarters, bedding, and meals. Reimbursement will not be made on the vessel for food and lodging. Support of the observers is one of the requirements of the fishing permit. In addition, it is expected that the vessel captain will allow the observer an adequate and safe space in which to carry out his duties.

The following pages are lists covering the clothing and equipment necessary to perform 60 days sampling aboard a foreign fishing vessel.

Handwritten notes:
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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, shorts - 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
 Toilet articles
 Suitcase or duffel bag, light, medium size, old or inexpensive - 1
 Traveler's checks purchased with the cash advanced
 Language dictionary and/or phrase book

Optional/Recommended Items

Felt/wool boot insoles (not liners)
 Needle and thread for repairs
 Extra eyeglasses/contacts
 Sunglasses
 Camera and film
 Watch and travel alarm
 Medication for seasickness and/or ginger root (raw or powdered)
 Vitamins
 Laxative (dried fruits and food high in fibre and/or medication)
 Diarrhea control medicine
 Laundry detergent and toilet paper (a small amount of both)
 Hand cream
 Paperback books
 Prints of family, home town, hobbies
 Small cassette player and tapes
 Water flavoring (i.e. kool-aid, lemon juice, etc.)
 Water bottle (1 qt.) - to keep drinking water in your cabin
 Sprouts (for growing your own edible greens at sea)
 Favorite foods (small quantities)

Sampling Gear Provided by NMFSTo be packed loose in baskets:

Baskets (2 or 3) with one wooden lid
 Set of castors or wheels for the basket
 Rope (one length, approximately 15 feet)
 Lined pads (2)
 Clipboards (2)
 Log book (1)
 Scouring powder (1 can)
 Lubrication oil (16 oz. bottle with applicator cap)
 50 kg scale (1) - (observer should check accuracy with standard weights
 on all scales before leaving)
 5 kg scale (1)
 2 kg scale (1)
 Sponges (2)
 Scale envelopes (50-200) (coastal hake fishery observers take twice as many)
 Plastic bags for salmon snouts (5) (15 for coastal hake fishery)
 Plastic bags (15)
 Glove liners (3 pair)
 Hardhat and chin-strap (1)
 First aid kit (1) - (check contents for completeness)
 Plastic measuring strips (3)
 Plastic sheets:
 Basket sample form (2)
 Prohibited species form (2)
 Dtolith form (2)

To be packed in cardboard box in basket:

Pencils #2 (6)
 Pencils #3B (2) - (soft lead - for use on plastic forms)
 Pens (4)
 Pencil erasers (2)
 Plastic ruler (1)
 Looseleaf rings for extra forms (3)
 Scotch tape (1 roll)
 Thumbtacks (1 container; about 25 tacks)
 Forceps (2)
 Rubber bands (1 container; about 40 rubber bands)
 Scalpel handles (2)
 Hooked scalpel blades (10)
 Tape measure (1 small, steel, 2 meter)
 Tape measure (1 large, reel-type, 15 meter)
 Thumb counters (1) - (mothership observers take 2; longline observers take 3)
 Twine (1)
 Knife (1)
 Whet stone (1)
 Flashlight and 2 size "N" batteries

Number of Data Forms to Take for a Two-month Cruise

	Stern Trawlers	Longliners	Motherships
Form 1	0	0	20
Form 1L	0	10	0
Form 2	25	0	0
Form 2JV	50	0	50
Form 3	140	0	140
Form 3L	0	140	0
Form 4	30	50	50
Form 6	6	0	6
Form 7	40	60	60
Form 8 Worksheet	8	8	8
Form 8	4	4	4
Form 9	30	50	50
Form 10	10	0	5
Form 11A	30-50	30-50	30-50
Form 11B	5-10	5-10	5-10
Radio rpt. worksheets RM	15-20	0	0
Radio rpt. worksheets RM-1	15-20	15-20	15-20
Radio rpt. worksheets RM-3	15-20	15-20	15-20
Enforcement report #1	2	2	2
Cruise report #2	2	2	2
Net-scarred salmon form	3	0	3

A packet of forms and letters in English and in the language of the host country will be provided with the gear. In this packet is a letter of introduction, written by the Director of the Northwest and Alaska Fisheries Center, which will introduce the observer to the captain of the fishing vessel and will also explain the duties of the observer. A personal history sheet is provided for the observer to fill out and give to the captain. This should be a brief statement which provides information about you as an individual. Each packet contains two copies of each translated form in case the observer is on more than one ship.

Contents of Translated Packet:

1. English letter of introduction
2. Translated letter of introduction
3. Personal history sheet
4. Notice to vessel captains (Japanese only)
5. Gear, weather and sea codes
6. Meal and bath schedules
7. Form 12 - Vessel Data Form
8. Translated Net or Longline Dimensions Form
9. Language helper and translated phrases

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 NWAFC if this could not be done while 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. Keep all paper products and small, loose equipment (pencils, pens, thumb tacks, scissors, counters, etc.) in plastic bags throughout your trip.
2. Try to keep as dry as possible: calculator, stopwatch, thumb counters, and tape measure.
3. Books should be protected from water and slime at all times.
4. Most important: Every day after use, the 2 kg, 5 kg, and 50 kg scales must be cleaned and oiled. They 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). (Do not oil thumb counters.)
6. It is recommended that your knife be kept clean and sharpened.
7. 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.

Please do not give away any gear or books. You will have to replace any

PREPARATION AND CARE OF SAMPLING EQUIPMENT

The sampling gear provided for you may not be new, but it 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 NWAPC if this could not be done while aboard ship.

All returnⁿg gear must be clean, dry, 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. Keep all paper products and small, loose equipment (pencils, pens, thumb tacks, scissors, counters, etc.) in plastic bags throughout your trip.
2. Try to keep as dry as possible: calculator, stopwatch, thumb counters, and tape measure.
3. Books should be protected from water and slime at all times.
4. Most important: Every day after use, the 2 kg, 5 kg, and 50 kg scales must be cleaned and oiled. They have steel springs inside which will rust - oil must be squirted up inside the scales.
5. Tape measures and calipers must also be cleaned (and oiled if necessary) each day when used. Thumb counters must be cleaned after use.
6. It is recommended that your knife be kept clean and sharpened.
7. Keep your otolith alcohol in your room. Crew members might consume alcohol which has been left out.

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

adjust right margin

Please do not give away any gear or books. You will have to replace any government equipment that you give away. Replacement calculators cost about \$30.00 and must be of the type specified. There is some theft of gear aboard American ships, so all gear should be labeled with indelible ink.

Check the calibration of your scales during gear checkout. Then prepare a known weight by selecting items which may be easily assembled later. (i.e. a basket, the hardhat, the plastic forms, etc.) List the items weighed and their total weight in your logbook. This known weight may then be used to check your scale adjustment or to check the accuracy of shipboard scales.

Just prior to the start of basket sampling, prepare the weighing scale to read zero when the basket is attached. Do this by adjusting the set screw at the top of the scale. With the scale adjusted, all measurements will then reflect the weight of the basket contents only.

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 flatbed scale belonging to the ship 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. Remove the casters from the basket to avoid their loss before checking in your baggage at the airport.

TRAVEL TO THE SHIP

Shipment of Gear

The observer carries sampling baskets with him to the various ports whether traveling via auto, bus, train, airplane, or helicopter. If traveling by plane, the baskets are normally transported as part of your personal luggage. Excess baggage costs can usually 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. (If you bring much more there won't be any place to store it on your vessels.) Distribute baggage weight between your pieces of luggage so that no piece exceeds the weight limit of the airline you are flying with (70 lbs on Alaska Airlines and Mark Air). 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 \$60 - 100 per piece for over 3 bags 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 that it can be brought out to you later.

On the flight to the embarkation port, carry the observer training manual and a copy of each form in your carry-on luggage. Some extra gear is available in Dutch Harbor and Kodiak, but no data forms or manuals are out there. On the return journey from the ship, carry the completed data forms with you if you are flying home. If you are going out on another ship, data forms should be completed and the report written and ^{photo copies of} both should be sent via registered mail to Janet Wall. If these forms are lost, your whole trip is essentially wasted.

Some foreign fisheries 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 further--dump the alcohol, rinse the container if necessary, and when you get to your destination, purchase rubbing alcohol or everclear to replace the ethyl alcohol that was dumped. Inform the staff upon your return and note on the top of form 9US that another type of alcohol was used. These others should also be diluted by 50% with fresh water.

Customs

Domestic observers do not need to clear customs unless their host vessel ties up to a foreign vessel at sea or goes into a foreign port while the observer is aboard.

Customs Offices:

Anchorage, AK (907) 243-4312 or 248-3373
Kodiak, AK (must check in at Anchorage: 271-4043)
Seward, AK (must check in at Anchorage: 271-4043)

Dutch Harbor, AK (907) 581-1270

Expenses Incurred While Traveling

The contracting agency should inform the observer before departure, on the procedure for accounting for money spent while traveling from Seattle to the vessel, while in port without a vessel, and while traveling back to Seattle. 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 in both getting their ships and in getting flights out of the port on their return. Layovers between ships can also be expensive. Additional travel advances should be requested at least 5 days before you plan to run out of money. The University of Alaska is billed directly by the Royal Dutch Inn in Dutch Harbor for room and board. In Kodiak, the Kodiak Bed & Breakfast bills the University of Alaska for lodging and breakfast. You may have to pay cash for any excess baggage charges on your return flights, so don't forget to allow enough money, and get a receipt. Remember, excess baggage charges from Alaska to Seattle can easily run \$60-200. Retain any unused airline tickets and your ticket receipt and turn them in to your contract agency upon your return.

Time Cards for University of Alaska

Observers with the University of Alaska are required to send in time cards every two weeks and to phone in their hours on the last friday of each time period.

Transport to the Ship

There are several methods employed in transporting observers to and from domestic vessels. The most common system is for the vessel to tie up to a pier and for the observer to climb aboard. Sometimes the vessel will anchor up in the harbor and will send over a small skiff to pick up the observer. One vessel which does not come into port very often uses a helicopter to transport the observer ^{to and} from _^ port ~~to the vessel~~.

Normally, airplane flights are arranged so that an observer arrives at the embarkation port at least one day in advance of the vessels scheduled departure date. However, if there is no logistics person, there will be no prearranged vessels, and observers will be sent to their home ports at the end of training. The observers will then have to find vessels willing to take them. Delays in getting to the home port are often caused by weather. Your contractor will have arranged hotel reservations for you, so you need to call and cancel your reservations if weather prevents you from getting to your destination. If you are going to miss a pick up time in port, try to contact the vessel or its company and let them know what has happened to you. Unless you are going on a ship that is required to have an observer to participate in a certain fishery, the vessel will not wait for you.

Embarking/Disembarking Through Dutch Harbor

Observers flying into Dutch Harbor should call the Royal Dutch Inn (RDI) and ask them for a ride. ^{to the Inn.} If they can't pick you up, they will tell you to take a taxi. When you find a vessel, it is your responsibility to inform the RDI that you are leaving and to remove

all your gear from your room. The RDI has a storage room where you can leave extra gear.

When you return to Dutch Harbor, you can call the RDI for a reservation from your vessel. The RDI monitors channel 6 on the marine band VHF radio from 8am to 3pm and from 6pm to 8pm. You can also telephone the RDI at 581-9981 and ask for the manager. If the Royal Dutch Inn does not have space available, Captains Bay Lodge might. They also monitor channel 6. If these are both unavailable, you might want to try the Unisea Inn. They monitor channel 70, or you can call them at 581-1325.

If you can't get a hotel room the day you get into port, your vessel will generally let you spend the night aboard, but make sure you get a reservation for the next night.

Embarking/Disembarking Through Kodiak

I NEED HELP ON THIS ONE - JANET OR MANDY OR PAM

Embarking/Disembarking Through Seward

~~I NEED HELP ON THIS ONE - JANET OR MANDY OR PAM~~

Breeze Inn 224-5238
Murphy's Motel 224-5650
New Seward Hotel 224-5211
Van Gilder Motel 224-3079

Embarking/Disembarking Through Cordova

I NEED HELP ON THIS ONE - JANET OR MANDY OR PAM

Safety in Transfers

To date, observers have always transferred in port, usually with the vessel tied to a pier. In the future, some at sea transfers may take place.

Transfers between a small transport vessel and a large fishing vessel are potentially hazardous, especially in rough weather. At

sea, you may receive a message requesting you to transfer to another vessel. All transfers should be made in reasonable weather.

Domestic observers are not protected by law, but you must insist upon reasonable safety during transfers. This includes waiting for good weather when necessary. It may mean missing the other vessel you were supposed to transfer to. Since the boats are American, they can come within 3 miles at any time for any reason, including the transfer of observers. This would probably mean a waste of fuel for both vessels, but you should insist on it if the captains are determined to transfer you in rough weather.

There are no hard and fast rules for allowable safety limits during transfers. Conditions such as vessel size, swells versus waves, impending weather, and mode of transfer 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. 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. 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 on small vessels should not transfer when the sea state is two meters or more.

Other 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

ropelines or cargo nets.

4. Given a choice between using a Jacob's rope ladder or a gangway, to board a ship, in most cases use the Jacob's ladder since the use of a rigid ladderway in rough seas can be extremely hazardous to the observer and 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 swaying. 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 and lifejacket in this mode of transfer.

ARRIVAL ABOARD THE SHIP

LIVING CONDITIONS ABOARD VESSEL

As a guest of the fishing vessel, the observer will be courteously treated. Living conditions will vary widely, depending on the ship type, size, age, and country of origin.

Observers may be provided with accommodations. If bunk space is available, the observer will probably share a room with several other people. For female observers, this may mean sharing a room with one or more men. Quarters are more apt to be cramped on small trawlers, longliners, and older vessels. Bedding will not ^{normally} be furnished, so observers should take sleeping bags.

Every vessel has a different meal schedule. Some serve meals at what feel like normal times; 8 am for breakfast, noon for lunch, and 7 pm for dinner. Others serve meals once every 8 hours or once every 6 hours. Snacks are often available. The food is usually quite good. Poor cooks get fired.

Fresh, potable water is available on most vessels. Sometimes the quantity is limited and showers are not available daily. Observers should adhere to any showering restrictions which apply to the crew.

Seasickness sometimes hampers an observer at the beginning of a cruise, but give it time - most seasick victims recover after a few days. Domestic vessels will not take seasick observers into port to drop them off, so take medication with you if you are subject to seasickness.

In the event of a real emergency, such as an injury or illness requiring hospitalization, contact the Coast Guard via voice radio, and they will attempt a rescue and/or advise you on how to proceed.

If you ask them to, the Coast Guard will contact the Observer

Program office and keep them advised. Many vessels have a drug locker, and the captain can issue drugs if you become ill. The captain may not have very much medical training; however, so it might be a good idea SAFETY ABOARD VESSELS to contact the coast guard and have them contact a doctor and recommend which drug to take.

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, survival suits and other safety devices are kept. Memorize the exit route from your cabin, the factory, the mess hall, 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. Find out whether there is anyone who would be responsible for your safety in the event of such an emergency.

(3) Observers will wear hard hats at all times when sampling or on deck.

(4) Observers will wear life vests at all times on the trawl deck, whether sampling or observing a trawl being dumped into a bin. If life vests are worn under your rain jacket, they will stay cleaner.

(5) The observer should be cautious when wading through the fish catch since fish spines can penetrate rubber boots and cause painful wounds to the feet.

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

(7) Observers should not run aboard the vessels. Slipping, tripping, and bumping are all very common accidents which often happen when an observer is in a hurry. Specifically, the observer should watch out for slick spots where the deck is wet or frozen, the half-foot combing rising from the bottom of metal hatch doors and passageways, and the low overheads of vessel ladderways.

(8) The observer should stay clear from under the area where the hatch covering the bin on stern trawlers swings down to open. Furthermore, when the observer is working inside the bin, he should be cognizant of the low overhead and especially of the over^ahanging parts of the hydraulic system of the hatch cover.

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

(10) Cables that break under strain frequently kill sailors. Whenever a cable is subjected to tension, stand in a place where a backlash will not hit you. If your sampling station is on deck, do not work while a trawl is being set or retrieved. When nets are being hoisted off the deck, stand well clear.

(11) When working near the exit door or hatch, where incidental halibut are released, the observer should be extremely cautious not to slip and fall overboard through the exit door. Moreover, the observer should be aware of the danger of surging seawater that may pour in through the exit doors and portholes during rough seas. Therefore, the sampling site should be situated away from exit doors and portholes during rough weather.

(12) 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.

(13) Electrical lines are everywhere in the processing room. Therefore, when reaching and picking up anything, the observer should look beforehand to see that the area is clear of any suspicious "hot wires".

(14) Observers must avoid close proximity to equipment used in filleting or reducing fish to surimi or meal.

(15) The observer should notify the U.S. Coast Guard should an injury or illness occur to him which requires immediate hospitalization.

(16) Treat all minor cuts, especially those on hands, with antiseptic to avoid infection from fish slime. Wash hands thoroughly after sampling.

(17) Ask ship personnel which water sources are safe to drink.

FIRST DAYS ON BOARD

For the first day, the observer should spend his time adapting himself to his new surroundings, meeting people, and making preparations for work. Soon after boarding you should have a meeting with the captain. Cooperation from the captain, officers, and crew is essential in many instances in order to obtain the unbiased sampled^s 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 the letter of introduction from your contractor and a copy of your resume or personal history sheet. If the host vessel has not had an observer before, you will have an opportunity to explain what you will be doing and the purpose of the domestic observer program.

At this time, the observer can explain what he will be needing. Most bridge officers are willing to collect form 1US or form 2US data for you. Some ships keep a log and may be willing to allow you to copy the necessary information from their logs. Ask to be informed, in advance, of changes in the fishing schedule so that you may sample the catches from each day of fishing. Also ask to be informed if any marine mammals are found in the catches or sighted near the vessel. You will probably be given a tour of the ship, or at least the areas you will be frequenting.

If the host vessel fishes on the first day you are aboard, you can watch the fishing, sorting, and processing operations of the first set or haul, and decide what would be the best location for your sampling station. Observers on trawlers should note where and

how codends are dumped; if crab, halibut, salmon, or other species are presorted on deck; and whether different hauls are mixed in the bins. Note where the catch is sorted by species and size and generally how the fish are handled, including the system of conveyor belts, tables and chutes being used. The location of the sampling station is determined by sampling requirements, considerations for personal safety, convenience, and minimum interference in fish processing.

Observers on longline vessels should note the configuration of the set (i.e. the number of hooks per skate or magazine and the number of skates per set), the species that are landed, and the species that are utilized. Ideally, the sampling station location should be convenient, safe and out-of-the-way.

Once the location of the sampling station has been determined and agreed to by the captain, deck boss, or factory foreman, the observer may wish to arrange for the construction or adaptation of a sampling table, and check for adequate lighting and accessibility to running water. Remember, this is a voluntary program. The crew does not have to build anything for you or help you get set up. If fish are available, you might want to familiarize yourself with the species being caught. Practice sexing the target species or other species that will have to be sexed for your work. Work out efficient routines for sorting, weighing, and counting fish. Consider the methods for making estimates of catch size and sample size. This preparation should make the first day of sampling run much smoother.

SECTION I - SAMPLING PROCEDURES

INTERACTION WITH VESSEL PERSONNEL CONCERNING SAMPLING

In most cases, observers are treated fairly well by both officers and crew. Sometimes they are provided work space and a sampling table. Assistance is generally not available, but some crews will help with the collection of crab and halibut. At times, observers are faced with situations in which their sampling data could be biased (either unintentionally or on purpose) due to requests from ship officers or actions of crew members. Common sense, good judgement, and diplomacy are needed when dealing with such situations, but the observer should be insistent in efforts to avoid data bias. The following are some situations which have occurred in the past and suggested ways of dealing with them:

1. Officers or crew may request that you not sample at a particular time--in this case, evaluate the request by finding out the reason they do not want you to sample, and if your data might be biased if you complied with their request. Some possible reasons:
 - a) Concern for observer safety--During rough weather the officers may not want observers to watch the dumping of codends on deck or to sample on deck. Evaluate the safety hazard and see if you can satisfy the concern for safety.
 - b) High incidence of crab, halibut, rockfish, or bycatch--This is not a valid reason for not sampling; you should decide whether or not to sample a particular catch before it comes on board.
 - c) If your vessel enters a new fishery which it has never before participated in, the officers may request that you not sample for the first haul or two while the crew learns the new sorting and processing techniques for that fishery. Since this is a voluntary observer program, such requests should be complied with.
2. Observers may have sampling problems due to the actions of crew members. Crew members may provide invaluable assistance in sorting out prohibited species, but the observer should oversee their actions as much as possible. Watch the catch being brought aboard to be certain that presorting does not occur which would bias the sampling data. The crew may chose to remove live halibut from the catch and throw them overboard right away. You should get a tape measure, pencil, and plastic form and collect the necessary data from the halibut before the crew throw them overboard. Most crews will cooperate if you are right there. If there are other problems caused by vessel personnel and you are unable to deal with the people who are causing the problem, try talking to the factory foreman or the deck boss. As a last resort, try talking to the captain. If the problem continues, try to find another way to sample, or do what you can to circumvent the problem and get good sampling data.
3. Observers are asked to provide vessel personnel with copies of completed data Forms 1US or 2US, and 3US. The provision of these data should be made at the convenience of the

Double
space

observer, and should not interfere with the daily sampling routine. The observer may be able to show the captain or factory manager how to use observer data to calculate the amount of discards. If the vessel is using your data to calculate discards, it would be nice to get the data to them as soon as possible.

OBSERVER OBJECTIVES

The main objectives of the observers are to make estimates of total catch size and retained catch size, to determine the catch composition, to figure out the incidence of specified prohibited species in the catch, and to collect biological data on target and other species. Secondary objectives include gathering factory production information, marine mammal observations, recording gear design and factory layout, etc. Domestic observers do not monitor their vessels for compliance with state or federal laws.

Since ship design and procedures vary from ship to ship, it is the responsibility of the observer to devise sampling techniques which will obtain the needed data. In the following sections, several basic methods of sampling will be outlined. In most cases, the observer will be able to use one of those methods or an adaptation of one of them.

When conducting biological sampling, the two most important things to remember are to take representative, unbiased samples, and to do so with a maximum amount of accuracy. Accuracy is important in all aspects of the work, including actual sampling, recording the data on plastic sheets, transposing the data on the plastic sheets to the final paper copy, and correctly calculating averages and totals on the final copy. The need for representative, unbiased sampling and accuracy cannot be overstressed.

OBSERVER WORK SCHEDULE AND WORKLOAD

There has been much confusion in the past about how many hours per day an observer should be working. ^{1940's} Observers were expected to get a certain quantity of data without concern for how many hours it would take to get that data. The current recommendation is that an observer spend about 8 hours each day collecting data (this includes time spent putting on raingear, watching the net being pulled aboard, and waiting for the crew to begin processing the catch) and about 2 hours each day filling out and checking data forms.

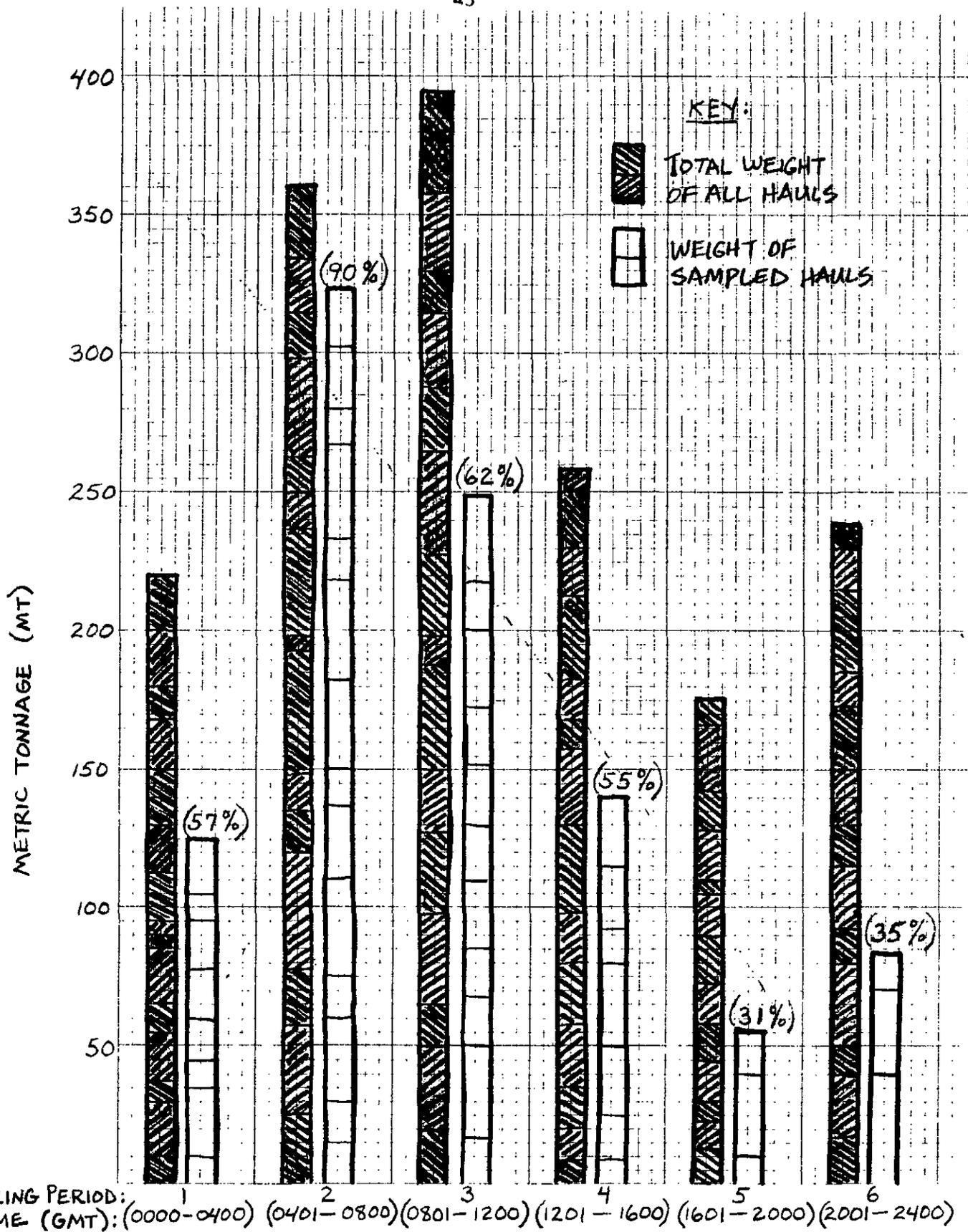
Not only must an observer strive to obtain representative samples of a certain haul or during a sampling period, but the observer should also select sampling periods so that the catch sampled is representative of the daily catch. Since many of the domestic vessels fish around the clock, the observer should arrange his schedule to allow for sampling at different times of the day. Care should be exercised so that all or most of the observation and sampling is not done during the same time period. The observer's efforts should correlate with the time period that the catch is brought aboard.

The bar graph on the following page is offered as a suggested way of keeping track that the tonnage you sampled by time period is proportional to the total tonnage that is brought aboard during those time periods. This is a cumulative graph showing tonnage landed on a large vessel over a two week period. The day has been

OBSERVER WORK SCHEDULE AND WORKLOAD

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The bar graph on the following page is offered as a suggested way of keeping track that the tonnage you sample by time period is proportional to the total tonnage that is brought aboard during those time periods. This is a cumulative graph showing tonnage landed on a large vessel over a two week period. The day has been divided into six equal periods of four hours each, and the haul tonnage has been assigned according to the time the haul was retrieved. The shaded bars indicated the tonnage landed during that period and the open bars stand for the tonnage of the sampled hauls. The percentage of the sampled hauls (by weight), for each time period is given in the parentheses at the top of the bars. The graph can be updated periodically by adding to the bars and recalculating the percentages. In this example, the observer needs to adjust the sampling pattern so that more hauls are sampled from periods 5 and 6 and somewhat less from period 2. The graph is only a suggestion--you may find



GRAPH USED TO INSURE THAT HAULS FROM VARIOUS TIME PERIODS WERE SAMPLED PROPORTIONALLY ACCORDING TO TONNAGE CAUGHT.

divided into six equal periods of four hours each, and the haul tonnage has been assigned according to the time the haul was retrieved. The shaded bars indicate the tonnage landed during that period and the open bars stand for the tonnage of the sampled hauls. The percentage of the sampled hauls (by weight), for each time period is given in the parentheses at the top of the bars. The graph can be updated periodically by adding to the bars and recalculating the percentages.

Once a given time period or haul has been selected for sampling, the appearance of the catch should not be a factor in deciding whether or not to sample it. For example, the observer may decide to sample the next haul--he should not change his mind after it comes on board. This way the observer will not intentionally select for small hauls or large hauls, hauls with large numbers of rockfish, or with many salmon, crab, or halibut, etc.

The frequency of sampling may vary according to the type of host vessel and its schedule. The following workloads are meant to be guidelines for minimum sampling. On some days however, an observer may sample only one haul because the ship moved to another area and did not fish any more that day or because the observer was ill or it was their first sampling day onboard and they were still orienting themselves to their new sampling situation. Specific directions on taking different kinds of samples are given in the appropriate section. Observers with extra time should consider reading the section "Extra activities for the bored or ambitious observer."

STERN TRAWLERS, CATCHER PROCESSORS, ~~AND~~ MOTHERSHIPS, AND TENDERS
Observer estimate of haul weight (Form 2US): from as many hauls as possible, but aim for at least 3 per day.

Determine retained catch weight (Form 2US): this should be done every haul.

Determine official total catch (Form 2US): this should be done every haul.

Sampling for species composition and incidence of prohibited species (Form 3US): 2-3 times daily if the ship is making 4 to 6 hauls per day. If the ship averages fewer hauls per day, you may sample less, but try to get larger sample sizes. If your ship averages more hauls per day, try to reduce sample size and increase sampling frequency. Whole haul sample whenever possible without sacrificing accuracy.

Biological data from crab, halibut, & salmon (Form 3US): various combinations of species, length, weight, sex, and viability data are to be collected from the king crab, tanner crab, halibut, and salmon that occur in your samples for the incidence of prohibited species.

Length frequencies (Form 7): approximately 150 lengths of the sampling species each day.

Age structures (otoliths/scales) (Form 9): as assigned. Collect

scales from all salmon in your samples.

Other special projects as assigned (i.e. stomachs, measuring crab, etc.).

LONGLINERS

Observer estimate of haul weight (Form 1US): for each set sampled.

Determine retained catch weight (Form 1US): this should be done every haul.

Determine official total catch (Form 1US): this should be done every haul.

Sampling for species composition and incidence of prohibited species (Form 3US longline): sample the catch from at least 20% of the skates set each day. If the vessel sets one very long set, like the Japanese do, it might be appropriate to break up sampling into 2 or 3 periods, but the data should be combined into one Form 3US. If the vessel sets several short lines, then a partail haul sample from 2³ to 4 of the sets would be more appropriate. Whole haul samples are acceptable, but not necessary.

Biological data from crab, halibut, & salmon (Form 3US): various combinations of species, length, weight, sex, and viability data are to be collected from the king crab, tanner crab, halibut, and salmon that occur in your samples for the incidence of prohibited species.

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Other special projects as assigned (i.e. stomachs, measuring crab, etc.).

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 should cease. Data from well over 100 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 in others, zeros filled in behind the 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.

These 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 or a mechanical pencil, not a pen, to fill out all forms so that erasures can be neat if changes have to be made. Brackets and arrows can be used to indicate that the numbers in a column are to be repeated. Ditto marks should not be used.

Much of forms 1US and 2US can be filled out from the ship's fishing logs (if they have ^{them} any). Observers should take care to record the correct information and avoid making copying errors. Avoid the practice of leaving the forms on the bridge - foreign fisheries observers have forgotten to pick up these forms when hurriedly packing for a transfer. All sampling data require the position data on these forms, so if these are missing, other data cannot be used.

Observers should provide the ship captain with copies of all completed form 3US's unless the captain states that he does not want a copy. Carbon paper is provided so that the forms can be made out in duplicate. If the captain would like copies, but does not need

them right away, the forms can be photocopied by the observer when he/^{she} returns to Seattle. The photocopies can then be mailed to the vessel, the captain, or the company. 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 determine his discards and report them, then it will behoove you to provide the captain with copies of your form 3US's in a timely fashion.

CRUISE NUMBERS AND VESSEL CODES

The cruise number and vessel code help to identify each set of data from a particular sampling period on a particular vessel. The cruise number is assigned according to the day each observer begins sampling. There are three different situations when your cruise number would change:

- 1) If you transfer to another ship, on which you sample, you begin a new cruise, and will have a different cruise number.
 - 2) If you should happen to be aboard a vessel from December to January of a new year, treat the data beginning with January 1 as a separate cruise.
 - 3) If your ship fills up with fish and goes into port to offload its cargo, your cruise is over. If you stay onboard for the next trip, it is considered a new cruise.
- Cruise numbers will be assigned during your trip, and you will

find out what they are upon your return to port by calling Janet Wall. In the meantime, keep separate sets of data for each cruise and mark your name and the ship's name on the first page of each set of forms.

There is a unique vessel code for each ship. You will be given the vessel codes of your ship upon your return to port.

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 cruise #47, 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 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

In all your data, ≥ 5 is rounded up, < 5 is rounded down. When rounding, look only at the first digit to the right of the place you are rounding off at.

All calculations on Forms RM, RM-1, and RM-3 should be carried out to 3 decimal places.

Average weight determination for Pacific halibut should be carried out to at least 4 decimal places.

Average weight determinations for other species on Form 3US should be carried out to 2 decimal places.

GREENWICH MEAN TIME

The time and date to be used on all forms (except form 11A) is Greenwich Mean Time (GMT), which is the time and date at that moment in Greenwich, England. All ships keep track of GMT since it is a

nautical convention. This eliminates much confusion concerning time zones as all ships keep the same time regardless of longitude.

A GMT day or "data day" is defined as the time period from 0000 to 2359 GMT for a given GMT date. On stern trawlers and motherships, the date of a haul is the date the trawl net leaves the "fishing level" as it is begun to be retrieved. On longliners, the date of a set is the day the set has finished being retrieved. Make certain that hauls, codends, or sets are attributed to the proper GMT day on the total catch forms (Forms 1US and 2US).

The dates on the sampling data forms (species composition, length frequency, and list of otoliths or scales) must correspond to the dates on the total catch form. New Forms 7US and 9US must be used when the day changes. These forms can take data from several different hauls or sets in a day, but only from one day.

Daylight hours will not correspond to the GMT day; and most ships also keep track of "ship time", in addition to GMT. This may cause a little confusion when you first board your vessel, but you will soon adapt to thinking in two time zones simultaneously. Ship time will usually be Alaska daylight savings time (ADST) or Alaska standard time (AST). Form 11A should be filled out in local time. Most of the clocks will be set in ship time.

STERN TRAWLERS AND MOTHERSHIPS

POSITIONS

Each vessel may keep several sets of logs. They will probably keep a set of logs for their own records. Some vessels keep records of the catch on a haul by haul or a daily basis. Others have no records of the catch. Most vessels keep some record of their

fishing positions. The observer will need to inform the captain and bridge officers of what data he needs. The bridge officers might be willing to collect the information and record it on the observer's forms. The observer might be given access to the vessels logs. In joint venture situations, the observer may need to call catcher boats on the radio to obtain the necessary data. Some vessels will not provide observers with positions but will provide the program with the positions. It is a good idea to check the loran or Sat-Nav occasionally to make sure the positions you are given are reasonable.

If you are on the Alaska I or the Alaska Voyager, they will not give you their positions. You will need to keep two sets of Form 208 on the bridge. On one set, they will fill out everything except the positions. On the other set, they will fill out haul number and position. You will not be allowed to see the set with the position data. They will tell you which NMFS statistical area you are in, so you can calculate your radio reports.

CATCH RATES

Most vessels are not required to document the tonnage of each haul. Some vessels are required to send in weekly catch messages to NMFS, or to fill out ADF&G fish tickets. Ships are not required to provide catch estimates to domestic observers.

Some vessels make good catch estimates, other vessels make estimates of only what they retain in a day, and other vessels don't make any estimates. If you are on a vessel that provides you with what you feel are reasonable estimates of total and retained catch weights for each haul, then use them on Form 208. If you are only

able to get retained catch weight for each set, then use your sample data to determine adjustment factors to calculate total catch weight each haul, or use the observer estimate of catch as the official total catch. You may end up using both systems in one day. If the vessel only gives you the retained catch for the day, you will have to do your best to attribute it to the hauls for that day. Official total catches can be based on observer estimates or adjustment factors. Often what you are given is the number of cases of each product each day. You will need to find out the case weights and the product recovery rates that the ship is using, and calculate the retained weight yourself.

On some ships, an officer will make a rough estimate of the tonnage for each haul based on codend or bin volume. For hauls which you do not sample or observe, this may be the best estimate of total catch.

There are several methods of estimating retained and total catch that your vessel might use. Back-calculation from production figures is a very common way to calculate the round weight of fish that went into product. An officer gets a count of the number of units of product produced by the factory for each haul or each day. A unit would be a tray of fish packed for freezing or a bag of fish meal. The number of units x the average unit weight = the total weight of product produced. Vessel officers then use a recovery rate to estimate the whole weight of the catch from the tonnage of the products. A recovery rate represents the proportion of the organism that is used in any given product. The use of the recovery rate (or ratio) is shown in the following equation:

REMOVE FROM FILE

Product Weight = Whole weight of fish used to make product.

Recovery Rate

Sometimes, such as on longliners, the captain gets a tally of the number of fish brought aboard during a set. The retained catch weight would equal the tally times the captain's estimate of average weight for the fish.

Some captains do not know how to estimate total catch by bin volume, and an observer might be able to teach them how.

Total catch weight typically results from one of four methods.

- 1) Back-calculation from production figures = total catch.
(This assumes no fish were discarded.)
- 2) Back-calculation from production figures + captain's or factory manager's estimation of discarded tonnage = total catch.
- 3) Back-calculation from production figures + observer's data on the weight of bycatch = total catch.
- 4) Hail Weight = total catch. Hail weight - back-calculation from production figures = weight of discards. On one vessel, the observer's hails were used by the captain to determine the amount of discard.

Observers should find out how catch estimates are being determined if they are being provided by the ship. If some species are not being included, the observer may want to adjust the estimates. Ship's estimates can be adjusted by the observer any time there are species or species groups being excluded from the estimates. If an observer finds that a ship is not accurately reporting the catch, the observer may make independent estimates. It would be a good idea to record the figures the ship gives you in your logbook in case you discover later that the error was yours and not the ship's.

If you chose to use a ship's estimate, it can be adjusted for unreported species by using the following formulas:

$$\frac{\text{observer's total species comp. sample weight}}{\text{weight of reported species in species comp. sample}} = \text{adjustment factor}$$

(cra)

$$\text{adjustment factor} \times \text{original ship's estimate} = \text{corrected ship's estimate.}$$

Correct each haul individually using your sampling data for that haul. To calculate a factor for hauls that you did not sample, sum the adjusted ship's estimate for the hauls you sampled that day and divide the resulting figure by the sum of the original ship's estimates for those hauls. This will yield an adjustment factor for the day, which is weighted by the size of the sampled hauls. Use this factor for the day to adjust the ship's estimates of those hauls that you did not sample that day.

These same formulas can be used for converting from retained catch weight for a haul to total catch weight using your observer data.

OBSERVER ESTIMATES OF CATCH RATES

Observer estimation of the total catch is important, so you should do your best to get good data. Observers should make their own estimates, and record them even if they are close to or the same as the ship's estimate. You should estimate the weight of several hauls per day, and record the date, haul number, and your estimate in your logbook. Observer estimates need not be made on the same hauls that are sampled, but this is the usual case. Some techniques for estimating haul weights are as follows:

(1) Bin Volume and Density Method: 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 by the height of the 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 the floor area.

Useful Formulas You May Need

Area of a circle = πr^2 Circumference = $2\pi r$

Area of a square or rectangle = length x width

Area of a triangle = $(1/2) \times$ base x height

For bins floors with a conical shaped depression:

Volume of a right cone = $(1/3)\pi r^2h$

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 for permission to mark the sides as to height. 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 the bin. The area of the fish bin multiplied by the height of fish from that catch equals the volume.

If you have a relatively large bin, you might want to break it up into several sections and determine the area of each section.

Then each haul you estimate the depth of fish in each section.

Calculate the volume of fish in each section and sum these to get the total volume.

The volume is then multiplied by a "density" figure for that haul, day, or cruise. One cubic meter of water weighs one metric ton. The "density" of water (it's ratio of weight to volume) is 1.00. The density of fish in a fish bin should be close to 1.00 and can be derived from random basket samples for any haul.

Density is variable and should be recalculated whenever using it to make a haul estimate. Often observers do not have time to determine density every haul, but strive for at least one density determination each day. You might want to calculate a daily average density or a weekly average for using on other hauls. A minimum of four baskets should be used to calculate density. First obtain the volume of fish in the sampling baskets or any other container where fish weight and volume can be accurately determined. The basket sides are sloped, 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 approximates the way that the fish are packed in the fish bin.

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. Then simply divide the average weight of a basket by the average volume of a basket to calculate the density figure for that haul.

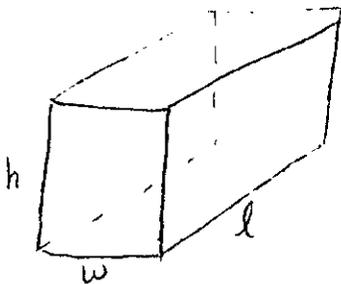
Using the volume of the fish in the bin and the density of those fish, you can figure out the total weight of the fish in the bin by using the following equation:

$$\text{Volume of fish in bin} \times \text{density} = \text{weight of fish in bin}$$

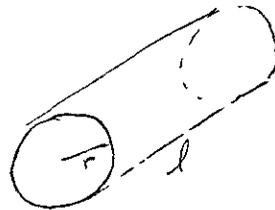
(2) Codend Volume and Density Method: On some ships, it may be necessary to estimate the catch size by the [✓]volume of fish in the codend, because the volume of fish in the holding bin cannot be determined. On these ships, the fish bins may be enclosed and thus difficult to measure; the floor of the bin may be moveable; large quantities of water may be used to float the fish in the bin or the bin shape may make volume estimates of the quantity of fish in the bin difficult.

The first step in the estimation of the volume of fish in the codend is to decide which geometric form a particular codend most closely resembles: a rectangular solid, a cylinder, an ellipsoidal solid, a semi-ellipsoidal solid, or some other form. Determine the needed dimensions for volume calculation of the chosen solid and measure each codend of fish with a tape measure or by using premeasured deck lengths, heights of people, or other standards of reference. Calculate the volume in cubic meters using the appropriate formula ~~formula~~, then multiply the volume times the density to obtain the metric tonnage of the catches. However, be careful when calculating the density of the fish in a codend because

it is often different that the density of fish in a bin or basket. The fish in a codend are often very tightly compacted and thus their density would be greater than the density of loosely packed fish in a basket. To simulate the pressure on the codend, place an empty basket on top of a full basket of fish and then stand in the empty basket to try and smash the fish more tightly together before measuring their height in the basket. Densities of fish in a tightly packed codend will probably approach 1.00 and may even be greater than 1.00.



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



Cylinder
 Volume = π x radius² x length
 $V = \pi r^2 l$



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



Semi-ellipsoidal solid
 Volume = $(1/2)\pi abl$

Allowances can be made for irregular shapes or partially filled portions of the net by the way in which the measurements are taken. In some cases, it may be easier or more accurate to estimate the

volume of fish in each banded section and add them together instead of treating the whole codend as a single unit.

(3) Back-calculation from Factory Production Method: Another approach to estimating the weight of a haul, involves monitoring the factory products and back-calculating to whole catch weight, by product and species, in much the same way that the ship officers normally do. As was explained earlier, the following equation would be used to calculate the whole weight of fish that went into the making of each product:

$$\frac{\text{Product Weight}}{\text{Recovery Rate}} = \text{Whole Weight of fish used to make the product.}$$

First of all, each separate product weight would have to be determined. This would be done by counting all of the units (trays or sacks) of each product and then multiplying that number by an average weight per unit to get the total weight of each product. Of course, the average unit weights and total numbers of product units should be verified by you. Secondly, a recovery rate would have to be determined for each species and product. You can use the ships figures for recovery rates since domestic observers are not required to test product recovery rates. The observer can then calculate the whole weights of all the fish that went into the products. Then simply by adding an estimate of the bycatch from that haul, to the back-calculated whole weight from products, the observer can determine his own haul weight estimate. The estimate of bycatch weight can come from the observers species composition data for that haul. If large numbers of prohibited species were observed, an estimate of their weight can also be included.

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 or volume of the catch. Do not include the weight of the mud or rocks in your catch estimation, and avoid including this in your species composition samples.

There is no need to be surreptitious about making your estimates of catch size. You should have already informed the captain that you will be doing this. In some cases, captains have improved their method of estimating the catch size by watching or talking to the observer. If the captain asks for your estimate, give it to him. Remember, we are here to make this program work and to collect data.

INSTRUCTIONS ON FILLING OUT DOMESTIC TRAWLER DATA FORMS

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

This form summarizes stern trawler fishing effort and total catch by haul. Obtain data for this form from the ship's logs (if available), from vessel personnel, from catcher boats, and from direct observation. 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 the hauls recorded for the days you begin and end sampling. (Port Moller cod fishery observers--if possible, collect these data for the entire period, but if this is not possible, make sure that you have the data for all hauls taken in area 512, or for any other period that you are able to sample.)
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 hauls you sampled.

4. A given haul number should be used only once - no duplicates. The haul numbers must be in numerical sequence. Make sure that the haul numbers do not exceed 3 digits. All hauls must be recorded unless there was a gear malfunction resulting in a zero catch. 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. If the ship numbers the hauls in their log books, you should try to use the same haul numbers. This will enable you to more easily compare your data with the ship's.
5. Leave the "merge" column blank (col. 19).
6. Enter the gear type:
 - 1 - bottom trawl - Common otter trawl corresponding closely to the bottom trawl diagram provided to you. This type of net is designed to drag on or close to the bottom, and may be equipped with chafing gear, rollers, or bobbins.
 - 2 - pelagic trawl - Trawl designed to fish off-bottom. Wings may be of very large mesh or composed of lines. The net seldom has chafing gear, rollers, or bobbins, and is designed to minimize drag.

Leave this column blank temporarily if the gear doesn't fit either category.

7. Enter the gear performance code:
 - 1 - no problem
 - 2 - problem--crab pot was in the haul (don't count the crabs in pot)
 - 3 - problem--net hung up on some bottom obstacle (vessel had to back down). Net may have ripped or trawl doors twisted
 - 4 - problem--net ripped
 - 5 - problem--other problem
8. Enter the processing mode: (indicates where the utilized fish from the 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 catch is delivered to a mothership at sea for processing.
 - 3 - Utilized catch is delivered to a shoreside processing plant. The trip usually lasts no more than 3 to 4 days and

in the meantime the catch is kept on ice.

9. For the location code, enter R if the location in columns 25-33 is a retrieval position, D if it is the position of delivery, and N if it is a noon position on a nonfishing day.
10. If there were no hauls on a given day, enter the GMT noon position in columns 25-33 and enter 0 in the haul number column. In columns 34-72 comment on the reason there was no fishing. All days at sea must be accounted for in this manner.
11. 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. The first digit of longitude (l) is understood, so record only the following digits. Each haul must have a position. On nonfishing days, record the GMT noon position in these columns.
12. The time system used (on this and all other forms) should be GMT time and dates. Time recorded should be in the 24-hour system

13. 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.
If a haul is retrieved at 0000, you must list the time as 0005, because the computer cannot handle 0000.
14. When net retrieval is begun, the time is recorded under "nets off bottom". ("Bottom" may refer 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.
15. 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. *If a haul is retrieved at 0000, you must record the time as 0005 because the computer cannot handle 0000.*
16. 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.
17. If "nets on/off bottom" times are recorded (cols. 34-41), then the fishing duration (cols. 42-45) should not be recorded. Record fishing duration only when you are unable to obtain on/off bottom times, or if the fishing duration is substantially different than what would be obtained by calculation from the on/off bottom times. (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, so record only the duration and off bottom time. Note reason at the top of the form.) On/off bottom times are otherwise preferred because they provide us with more detailed information. Make a real effort to either get on/off bottom times or fishing duration.
18. 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 the depth recording instruments that the vessel has. Try to obtain both fishing and bottom depths as that will indicate whether the net was fishing on or off the bottom. Make sure you indicate the units (fathoms or meters) for every depth that you record (cols 50 + 55).
19. Record the average trawl speed in columns 56-57.
20. Retained catch: this is the amount of catch (in metric tons, not pounds or short tons--see Table of Equivalents) that is retained aboard the ship. On catcher processors, generally the retained catch is just the round weight of the fish that are actually utilized for products. The retained catch may thus be the ship's estimates of the products (converted to round weight using product recovery figures and from pounds to metric tons).

On vessels that deliver catch to shoreside processing plants, there may be some discard of prohibited species, small fish, and nonutilized species at sea, but the main discard of fish may occur at

the processing plant. Your job will be to estimate the amount that is actually discarded by the catcher boat and hence, by subtraction, the amount that is delivered to the processing plant, not what is eventually retained by the processing plant. If discard is occurring at sea, the best way to determine how much, may be to estimate the amount of utilizable species in the haul using the observer sampling data for the haul or the day, and a rough estimate of amount of the undersized target species that were discarded.

Use your judgement as to how to obtain the most accurate data--this figure should always be filled in for unsampled as well as sampled hauls, and must be recorded to two decimal places. Give a complete description in your report of how these figures were obtained.

21. Official total catch: this will be the official catch weight for the haul, and should be used in all calculations involving haul weight on Forms 3US and radio message worksheets. This should be the best estimate of total catch (all species included), and in most cases it should be based on the ship's estimate of retained catch (round weight), adjusted for the nonutilized species (using the observer's sample data). To adjust hauls for which you do not have sampling data, calculate an adjustment factor for the day (see example below) and multiply the retained catch for that haul times the adjustment factor for that day. If you observed the haul but did not sample it, and feel that the adjustment factor for that day would not give an accurate estimate of the total catch, then use your judgement as to how to obtain the best estimate of total catch. If the vessel officers can provide good estimates of total catch (all species included), then convert these estimates from pounds to metric tons and use them as the official catch weight. This figure must always be filled in (record it to two decimal places). Note at the top of the form 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.

*Dutch Hbr
pallack boats
plump fish from
net in water
into hold*

$$\frac{\text{sum of adjusted ship's estimates for the sampled hauls for the day}}{\text{sum of the retained catch estimates for the sampled hauls for the day}} = \text{adjustment factor for the day}$$

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

(Example--see 9/10 on example form 2US:

$$\begin{array}{r} 16.00 + 20.00 + 12.00 \quad 48.00 \\ \hline 15.80 + 19.90 + 10.50 \quad 46.20 \end{array} = \frac{48.00}{46.20} = 1.0390$$

1.0390 x 7.94 = 8.25
and
1.0390 x 17.92 = 18.62

- 22. Observer's estimate: record your estimate of the hauls that you observe. This will usually be a codend or bin-depth estimate. Record it to two decimal places. Density *cruise wide estimate w/ specific exceptions.*
- 23. Enter the 6-digit ADF&G statistical area that the haul retrieval position places each haul in. Refer to the special supplement on the ADF&G statistical areas for your determination of the correct area.
- 24. Leading zeros should be in the dates (cols 12 & 14) and the times (cols 34-41) only, as needed.
- 25. Skip a line after each GMT day.
- 26. Any notes, or comments (other than notes for nonfishing days) should be placed in a part of the form that is not keypunched.

27. Joint Ventures - see back of page _____

INSTRUCTIONS TO OBSERVERS
RECORDING SPECIES COMPOSITION (INCLUDING PROHIBITED SPECIES)
ON THE NEW FORM 3US

*Insert
pages
70-80
from old
manual*

The new Form 3US is to be used instead of the present Form 3(1), Form 3(2), and Form 4. Observers in the domestic trawler fishery are asked to use this new form (and the accompanying 2US, 7US, and 9US forms). It is our hope that the forms will be more flexible in accommodating data from many of the different sampling situations. We also hope that the new forms will be easier for observers, debriefers, keypunchers, and data editors than the present forms used by the foreign fishery observers. Let us know your opinions and suggestions on these forms.

The Form 3US allows observers to whole-haul or partial-whole haul sample for some species, such as sablefish or a rockfish species, while basket sampling for other species. A sample weight is recorded for each species seen. Prohibited species such as Tanner crab, king crab, or salmon are listed separately by species and sex. If large quantities of, for example, Tanner crab are seen, it is still possible to count a large number of the prohibited species group, apply an average weight, and record these as Tanner crab, unid., unknown sex. Refer to the detailed instructions below and the example forms that follow.

- 1. Enter the identifying information: cruise no., vessel code, date, and haul no. (The cruise number and vessel code will normally be given to you during debriefing.)
- 2. 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.
- 3. Group the species in your species composition samples by the sample size, starting with the largest sample size first. For example, if you whole-haul sampled for halibut and salmon, partial whole-haul sampled

27. Joint Ventures
comments about times of catcher
boat retrievals

SPECIES COMPOSITION OF THE CATCH

Determination of the species composition of the catch is one of the high priority duties of an observer. The essential features and data that must be obtained for determining species composition are as follows:

- (1) Samples of the catch must be representative of a particular haul.
- (2) The sample must have a known weight. This is referred to as a "sample weight". (It is sometimes obtained by actual measurement, and sometimes calculated.)
- (3) The sample is sorted according to species or species groups, and the total weight of each group is determined. The combined weight of all species groups must equal the sample weight.
- (4) The number of individuals in each species group is determined. Thus a weight must be entered for every group making up the sample and the number of individuals making up each weight must also be recorded.
- (5) When sampling for species composition, you must also sample for the incidence of halibut, salmon, king crab and Tanner crab. The species composition information will be recorded on the 3(2) side of form 3 and the incidence of king crab, Tanner crab, halibut and salmon will be recorded on the 3(1) side of form 3.

There are a number of different ways the above information can be obtained. The sampling method you choose is dependent on the diversity and size of the catch, the shipboard setup and your time and energy. 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 use a whole haul sampling scheme or a variation of it. In addition, some observers have devised other, but equally valid means of sampling species composition for use in certain situations.

The above mentioned methods will be discussed in detail; it is up to you to decide which method provides the most accurate information in your particular situation, or if none of them are practical, to devise or adapt a sampling scheme which will work.

METHODS OF SPECIES COMPOSITION SAMPLING

Basket Sampling

The sampling aim is to obtain baskets of fish from a particular haul's catch so that the sample will represent the species composition of the whole haul. In the course of your work you will be collecting baskets of fish for various purposes. However, when your method of collecting species composition data is "basket sampling", this means that your sample is limited to only the organisms you gather in baskets from different parts of the haul. Basket sampling yields the smallest sample size, or weight, of any recommended method. Some things to watch for in taking the samples:

(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 holding a basket into the flow of fish as they fall from the net into a hatch opening on the deck. Another good method is to hold the basket where unsorted fish are falling from the bin 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 slats of the bin can be raised, allowing fish to spill into a basket, but be careful, this could be a size selective method. It commonly takes an hour or several hours for all of the fish to be emptied from the bins to the factory and sometimes there aren't many unused 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. The observer may choose to collect all of the fish in a section or several different small sections of the bin (make sure that all fish in the chosen areas are taken and that the fish are representative of the composition of the haul). As a guideline, when basket sampling for species composition, collect a minimum of 8 - 10 baskets of fish or at least 300 kg.

Once the sample has been taken, there are two ways to handle the weighing of the species groups. The best method is to sort the sample by species, weigh each species group, count the number of individuals making up each group, and total the weights of each group to obtain a "total basket sample weight."

The second method may be more practical when one species predominates in the sample. In this method, weigh the basket of unsorted fish, then sort the sample by species. Count the number of the predominant species, and count and weigh the remaining species groups. The weight of the dominant species group can then be obtained by subtracting the total weight of the various species groups from the total basket weight.

Whole-Haul Sampling
(With One Predominate Species in the Catch)

In some cases hauls are composed almost entirely of the target species and basket sampling would not provide a large enough sample size to get an accurate representation of the percentages of the other incidentally-caught species. This happens very frequently on vessels fishing for hake, and often on pollock-fishing ships. Due to the relative purity of hake catches, all hauls should be sampled using whole-haul sampling or a variation of it, such as partial whole-haul sampling which allows for a large sample size. (Refer to "Partial Whole-Haul Sampling" on the following pages.)

If you decide to whole-haul sample, the total sample weight would then be the ship's final catch weight estimate of the entire haul. In whole-haul sampling, a method must be devised to separate out all of the non-target or "bycatch" species from the entire haul. The observer must be present at all times to sort or supervise the sorting of bycatch from the entire catch. Ideally, the catch would pass by the observer at one point and the flow would be slow and shallow to allow for the complete sorting of bycatch by the observer alone, but these circumstances do not always exist. You are expected to work within the constraints of each sampling situation and produce high quality sampling data. If processing is very slow, the observer may choose to sort during the dumping of a catch on deck or sample less than the whole haul, thus changing to a partial whole-haul sampling method. The bycatch species

(which include any prohibited species) that have been sorted out of the entire catch, must then be counted and weighed. The weight of the predominate species can then be obtained by subtracting the total weight of the bycatch from the sample weight, (which in this case would be the ship's estimated haul weight). The observer should then randomly obtain a sufficient number, (about fifty), of the predominate species and count and weigh them to obtain their average weight. Dividing the total weight of the predominate species by the calculated average weight will provide an estimate of the number of predominate species in the haul. This is a very common sampling method, and the recording of the data from this type of sampling is illustrated in the first sample on the "Form 3 example of data from a large stern trawler" on the following pages. Refer to "Recording Whole-Haul Sampling With One Predominate Species" preceding the form example.

Whole-Haul Sampling
(With Two Predominate Species in the Catch)

When two species (for example--pollock and Pacific cod) dominate the catch, it may be possible to use a variation of the whole-haul sampling method and determine the proportionate numbers and weights of the two species in the catch. (The predominate 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 basket starfish.) Sort out all of the bycatch, (in this example, everything that isn't pollock or Pacific cod) from the whole haul--identify, count, and weigh these. Subtract the weight of the bycatch from the ship's estimate of the haul weight to get the combined weight of the pollock and Pacific cod. Take representative samples of the pollock and Pacific cod in the haul (maybe

4-8 baskets full) and count and weigh the pollock and Pacific cod. Determine the proportionate weights or percentages by weight of the pollock and Pacific cod in this sample. These percentages can then be applied to the combined weight of pollock and Pacific cod in the entire haul. Using the average weights of the pollock and Pacific cod, (which were calculated from your sample) it is now possible to estimate the number of pollock and Pacific cod in the entire haul. Make sure that you note what type of sampling system you used for each haul. (Refer to the second sample on the "Form 3 example of data from a large stern trawler and "Recording Whole-Haul Sampling With Two Predominate Species" preceding the form example.)

Partial Whole-Haul Sampling

When your normal sampling procedure is to whole-haul sample, and you are faced with a haul containing large numbers of non-target species (bycatch), you may be forced to sample only a portion of the haul. The sampling procedure is the same as when whole-haul sampling but the observer must determine what the sample weight is. The sample weight is usually computed as a fraction or percentage of the whole-haul weight. For example, the sample weight may be determined by measuring the difference in the depth of fish in the bin at the beginning and end of the sampling period and dividing that by the measurement of the depth of the total catch in the bins (taken prior to processing). This will enable you to determine the percentage of the whole-haul that was sampled. The partial whole-haul sample weight would then be that percentage of the ship's final catch weight estimate for that haul. Alternatively, if after sampling a portion of the haul, you cannot be sure what percentage of the haul you have looked at, then you could determine the volume of the fish you have sampled and then multiply that volume by the density, to determine the sample weight.

Other Methods of Obtaining Species Composition

Due to problems in using the previously described methods, some observers have devised other means of obtaining data on species composition:

(Note--In these cases, the sample weight will not be the captain's estimate of the haul size.)

1. "Since the conveyor belt moved slowly and erratically, I had to devise a new method for estimation of my sample weight. I found that monitoring the entire haul resulted in confusion and misunderstanding between the factory workers and the manager. For 3 or 4, 15-minute periods per haul I would time each decapitator. From this I could obtain the average hake per minute (h.p.m.). After weighing several baskets of hake, I could obtain the average weight of one hake for that haul. I would remain in the factory anywhere from 1-1/2 hours to 3-1/2 hours to monitor for incidence of prohibited species and obtain species composition. My calculations for a hypothetical sample would be as follows:

- (a) 120 minutes sampling time
 - (b) 68 h.p.m.
 - (c) .817 kg average weight of 1 hake
- 120 minutes x 68 hake/minute x .817 kg = 6666.72 kg = 6.67 mt of hake observed.

I would then add the weights of the other species to this total to achieve my total sample weight."

"I feel confident in this method since I obtained an average h.p.m. for each haul. The processing time ranged from 58-125 h.p.m. To test this method I monitored two entire hauls of known quantity (hauls 21 & 58). The time it took to observe entire hauls was fairly closely correlated with the time it took to observe partial hauls." (Leslie Watson, Polish Cruise #17, Wlocznik).

2. "The fish bunker opened directly into the processing area so it was necessary for me to take my samples of hake directly from the codend as the fish were dumped into the bunker. I attempted to space my sampling so as to get fish from all parts of the net."

"To estimate frequency of incidentals, I went into the factory and had the factory crew dump all non-hake fishes onto the garbage conveyor belt that led from the cleaning stations to the fish-meal plant. I supervised the factory workers to make sure that they were sorting out all of the bycatch and putting it on the garbage conveyor belt. I monitored this belt for half an hour for each haul that I sampled, removing all incidentals as they passed. In order to estimate sample weight during this period, I simultaneously counted all hake heads that passed me. Multiplying the number of hake heads counted by the average weight of one hake (obtained from the basket sample) gave me the estimated weight of hake observed; which,

added to the weight of incidentals, yielded observed sample weight. I feel that this sampling technique is fairly accurate providing the following assumptions are true:

- (a) "The average weight of hake obtained from the basket samples was an accurate reflection of the average weight of all hake in the catch."
- (b) "The frequency of incidentals in the portion of the catch samples was representative of the frequency in the entire haul." (Charles West, Soviet Cruise #31, Vulkan)

Species Composition Sampling -- Objectives and Priorities

Species composition samples should be representative and unbiased. The larger the sample weight the better. To accomplish these objectives you can choose from various methods of sampling: whole-haul, partial whole-haul, basket sampling, bin volume, difference in bin volume, timing of constant rate machinery, tally (counting) method, sections of a belt or bin, and others. It is up to you to choose, adapt or devise a sampling method which provides the most accurate information for your particular situation. If you deviate, adapt, or combine methods, document this fully. Remember, you must have good 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) You must be present to sort, or directly supervise the sorting, through the entire collection of all of every sample.
- 2) 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 the sorters.

3) 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 with the exception of the calculations for the predominate species as used in whole-haul sampling.

4) You cannot have more than one sample weight on Form 3(2) for species composition data on one haul. This becomes a temptation when you wish to sort one or more species from the whole catch and the remainder of the bycatch from only a portion of the haul. This may be a problem with certain low allocated species like sablefish or prohibited species such as halibut, salmon, king crab and Tanner crab. (Refer to "The Inclusion of Presorted Prohibited Species in the Species Composition Samples" on the following pages.) The proper solution to this is to calculate the percentage by weight of the whole-haul sampled species (i.e. sablefish) that would have occurred in your sample weight:

$$\frac{\text{sample weight}}{\text{haul weight}} \times \text{weight of sablefish in haul} = \text{weight of sablefish in sample}$$

Calculate the number of sablefish in your sample based on the average weight of sablefish from that haul and round the number to the nearest whole individual without changing the calculated weight.

5) If you are spending more than three hours per sample you won't be able to sample three times per day. Sampling twice per day is fine, especially if there are only about three or four hauls per day, but if your sampling time is not active and productive, and your ship is hauling four to six catches per

day, you should attempt to reduce your sample size and increase the number of samples per day.

6) 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 overrepresented in some of your samples and underrepresented 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. In general: It is better to produce accurate data using a small sample size than to have a much larger sample size with dubious data on bycatch species.

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.

FORM 3(2)--SPECIES COMPOSITION

1. Enter the identifying information at the top of the page and the haul number.
2. Remember that the date of the sample should correspond to the information on Form 2. The date should thus be the day the trawl began to be hauled in.
3. Enter the number of baskets collected during the sampling period (if basket sampling).
4. Enter the time you began sampling or the time the net was landed. (This serves as a reference point in case there is some confusion about which haul was sampled.)
5. The total sample weight is entered on the first line of the species list, opposite the preprinted code number 999.
6. All weights placed in the weight columns (columns 41-49, 56-64, 71-79), should have a well-defined decimal point and trailing zero, since the decimal point itself will be keypunched 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 3). Do not record weights to the thousandths (.001).
7. Below the sample weight row, each species is listed by its family or specific common name and the corresponding species code found in the list of alphabetically arranged species on the following pages. Look up a species under its family or group name--rockfish, sole, etc. All king crabs and Tanner crabs should be identified to species. All commercially important species of fish should also be identified to species. Try not to use categories such as "flatfish unidentified" and "rockfish unidentified." If you have been unable to identify, for example, two species of rockfish, keep the data for the two species separate by labeling them "rockfish A" and "rockfish B." If you are later able to determine their identity, then substitute the species name and code. On the other hand, for non-commercially important species (sculpins, eelpouts, pricklebacks, rattails, etc.), a designation such as "sculpin, unident." is fine. If you label them "sculpin A" and "sculpin B" and do not get a positive ID on them later, then you must group them all under "sculpin unident." (Refer to "What Fish to Describe" on the following pages.)
8. Items such as seaweed, old boots, pieces of wood, etc., should be combined under "miscellaneous items" code 900, and given a "number" of 1. (We are only interested in the total weight for all miscellaneous items within a haul.)
9. If there is no species code for a given species or family in the sample, enter the accepted common name, leave the species code blank, and put the scientific name and reference source in the "remarks" section. Document the identification procedure thoroughly with a species description, in your logbook, take a photograph of the fish or bring a specimen back. A new code will be assigned after you return. (Refer to "How to Write a Species

How to Write a Species Description

In your logbook, set off the entry with a title such as:

Saffron Cod - Species Description

Date:
Haul no.:
Lat. & Long.:
Depth of Capture:
Length:
Weight:

Then, as necessary, also list features appropriate to the family such as:

1. Fin spine & ray counts.
2. Pelvic fin placement.
3. Other spination (such as thornyhead's cheek spines).
4. Lateral line description and features.
5. Scale and tubercle patterns, size, and type.
6. Morphometric data which is pertinent to the family.

If it will help, make a sketch of the fish showing the main features.

What Fish to Describe

Make a species description for only the first sighting during a trip, of the species listed below:

- 1.) All flatfish species other than: halibut, Greenland turbot, yellowfin sole, rex sole, dover sole, deepsea sole, and starry flounder.

Be particularly careful in your identifications and descriptions of:

English sole vs. longhead dab
Flathead sole vs. Bering flounder vs. petrale sole
Greenland turbot vs. Arrowtooth flounder vs. Kamchatka flounder

- 2.) Describe all rockfish species. (Collect specimens of any PDP \geq 1.0 kg.)
- 3.) Describe all cod (Gadidae) species other than pollock, Pacific cod, and hake.
- 4.) Describe all shark species other than salmon shark or spiny dogfish.
- 5.) Describe eulachon-and-capelin.
- 6.) Describe all salmon species and king crab and Tanner crab species.

1.) D. ...

SPECIES CODE LIST

<u>CODE</u>	<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>	(Revised 3-20-86)
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	UROCHORDATA	
204	ATKA MACKEREL	PLEUROGRAMMUS MONOPTERYGIUS	
48	BARNACLES	CIRRIPIEDIA	
795	BARRACUDA, PACIFIC (CALIFORNIA)	SPHYRAENA ARGENTEA	
770	BARRACUDINA - UNIDENT.	PARALEPIDIDAE	
622	BARRELEYE or SPOOKFISH - UNIDENT.	OPISTHOPROCTIDAE	
289	BIGSCALE, (MELAMPID) - UNIDENT.	MELAMPHAEIDAE	
998	BIRDS - UNIDENT.	AVES	
618	BLACKSMELT - UNIDENT.	BATHYLAGIDAE	
260	BLENNY - UNIDENT.	PHOLIDAE, STICHAETIDAE	
302	BOCACCI	SEBASTES PAUCISPINIS	
27	BRACHIOPOD		
32	BRYOZOANS		
604	CAPELIN	MALLOTUS VILLOSUS	
44	CHITON - UNIDENT.	AMPHINEURA	
199	CHUB MACKEREL	SCOMBER JAPONICUS	
29	CLAMS MUSSELS OYSTERS SCALLOPS	PELECYPODA	
211	COD, ARTIC (RACE)	BOREOGADUS SAIDA	
203	COD, BLACK (SABLEFISH)	ANOPILOPOMA FIMBRIA	
202	COD, PACIFIC	GADUS MACROCEPHALUS	
208	COD, SAFFRON	ELEGINUS GRACILIS	
214	CODLING - UNIDENT.	MORIDAE	
32	CORALS		
1	CRAB - UNIDENT.		
6	CRAB, BLUE KING	PARALITHODES PLATYPUS	
11	CRAB, BOX	LOPHOLITHODES FORAMINATUS	
49	CRAB, CANCER	CANCER OREGONENSIS	
16	CRAB, COUESI KING	LITHODES C OUESI	
39	CRAB, DECORATOR	OREGONIA GRACILIS	
12	CRAB, DUNGENESS	CANCER MAGISTER	
8	CRAB, GOLDEN KING	LITHODES AEQUISPINA	
15	CRAB, HERMIT - UNIDENT.	PAGURIDAE	
7	CRAB, KOREAN HORSEHAIR	ERIMACRUS ISENBECKII	
37	CRAB, LYRE -- ROUNDED SPINED	HYAS COARCTATUS ALUTICUS	
9	CRAB, LYRE -- SHARP SPINED	HYAS LYRATUS	
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	CHIONDECETES ANGULATUS	
4	CRAB, TANNER, BAIRDI	CHIONDECETES BAIRDI	
5	CRAB, TANNER, OPILIO	CHIONDECETES OPILIO	
18	CRAB, TANNER, TANNERI	CHIONDECETES TANNERI	
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
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)	ANTIMDRA 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 (RED, BLUE, GOLDEN) CRAB	CODE FOR INCIDENCE OF SPECIES ONLY
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
52 LEECH - UNIDENT.	HIRUDINEA
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, BOOTS, BARRELS, ETC)
29 MUSSELS CLAMS OYSTERS SCALLOPS	PELECYPODA
25 NUDIBRANCH	NUDIBRANCHIATA
715 DARTFISH	REGALECUS GLESNE
810 OCEAN SUNFISH	MOLA 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 - UNIDENT.	POLYCHAETA
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, RASPEAD	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, ROUGH EYE	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, STRIPETAILED	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 ROUND FISH - UNIDENT.	
203 SABLEFISH, (BLACK COD)	ANOPLPOMA 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 TRICHODON
614 SARDINE, PACIFIC	SARDINOPS SAGAX CAERULENS
607 SAURY, PACIFIC	COLOLABIS SAIRA
660 SCABBARD FISH, (CUTLASS FISH) - 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
59 SEA MOUSE	APHRODITE ACULEATA
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	UROCHORDATA
40 SEA URCHINS	ECHINOIDEA
58 SEA WHIP, SEA PEN - UNIDENT.	PENNATULA
54 SEA WORMS - UNIDENT.	POLYCHAETA
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 SMOOTH TONGUE, 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	CLIDDERMA 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 (BAIRDI, OPILIO) CRAB	CODE FOR INCIDENCE OF SPECIES ONLY
209 TOMCOD, PACIFIC	MICROGADUS PROXIMUS
113 TONGUEFISH, CALIFORNIA	SYMPHURUS ATRICAUDA

227 TROUT, CUTTHROAT (SEA RUN)	SALMO CLARKI CLARKI
807 TUBESHOULDER - UNIDENT.	SEARSIIDAE
43 TUNICATES	UROCHORDATA
143 TURBOT - UNIDENT.	
102 TURBOT, GREENLAND (HALIBUT)	REINHARDTIUS HIPPOGLOSSOIDES
805 VIPERFISH - UNIDENT.	CHAULIODONTIDAE
757 WARBONNET, DECORATED	CHIROLOPHIS DECORATUS
762 WEARYFISH, (PAPERBONES) - UNIDENT.	NOTOSUDIDAE
779 WOLFFISH - UNIDENT.	ANARRHICHADIDAE
780 WOLF-EEL	ANARRHICHTHYS OCELLATUS
759 WRYMOUTH - UNIDENT.	CRYPTACANTHODIDAE
999 Z TOTAL BASKET WEIGHT	SPECIES COMPOSITION ONLY

DETERMINING INCIDENCE OF KING CRAB, TANNER CRAB, HALIBUT, AND SALMON

Catch landed other than the target species is called incidental catch or bycatch. Among the species caught incidentally are those that are described as "prohibited species". The prohibited species are listed below by general regional area:

<u>Bering Sea and Aleutians:</u>	<u>Gulf of Alaska:</u>	<u>Wash. Ore. & Cal. Coasts:</u>
Salmon	Salmon	Salmon
Halibut	Halibut	Halibut
King crab	King crab	Dungeness crab
Tanner crab	Tanner crab	
Horsehair crab	Horsehair crab	
Lyre crab	Lyre crab	
Dungeness crab	Dungeness crab	
Scallops	Scallops	
Surf clams	Surf clams & clams	
Snails	Snails	
Shrimp	Shrimp	
Corals	Corals	
Herring *	Herring	

* Herring in the Bering Sea is reported separately from the rest of the prohibited species and nonallocated species--refer to the "Report Groups" part in the "Radio Messages" section.

(A complete discussion of prohibited species and their proper handling under the requirements of the Magnuson Fisheries Conservation and Management Act (MFCMA) is discussed in the Enforcement manual.)

The prohibited species listed above that are of particular importance are Pacific halibut (Hippoglossus stenolepis), salmon (Oncorhynchus spp.), steelhead (Salmo gairdneri), king crab (Paralithodes spp. and Lithodes spp.), and Tanner or snow crab (Chionoecetes spp.). As the United States extensively fishes these species, a great deal of interest has been shown concerning their number per ton of catch on foreign 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, a large sample weight must usually be observed in order to obtain effective data.

The essential features of incidence of prohibited species sampling are as follows:

- (1) The observer must be able to identify to species and count and/or weigh all of the individuals of an incidental prohibited species in a given portion (sample) of the catch.
- (2) The catch sampled should be representative of the haul.
- (3) It must be possible to estimate the weight of the sample observed.

Remember that when you sample a haul, you must sample for both species composition and the incidence of prohibited species. As with sampling for species composition, there are a number of different ways to determine the incidence of a particular species per ton of catch. On hauls in which species composition is obtained by separating out all of the non-target species for the whole haul (whole-haul sampling method), the prohibited species would be part of the bycatch that is sorted out. Therefore, when whole-haul sampling, the sample weight for both species composition and prohibited species sampling would be the ship's estimate of haul weight.

In some situations, because the prohibited species are too abundant, the haul is too large, the sorting too slow, or for some other reason the observer may choose to partial whole-haul sample for prohibited species. The sample weight for partial whole-haul sampling would not be the ship's estimate of haul weight but may be determined as a percentage of the ship's haul weight. The observer can use several other methods to determine the sample weight when partial whole-haul sampling and should refer to "Partial Whole-Haul Sampling" in the "Species Composition" section on the preceding pages.

It is not necessary that the sample weight for species composition and the incidence of prohibited species be equal. For example, the haul may be very diverse and therefore the method chosen for species composition sampling might

be basket sampling. However, even though the catch is very diverse, if the prohibited species are not abundant in the catch, the observer may chose to whole-haul sample for prohibited species and basket sample for species composition. In this case, the sample weight for species composition sampling would be the weight of the basket samples, while the sample weight for prohibited species sampling would be the ship's estimate of haul weight. A slight problem could occur if, for example, the catch is dumped from the codend into the fish bins slowly enough so that the crab, halibut, and salmon can be sorted out on deck as the net is emptied, and the observer chooses to collect his basket samples for species composition from the factory-level fish bins after the presorting of prohibited species has been completed on deck. In this case, the baskets of fish that were collected in the factory for species composition, would not contain any prohibited species. This problem can be compensated for by following the directions explained in the section on the following pages entitled: "The Inclusion of Presorted Prohibited Species in the Species Composition Samples".

Observers have experienced other types of problems in attempting to determine the incidence of prohibited species:

- 1) Since king crab, Tanner crab, halibut, and salmon are designated as "prohibited species" and fisheries regulations dictate that prohibited species must be thrown overboard as soon as possible, observers sometimes have a difficult time convincing fishing crews to allow them to collect data on these species before throwing them overboard. Hopefully a new clause in the regulations will clear up these misunderstandings, and the observer will be able to count, weigh, measure, and sex these species without interference.
- 2) Presorting of the prohibited species by crew members on the trawl deck as the catch is emptied into a below-deck bin, is often the routine procedure.

If this is the case on your ship, you may choose to whole-haul sample for prohibited species and take advantage of the crews sorting effort. However, remember to always be present on deck to oversee the sorting operation. If you must gather your species composition sample from the factory level below, you may feel the need to be in two places at once. If the prohibited species sampling on deck can be accomplished quickly you may be able to convince the factory crew to wait for you. To do this you may find it necessary to subsample for the biological information on crab and halibut and bring any salmon you collect to the factory and complete your sampling of them later. If the factory crew can't or won't wait, you may have to reduce your sample size for species composition.

3) Occasionally a haul comes in with a high incidence of a prohibited species group. (i.e. >20 halibut, salmon or king crab and/or >70 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 could reduce your sample size to a partial whole-haul sample. If there is a high incidental catch of only one prohibited species group, the observer could choose to partial whole-haul sample (subsample) for only one of the prohibited species groups and whole-haul sample for the others. This alternative is possible because the sample weight for each prohibited species group is recorded separately on the form 3(1). (Refer to the example of "Form 3(1) - Incidence of king crab, Tanner crab, halibut and salmon" and item #7 in the explanation of this form, on the following pages.)

Sometimes it is possible to sort a prohibited species out of a large sample with the help of the crew. However, if after sorting them out, it becomes apparent that the species may be too abundant to count; (i.e. many small crab) or weigh; (i.e. many large halibut), then either count or weigh all

of the abundant prohibited species which has been set aside. Take a random subsample of them and count and weigh all of the individuals in the subsample. The subsample is then used to determine an average weight that will be used to estimate the number or weight of the remaining individuals. Remember that you must at least have an actual weight or actual count of all of the prohibited species that occur within your sample weight.

4) Sometimes halibut are too large 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 as actual weight under the "total weight" column on form 3(1).

5) Sometimes a vessel will accidentally pick up a crab pot that has been snagged by the trawling gear. This incident would fall under the heading of a "gear conflict" and should be handled according to fishing regulations (Refer to your manual entitled "Observer Guide to Foreign Fishing Regulations for the North Pacific Ocean and Bering Sea"). However, it is important to not count any crab that may be in the pot, as part of your sampling for the incidence of King and Tanner crab.

THE INCLUSION OF PRESORTED PROHIBITED SPECIES IN THE SPECIES COMPOSITION SAMPLES

When presorting of prohibited species occurs before sampling for species composition, then the prohibited species would not be accurately reflected in the species composition sample. Furthermore, if the weight of the prohibited species is included in the ship's haul weight estimate, because of adjusting the ship's estimate by the observer, then the resulting species composition that will be extrapolated for that haul will be inaccurate. This is because of the absence of prohibited species in the species composition sample. If you are whole-haul sampling, this can be avoided by including all the

BIOLOGICAL DATA COLLECTED FROM PROHIBITED SPECIES

In addition to the data required on form 3(1) for the incidence of prohibited species (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
- 2) detailed species composition - numbers and weights by individual species and sex groups (except halibut)
- 3) measurements - crab will be measured only by those assigned to do it
- 4) viability - for halibut and crab only

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 other 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 70 Tanner crab per sample.

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--note the species identification of all individuals--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 individual should be recorded in the same manner as for sampling species, see "Length Frequencies" (Section I). Lengths are recorded to the nearest whole centimeter.

- (f) Scale samples--remove scale samples for aging from all salmon, according to the directions in "Scale Samples and Random Stratified Otolith Samples"--Section I.
- (g) Check for missing adipose fin--this may indicate that the salmon or steelhead was tagged with a coded wire in the snout. Follow the directions in "Tagged Fish." (Section II).
- (h) ~~Check for "net marks" or scars~~ (see Net Scarred Salmon form-Section II) note the presence of net marks on a salmon also on Form 9 with a code 9 under special handling, column 60.

The observer should seldom have to subsample salmon from the prohibited species incidence sample. If time does not allow the observer to gather all of the above information from each salmon, then take scale samples from a subsample, but make sure that the subsample contains fish from each species of salmon in that haul.

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--note the species identification of all individuals--red, blue, golden, and Lithodes couesi king crab; Chionoecetes bairdi, C. opilio, 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 "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) 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 following pages for a discussion on how to sample for the viability of crab.)
- (f) Check for tags--follow the directions in "Tagged Fish." (Section II).
- (g) Length--Observers who are assigned to measure crab should measure the lengths of king crabs and widths of Tanner crab as described below. (King and Tanner crab are the only species of crab which should be measured.)

The observers who are assigned to measure crab will be provided with calipers or dividers. Measure the width of Tanner crab carapaces at their widest points, excluding spines, recording the measurements to the nearest 5 mm size group (i.e. crabs 41 to 45 mm in size are recorded as 43 mm; crabs 46 to 50 mm are recorded as 48 mm). Observers should measure all of the Tanner crab found in each of the daily prohibited species incidence samples. Normally less than 70 Tanner crab will be found in the sample. If more than 70 are found, and the observer cannot measure all of the crab, then take a representative subsample, selecting every second, third, etc., so that carapace width measurements are made from approximately 70 Tanner crab.

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 and record the length to the nearest 5 mm size group as with Tanner crab (refer to the illustration of "Length Measurements for Various Species" in the Appendix).

COLLECTING DATA FROM HALIBUT

The following information should be collected from halibut obtained from the prohibited species incidence 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 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--except in the case where halibut are mistakenly discarded before you have a chance to measure them, you should be able to get lengths of all individuals. Lengths are recorded to the nearest whole centimeter.

(d) Viability--an estimate of the survival chance of halibut upon release to the sea is composed of:

- (1) an appraisal of the condition of the halibut
- (2) the probability of the halibut being consumed by a sea lion or killer whale upon release. (See below for sampling procedure.)

[Note: Do not sex halibut, not even the dead ones. Simply list the sex as "unknown".]

VIABILITY OF HALIBUT, KING CRAB AND TANNER CRAB

The estimates of the condition of halibut, king crab and Tanner crab should be made only in those cases in which observer interference with the way the crew normally handles the halibut or crab is minimal. The observer's primary duty is to get accurate incidence data, lengths, and total weights, and these tasks may require that the halibut or crab be handled in a different manner than when the observer is not sampling. If the ship crew normally presort prohibited species on deck and you continue the practice, the viability of the halibut and crab should not be affected by your sampling and biological data collection. If the crew normally presort prohibited species on deck but your sampling method requires that the catch be dumped into bins unsorted, then you should not use your prohibited species incidence samples to judge viability. Similarly, if on a longline vessel you tally the catch from a deck above the gurdy, and prohibited species are kept for you for some time out of water, the condition of the halibut and crab will be affected by your sampling procedure. If you are unable to get viability information as part of your ordinary sampling procedure, then try to sample specifically for viability of halibut and crab at least twice a week. Viability sampling should not take precedence over sampling for their incidence and obtaining the other biological information needed.

Using the tables on the following pages giving the definitions of "excellent," "poor," and "dead", note the number of halibut and crab in each category. The viability estimate should be the estimate of the condition the halibut or crab upon release to the sea, under normal shipboard handling conditions, when your sampling does not interfere with their return to the sea. Do not guess the condition of halibut or crab that you do not personally examine. If the sample of halibut or crab, that is checked for viability, is a subsample of the incidence of prohibited species sample, make certain that the subsample is a representative one.

There is an additional item that comprises the viability information for halibut. That item is a measure of the probability that the halibut will be eaten by a marine mammal at the time that it is released to the sea. This "probability of marine mammal predation" need not be judged for crab, because they are not usually consumed by marine mammals that are swimming around the ship. As it is difficult to make an estimate of the probability of a halibut being consumed by a marine mammal, this estimate is based upon the numbers of sea lions or killer whales present around the ship at the time that most of the halibut in the viability sample are released. If you do not see any sea lions or killer whales around the ship, record "1" as the probability; if you see one to three sea lions, record "2"; and if you see more than three, enter "3." If the halibut in your viability sample are released out an outwash hole in the factory, base your estimate of marine mammal predation on what you feel is a likely estimate.

DEFINITION OF HALIBUT CONDITIONTrawl 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
- (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 CONDITIONTrawl 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

for king and Tanner crab, and basket sampled for the rest of the species, enter the halibut and salmon data first, the crab data next, and the basket sampled species last (as in Form 3 example 3).

4. List each species by the specific common name and the corresponding species code found in the list of alphabetically arranged species in your 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. Try not to use categories such as "flatfish unidentified" and "rockfish unidentified." If you have been unable to identify, for example, two species of rockfish, keep the data for the two species separate by labeling them "rockfish A" and "rockfish B." If you are later able to determine their identity, then it would be possible to substitute the species name and code. On the other hand, for non-commercially important species (sculpins, eelpouts, pricklebacks, rattails, etc.), a designation such as "sculpin, unident." is fine. If you label them "sculpin A" and "sculpin B" and do not get a positive identification on them later, then you must group them all under "sculpin unident".
5. All Tanner crab, king crab, or salmon should be listed separately by species and sex whenever possible. For these species only, record an "M", "F", or "U" in column 1. If large quantities of one of these species groups are seen, it is permissible to take random subsamples of the species 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 species 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. In column 23, indicate the sampling type for each sample size. For species that you whole-haul sampled, use "W"; for species that you partial whole-haul sampled, use "P"; for species that you basket-sampled for, use "B"; and for species that you sampled using any other type of sampling, use "O".
7. Skip a line between species with different sample weights (see example 3).
8. The number of individuals and weight of each species group are then placed in the appropriate columns. Every number you enter 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 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.

9. Enter the weight sampled for each species in columns 41-51, using a well-defined decimal point. If you whole-haul sampled for the species, the sample weight should be the same as the official total catch estimate (cols. 63-67 on the Form 2US). If you partial-haul sampled, the sample weight is a fraction of the official total catch estimate or the sample weight you calculated using difference in bin depth or other means. 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). The sample weight can equal but must never be greater than the official total catch.

Please note: if an observer is whole-haul or partial whole-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 whole-haul sample.

10. A worksheet is included as part of the form. The observer should record there 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) When whole-haul sampling, the observer should enter here the results of basket sampling for the average weight of the target species (see Form 3US examples 1 and 2).
- b) If the observer counted more individuals of a species than he was able to weigh, he should enter the actual weight of the individuals he was able to weigh, use this space to calculate the average weight, and enter the total extrapolated weight for all observed on the keypunch form (see how the halibut and salmon were handled on Form 3US example 3).
- c) Similar entries should be made for the reverse situation (to item b above) when you, for example, weigh large quantities of small Tanner crab, and must extrapolate a total number.
- d) Individuals whose weight is estimated can be entered on the worksheet as in example 3--enter the numbers and weights of the ones that were actually weighed and apply the average weight to the nonweighed individuals. If you feel the nonweighed 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. Include the total number observed and the combined weight of the actual and estimated individuals on the keypunched form below.

Note in the comments section the number of basket samples that were taken, the type of sampling you used, and anything unusual about the catch or sampling.

11. 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. The observer should check to see whether or not each of the prohibited species groups was represented on the form. 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, and 3.)

12. Under the heading "Viability", record the number of halibut and crab judged to be in each category. For the definition of "excellent", "poor", and "dead" conditions, please refer to the table in the section "Biological Data Collected from Prohibited Species." The sum of the numbers recorded in those three categories should be the total number of halibut or crab examined for viability but it doesn't have to match the numbers weighed (on the same line to the left of the viability).

*If the observer wishes to record viability of prohibited species from a haul that was not sampled, the observer should use a separate sheet and record the identifying information including haul number, the species name, sex, species code, and viability data. A "V" (for viability only) should be recorded as the sample type in column 23.

13. To complete the keypunch check (line 999 at the top of each form), add 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 haul 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 radio report worksheet forms.) Add the numbers in each viability category and enter in columns 52-60 of line 999.
14. In the boxes just above the column heading labelled "Viability", check the sampling method for each of the prohibited species groups. 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 nonobserved prohibited species groups.

FORM 7US INSTRUCTIONS

Refer to the regular sampling manual for directions in filling out Form 7US. The only difference between the 7US form and the regular Form 7 is the accommodation for the 5 digit cruise number and the keypunch check (columns 23-27. The keypunch check column replaces the "no. of individ. in row" and "sum of lengths in row". Simply add all of the numbers in the row (size group and frequencies together) and put the sum in the keypunch check column (see example Form 7US).

Form 4 - SPECIES COMPOSITION OF SALMON, KING CRAB,
TANNER CRAB; VIABILITY OF HALIBUT, KING CRAB AND TANNER CRAB

Cruise No.			Vessel code				Date						
1	2	3	4	5	6	7	Year	Mo.			Day		
5	3	0	N	S	7	8	8	9	10	11	12	13	
							8	3	0	9	1	0	

1. Record individuals from form 3(1) or a random subsample.
2. Leading zeros in columns 1, 2, 10 and 12 only as needed.
3. Sex: male = M; female = F; unknown = U.
4. Probability of predation; none (0 sea lions) = 1; moderate (1-3) = 2; high (≥ 4) = 3.
5. Skip a line after each haul/set sample.

Keypunchers: right-adjust all columns.

Set	Haul or sample number			Species Name	Species code			Sex	No. of indiv.							Total weight with decimal point	Halibut and crab condition						Probability of marine mammal predation on halibut					
																	Number excellent		Number poor		Number dead							
14	15	16	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44
	1	0	1	Opilio Tanner Crab	5	M		3														1				2		
				" "	5	F		1																				
				Bairdi Tanner Crab	4	M		71											13			22				36		
				" "	4	F		85											16			28				41		
				Pacific Halibut	10														2								1	
				King Salmon	222	M		1																				
				" "	222	F		1																				
	1	0	1	" "	222	U		1																				
	1	0	3	Pacific Halibut	10																				1		3	
	1	0	4	Opilio Tanner Crab	5	M		8											1			5				2		
				" "	5	F		8														4				4		
				Bairdi Tanner Crab	4	M		53											9			13				31		
				" "	4	F		47											6			10				31		
				Pacific Halibut	10														4			3				2	2	
	1	0	4	King Salmon	222	F		3																				

LENGTH FREQUENCIES

SELECTION OF SAMPLING SPECIES

Some observers will be specifically assigned particular species from which to take otolith/scale samples and length frequencies. Other observers may be asked to collect age structures from either primary or secondary species. In addition, some observers may be assigned special projects such as collecting ovary or stomach samples which may or may not require accompanying length frequencies or age structure collections. All observers (unless told otherwise) will take length frequencies of their sampling species. The following section will help you select your sampling species if you were not assigned one.

Observers that were not asked to make otolith/scale collections (except for salmon) should take length frequencies of the target species. The target species are usually those listed in column 1 of Table A below.

Table A has two columns: column 1 lists those species that are considered primary species and column 2 gives the secondary species for the Alaska and Washington-Oregon-California regions. If you are assigned to collect age structures from a primary species, select the species from column 1 on which your ship seems to be targeting and try to complete your collection during the month specified. If, for some reason your ship is targeting on a species other than those in column 1, then choose as your sampling species the target species. Length frequencies should be taken of that sampling species throughout your observer trip, even during the period you are not collecting otoliths/scales.

Observers assigned to collect age structures from secondary species should choose a species from column 2. These species should be common enough in the catches so that you can collect enough for good length fre-

quency samples. The otolith collections may be made whenever the secondary species is available, but try, if possible, to take all of your collection on a single vessel.

Sometimes observers have difficulty collecting enough otolith/scales or length frequencies if their ship changes target species. If this happens, stop collecting age structures and length frequencies of your first species until you can get enough of them. During the interim, choose a different species from which to take length frequencies until your first sampling species starts reappearing in the catches. If the ship shifts its target from one species to another for what is expected to be a considerable length of time, shift your collection of lengths and age structures to the new species. When your assigned species is from the primary species list, (see Table A below) avoid having a collection of fewer than 50 age structures per species.

Table A. Biological sampling species

Region	Column 1 Primary Species	Column 2 Secondary Species
Alaska	Walleye pollock Yellowfin sole Greenland turbot Atka mackerel <i>Sole Roll 30.2</i>	Alaska plaice Arrowtooth flounder Flathead sole Rock sole Rex sole Dover sole Pacific cod Sablefish Northern rockfish Pacific ocean perch Rougheye rockfish Shortraker rockfish Redstriped rockfish
Washington- Oregon- California coast	Hake	Sablefish Jack mackerel Pacific ocean perch Widow rockfish Yellowtail rockfish

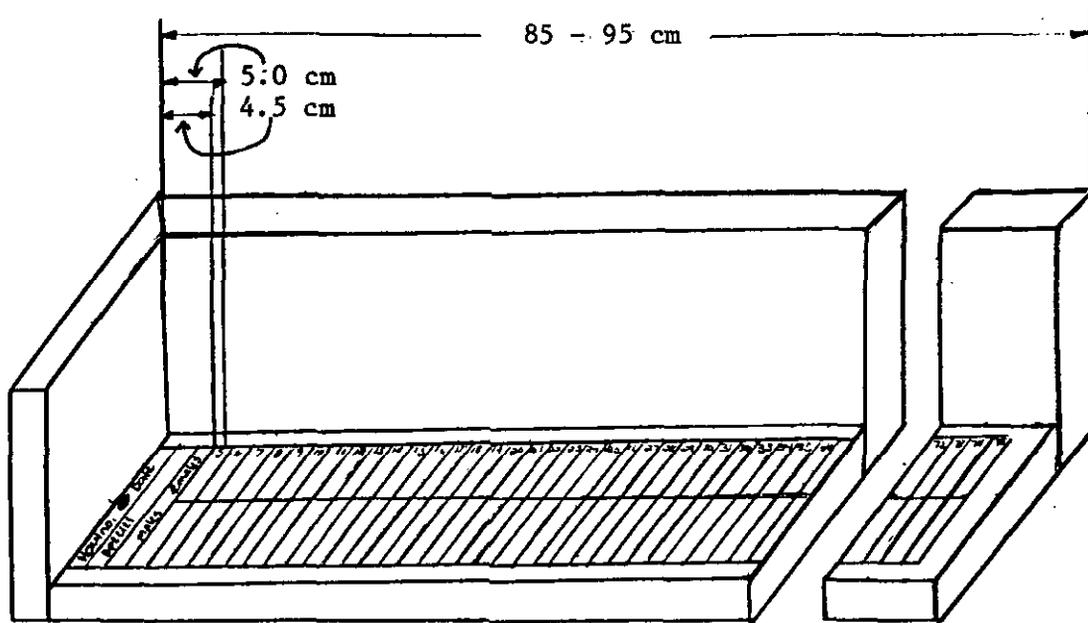
SAMPLING METHOD

Length frequencies should be collected from each sampling species selected. Approximately 150 individuals of the particular sampling species should be measured each day. Length data of the sampling species are normally obtained using a plastic measuring strip. This is a long, narrow piece of white plastic divided into one centimeter spacings. The strip is held to a 3-sided measuring board (bottom, end, and back) by thumbtacks. For species of fish whose length range is less than 75 cm, the strip should be positioned on the measuring board so that the first spacing line is at 4.5 cm from the crossboard and the center of the 5 cm space is at exactly 5.0 cm. Mark each 10th strip unit to read 10, 20, 30...etc. For species of fish whose length range commonly exceeds 75 cm, the measuring strip may be offset (as in the illustration on the following page) so that the first spacing line is at 14.5 cm for instance, and the center of the first centimeter space is at 15 cm. Mark the units of the strip accordingly.

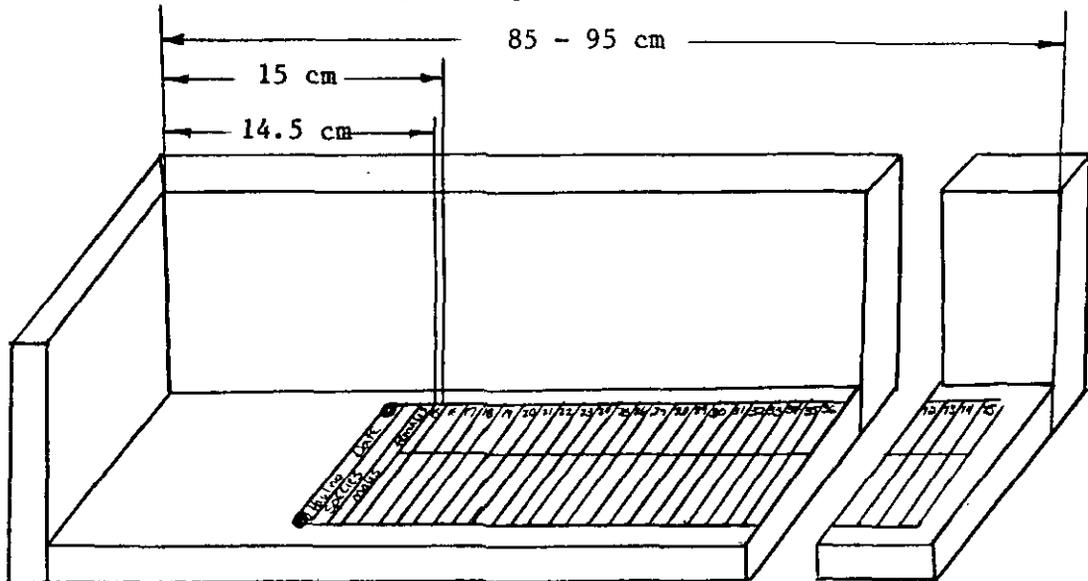
Position the fish on the strip measuring board with snout against the end, dorsal surface against the back, and the fish body flat and straight. With a pencil, place a stroke on the plastic strip at the fork length of the fish tail (total length to midpoint of tail on flatfish). Place the marks for males on one-half of the measuring strip and for females on the other. At the end of sampling, the number of pencil strokes per cm length spacing will give the size group length frequency.

Fork lengths should be taken of all fork-tailed species, even if the tails are ragged and the exact location of the fork has to be estimated. Measurement of round-tailed species (most flatfish) should be of the total length from the snout to the midpoint of the tail. (See "Length Measurements for various species" in the Appendix.)

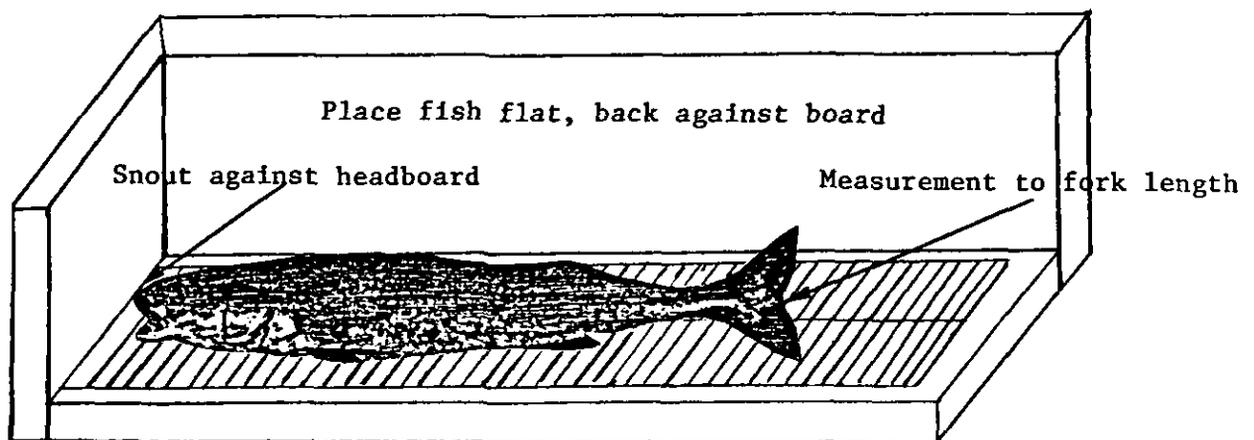
Length Frequency Measuring Board and Measurement



Measuring board with strip set up to measure most fish species.



Measuring board with strip offset in order to measure larger fish.



Measurement of a roundfish on measuring board.

Length frequencies are taken from fish that were collected in a random, non-size selective manner during your species composition sampling. Take the basket of fish, sex each fish (refer to "Sexing Fish" in the Appendix), and deposit it in a basket by sex. If you are unable to sex some fish, (usually the small ones), separate them into a third group to measure. Their lengths should be recorded also 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. One side or half of the plastic strip is designated for males, and one for females. Measure all of the fish in each basket (measurements to the nearest cm). Some of these fish may be used for otolith or scale samples. (Refer to "Scale Samples and Random Stratified Otolith Samples" in the following section.)

In some cases, it may be difficult to fulfill the suggested daily workload of about 150 lengths of each sampling species. It is usually easy to obtain enough fish of the primary species to get a good length-frequency sample. If a secondary species is not plentiful, there may not be enough in the sample for species composition, for a good length-frequency sample and you may have to use other methods to get additional randomly selected fish of that species. In this case, the observer could collect all individuals of that species (large and small) from the conveyor belt over a period of time or use some other method to obtain randomly-selected fish from a larger sample weight. After using these or other methods to collect fish for the length-frequency sample, the observer may still not be able to collect enough fish to fulfill the requirement of approximately 150 lengths per day. When this happens, the observer should supplement the lengths that they have already collected from the secondary species that day and collect 150 lengths from the primary (target) species.

Observers on independent stern trawlers should keep length frequencies for each haul separate, recording the data for different hauls on different plastic strips.

LENGTH FREQUENCIES OF PROHIBITED SPECIES

All observers should take length frequencies of all salmon and halibut found in the prohibited species incidence sample. Only observers who were assigned to measure crab and were provided calipers or dividers should measure king and Tanner crabs. Do not measure crab unless you were given that assignment.

Length frequencies are recorded by species and by sex. Identify salmon to species and do not use 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).

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

FORM 7--LENGTH FREQUENCY OF MEASURED SPECIES

Form 7 is used for recording the lengths collected on the plastic measuring strips (primary and secondary species) and from other plastic forms (crab, halibut, and salmon caught incidentally).

1. Fill in the cruise number (when known), vessel code, and date; start each day's measurements on a new side.
2. Under species name, record the specific common name and the related species code from the same alphabetical code list as used for Form 3.
3. On stern trawlers, record the haul number in columns 17-19.
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 7 sizes in a group.
8. Sum the frequencies in each row and enter in the column "no. of individuals in row."
9. Calculate the "sum of lengths in row" by multiplying each frequency times the appropriate size group and summing the products.
10. 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.
11. 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.
12. Leading zeros should appear in the cruise number, month, and day only (columns 1, 2, 10, and 12 only, as needed). No leading zeros in species code, haul number, size, or frequency.
13. To indicate the repetition of a number or letter, such as species code, haul, or sex, draw brackets and arrows as shown in example form. Do not use ditto marks.
14. Caution: Only actually measured lengths, not estimated lengths, should be recorded on this form.

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LENGTH FREQUENCIES AND OTOLITH COLLECTIONS OF POLLOCK

Upon consultation with some the Northwest and Alaska Fisheries Center scientists, we have decided on a sampling scheme for collecting biological data on walleye pollock in the Kodiak Island area. The enclosed map indicates the areas of the Gulf of Alaska in which we are interested in collecting pollock biological data--essentially all areas around Kodiak Island, although any Gulf pollock data would be useful.

Length frequencies:

Sexed length frequencies would be preferred, but unsexed length frequencies would be fine. It takes much less time to do unsexed length frequencies, and sometimes less space, so with lack of time and space a real consideration on board small vessels making shoreside deliveries, unsexed length frequencies may be the only practical solution. Another consideration is that the fishermen may prefer this because fewer fish may be damaged. (This depends on the processing method to be used.)

We usually ask our observers to measure a random sample of approximately 150 fish per day. This sample could come from a single haul or smaller samples could be taken from several hauls. It is important that these samples not be size selected in any way.

Pollock should be measured from the tip of the snout to the fork of the tail. See the enclosed sheets on measuring various species.

It would be preferable if the length data were recorded on our Form 7's, but if you have your own length frequency forms we could probably write a simple program to convert the data from the form that you use.

Otolith collection:

After some consultation, it was decided that the easiest and most practical type of otolith collection to make aboard vessels making shoreside deliveries was a random otolith collection. In this type of sampling, the observer would reach into the basket of fish saved for length frequencies without looking or size-selecting in any way, measure each fish in turn, and save every nth fish for otoliths. If the observer removed otoliths from every 5th fish that was measured, approximately 30 otoliths would be collected daily, which on a two-or-three day cruise would result in a collection of 60 to 90 otoliths. This would be an ideal collection size, but smaller collections would also be acceptable.

The fork length and weight of each individual fish should be entered on Form 9. (A plastic Form 9 is usually used to collect the data in the sampling situation, then the data are transferred to the paper forms when time allows.) The individual fish weights are weighed using a 2 kg or 5 kg handheld spring scale, depending on the size of the fish. Both sagittal otoliths are collected from each fish, and if an otolith is inadvertently broken, both halves

are included in the vial. An "F" or a "M" should be entered on the form, depending on the sex of the fish. It would be preferable if the sex was determined of the fish from which otoliths were collected, but if this is not possible, enter the sex as "U". I have included some additional information on otolith removal and the sexing of fish--ignore anything dealing with making a stratified otolith collection.

Otoliths should be rubbed clean and placed in the numbered vials. There should be one set of two otoliths per vial. A squeeze bottle is used to add a 50% ethyl alcohol-50% fresh water solution to each vial of otoliths.

Location data for length frequencies and otolith collections:

We still have not received a definitive answer on questions of confidentiality regarding passing raw data forms from ADF&G to NMFS and vice versa. I would not expect that there would be any problem with the transfer of length frequency data or otolith collections. There may be a problem with the transfer of Form 2 haul data, however, because it contains latitude-longitudes of catches and catch sizes. The scientists did not feel that it was necessary to have the exact position of capture of the fish used for length frequencies or otoliths. It would be preferable to have the ADF&G statistical area of the haul retrieval, but if this is not possible, indicate whether the data come from Shelikof (West Kodiak), East Kodiak, or Southwest Kodiak (see enclosed map). The boundaries of the Shelikof area are from the description used to designate Inside/Outside Shelikof pollock allocations (see second map giving the Shelikof description) in the 1986 joint venture permits. These ADF&G statistical areas or broader regions can be marked in the upper left corner of each Form 9 (in the Area blank), and in the upper left corner of each length frequency form. (See the example data forms.)

SCALE SAMPLES AND RANDOM STRATIFIED OTOLITH SAMPLES

RANDOM STRATIFIED OTOLITH SAMPLES

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 name "random stratified" which is 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 not 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 normally 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. 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 otolith sheet after the vial number in which the otoliths will be placed. The otolith vials are to be

filled in numerical order and the sexes should be grouped. Remove the pair of otoliths, rub and rinse them in water, and place them in the vial. There is one set of two otoliths per vial. Add the alcohol-water solution if it is called for, and cap the vial. 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. Try not to collect more than 20 age structures per day (10 males and 10 females).

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 essentially be a new collection. If you have collected less than 50 age structures from a primary species and then transfer to a second vessel, 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.)

Otoliths lie in the head region, posterior of the eyes and are located bilaterally to the dorsal midline (refer to the diagram in the Appendix). Removal of the otoliths is accomplished by making a cut through the dorsal surface to the point where the preopercular bone and the lateral line would meet if they were extended. This will break the otolith cavities, exposing two white otoliths. 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 that size of fish again. After extraction, clean the otoliths by

rubbing them between your fingers, in water, to remove slime and tissue. Store most roundfish otoliths in a 50% ethyl alcohol--50% fresh water solution, filling 1/2 of the plastic vial; flatfish and jack mackerel otoliths are stored dry in plastic vials; (see "Otolith and Scale Collection for Select Species" in Appendix).

Some fish with bony skulls and small otoliths (jack mackerel, sablefish, some rockfish, etc.) may pose problems at first. If you have the tools available you may want to try using a hacksaw or bone knife on species with bony skulls. Refer also to the diagram in the Appendix "How to Determine Sex and Remove Otoliths from Jack Mackerel." This should help you determine exactly where to cut to find small otoliths.

Start with vial number one when filling your otolith vials and fill consecutively numbered vials. Attempt to take some otoliths each sampling day if the species seems readily available. If possible, you should not collect more 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.

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 9. There is no need to fill out an additional Form 9 unless instructed to do so.

SCALE SAMPLES

For certain species of fish, the scale is the preferred structure for determining age; on some species, otoliths are used. Scale samples should be taken from all salmon or steelhead in the incidence of prohibited species samples, or from as many as possible (to subsample, see instructions under Biological Data Collected from Prohibited Species, and its salmon data section). 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 the salmon scale samples dry, in small paper envelopes. Try to smear or spread-out the scales inside the envelope so that they will not stick together in one large clump. On each pre-printed envelope, fill in the requested information. If you should run out of envelopes, the ship may have some you can use or you should make some. Number the salmon scale samples sequentially, within each species group. Record their data on Form 9 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. Using any clean, thin-edged instrument (knife, scalpel, forceps), scrape within the zone in an anterior direction (toward the head). For salmon, try to pluck scales out with forceps so as to minimize the amount of accompanying mucus.

4. Wipe off, inside the envelope or vial, 15 to 20 scales that adhere to the instrument. Be certain the envelope is properly labeled or the vial is marked and all pertinent information is recorded on the plastic sheets.
5. Remove excess scales from instrument before sampling the next fish.

Scale samples, as well as otoliths, from Pacific cod and sablefish should be taken from a stratified centimeter/sex group as explained in "Scale Samples and Random Stratified Otolith Samples." Unlike most age-structure samples, Pacific cod and sablefish scales and otoliths should be put into vials of alcohol instead of into scale envelopes. The primary reason for this is to prevent the scales from sticking together so badly that they are damaged by pulling them apart. Thus it is important to insert the scales into the alcohol solution in the vials rather than to add the alcohol to the scale samples at a later time.

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.

FORM 9 - LIST OF OTOLITHS OR SCALES

Form 9 is used for recording the data on the stratified otolith or scale collections of the primary and secondary species you were instructed to take, plus data on scales of salmon caught incidentally.

1. Otolith and scale data sheets are filed separately by species and cruise. 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 management area corresponding to the catches on the sheet. (Refer to the map in the radio message section.)
3. Circle "otoliths" or "scales" in the title of the form to indicate which structures were taken.
4. Fill out the vessel name, observer name, and species common name on each sheet. These data forms are duplicated, separated, given to different otolith/scale readers, and eventually filed and used by various groups at NWAFC. The different users cannot always be provided with current cruise number and vessel code lists.
5. Fill in the cruise number and vessel code (when known), species code, and date; start each day's measurements on a new side.
6. Leading zeros should appear in the cruise number, month, and day only (columns 1, 2, 13, and 15 only, as needed).
7. On stern trawlers record the haul number in columns 26-28.
8. Note that several hauls can be recorded per sheet as long as the hauls were begun to be retrieved on the date written on the top of the page and they were all taken from hauls 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 is in a different management area.
9. The otolith or scale number is the identifying number on the vial or scale envelope. There should not be any duplicate otolith or scale numbers within a species. The otolith/scale numbers should also be listed in sequential order, which should be the case if the sampling directions were followed. (We want to avoid having vials filled at random.)
10. Salmon scale samples are numbered sequentially by species and are recorded on separate groups of pages.
11. If you transfer to another ship, you can continue with the same sequence of otolith numbers, but keep the Form 9's and the otoliths separate for the two different cruises. (Remember that if you are

assigned to collect age structures from a primary species and you change vessels with less than 50 age structures collected, then you should dump the collection and start over. A collection of less than 50 age structures is not of much value.)

12. It is also best if the otoliths are removed by sex group and recorded separately by sex on the form.
13. Record the sex of the fish using "M," "F," and "U" notation; not ♂ and ♀. (M = male; F = female; U = unidentified)
14. Record the length of the fish to the nearest cm--no decimal places.
15. The weight is to be filled out to two decimal places.
16. If you took a scale sample from a salmon with a possible net scar, note the presence of the scar with a "9" entered in column 60.
17. If for some reason, some preservative other than ethyl alcohol was used (such as rubbing alcohol), note the preservative at the top of the first page of each set of Form 9's.
18. Note the type of sample at the top of the form if it is something other than salmon scales or a typical random stratified collection.

FORM 9 LIST OF OTOLITHS OR SCALES
(CIRCLE ONE)

AREA 54

CRUISE NO.			VESSEL CODE				SPECIES CODE			DATE					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0	8	3	0	5	2	1	2	0	1	8	3	0	5	1	5

VESSEL Uzbekistan
OBSERVER John Brown
SPECIES Pollock

SET NUMBER	HAUL NUMBER	OTOLITH OR SCALE NUMBER	SEX	LENGTH (cm)	AGE	WEIGHT (kg)	special handling		total age		AGE REMARKS
							55	56	61	65	
1	154	26	M	32		.80					
2		27		40		.95					
3		28		35		.93					
4		29		34		.85					
5		30		34		.89					
6		31		42		.96					
7		32		44		.96					
8		33		33		.80					
9		34	↓	35		.86					
10		35	M	34		.83					
11		36	F	34		.90					
12		37		35		.93					
13		38		33		.80					
14		39		43		.95					
15		40		34		.91					
16		41		42		.96					
17		42		47		1.20					
18		43		43		.95					
19	↓	44	↓	32		.80					
20	154	45	F	40		.93					
21						.					
22						.					
23						.					
24						.					
25						.					
26						.					
27						.					
28						.					
29						.					
30						.					
31						.					
32						.					
33						.					
34						.					
35						.					
36						.					
37						.					

FORM 9US INSTRUCTIONS

Form 9 is used for recording biological information concerning individual fish or invertebrates. 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 will be used for collecting data to accompany scales of salmon caught incidentally as well as age structure collections of primary or secondary target species which you may have been specifically instructed to collect.

1. Form 9US data sheets are filed separately by species and cruise. 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. Fill in the cruise number and vessel code (when known), date, species common name, and the species code corresponding to the common name. Start each day's measurements (or subarea if it changes during the day) on a new side.
4. Leading zeros should appear in the month and day only (columns 12 and 14 only, as needed).
5. Record the specimen type that is being collected:

1--otoliths — Sablefish
 2--scales
 3--fin rays
 4--otoliths and scales — Pacific Cod
 5--otoliths and fin rays
 6--scales and fin rays
 7--otoliths, scales, and fin rays

6. 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. Usually the fish are obtained from your length frequency samples and a talley sheet is used to ensure that age structures are obtained from no more than 5 fish per cm sex group.

← Shoreside
delivery
system

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.

7. Ignore "Total no. of specimens" and "Catalogue date," as this information will be filled in by others after you return.
8. On trawlers record the haul number in columns 25-27; on longline or pot vessels record the set number in those columns.
9. 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 GMT day, or a haul/set is in a different subarea.
10. 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 sequential number, which should be the case if the sampling directions were followed. (We want to avoid having specimen containers filled at random.) Salmon scale samples are numbered sequentially by species and are recorded on separate groups of pages.
11. If you board another ship during the same trip, you can continue with the same sequence of otolith numbers (or other specimen numbers), but keep the Form 9US's separate for the two different cruises.
12. It is best if the specimens are removed by sex group and recorded separately by sex on the form.
13. Record the sex of the fish using "M", "F", and "U" notation; not ♂ and ♀. (M = male; F = female; U = unidentified)
14. Record the length of the fish to the nearest cm--no decimal places.
15. The weight is to be filled out to two decimal places.

16. If you recorded the length of the fish on the Form 7US forms (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.
17. If you are requested to record maturity stage, record this in columns 42-43. Use the appropriate maturity scale for this species.
18. 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 the individual fish that you think people should be made aware of, write your comments small enough to allow the age readers to also record remarks, if necessary.
19. If for some reason, some preservative other than ethyl alcohol was used (such as rubbing alcohol), note the preservative at the top of the first page of each set of Form 9US's.
20. 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 this means that you should do this at the top of the first sheet for each species.

Radio Report Worksheets

The new Form 3US requires, in some cases, a more complicated procedure for the calculation of the radio messages, due to the potential for having different sample sizes for different species in the same haul. The example Form RM shows the proper way to enter the data obtained from the Form 3US examples 1, 2, and 3. If you whole-haul sampled all of the species in the haul, the data are entered and the calculations made in the same manner as is instructed in the manual (see the example RM form for hauls 101 and 103).

If you have different sample sizes for the same haul as in haul 104, enter the data on separate lines, the largest sample size first. In extrapolating the partial whole-haul sample, the observer should analyze the sampling method, and decide whether the removal of the species that were whole-haul sampled affected the sample size of the partial whole-haul sample. If the observer removed both the whole-haul sampled species and the partial whole-hauled sampling species at the same time, and their removal did not affect the determination of the fraction of the haul that was sampled, then the sample is extrapolated to the weight of the whole haul, as in the entry of haul 104 pwh. If the removal of the whole-haul sampled species did affect the determination of the fraction of the haul that was sampled, then the weight of those species should be subtracted from the haul weight in column A before the extrapolation to calculate the column D figures. The entry of the basket sample data for haul 104 bask illustrates this principle. In basket sampling, the observer is actually sampling only the species that remain. (If any of the whole or partial whole-hauled species appear in the basket samples, the observer was instructed to subtract the weight of these from the basket sample weight and include these elsewhere.) The basket sample species composition should not be expanded to the entire haul weight but to the haul weight minus the extrapolated weight of the species that were partial or whole-haul sampled. (In the example, $12 \text{ mt} - (.093 + .084) = 11.823 \text{ mt}.$)

Form RM-1 is calculated and summed as one normally does for the foreign fishery data forms. Use the same Bering Sea and Gulf of Alaska subareas for reporting the catch.

Form RM-3 is also calculated and summed as usual with one minor exception: if you observed a large number of a prohibited species group (such as the Tanner crab in Form 3US example 1) and took a subsample of that number to weigh by species and sex, you will need to apply the proportions of species observed to the total number of individuals observed. These calculations are shown by the asterisks in the RM-3 example to the right of the area.

Radio messages are sent in the same standard format, but omit PARA 3 (Marine mammal data). Indicate "ALL DOMESTIC CATCH", and don't forget the ORC numbers.

FORM 205-HAUL FORM FOR U.S. SAWLER

1. Leading zeros in columns 12, 14, 34-41 only.
2. Skip line after each day.
3. On days with no hauls, enter date, noon position in 25-33 and haul no. = 0. Note reason.
4. Trailing zeros are required in columns 56-72.

Depth (columns 50 and 55)

M = meters

F = fathoms

Date		Vessel code				Year		Gear type	Gear	Gear performance	Processing mode	Location code
Mo.	Day	Haul no.	Merger	Year	Month							
12	13	15	16	17	18	19	20	21	22	23	24	
✓	09	10	101					1	1	1	R	
✓	10	102						Y	1	1		
✓	10	103						2	1	1		
✓	10	104						1	1	1		
✓	10	105						1	1	1	R	
✓	11	0									N	
✓	12	106						1	1	1	R	
✓	12	107						1	1	1		
✓	12	108						1	1	1		
✓	12	109						2	1	1		
✓	12	110						4	1	1		
✓	13	111						1	1	1		
✓	13	112						1	1	1		
✓	13	113						1	1	1		
✓	13	114						2	1	1		
✓	14	115						1	1	1		
✓	14	116						1	1	1		
✓	14	117						1	1	1		
✓	09	118						1	1	1	R	

Location		Fishing time (GMT)				Fishing duration (min)	Avg. fishing depth	M/F	Avg. bottom depth	M/F	Avg. speed (knot)	Retained catch (round wt.) (mt)	Official total catch (mt.)	Observers total catch (mt.)	ADF+G stat. area																																						
(N)	(W)	(l)	(b)	(b)																																																	
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78
5838	W	7624		2345	0525		130	F	130	F	3.5	15.80	16.00	18.50	73-78																																						
5837		7630		0610	0920		135		135		3.5	7.94	8.25	765830																																							
5837		7607		1015	1435		140		150		3.2	14.90	20.00																																								
5838		7647		1530	1850		140		145		3.2	10.50	12.00																																								
5838		7654		1935	2330		138	F	138	F	3.5	17.92	18.62	765830																																							
5832		7620		No Fishing	-	Rough	h	Seas						765830																																							
5826		7553		2000	0000		240	F	260	F	3.4	8.50	11.75	755800																																							
5824		7525		0145	0745		240		260		3.6	5.62	7.28																																								
5826		7511		0830	1100		235		250		3.6	6.30	8.22																																								
5826		7546		1200	1300		220		245		3.0	10.20	13.21	755800																																							
5814		7710		1800	2350		250		265		3.2	5.34	6.12	775800																																							
5812		7706					180		240		3.6	15.08	17.35	775800																																							
5812		7709					120		210		3.5	16.00	19.20																																								
5810		7704		1215	1340		216		250		3.5	5.25	7.80	775800																																							
5735		7550		1730	2240		205		265		3.5	4.62	5.64	755730																																							
5732		7548		0055	0855		180		190		3.4	8.50	11.20	755730																																							
5731		7547		0735	1442		185		195		3.5	6.90	7.86	755730																																							
5731		7542		1735	1930		162		172		3.2	20.13	22.16	755730																																							
5728		7546		2105	2355		168	F	178	F	3.2	16.72	18.30	755730																																							

Worksheet

Example 1

NMFS SubArea _____
of Baskets _____

species :	pollock					
no. weighed :	170					
wt. of above :	129.4					
avg. weight :	.7612					

other calc., comments: This was a whole haul sample for all bycatch. 4 baskets were taken for pollock average wt. and density. Tanner crab were subsampled for species, sex, and length data (all were counted and weighed)

CRUISE NO.		VESSEL CODE		YEAR		MO.		DAY		HAUL NO.	
1	2	3	4	5	6	7	8	9	10	11	12
		1	1	4	A	1	2	1	8	7	0
									9	1	0
									1	0	1

ST = Sampling Type:
B = basket
P = partial whole haul
W = whole haul
O = other
V = viability only

check type: W P B whole haul (W)
halibut partial haul (P)
salmon basket sample (B)
king crab
Tanner crab

SPECIES NAME	SEX	SPECIES CODE	ST	NUMBER		WEIGHT (in kg. with decimal amt)	SAMPLE (in kg. WEIGHT with d.p.)	VIABILITY					
				20	21			NUMBER EXCELLENT	NUMBER POOR	NUMBER DEAD			
(Karpunch check)	X	999	X	2	1	4	6	9	16000.00	16000.00	22	23	44
pollock		201	W	2	0	7	2	9	15778.78	16000.00			
POP		301						1	.45				
redbanded rockfish		308						1	1	5.0			
darkblotched rockfish		311						2	2	1.3			
rougheye rockfish		307						1	1	3.2			
shortspine thornyhead		350						1	2	4.5			
sablefish		203						3	1	72.6			
arrowtooth flounder		141						2	2	5.0			
rex sole		105						6	6	1.45			
Alaska skate		88						1	1	4.1			
dogfish shark		66						4	4	2.7			
* Tanner crab, unid. U	U	3				5	6	2	89.5				
ovilio Tanner, M	M	5						3	.43				3
ovilio Tanner, F	F	5						1	.17			1	
knirdi Tanner, M	M	4				3	2	5.44		6	5	18	
bairdi Tanner, F	F	4				5	9	8.70		15	16	23	
Pacific halibut	U	101						2	6.20	1	1		
King salmon, M	M	222						1	1.62				
King salmon, F	F	222						1	2.1				
King salmon, U	U	222						1	1.76				
King crab, unident. U	U	2						0	0.0				
Pacific lamprey		79	V					2	1.4				
squid		50	W					5	3.6	16000.00			

Viability does not equal #

FORM 3US—SPECIES COMPOSITION

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

Worksheet

Example 3

Species:	P. halibut	King salmon				
No. weighed:	9act 2est	3act 1est				
Wt. of above:	60.7 ↗	13.17 ↗				
Avg. weight:	6.74 ↗	4.39 ↗				

Other calc.; comments: Whole-haul sampled for salmon, steelhead, and halibut.

Partial whole-haul sampled for Tanner + king crab (1/4 of haul, using bin depth).

Took ten baskets for other species. Applied avg. wts. to observed (but not weighed) halibut

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		
		1	1	4	A	1	2	1	8	7	0	9	1	0	1	0	4																				

ST = Sampling Type: Check Type: W P B and salmon.
 B = basket Halibut
 P = partial whole haul Salmon
 W = whole haul King crab
 O = other Tanner crab
 V = viability only

Species name	x s	Species code				ST	Number				Weight (in kg. w/ decimal pt.)	Sample weight (in kg. w/ decimal pt.)	Viability														
		20	21	22	23		24	25	26	27			28	29	30-40	41-51	Number excellent		Number poor		Number dead						
(Key punch check)	X	9	9	9	X							567.63	12000.00	32	37	56											
Pacific halibut	U	1	0	1	W						1	1	74.19	12000.00	5	4											
King salmon, F	F	2	2	2	↓							3	13.17														
Steelhead, M	M	2	2	6	↓							1	1.20														
Salmon, unident., U	U	2	2	0	W							1	4.39	12000.00													
Opilio Tanner, M	M		5		P							8	1.40	3000.00						3	5						
Opilio Tanner, F	F		5		↓							8	1.65		4	2	2										
Bairdi Tanner, M	M		4		↓							5	7.23		8	16	29										
Bairdi Tanner, F	F		4		↓							4	10.60		15	12	20										
King crab unid., U	U		2		P							0	0.00	3000.00													
pollock		2	0	1	B							4	49	350.00	453.80												
red banded rockfish		3	0	1	↓							4	0	20.50													
darkblotched rockfish		3	1	1	↓							5	2.50														
sablefish		2	0	3	↓							2	5.20														
squid			5	0	↓							7	2	51.80													
Pacific cod		2	0	2	B							2	3	23.80	453.80												
<p>OKAY TO ADD ANOTHER WHOLE HAULED SPECIES HERE RATHER THAN ERASING ABOVE</p>																											

Example

FORM 7 US - LENGTH FREQUENCY OF MEASURED SPECIES

(Includes halibut, salmon, and crab measurements)

- NOTE: 1. Leading zeros in columns 12 and 14 only - as needed.
 2. For mother ships - leave columns 17-19 blank. For longliners - enter set no. in column 17.
 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.

Cruise No.	Vessel Code	Date		
		Year	Mo.	Day
1 2 3 4 5	G 7 8 9	10 11 12 13	14 15	
1 1 4	A 1 2 1	87	09 10	

Page 21 of 65

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.	X g S	Keypunch Check	Size Groups	Freq.	Size Groups	Freq.	Size Groups	Freq.	Size Groups	Freq.	Size Groups	Freq.	Size Groups	Freq.	Size Groups	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	37	1
			M	129	40	1	42	1	44	1								
			F	300	33	4	34	9	35	12	37	4	38	1	43	2	45	3
Pollock	201		F	48	47	1												
Opilio Tanner	5		M	217	73	1	83	1	88	1								
Opilio Tanner	5		F	79	78	1												
Bairdi 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
Bairdi 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 M	222		M	39	38	1												
King salmon F	222		F	44	43	1												
King salmon U	222	101	U	41	40	1												
Pacific halibut	101	103	U	77	76	1												
Pacific halibut	101	104	U	544	48	1	56	2	58	1	78	2	80	1	88	1	127	1
King salmon	222	104	F	130	38	1	42	1	47	1								

Cruise no.					Vessel code				Date			Species name	Species code	Specimen type	Sampling system
1	2	3	4	5	6	7	8	9	10	11	12					13	14	15
114					A121				87 09 10			Walleye pollock	16-18	20-21	22-23
												201	1	1	

Total no. of specimens Blank
 Catalogue date Blank

Set/haul number	Specimen number			Sex	Length (cm)			Weight (kg)			Form 7	Maturity stage	Notes	Age	REMARKS													
	25	26	27		28	29	30	31	32	33						34	35	36	37	38	39	41	42	43	44	45	47	48	49
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	102			85	M			33			.80	Y																
22	102			86	M			40			.90	Y																
23	102			87	F			43			.95	Y																
24	103																											
25																												
26																												
27																												
28																												
29																												
30																												
31																												
32																												
33																												
34																												
35																												
36																												
37																												

group by sex if reasonable, but if time is a problem, don't waste extra time, mix sexes

OK if same day

FORM RM WEEKLY RADIO REPORT WORK SHEET AREA 521

PAGE 5 OF 15

D = $\frac{A \times C}{B}$ CRUISE NO. 114 VESSEL CODE A121

No herring were seen

DATE & HAUL NO.	HAUL WT MT	TOTAL SAMPLE WT KG	SQU		YELL		TURB		ARROW		OFAT		FOLL		COD		SAB		ATKA		POP		OROCK		OTH		NDN						
			KG	MT	KG	MT	KG	MT	KG	MT	KG	MT	KG	MT	KG	MT	KG	MT	KG	MT	KG	MT	KG	MT	KG	MT	KG	MT	KG	MT			
9/10 101 wh	16.00	16000.00	3.6	.004					5.0	.005	1.45	.001	1578718	15.779			72.6	.073				.45	.0004	1100	.014	6.8	.007	115.92	.116				
103 wh	20.00	20000.00						5.9	.006	1.4	.001	1831131	16.954	2951.1	2.951	78.5	.079								3.8	.004			92.95	.093			
104 wh	12.00	12000.00																												2088	.084		
104 owh	12.00	3000.00																															
104 back	11.823	453.80	51.8	1.350									380.0	9.119	23.8	0.620	5.2	.135							23.0	0.599							
Days Totals				1.350					.011		.002		41.852	3.571								.0004									.298		
9/11																																	
9/12 106 wh	11.75	11750.00	750.00	.750					2412.00	2.450			650000	6.500	2000.00	2.000																50.00	.050
108 wh	8.22	8220.00																														86.0	.086
108 back	8.134	312.80		.750									212.0	5.513								2.1	.055			13.5	.351						
Days Totals (DOB = .8)													12.013	2.000																			

Hybrid Tanners
go in other tanner
category

FORM RM-3 WEEKLY RADIO REPORT WORK SHEET FOR PROHIBITED SPECIES

CRUISE NO. 114 VESSEL CODE A121 AREA 521 * $9195 \times 562 = 538 + 91 = 629$ *Boyd*
 ** $495 \times 562 = 24 + 4 = 28$ *Quito*

D = $\frac{A}{B} \times C$

DATE AND HAUL NO.	HAUL OR DAY WT (mt)	KING CRAB						TANNER CRAB						PACIFIC HALIBUT						SALMON					
		REDKNG		BLUKNG		OTHKNG		BTAN		OTH TAN		3(1) Sample wt		HBT		3(1) Sample wt		CHIN		OTH SAL					
		No. Observ.	Est. No.	3(1) Sample wt	No. Observ.	Est. No.	Avg. wt (kg)	Est. No.	3(1) Sample wt	No. Observ.	Est. No.	No. Observ.	Est. No.												
9/10 101	16.00	0	0	0	0	0	0	629	28	28	28	16.00	2	wh	2	6.25	16.00	3	3	0	0				
103	20.00	0	0	0	0	0	0	0	0	0	20.00	1	wh	1	5.00	20.00	0	0	0	0					
104	12.00	0	0	0	0	0	0	100	16	64	3.00	11	wh	11	74.19	12.00	3	3	2	2					
9/11 No Fishing																									
9/12 106	11.75	1	8	8	0	0	15	15	23	23	11.75	5	wh	5	32.00	11.75	2	2	1	1					
108	8.22	0	0	0	0	0	75	75	4	4	8.22	15	wh	15	76.00	8.22	0	0	3	3					
Weeks Total	67.97	1	8	8	0	0	119	119	119	119		34		34	193.39		8	8	6	6					

GENERAL DIRECTIONS FOR OBSERVERS ON JOINT VENTURE CRUISES

A joint venture (JV) is a combined fishing and processing effort between a U.S. domestic fishing boat(s) and a ~~foreign~~^{domestic} processing vessel(s). The U.S. fishing boat is often called a "catcher boat", and the ~~foreign~~^{domestic} processor is sometimes referred to as a "mothership" or "processor". In a joint venture, the U.S. fishing boat catches the fish and delivers them to the foreign processor by transferring a fishing net codend. The financial and business arrangements between the ~~foreign~~ JV mothership and the ~~U.S.~~ catcher boat are usually handled by ~~a third party~~^{the company which owns the processor or by a third party} which is called a "joint venture company." The JV company will usually place a "JV representative" (JV rep.) aboard the ~~foreign~~ processor to assist in communications with the catcher boat and in settling disagreements about codend delivery weights and species composition. The JV rep. will sometimes carry out similar duties as the observer (i.e. catch rate estimates and species composition sampling), but this should not deter observers from doing their assigned work. The JV reps. can sometimes be of help ~~in communicating with foreign ship personnel because of their possible language ability or~~ in communicating with the catcher boats for needed data on the Form ~~222~~^{US} (see following section).

Observers will find it ~~necessary~~^{valuable} to create a good working relationship between themselves and the JV representative. The JV rep. is important to the smooth operation of the joint venture and can be very influential in the observers dealings with the ~~foreign~~ crew or U.S. fishermen. ~~It is important that observers act in a mature, diplomatic and tactful manner when dealing with the U.S. fishermen, JV rep. or foreign fishermen.~~

Observers can work with JV reps. to figure out densities and haul weight estimates or maybe product recovery rate determinations. You should not however, let a JV rep. do your sampling, or conversely, you should not do the

JV reps. job for them. This could be considered a possible conflict of interest and under no circumstances should you accept payment from a JV company while you are employed as an observer.

SHIP ESTIMATE OF CATCH RATES

On joint ventures, an immediate estimate of the weight of a codend is sometimes required by the catcher boat that delivers the codend. This quick estimate or "hail weight" is usually settled upon by the captain and JV rep. and comes from a rough estimate of the volume and weight of fish in the net or fish bins. ~~The hail weight may be written into the "Section One - Effort" of the ship's "Daily Joint Venture Log" under "Estimate of Receipt Weight".~~ (Other methods that may be used by the ship to estimate catch weights ~~have been discussed earlier in this manual under "Catch Rates" in the "Independent Stern Trawler" section.~~) The total catch estimate that you should record and use in your data is the final and most accurate estimate of a codend that is available from the ship's fishing logs. ^{personel or} The ship's estimate can be determined by adding together all of the species report group weights that are recorded in the ^{logs and} ~~"Section Two - Catch" part of the daily joint venture log and adjusting for any non-reported species if necessary. (Refer to "Adjusting the Ship's Estimate" in Section II of the manual and "How to Complete a Form 28V by using the Ship's Fishing Logs" on the following page.)~~

OBSERVER ESTIMATES OF CATCH RATES

The methods described in your manual for determining catch estimates on stern trawlers (i.e. bin volume and codend volume methods, etc.) will also apply to joint ventures, therefore refer to those sections in your manual for a complete description.

Form 2 US

Special directions for joint ventures.

1) Record the catcher boat which delivered each haul. This can be done on the left side of the form.

2) IF possible, get catcher boat data

- a) Set and Haul Time (and date) or duration
- b) retrieval position
- c) depth
- d) speed

3) Otherwise use

- a) delivery time (and date)
- b) delivery position
- c) depth at time of delivery
- d) your best estimate of duration if catcher boat won't provide this information

4) ~~IF~~ IF two catcher boats haul back at the same time, list them in order of delivery and add 1 minute to the retrieval time of the 2nd tow so that the retrieval times are different.

5. When you are working with several catcher boats, they may deliver the hauls in a different order than they retrieve them. When possible, use the retrieval times, but keep the deliveries in the order used by the ship so you can compare data and avoid confusion. You may have to change the retrieval time to the delivery time on one haul, omit the set time, and calculate the duration.

All other forms are filled out in the same way as trawlers.

The sampling is the same as for trawlers

GENERAL DIRECTIONS FOR OBSERVERS ON LONGLINERS

Longliners are small independent fishing vessels of about 50 meters in length and 350-500 gross tons with a total crew complement of between 25-35 men. Longliners catch fish using a line with baited hooks attached to it (refer to the diagram in "Final Report No.2 of section II). The longline is divided into sections called "~~hatchi~~ ^{skates or "magazines"}" (there are usually about ^{100 skates} ~~400 hatchi~~ per longline), which are separated by weights. Each ~~hatchi~~ ^{skate} usually has 35-50 hooks which are separately attached to the longline by lengths of line called "gangen." There ~~is~~ ^{are} typically ~~only one~~ ^{to four} longlines "set" that is put out and retrieved per day, and the target species is Pacific cod, sablefish, or Greenland turbot. On a longliner, the fish are removed from the hooks one at a time and immediately processed. This effort is usually labor-intensive, but it also produces a very high quality product.

SHIP ESTIMATES OF CATCH RATES

The information stated in the catch rate section for independent stern trawlers will also apply to ship estimates of catch rates on longliners (except for the bin and codend volume methods). However, longliner catches are recorded by set, and all sets are attributed to the day that the retrieval of that set was completed. Just like for joint venture ships, the only time a noon position is recorded is on a non-fishing day. (Refer to Form 115 in the following pages.)

OBSERVER ESTIMATES OF CATCH RATES

Observers on longliners should be able to estimate the total catch of each sampled longline set using the following proportion:

$$\text{Estimated catch weight} = \text{weight sampled} \times \frac{\text{skate} \text{ Hatchi retrieved}}{\text{Hatchi sampled}} \text{ (for that set) (during all sampling periods)}$$

skate

Observers should try to periodically verify the number of ~~hatchi~~^{skates} that are being set. Some methods for determining this are as follows:

- 1) Actual count of ~~hatchi~~^{skates} during the setting process.
- 2) Actual count of ~~hatchi~~^{skates} between buoy sections during retrieval.
- 3) Overall timing of the setting of ~~hatchi~~^{skates} with a calculation of the average number of seconds to set one ~~hatchi~~^{skate}.
- 4) A conversion of miles of gear set to ~~hatchi~~^{skates} using the video course plotter.

If some ~~hatchi~~^{skates} 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 these lost ~~hatchi~~^{skates} in the total catch estimation.

How to Complete a Form 1L by using the Ship's Fishing Logs

~~Most of the entries on Form 1L can be taken from "Section One - Effort" of the ship's "Daily Fishing Log". Copying the date and noon position onto your Form 1L from the Section One of the Fishing Log is straight forward. (Refer to the example of a Fishing Log and Form 1L that follows.) The set number will either be a "1" or "2" depending on whether the ship finished retrieving one or two sets that day. The table shown below, should assist you in transferring other Fishing Log entries onto Form 1L. Be aware that the Fishing Log formats can vary, but they must at least contain the items and information shown in the following example.~~

Fishing Log Entry: (is equivalent to) Form 1L Entry:

Depth of Set (meters)	Average Depth (m)
Duration of Set (minutes)	Fishing Time (hours)
Hauling Position	End Position of Set
No. of Pots or Longline Units	No. of Hatchi
No. of Hooks per Longline Unit	Average No. Hooks/Hatchi

Weather and sea codes (coded as shown in this manual) and surface and bottom water temperatures will, have to be provided by the ship's officer on watch, in some regular format. The approved Japanese Fishing Logs have columns for this information by set, but their weather and sea coding systems may be different.

OBTAINING SPECIES COMPOSITION ON LONGLINERS

Unlike the situation on a mothership or an independent stern 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. Many observers have noted "patchiness" of fish on a longline set. The change in species composition in different portions of the set makes it difficult to get samples that are representative of the entire set. The only solution to this problem is to try to get as large a sample size as possible; sample large portions of the longline set.

The large size of both sablefish and Pacific cod makes sampling a large portion of the set difficult, since the sample baskets fill up quickly but contain few fish. A sampling system has been devised to try to reconcile some of these problems. 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 up to three species at once, such as sablefish and rattails.) Include in your count, fish that drop off the hooks 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.). Do not bother to include rocks, old fishing gear, etc.--only organisms. ~~Continue in this fashion until all of the sample baskets are filled.~~ Note also how many ^{skates} ~~batches~~ were retrieved during the sampling period using a thumb counter or a stroke--tally on a plastic sheet. 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, gather several baskets of the species that you tallied, making sure that you get every fish in your representative sample. Weigh the baskets and count the fish to obtain an average weight of the tallied species. (You will also be able to use these fish for your length frequency sample, if desired.) 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.

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. If this alternative is chosen, 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, so it may not be possible to use this sampling method on board your vessel.

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 ~~catch~~ ^{skates} (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 as you would on an independent stern trawler.

FORM 3L(2) - RECORDING SPECIES COMPOSITION ON LONGLINERS

This form is filled out much like a Form 3(2) for stern trawlers except for the following differences:

1. Remember that the date of the sample should correspond to the information on Form 1L. The date should thus be the day the retrieval of the longline set was completed.
2. Set numbers should be recorded in columns 15, 20, and 25 and sample numbers should be recorded in columns 17, 22, and 27. The first sample of each set should be numbered 1; the second - 2; the third - 3; and so on. The next set, start over again with sample number 1. Therefore, if you want to refer to a given sample in your report, you must give both the date and the set-sample number.
3. Note the number of hachi that were sampled for species composition during each sampling period, and place in columns 18-19, 23-24, and 28-29.
4. Note in "Remarks" heavy predation on the set catch by sea lions or killer whales.
5. If the tally system was used to count the dominant species in the catch, record the number of fish tallied in columns 35-40. In a non-keypunched portion of the form (see example form), record the data on the baskets of dominant species that were collected at about the same time as each sampling period--note the sample number, the number of fish in the baskets, the weight of those fish, and the calculated average weight. Multiply that average weight times the number of that species tallied during that sampling period and record the weight in columns 41-49, opposite the tallied number. Enter the species names, species codes, numbers and weights of the bycatch taken during the sampling period. Total the weights of all the species to get the estimated weight of all the organisms that came up on the line during the sampling period and enter this figure in columns 41-49, opposite the species code 999 (see example form). Total the numbers of specimens in each sample at the top of the column, in line 999.

If all species were placed in the baskets during the sample period, record the actual counts and weights in columns 35-40 and 41-49, as you would for basket sampling on a stern trawler.

FORM 3L (2)

SPECIES COMPOSITION FROM BASKET SAMPLES ON LONGLINERS

Leading zeros in columns 1, 2, 10, 12 only.

* Indicates weight obtained by subtraction from total sample weight.

CRUISE NO.	VESSEL CODE				YEAR			MO.	DAY				
	1	2	3	4	5	6	7	8	9	10	11	12	13
475	N	L	O	6	8	3	1	0	2	0			

EXAMPLE OF DATA FROM A LONGLINE VESSEL

REMARKS: SERIONS WERE RESELECTING SABLEFISH IN FIRST SAMPLE. BREAKS OCCURED DURING THE 2ND & 3RD SAMPLES

SPECIES CODE	FIRST SAMPLE				SECOND SAMPLE				THIRD SAMPLE				TOTALS FOR THE DAY												
	Set No.	No. of hacht	Time	No. of baskets	Set No.	No. of hacht	Time	No. of baskets	Set No.	No. of hacht	Time	No. of baskets	No.	Weight	Avg. wt. (kg)										
																WEIGHT (in kg with decimal pt.)	WEIGHT (in kg with decimal pt.)	WEIGHT (in kg with decimal pt.)							
32	33	34	35	36	37	38	39	40	41-49	50	51	52	53	54	55	56-64	65	66	67	68	69	70	71-79		
No. of specimens and total basket weight	9	9	9	9	4	4	3	143	1.09	4	8	8	130	7.33	8	0	8	209	7.45	173	9	4	8	48	31.87
SABLEFISH	2	0	3	2	1	4	7	78	96	2	2	1	6	40.9	2	2	1	6	40.9	4	3	5	6	52.5	99.4
SHORTSPINE THORNWD	3	5	0	3	6	3	6	40.8		1	0	1	0	6.3	2	2	7	590.2		5	6	5	6	52.5	99.4
PECTORAL RATTAIL	8	2		1	8	1	5	79.2		2	2	7	5	90.2				590.2		4	0	8	4	116	9.4
UNIDENT. SKATE	9	0		6	6	6	14.8			1	7	1	7	48.03				48.03		6	6	6	6	14.8	14.8
PACIFIC HALIBUT	1	0	1	6	6	6	17.53			1	7	1	7	48.03				48.03		6	6	6	6	14.8	14.8
RED KING CRAB	1	3		6	6	6	17.53			1	7	1	7	48.03				48.03		6	6	6	6	14.8	14.8
ROUGHSCALE RATTAIL	8	1		6	6	6	17.53			1	7	1	7	48.03				48.03		6	6	6	6	14.8	14.8
SHORTRAKER ROCKFISH	3	2	6	6	6	6	17.53			1	7	1	7	48.03				48.03		6	6	6	6	14.8	14.8
PACIFIC COD	2	0	2	6	6	6	17.53			1	7	1	7	48.03				48.03		6	6	6	6	14.8	14.8
WALLEYE POLLOCK	2	0	1	6	6	6	17.53			1	7	1	7	48.03				48.03		6	6	6	6	14.8	14.8
GOLDEN KING CRAB	2	0	1	6	6	6	17.53			1	7	1	7	48.03				48.03		6	6	6	6	14.8	14.8
ARROWTOOTH FLOUNDER	1	4	1	6	6	6	17.53			1	7	1	7	48.03				48.03		6	6	6	6	14.8	14.8
*1 47 SABLEFISH=150.4																									
avg = 3.64 kg																									
*1 38 P. RATTAILS=138.3kg																									
avg = 3.20 kg																									
*2 51 SABLEFISH=147.9kg																									
AVG = 2.90																									
*2 33 P. RATTAILS = 85.8																									
avg = 2.60kg																									
*3 62 COD=167.4kg																									
avg = 2.70 kg																									

DETERMINING INCIDENCE OF CRAB, HALIBUT, AND SALMON

On longliners, the incidence data is taken from the same sample as the species composition. Both species composition and prohibited species sampling can be accomplished at the same time and will have the same sample weight. Refer to the appropriate section for stern trawlers for a complete discussion of prohibited species sampling.

OTHER NOTES FOR LONGLINERS

Remember that often on a longline vessel you cannot immediately work with the prohibited species that are being saved for you because you are too busy tallying species as the line comes on board. If the halibut and crab are kept for you for some time out of water, the condition of the halibut and crab will be affected by your sampling procedure. You may be able to have a salt water tank constructed to hold the halibut and crab, until you are able to work with them. If you are unable to get viability information as part of your ordinary sampling procedure, then try to sample specifically for viability of halibut and crab at least twice a week. Using the table in the independent stern trawler section giving the definitions of "excellent," "poor," and "dead" condition for longliners, note the number of halibut and crab in each category. The viability estimate should be the estimate of the halibut and crab condition upon release to the sea. Do not guess the condition of animals that you do not personally examine. If the sample of halibut checked for viability is a subsample of the incidence of prohibited species sample, make certain that the subsample is a representative one.

INSTRUCTIONS FOR FILLING OUT DOMESTIC LONGLINE AND POT VESSEL FORMS

FORM 1US - CATCH SUMMARY

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 (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.
 - 2 - The catch is delivered to a mothership at sea for processing.
 - 3 - Utilized catch is delivered to a shore-based processing plant. The trip usually lasts no more than 3 to 4 days and in the meantime the catch is kept on ice.
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.
10. The location entered should be the latitude and longitude of the ship at the time the retrieval of the set was completed. 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 GMT noon position in these columns.
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 GMT 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.

15. Pot/trap vessels only:

Record the number of pot/traps retrieved per set or string in columns 53-55. 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.

Record the total length of the groundline of the set in columns 56-59. 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 amount of catch (in metric tons, not pounds or short tons--see Table of Equivalents) that is retained aboard the ship. On catcher processors, generally the retained catch is just the round weight of the fish that are actually utilized for products. The retained catch may thus be the ship's estimates of the products (converted to round weight using product recovery figures and from pounds to metric tons).

On vessels that deliver catch to shoreside processing plants, there may be some discard of prohibited species, small fish, and nonutilized species at sea, but the main discard of fish may occur at the processing plant. Your job will be to estimate the amount that is actually discarded at sea and hence, by subtraction, the amount

that is delivered to the processing plant, not what is eventually retained by the processing plant. On longline vessels, probably only the utilizable species and sizes are being retained. If discard is occurring at sea, the best way to determine how much, may be to estimate the amount of utilizable species in the set using the observer sampling data for the set or the day, and a rough estimate of the amount of the undersized target species that were discarded.

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 official catch weight for the set, and should be used in all calculations involving set weight on Forms 3US and radio message worksheets. This should be the best estimate of total catch (all species included), and in most cases it should be based on the ship's estimate of retained catch (round weight), adjusted for the nonutilized species (using the observer's sample data). To adjust sets for which you do not have sampling data, calculate an adjustment factor for the day (see example below) and multiply the retained catch for that set times the adjustment factor for that day. If you observed the set but did not sample it, and feel that the adjustment factor for that day would not give an accurate estimate of the total catch, then use your judgement as to how to obtain the best estimate of total catch. If the vessel officers can provide good estimates of total catch (all species included), then convert these estimates from pounds to metric tons and use them as the official catch weight. This figure must always be filled in (record it to two decimal places). Note at the top of the form 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.

(see manual for directions for adjusting a sampled set)

$$\frac{\text{sum of adjusted ship's estimates for the sampled sets for the day}}{\text{sum of the retained catch estimates for the sampled sets for the day}} = \text{adjustment factor for the day}$$

$$\text{adjustment factor for the day} \times \text{retained catch est. for a nonsampled set} = \text{adjusted ship est. for that set}$$

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 your sampling manual 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. Leading zeros should be in the dates (cols 12 & 14) and the soak time (cols 33-35) only, as needed.
21. Skip a line after each GMT day.
22. Any notes, or comments (other than notes for nonfishing days) should be placed in a part of the form that is not keypunched.

FORM 3US - SPECIES COMPOSITION 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. At this time I will not reiterate column by column what should be recorded on this form, but will simply indicate the features that make this different from the U.S. trawler forms.

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, because P is already reserved for "partial whole-haul sample." Use a "V" if you are sampling the set only for viability (in which case, use a separate sheet). In most cases you will be recording the viability data for the same set (though possibly a different portion of the same set) and you will be able to use the same form.
2. Columns 41-51: Number of hooks or pots sampled: As the sampling on longline vessels will probably be much the same as on foreign longline vessels, you will probably use the same sample size for all of the species. If you sample multiples of whole skates, all you need to do to obtain the number of hooks sampled is to multiply the number of skates sampled times the average number of hooks per skate. With pot vessels, you will probably sample a random number of pots and record everything that was in those pots. If you do run into a large number of small individuals of a given species, the form does allow you to sample a smaller random sample of pots for those species, and a larger number of pots for the larger, rarer species. If you do use different numbers of pots to sample different species, remember to take this into account when you do your extrapolation for your radio messages.
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 checkoff boxes above the viability column to remind yourself to record those groups not seen.

FORMS 7US AND 9US: refer to the instructions included with the trawler forms.

FORM 10S - CATCH SUMMARY FOR U.S. LONGLINE AND POT VESSELS

Depth (column 41)

M = meters

F = fathoms

Sets sampled	Date		Vessel code				Year		Gear performance	Processing mode	Location code	End position of set			Soak time hrs:min	Avg. bottom depth	M/F	Longline fishery			Pot fishery			Retained catch (round wt.) (mt.)	Official total catch (mt.)	Observers total catch (mt.)	ADFG stat. area												
	Mo.	Day	Set no.	12	13	14	15	16				17	18	19				20	21	22	23	(N) latitude	(E) longitude					(l) longitude	No. of skates	Skate length (fathoms)	No. hooks/skate	No. of pots	Length of set (fathoms)	60	61	62	63	64	65
✓	10	20	1	8	11	R	55	34	W	68	42	10	45	32	5	F	10	300	140	53	55	56	1	62	2	30	65	66	67	68	69	70	71	72	73	74	75	76	
✓	10	20	2	1	11	R	55	42	W	68	42	12	10	28	5	F	10	300	140	53	55	56	1	45	1	65	65	66	67	68	69	70	71	72	73	74	75	76	
✓	10	20	3	1	11	R	55	28	W	68	21	12	20	16	5	F	12	300	140	53	55	56	1	08	1	80	65	66	67	68	69	70	71	72	73	74	75	76	
✓	10	20	4	1	11	R	55	24	W	68	02	11	50	12	5	F	12	300	140	53	55	56	1	85	1	55	65	66	67	68	69	70	71	72	73	74	75	76	
✓	10	20	5	1	11	R	54	56	W	67	11	11	50	18	6	F	10	300	140	53	55	56	1	62	1	00	65	66	67	68	69	70	71	72	73	74	75	76	
✓	10	21	6	1	11	R	54	58	W	67	20	10	20	21	7	F	10	300	140	53	55	56	1	58	1	40	65	66	67	68	69	70	71	72	73	74	75	76	
✓	10	21	7	1	11	R	54	45	W	67	11	10	45	19	8	F	12	300	140	53	55	56	1	75	2	15	65	66	67	68	69	70	71	72	73	74	75	76	
✓	10	21	8	1	11	R	54	48	W	67	08	09	15	17	9	F	10	300	140	53	55	56	1	23	1	60	65	66	67	68	69	70	71	72	73	74	75	76	
✓	10	21	9	1	11	R	54	36	W	67	10	09	30	25	10	F	10	300	140	53	55	56	1	90	2	20	65	66	67	68	69	70	71	72	73	74	75	76	
✓	10	22	0	1	11	R	54	20	W	65	18	ND	ND	ND	11	F	10	300	140	53	55	56	1	01	2	65	65	66	67	68	69	70	71	72	73	74	75	76	
✓	10	23	10	1	11	R	54	18	W	65	20	16	30	11	10	F	10	300	140	53	55	56	2	05	2	65	65	66	67	68	69	70	71	72	73	74	75	76	
✓	10	24	11	1	11	R	54	17	W	65	42	17	10	13	10	F	10	300	140	53	55	56	1	62	2	05	65	66	67	68	69	70	71	72	73	74	75	76	

FORM 7US—LENGTH FREQUENCY OF MEASURED SPECIES

Cruise no.	Vessel code	Date		
		Year	Mo.	Day
1 2 3 4 5	6 7 8 9	10 11	12 13	14 15
132	A321	87	10	21

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

(Includes halibut, salmon, and crab measurements)

1. Leading zeros in columns 12 and 14 only — as needed.
2. For motherhips — 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.

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 groups	Freq.	Size group	Freq.	Size group	Freq.
					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				
P. halibut	101	6	U	429	53	1	54	2	59	1	60	1	62	2	64	1	68	1				
"	101	6	U	405	70	2	73	1	75	1	90	1	91	1								
P. halibut	101	7	U	397	54	1	62	1	64	2	65	1	68	1	77	1						
Red king crab	13	9	M	323	153	1	168	1														
Red king crab	13	9	F	129	128	1																
Golden king crab	8	9	M	119	118	1																
P. halibut	101	9	U	392	48	1	52	1	53	5	54	3	55	3	56	3	57	1				
↓	↓	↓	↓	443	58	1	59	2	61	3	62	1	63	2	64	1	65	1				
P. halibut	101	9	U	349	66	1	67	3	68	1	69	1	72	1								
Sablefish	203	9	M	390	46	1	48	3	50	2	55	1	59	1	60	1	62	1				
↓	↓	↓	↓	480	63	1	64	1	66	2	67	1	68	4	69	1	70	3				
↓	↓	↓	↓	534	71	2	72	1	73	2	74	2	75	3	76	4	77	2				
↓	↓	↓	↓	593	80	1	81	1	82	2	83	2	84	1	86	1	87	2				
↓	↓	↓	↓	184	88	2	92	2	82	2												
↓	↓	↓	↓	348	44	1	46	2	47	2	48	1	49	2	50	3	51	2				
↓	↓	↓	↓	457	60	1	61	1	62	1	63	3	64	2	65	6	66	2				
↓	↓	↓	↓	504	67	1	68	4	69	1	70	3	71	1	72	2	73	2				
↓	↓	↓	↓	560	74	3	75	1	77	2	78	3	79	3	80	3	81	1				
↓	↓	↓	↓	616	82	1	83	1	85	4	86	2	87	4	88	2	89	2				
Sablefish	203	9	F	567	90	2	91	2	92	4	93	1	94	1	95	2						

INSTRUCTIONS FOR WEEKLY RADIO MESSAGES

One of the ~~primary~~ tasks of the Observer Program is the estimation of the ^{Domestic} ~~foreign~~ catch of groundfish and prohibited species throughout the year to insure that these catches remain within the quotas established by the United States. In order that the observers' data may be utilized before returning from sea, a radio message is sent each week to the Northwest and Alaska Fisheries Center summarizing the weeks' fishing activity. The first paragraph of the message will give the estimated catch by species group (species composition data) for each area and the second paragraph will provide data on the prohibited species. ~~A third paragraph is to be included in the radio message only if the vessel is operating in a joint venture. It will list the number of codends delivered, and will include a marine mammal catch disposition report.~~

The report week for each message will always run from SUNDAY through SATURDAY, Greenwich Mean Time and date regardless of the date the message is actually sent. The reporting areas to be used for radio messages are shown in the maps on the following pages.

~~Catch report radio messages should not be sent during four one-hour periods of each day. These periods are 2330-0030 GMT, 0530-0630 GMT, 1130-1230 GMT, and 1730-1830 GMT. Catch messages coming into the Coast Guard communications center during these certain times of the day severely hamper their ability to handle time-critical weather messages.~~

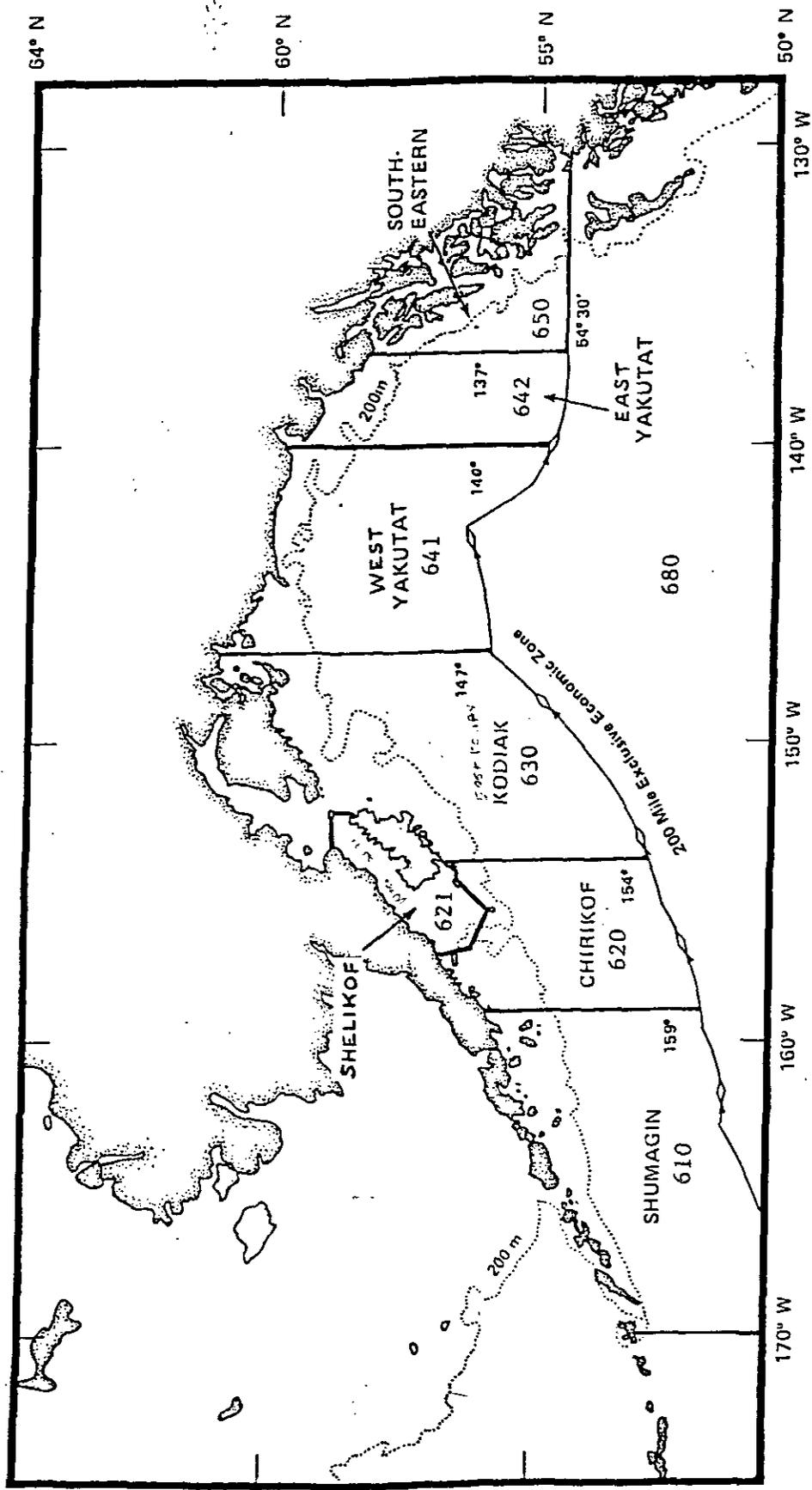
~~In order to alleviate the problem of too many catch reports being sent to the Coast Guard communications center on any one day, the following schedule has been set up. The catch report radio messages should be sent on the GMT day shown below:~~

~~Sunday--All joint venture vessels and all WDC coast vessels
Monday--All other vessels (non-J.V. in Alaskan waters)~~

Keep a copy of all weekly messages sent. You will be asked to transfer this information to keypunch forms for verification purposes upon your return to Seattle. Send your last radio message from your ship before you leave to come back to Seattle. (This radio message will normally only contain a partial weeks sampling information because observers don't always stop sampling on Sunday.)

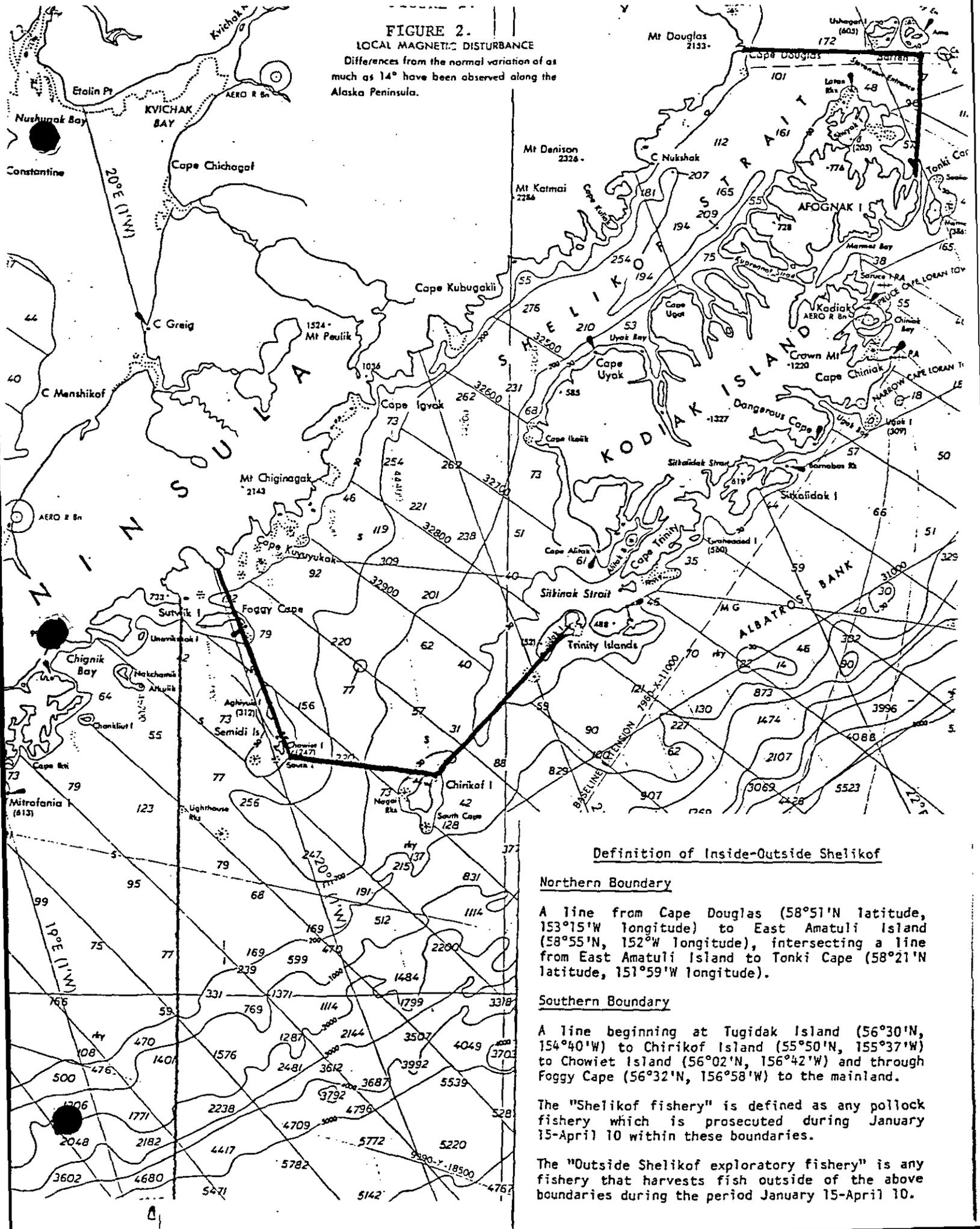
INSTRUCTIONS FOR MAKING WEEKLY SPECIES COMPOSITION CATCH REPORTS - PARAGRAPH 1

Paragraph 1 of the message will give, by reporting area, the vessel days on the grounds and the estimated catch by your vessel of each of the species groups managed in the major fishing regions (i.e., Bering Sea/Aleutians or Gulf of Alaska, ~~or Washington-Oregon-California~~). The table "Reporting Groups for Species Composition Radio Messages" is correspondingly divided into the three regions. Each section indicates the report groups and abbreviations under which all species in the observer's species composition samples should be reported.



GULF OF ALASKA REPORTING AREAS

FIGURE 2.
LOCAL MAGNETIC DISTURBANCE
 Differences from the normal variation of as
 much as 14° have been observed along the
 Alaska Peninsula.



Definition of Inside-Outside Shelikof

Northern Boundary

A line from Cape Douglas (58°51'N latitude, 153°15'W longitude) to East Amatuli Island (58°55'N, 152°W longitude), intersecting a line from East Amatuli Island to Tonki Cape (58°21'N latitude, 151°59'W longitude).

Southern Boundary

A line beginning at Tugidak Island (56°30'N, 154°40'W) to Chirikof Island (55°50'N, 155°37'W) to Chowitz Island (56°02'N, 156°42'W) and through Foggy Cape (56°32'N, 156°58'W) to the mainland.

The "Shelikof fishery" is defined as any pollock fishery which is prosecuted during January 15-April 10 within these boundaries.

The "Outside Shelikof exploratory fishery" is any fishery that harvests fish outside of the above boundaries during the period January 15-April 10.

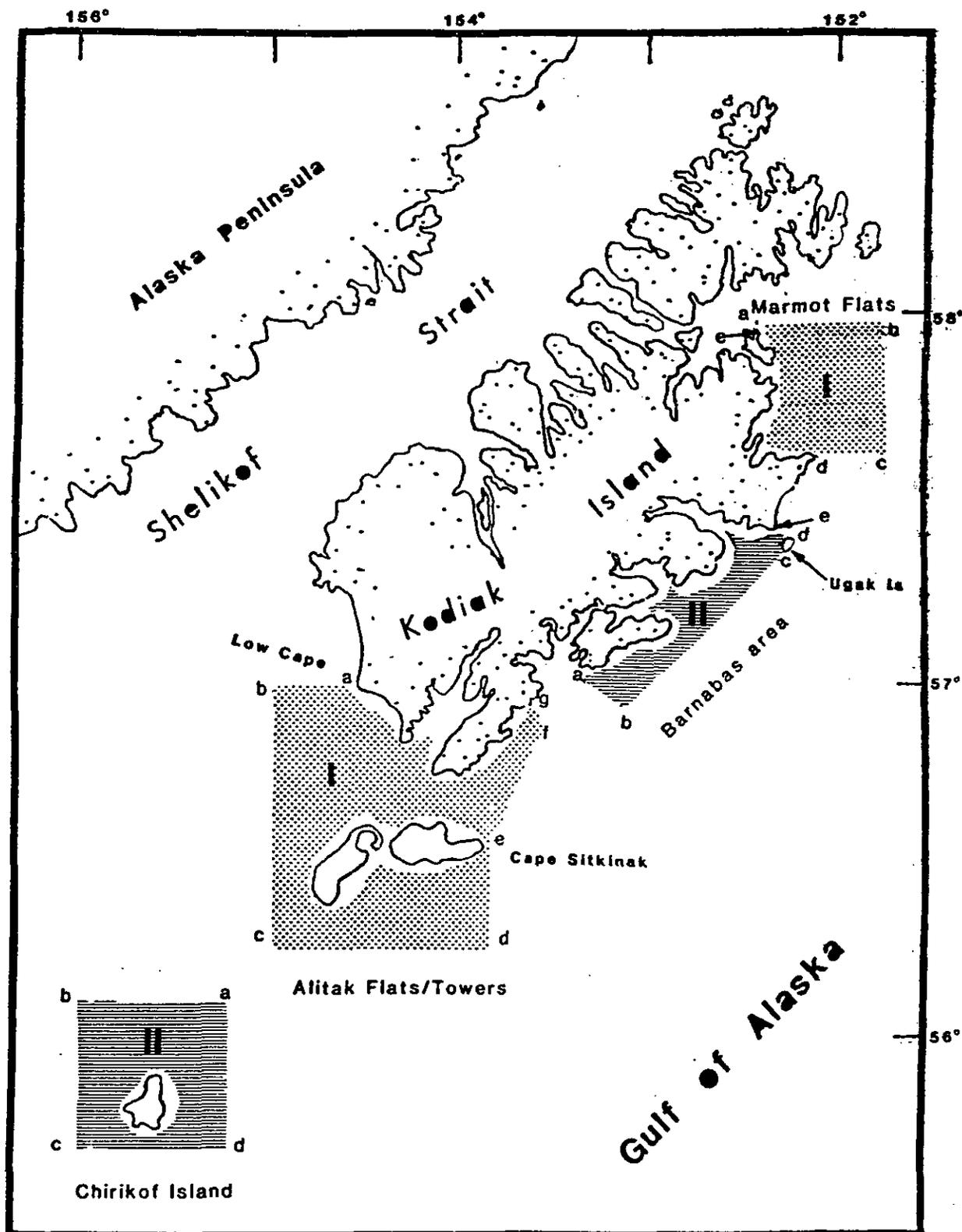


Figure 1. Areas around Kodiak Island closed to trawling except with pelagic trawls. TYPE I areas are closed year round. TYPE II areas are closed February 15 to June 15. See Section 672.24, Gear Limitations, for coordinate descriptions.

SUPPLEMENT TO ALASKA REGION REGULATIONS--1987

New regulations for yellowfin sole/other flatfish joint ventures in the Bering Sea set incidental catch limits for species of Pacific halibut, king crab and Tanner crab in a number of new areas. The independent foreign fishery on yellowfin sole/other flatfish may be affected if any of the joint venture limits are reached, plus there is a new limit on the number of Bairdi Tanner crab taken by the foreign fisheries. In addition, a new reporting area has been designated in the Gulf of Alaska with time-area dependent groundfish quotas.

This supplement is an attempt to explain what the new regulations are and to present the Bering Sea subareas by which all Bering Sea observers should send their catch messages. In addition, this supplement explains the present agreement between the U.S. and U.S.S.R. regarding the disputed area.

New Bering Sea Regulations Restricting Joint Ventures
and Domestic Flatfish Fisheries

Figure 1 illustrates the new regulations on 1987 domestic (non-joint venture U.S.) and joint venture fisheries which are intended to help protect the stocks of red king crab, Bairdi Tanner crab, and Pacific halibut.

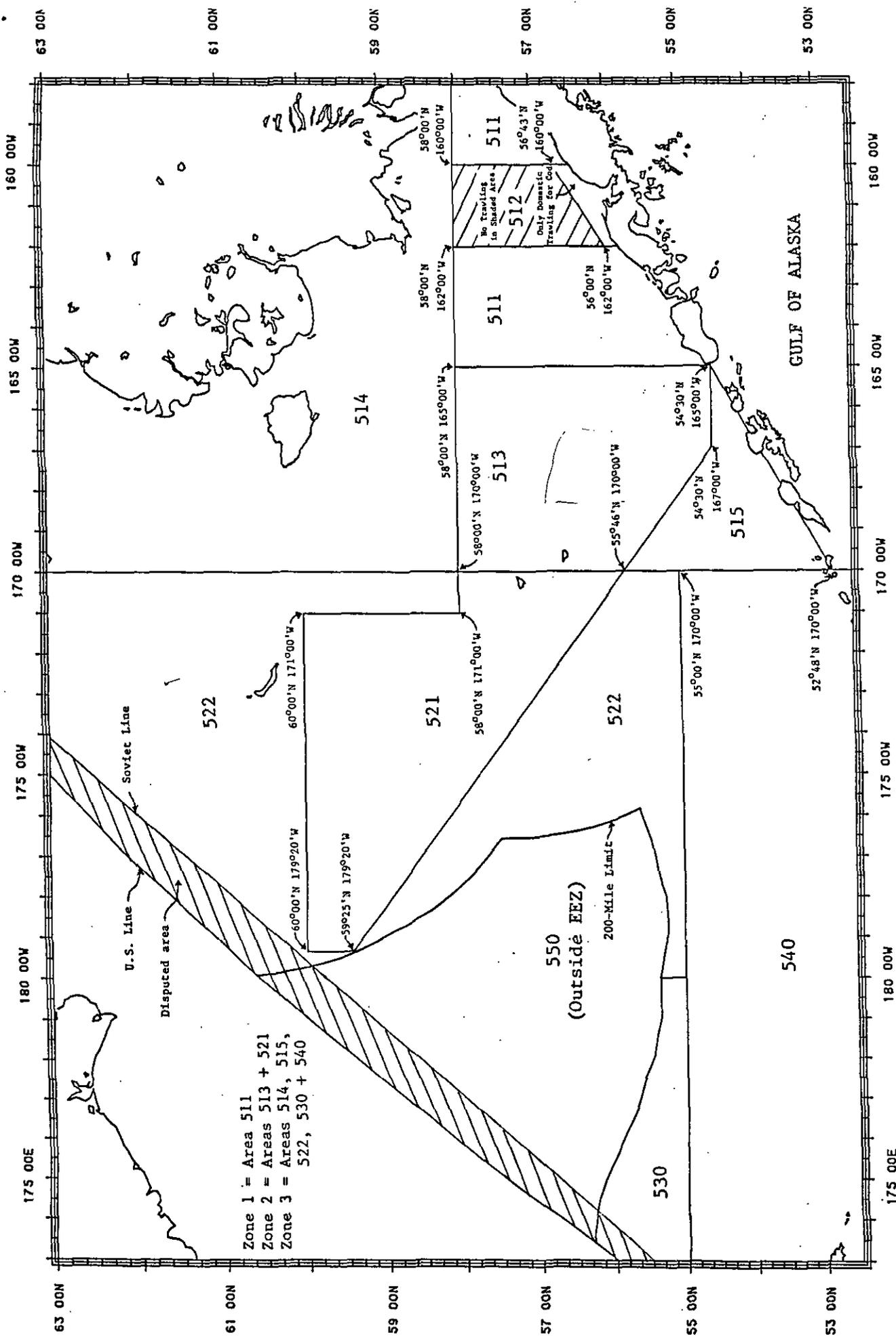
- a) No foreign or joint venture trawling is allowed in the area between 160 and 162 degrees W. longitude south of 58 degrees N. latitude and bounded on the south by the Alaskan peninsula, with one exception mentioned below. (Longline fishing is allowed in this area, unless it is restricted for some other reason.) Under certain circumstances, a domestic trawl fishery for cod may be allowed in the section of this area that lies south of a straight line connecting the coordinates 56° 43' N lat., 160°00' W long and 56°00' N lat., 162°00' W long. The owner/operators of these vessels must cooperate with an approved data gathering program, which may mean that they must accommodate an observer aboard and permit monitoring of the catch. All fishing with trawl gear will cease when a prohibited species catch limit of 12,000 red king crabs has been taken in that portion of the closed area.
- b) In the area east of 165 degrees W. longitude and south of 58 degrees north latitude (Zone 1, Fig. 1), the joint ventures and domestic fisheries fishing for yellowfin sole/other flatfish may not catch more than 135,000 red king crab or 80,000 Bairdi Tanner crabs.
- c) In Zone 2 (Fig. 1), the area bounded by the coordinates below, the Bering Sea joint venture and domestic yellowfin sole/other flatfish fisheries may not catch more than 326,000 Bairdi Tanner crabs.

54°30' N latitude, 165°00' W longitude
58°00' N latitude, 165°00' W longitude
58°00' N latitude, 171°00' W longitude
60°00' N latitude, 171°00' W longitude
60°00' N latitude, 179°20' W longitude
59°25' N latitude, 179°20' W longitude

54°30' N latitude, 167°00' W longitude
54°30' N latitude, 165°00' W longitude

- d) In the Bering Sea/Aleutian Islands management region, if yellowfin sole/other flatfish joint ventures take the limit of 828,000 Pacific halibut, then Zone 1 will be closed to joint ventures targeting on yellowfin sole/other flatfish for the remainder of the year.

When the limit for red king crab, Bairdi Tanner crab, or Pacific halibut is reached in any of the areas described, it will be up to the discretion of the Regional Director whether or not to allow some or all of the yellowfin sole/other flatfish vessels to continue to fish in those areas.



Zone 1 = Area 511
 Zone 2 = Areas 513 + 521
 Zone 3 = Areas 514, 515,
 522, 530 + 540

Figure 1. Bering Sea subareas.

New Bering Sea Regulations Restricting Independent Foreign Fisheries

- a) No foreign fishing is allowed in the area between 160 and 162 degrees W. longitude south of 58 degrees N. latitude and bounded on the south by the Alaskan peninsula. (This is area 512 in Figure 1.)
- b) If there is a closure of the yellowfin sole/other flatfish joint venture and domestic fisheries in Zone 1 due to the red king crab limit, then the independent foreign yellowfin sole/other flatfish fishery will also be prohibited from fishing in Zone 1 for the remainder of the year.
- c) In the combined area of Zone 1 and Zone 2, there is a prohibited species limit of 64,000 Bairdi Tanner crabs for the independent foreign vessels targeting on yellowfin sole/other flatfish. Each foreign fishing nation will be allowed its share of the prohibited species limit, based on its allocated portion of the yellowfin sole/other flatfish TALFF (Total Allowable Level of Foreign Fishing). When a nation reaches its share of the Bairdi Tanner crab limit, vessels of that nation will be prohibited from trawling for yellowfin sole/other flatfish in both Zone 1 and Zone 2.

The Bering Sea Disputed Area

There is a disagreement between the governments of the United States and the Soviet Union as to the location of the U.S.--Russian Convention Line of 1867. This line defines the junction of the U.S. EEZ (exclusive economic zone) and the Soviet zone for portions of the Bering Sea in which the respective 200-mile limits of the two countries would otherwise overlap. The U.S. conception of the line, which is drawn as a portion of a great circle, is printed on most nautical charts. The Soviet line can be drawn with straight lines connecting the following three points:

65°30.0' N 168°58'22.6" W
64°05.2' N 172°00' W
51°25.7' N 167°00' E

The area between the two lines is commonly referred to as the disputed area. The northern and southern portions of this area are claimed by both the U.S. and the U.S.S.R. The central portion is claimed by the U.S.S.R., but the U.S. holds that this is part of the "doughnut", the area in the Bering Sea which belongs to neither the U.S. nor the U.S.S.R.

After several seizures of fishing vessels and crab pots in the northern portion of the disputed area, representatives of the two contesting nations came to an informal agreement. The U.S. and U.S.S.R. agreed to refrain from interfering with each other's vessels in the area, but to allow no vessels of any other nation to fish there. If you are aboard a vessel approaching this area, and the nationality of the vessel is other than Soviet or U.S., you should caution the captain against entering the area.

New Gulf of Alaska Regulations

A new regulatory and reporting area has been designated in the Gulf of Alaska --the Shelikof Area. In addition, there are four areas in the vicinity of Kodiak Island which are off-limits to bottom-trawling for the period February 15 through June 15, 1987, in order to protect reproducing king crab. These new areas are shown in Figure 2.

The Shelikof area:

The Shelikof Strait subarea is defined as that area enclosed by line segments beginning to the north at Cape Douglas (58°51' N. latitude; 153°15' W. longitude), to East Amatuli Island (58°21' N latitude; 152°00' W longitude), to Tonki Cape (58°55' N latitude; 151°59' W longitude); includes the waters north and northwest of Kodiak Island and to the west and southwest waters shoreward of line segments connecting Tugidak Island (56°30' N latitude; 154°43' W longitude) to Chirikof Island (55°55' N latitude; 155°35' W longitude) to Chowiet Island (56°02' N latitude; 156°42' W longitude) in the Semidi Islands; and through Foggy Cape (56°32' N latitude; 156°58' W longitude) to the Alaska Peninsula (56°49' N latitude; 157°06' W longitude.)

In the 1987 Gulf of Alaska fishery, allocations have been assigned which reserve all Shelikof straits pollock (and other species) to the domestic fishery, thus there will be no joint venture fishing in Shelikof Straits this year. During the period January 15 to April 10, joint venture catcher boats may harvest up to 20,000 mt of pollock outside the Shelikof Straits area, but after April 10, any remainder of the 20,000 will disappear, and will not be added to the pollock quota for the Gulf of Alaska. The temporary provision of extra pollock quota in the outside Shelikof Straits subarea is intended to encourage the joint ventures to do some exploratory fishing outside of Shelikof during the spawning season. This would help NMFS determine whether there are any other exploitable stocks of pollock outside the Shelikof Straits area during the spring.

The King Crab Protection Areas:

Chirikof Island Area:

All waters surrounding Chirikof Island enclosed by a line from 56°07' N lat., 156°00' W long. then to 56°07' N lat., 155°13' W long., then to 55°41' N lat., 155°13' W long., then to 55°41' N lat., 156°W long., then back to 56°07' N lat., 156°00' W long.

Alitak Flats and Towers Areas:

All waters of Alitak Flats, and Sitkinak Island enclosed by a line from Low Cape (57°00' N lat., 154°31' W long.) to 57°00' N lat., 155°00' W long., then to 56°17' N lat., 155°00' W long., then to 56°17' N lat., 153°52' W long., then to Cape Sitkinak at 56°33'33" N lat., 153°52' W long, then to the easternmost point of Twoheaded Island at 56°54'30" N lat., 153°32'30" W long. then to the point of Kodiak Island located at 56°56' N lat., 153°35'30" W long.

Barnabas Area:

All waters enclosed by a line from Black Point (56°59'30" N lat., 153°18' W long. to 56°56' N lat., 153°09' W long. to the southernmost tip of Ugak Island (57°22' N lat., 152°18'30" W long.) and west of a line from the northernmost tip of Ugak Island (57°22'30" N lat., 152°17' W long.) to Narrow Cape (57°26' N lat., 152°19' W long).

Marmot Flats Area:

All waters enclosed by a line from East Cape (57°55' N lat., 152°19'30" W long. to Pillar Cape (58°09' N lat., 152°06' W long.) to Marmot Cape (58°10' N lat., 151°52' W long.) and from Cape St. Hermogenes on Marmot Island (58°15' N lat., 151°07' W long.) to 57°38' N lat., 151°47' W long. to the Cape Chiniak light at 57°38' N lat., 152°10' W long.

The above areas are closed to hard on-bottom trawling during the period February 15-June 15. These five areas encompass 80-90% of the known female king crab stocks during this period.

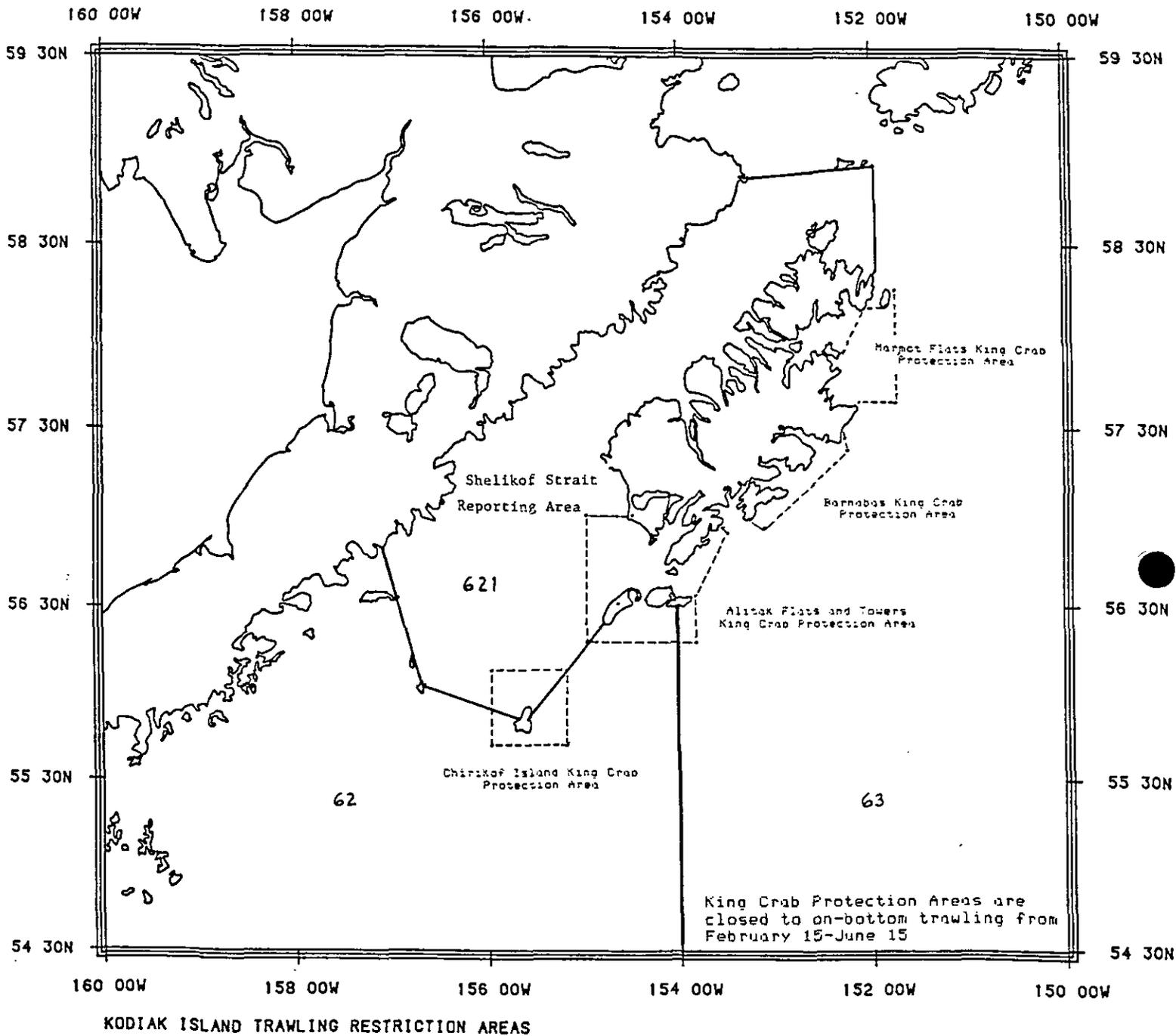


Figure 2, King crab protection areas and Shelikof Strait reporting area

REPORTING GROUPS FOR SPECIES COMPOSITION RADIO MESSAGES

Bering Sea/Aleutians (Areas 51 - 55)

<u>Species Group</u>	<u>Report Group</u>	<u>Abbreviation</u>
Squid	Squid	SQU
Yellowfin sole	Yellowfin sole	YELL
Greenland turbot	Greenland turbot	TURB
Arrowtooth flounder	Arrowtooth Flounder	ARROW
Kamchatka flounder		
Other flatfish (except halibut)	Other flatfish	OFLAT
Pollock	Pollock	POLL
Pacific cod	Pacific cod	COD
Sablefish	Sablefish	SAB
Atka mackerel	Atka mackerel	ATKA
Pacific ocean perch *	Pacific ocean perch	POP
All other rockfish (<u>Sebastes</u> and <u>Sebastolobus</u> spp.)	Other rockfish	OROCK
Herring	Herring	HER
Sharks, skates, sculpins, eulachon, smelts, capelin and octopus only	Other fish	OTH
All remaining fish spp. Prohibited spp. (except herring) Invertebrates (except squid and octopus) Miscellaneous items	Non-allocated	NON

* The POP report group has recently changed from a group containing the following five rockfish species: Pacific ocean perch, Roughey rockfish, Northern rockfish, Sharpchin rockfish and Shortraker rockfish. This change has been informally requested of the foreign nations as of the time of this printing but has not been formally required in the fishery regulations. Therefore be aware that your species composition data for rockfish may differ from that of the ship's when examining the fishing logs.

Gulf of Alaska (Areas 61 - 66, and 68)

<u>Species Group</u>	<u>Report Group</u>	<u>Abbreviation</u>		
Squid	Squid	SQU		
All flatfish (except halibut)	Flatfish	FLAT		
Pollock	Pollock	POLL		
Pacific cod	Pacific cod	COD		
Sablefish	Sablefish	SAB		
Atka mackerel	Atka mackerel	ATKA		
Pacific ocean perch Rougheye rockfish Northern rockfish Sharpchin rockfish Shortraker rockfish Thornyhead rockfish	Pacific ocean perch group	POP		
(shortspine and longspine thornyheads)			Thornyheads	THRN
Other rockfish (all other <u>Sebastes</u> spp.)			Other rockfish <i>See next page</i>	ORCK
Sharks, skates, sculpins, eulachon, smelts, capelin octopus, only			Other fish	OTH
All remaining fish spp. Prohibited spp. (includes herring) Invertebrates (except squid and octopus)			Non-allocated	NON
Miscellaneous items				

Washington-Oregon-California Hake Fishery (Areas 67, 71 and 75)

<u>Species Group</u>	<u>Report Group</u>	<u>Abbreviation</u>
Pacific hake	Pacific hake	HAKE
Jack mackerel	Jack mackerel	JACK
Pacific ocean perch	Pacific ocean perch	POP
Widow rockfish *	Widow rockfish	WIDOW
Yellowtail rockfish *	Yellowtail rockfish	YTAIL
Other rockfish	Other rockfish	RF
All flatfish (except halibut)	All flatfish	FLAT
Sablefish	Sablefish	SAB
All remaining fish spp. (except halibut and salmon)	Other fish	OTH
Squid and Octopus		
Invertebrates (other than squid and octopus)		
Prohibited spp.	Non-allocated	NON
Miscellaneous items		

* These two report groups (WIDOW and YTAIL) are not required by the fisheries regulations. Therefore be aware that your species composition data for rockfish will differ from that of the ships when examining their fishing logs.

GULF OF ALASKA ONLY

Table 2.--Rockfish species in the genus Sebastes and Sebastolobus contributing to the rockfish assemblages adopted in Amendment 16 to the FMP.

Slope Rockfish SLPRF

Aurora rockfish (Sebastes aurora)
 Blackgill rockfish (S. melanostomus)
 Chilipepper rockfish (S. goodei)
 Darkblotch rockfish (S. crameri)
 Greenstriped rockfish (S. elongatus)
 Harlequin rockfish (S. variegatus)
 Northern rockfish (S. polyspinus)
 Pacific ocean perch (S. alutus)
 Pygmy rockfish (S. wilsoni)
 Red banded rockfish (S. babcocki)
 Rougheye rockfish (S. aleutianus)
 Sharpchin rockfish (S. zacentrus)
 Shortbelly rockfish (S. jordani)
 Shorttraker rockfish (S. borealis)
 Splitnose rockfish (S. diploproa)
 Stripetail rockfish (S. saxicola)
 Vermilion rockfish (S. miniatus)
 Yellowmouth rockfish (S. reedi)

Thornyhead Rockfish THRN

Longspine thornyhead (Sebastolobus altivelis)
 Shortspine thornyhead (S. alascanus)

Demersal Shelf Rockfish DEMRF

Boccacio (Sebastes paucispinus)
 Canary rockfish (S. pinniger)
 China rockfish (S. nebulosus)
 Copper rockfish (S. caurinus)
 Quillback rockfish (S. maliger)
 Redstripe rockfish (S. proriger)
 Rosethorn rockfish (S. helvomaculatus)
 Silvergray rockfish (S. brevispinus)
 Tiger rockfish (S. nigrochinctus)
 Yelloweye rockfish (S. ruberrimus)

Pelagic Shelf Rockfish PELRF

Black rockfish (Sebastes melanops)
 Blue rockfish (S. mystinus)
 Dusky rockfish (S. ciliatus)
 Widow rockfish (S. entomelas)
 Yellowtail rockfish (S. flavidus)

double check name spelling

FORM RM - FOR INDEPENDENT STERN TRAWLERS AND JOINT VENTURE VESSELS

On stern trawlers and joint venture ships, the relative importance of each haul you sample for species composition is dependent upon the size of the haul in relation to the size of other hauls that were sampled. In order to reflect the relative importance of each haul that is sampled in your daily calculation of catch, you must first determine the estimated weight for each species or species group from each haul sampled for your data in the following way:

1. Determine the statistical area of each haul sampled. Data for each area should be recorded on separate sheets of Form RM.
2. According to the list by region, (BSA, GOA, ~~or GSA~~), write the species report group abbreviations, in order, across the tops of the columns on Form RM. (Note: There are not enough columns on the form to enable you to enter all of the report groups for the BSA. You will have to omit one report group that you don't expect to see that week.)

For each sampled haul:

3. Enter the date and haul number in the first column.
4. Column A. Enter the haul weight, in metric tons, from the "Total Catch" columns on Form 2 or Form 2JV.
5. Column B. Enter the total sample weight, in kilograms, from Form 3(2).
6. Column C. (For each species group) - Enter the weight for the species or species group, in kilograms, from the sample data on Form 3(2). To make certain all weights were transcribed and that they are correct, add the kg sampled for each species group. This should equal the sample weight for each haul (column B) exactly.
7. Column D. (For each species group) - Calculate the total catch of each species or species group as shown below. Record the result to the nearest .001 mt. Tonnages of .00049 or less may be recorded to the nearest .0001 and carried through the calculations to the summary for the week.

$$\frac{\text{mt of sp. in haul}}{\text{mt total haul wt.}} = \frac{\text{kg of sp. in sample}}{\text{kg total sample wt.}}, \text{ or } \frac{\text{Col D}}{\text{Col A}} = \frac{\text{Col C}}{\text{Col B}}, \text{ therefore:}$$

$$\text{Col D} = \frac{(\text{Col A}) \times (\text{Col C})}{(\text{Col B})}, \text{ which is the same as: } \text{Col D} = \frac{(\text{Col A})}{(\text{Col B})} \times (\text{Col C})$$

Note: If you whole haul sampled for species composition, the entry in column D is simply a conversion of kilograms in column C to metric

tons in column D, rounded to three decimal places.

8. For the day's totals of sampled hauls by area, sum column A and each column D. Add the column D summations across and compare this to the sum of column A. A variance of more than + or - .005 mt indicates the strong probability of calculation error.
9. Skip a line between days.
10. Number pages consecutively regardless of area designation.

The afore-mentioned procedure was an extrapolation of the species composition data from the weight by species in the sample to the weight by species for the entire sampled haul. Observers on independent stern trawlers and joint venture vessels now need to extrapolate the weight by species from sampled hauls to the weight by species for the total catch of the day, and sum these data for the week.

After computing column D for each species group, check your math by adding each column D entry for a line and comparing the summation to the column A entry for that same line. A variance of more than + or - .003 mt indicates the strong probability of calculation error.

FORM RM-1 - FOR ALL VESSEL CLASSES

The instructions for calculating the week's catch data on Form RM-1 are similar for all vessel classes. The difference lies in which Form the required information comes from. Guidelines for each vessel type are included with instructions below.

1. At the end of each day, determine the correct statistical area of each catch. The position which determines the statistical area is:

Independent Stern Trawler - the haul position
 Joint Venture - the delivery position
 Longliners - the set retrieval position
 Independent Motherships - the noon position
 For all vessels - the noon position on non-fishing days.

Data for each area should be recorded on separate sheets of Form RM-1. (Longline observers must not only calculate their radio information separately by area, but also by shallow or deep water catch. -- See the following section: "Additional Instruction by Vessel Type".)

2. According to the list by region (BSA, ^SGOA, ~~or WOC~~), write the species report group abbreviations, in order, across the tops of the columns. (If all of the species report groups will not fit on the form, then leave out one or two report groups that you do not expect to see in that weeks' catch.)
3. Enter the GMT date.
4. Column A. Record the total weight of catch landed by the vessel in the area that day.

By vessel class this is:

Independent Stern Trawler and Joint Venture - the sum of all individual haul weights from within the area for the day (both sampled and not-sampled hauls), from Form 2 or Form 2JV.

Longliners - the catch weight of each set from Form 1L. Calculate each set separately.

Motherships - the day's catch from Form 1.

The ship's final estimate of landed catch (or adjusted estimate) should be used as the official daily total. Check these data against the ship's log on a following day. Be aware that if the Captain later adjusts his first estimate of a catch, you must adjust your catch weights on your forms and recalculate the associated data.

need
up date

*Need
up date*

5. Column B. The entry according to vessel class is:
 - Independent Stern Trawler and Joint Venture - the sum of the haul weights of the sampled hauls. This is the sum of column A for the day on Form RM and is in metric tons, not kilograms.
 - Longliners and Motherships - the total weight of all species composition samples taken for that set or day from Form 3(2) under "Totals for the Day", in kilograms.

6. Column C. (For each species group) - Record the total weight of each species report group from the day's species composition sample.
 - Independent Stern Trawler and Joint Venture - This is the sum of Column D for the day from Form RM and is recorded in metric tons to the nearest .001 mt.
 - Longliners and Motherships - record the summed weight of that species report group from the species composition samples of that set or day, from Form 3(2), in kilograms. Check your transcribing and summaries by adding the Column C's across and comparing with Column B for an exact match.

7. Column D. (For each species group) - To calculate the total daily catch of each species report group, divide the total landed catch for the area (Column A) by the total sampled weight (Column B). Store this constant ratio in the calculator memory and multiply it by each species sample weight (Column C). Record the results to the nearest .001 mt. Tonnages of .00049 or less should be recorded to the nearest .0001 and carried through the calculations to the summary for the week.

8. Check your calculations by adding the Column D's across for each day or set and comparing with Column A. A tolerance of + or - .005 mt is acceptable for longliners or motherships, or + or - .01 mt for stern trawlers and joint venture.

9. For the week: Sum Column A. Sum Column D's for each species report group. All summations should be rounded and recorded to either two or three decimal places consistently. Add the Column D's across. The total of the Column D's should be within + or - .02 mt of the sum of Column A for the week.

10. If the difference between the sum of Column D's and Column A is within the tolerance specified, it is probably due to rounding. In paragraph 1 of your radio message however, species weights must equal the total weight exactly. Differences due to rounding must be eliminated by adjusting a predominant species weight sum (Column D). The correct figure should be circled and the adjusted figure written below it (see the Mothership Form RM-1 example).

FORM RM-1 WEEKLY RADIO REPORT WORK SHEET AREA 52 VESSEL CODE _____ PAGE 1 OF _____

CRUISE NO. _____

Extrapolation of Total wt. of hauls sampled up to total wt. of all hauls for the day.

* For motherhips and longliners, column B should equal the day's total sample wt. in kg, and the column C's should equal the total wt. of each group (in kg.) from the day's samples.

DATE	DAY WT IN MT	TOTAL WT HAULS IN MT	SQU		YELL		TURB		OFLAT		POLL		COD		SAB		ATRA		POP		DROCK		HER		OTH		NON	
			MT IN SMPLO DAY HAULS	MT SMPLO DAY HAULS	MT IN SMPLO DAY HAULS	MT SMPLO DAY HAULS	MT IN SMPLO DAY HAULS	MT SMPLO DAY HAULS	MT IN SMPLO DAY HAULS	MT SMPLO DAY HAULS	MT IN SMPLO DAY HAULS	MT SMPLO DAY HAULS	MT IN SMPLO DAY HAULS	MT SMPLO DAY HAULS	MT IN SMPLO DAY HAULS	MT SMPLO DAY HAULS	MT IN SMPLO DAY HAULS	MT SMPLO DAY HAULS	MT IN SMPLO DAY HAULS	MT SMPLO DAY HAULS	MT IN SMPLO DAY HAULS	MT SMPLO DAY HAULS	MT IN SMPLO DAY HAULS	MT SMPLO DAY HAULS	MT IN SMPLO DAY HAULS	MT SMPLO DAY HAULS		MT IN SMPLO DAY HAULS
9/9/83	40.0	40.0	9.163	9.163																								
9/10	83.0	48.0	1.353	2.340																								
9/11	No Fishing																											
9/12 (Pollack)	35.0	28.0	.020	.025																								
9/12 (Cod)	40.0	30.0																										
Totals for the week	198.0																											
9/11	198.0																											
MOTHERSHIP EXAMPLE																												
8/31/83	718.0	831.27																										
9/1	668.0	990.75																										
9/2	No Fishing																											
Totals for the week	1386.0																											
10/19 #1	11.4	3723.7																										
10/20 #1	16.5	4831.87																										
10/21 #1	8.6	2472.2																										
10/21 #2	10.1	3264.6																										
10/22 #1	No Fishing																											
Totals for the week	46.6																											
LONGLINER EXAMPLE																												
8/31/83	718.0	831.27																										
9/1	668.0	990.75																										
9/2	No Fishing																											
Totals for the week	1386.0																											
10/19 #1	11.4	3723.7																										
10/20 #1	16.5	4831.87																										
10/21 #1	8.6	2472.2																										
10/21 #2	10.1	3264.6																										
10/22 #1	No Fishing																											
Totals for the week	46.6																											

46.6 10.42 3.91 1.519 3.628 199.977 1.161 9.35 1.161 1.16

3.63 20.00 3.63 .52 3.63 20.00 3.63 .16 3.63 1.16

9.38

SPECIAL PROBLEMS

If Your Ship Fishes Outside of the FCZ

Continue to sample and send radio reports for any catches taken outside the FCZ. In the Bering Sea report the catch as coming from Area 55. Outside the FCZ in the Gulf of Alaska is Area 68, and outside the FCZ off the Washington Oregon-California coast is Area 75. (Refer to the charts on previous pages.)

Lack of Species Composition Data from an Area for a Day Fished

If, during the middle of a cruise you did not sample at all for a given fishing day due to illness, severe weather problems, or other reasons, do not extrapolate catch data for that period. In your weekly radio message, include only the catch data for the days you did sample, indicate the reason for not sampling, and report the dates and total catch tonnage of the non-sampled days in a separate sentence. (See the example of a message sent from a "vessel fishing independently in the WDC Hake Fishery.)

If, however, the ship fished in two or more areas in a day that you sampled but you were unable to sample the catch for all of the areas in which the vessel fished that day, an extrapolation may be possible. Apply the sampling data (percent composition by weight) of the hauls from the previous or following day from that same area to the catch from that area for the day.

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 should use the following method to calculate the daily catch for the weekly catch message. Both types of hauls must be sampled each day and you must be able to designate each haul as

one of the two types.

Within each area fished during the day, treat the two types of hauls separately on Form RM and Form RM-1 so that you estimate the catch of each species group separately for each type of haul. Within each area you will have two separate daily estimates of catch by species on Form RM-1. At the week's end, sum all estimates from both types of hauls for each species (Column D). There is no need to separate the week's totals into two types of hauls. (Refer to the date 9/12 on the RM and RM-1 examples.)

INSTRUCTIONS FOR MAKING WEEKLY PROHIBITED SPECIES CATCH REPORTS - PARAGRAPH 2

The following set of instructions pertains to the data you have collected on the incidental catch of prohibited species (king crab, Tanner crab, halibut, and salmon) and their inclusion in Paragraph 2 of the weekly radio message. The information to be included in the message should be recorded on Form RM-3 "Weekly Radio Report Worksheet for Prohibited Species". The data required to complete this form are recorded on Forms ^{3US} ~~1, 3(1) and 4 for motherships, Forms 2, 3(1) and 4 for stern trawlers, Forms 20V, 3(1) and 4 for joint venture vessels, and Forms 1L, 3L(1) and 4 for longliners.~~

Abbreviations to Be Used in RM-3 and the Radio Messages:

REDKNG	Red King Crab
BLUKNG	Blue King Crab
OTHKNG	Golden & Couesi King Crab
BTAN	Bairdi Tanner Crab
OTHTAN	Opilio, Angulatus, Tanneri Tanner Crab
HBT	Pacific Halibut
CHIN	Chinook Salmon
OTHSAL	The other four species of salmon

(As there are so many prohibited species report groups, report a prohibited species group only if you observed some. If there were no prohibited species in your samples for an entire week, then you must report the total weight of the hauls sampled and at least one prohibited species report group with "0" in the message so that the computer program will except the message.)

FORM RM-3 - FOR ALL VESSEL CLASSES

1. Entry of data on Form RM-3 will be made for every haul on stern trawlers, codend on joint-ventures, day on motherships, or set on longliners which you sample for the incidence of prohibited species (even if none are found in your samples).
2. All data should be separated by area (i.e. 51, 52, 53, etc., see charts on previous pages) and each area recorded on separate sheets of Form RM-3. ~~Longline observers should also report their data by depth (shallow--less than 500 m; deep--greater than 500 m).~~
3. Enter GMT date and the haul number for stern trawlers, delivery number for joint-ventures or set number on longliners. (~~Only the date is needed for motherships.~~) Remember the week runs from Sunday through Saturday GMT.
4. Column A: Enter the haul weight for stern trawlers, codend weight for joint-ventures, ~~day's total catch for motherships~~, or the set catch for longliners. Enter the weight in metric tons (mt), not kilograms.
5. Column B: Enter the weight of groundfish catch sampled for each of the prohibited species to the nearest 0.01 mt. The data will be recorded by haul on stern trawlers and codend on joint-ventures. A total sample weight for the ~~day (motherships) or set (longliners)~~ will have to be computed by summing the sample weight over all sampling periods. (This is obtained from your 3(1) forms.)
6. Column C: Using your Form ³⁴⁵X data for the same haul, determine the species composition of the prohibited species that you recorded in the "number observed" columns of Form 3(1). ~~If your Form 4 data are a subsample of your 3(1) number observed, you need to extrapolate the Form 4 data to the 3(1) number observed before entering the results on the worksheet. For example: you entered 1000 Tanner crab on 3(1) but you subsampled 100 for the Form 4 data, obtaining 25 Bairdi, 50 opilio, and 25 angulatus. On the RM-3 worksheet you would enter 250 Bairdi and 750 other Tanner crab.~~
7. Column D: Compute the estimated number of individuals caught of each species and record the result to the nearest 0.1.

$$\text{Column D} = \frac{\text{Column A} \times \text{Column C}}{\text{Column B}}$$

8. Column X: Enter the average weight to the nearest ^{0.0001}~~0.01~~ kg for the halibut you observed on Form 3(1). ~~For motherships, a daily average will have to be computed and a set average for longliners. To compute the daily or set average, divide the sum of the weights of those individuals estimated or weighed during all sampling periods by the sum of the number of individuals estimated or weighed during all sampling periods. (Please note that halibut is the only prohibited species that requires an average weight on RM-3.)~~

*Longliners
rewrite*

9. Column Y: Compute the estimated weight of the halibut and record the result to the nearest 0.01 kg. (Please note that halibut is the only prohibited species that requires an estimated weight.)

$$\text{Column Y} = \text{Column D} \times \text{Column X}$$

10. At the end of each week, sum columns A, D, and Y by area for each species.
11. Skip a line between weeks.

FORM RM-3 WEEKLY RADIO REPORT WORK SHEET FOR PROHIBITED SPECIES
 CRUISE NO. 530 VESSEL CODE NS78 AREA 52

STERN TRAWLER
 EXAMPLE

DATE AND HAUL NO.	HAUL OR DAY WT (MT)	KING CRAB						TANNER CRAB						PACIFIC HALIBUT						SALMON					
		REDKNG		BLUKNG		OTHKNG		BTAN		OTHAN		3(i) Sample Wt		HBT		3(i) Sample Wt		CHIN		OTHAL					
		No. Obsrv.	Est. No.	No. Obsrv.	Est. No.	No. Obsrv.	Est. No.	No. Obsrv.	Est. No.	No. Obsrv.	Est. No.	No. Obsrv.	Est. No.	Avg. Wgt (Lb)	Est. No.	Est. Wt (Lb)	No. Obsrv.	Est. No.	No. Obsrv.	Est. No.	No. Obsrv.	Est. No.			
9-9 #100	40.0	0	0	0	0	0	0	1	2.0	0	0	20.0	0	1	1.20	2.0	2.40	20.0	0	0	0	0			
9-10 #101	16.0	0	0	0	0	0	156	156.0	4	4.0	16.00	2	3.10	2.0	6.20	16.00	3	3.0	0	0	0				
#103	20.0	0	0	0	0	0	0	0	0	0	20.00	1	5.00	1.0	5.00	20.00	0	0	0	0	0				
#104	12.0	0	0	0	0	0	100	400.0	16	164.0	12.00	11	6.47	11.0	71.20	12.00	4	4.0	0	0	0				
NO 9-11 FISHING																									
9-12 #105	8.0	0	0	0	0	0	123	123.0	0	0	8.00	4	1.90	4.0	7.60	8.00	0	0	0	0	0				
#106	20.0	0	0	0	0	0	15	15.0	0	0	20.00	0				20.00	0	0	0	0	0				
#109	30.0	0	0	0	0	0	0	0	0	0	15.00	0				15.00	1	2.0	0	0	0				
WEEKS TOTAL	146.0	0	0	0	0	0	1676.0	168.0			20.0	16	20.0	92.40				9.0	0	0	0	0			

FORM RM-3 WEEKLY RADIO REPORT WORK SHEET FOR

CRUISE NO. _____ VESSEL CODE _____ AREA 52

PAGE 1 OF 52

DATE AND HAUL NO.	HAUL OR DAY WT (MT)	KING CRAB			TANNER CRAB			PACIFIC HALIBUT			SALMON								
		REDKNG	BLKNG	OTHKNG	BTAN	DTATAN	3(1) Sample WT	No. Obsrv.	EST. No.	3(1) Sample WT	Avg. WT (LB)	EST. No.	CHIN	DTHSAL					
		No. Obsrv.	EST. No.	No. Obsrv.	No. Obsrv.	EST. No.	No. Obsrv.	EST. No.	No. Obsrv.	EST. No.	No. Obsrv.	EST. No.	No. Obsrv.	EST. No.					
DEEP DEPTHS																			
10-19 #1	11.4	0	1	3.1	0	3.72	12.0	36.8	0		3.72	7	1.72	21.5	36.98	3.72	0	0	
10-20 #1	16.5	3	10.2	0	1	3.4	4.83	0	0		4.83	35	2.83	119.6	338.77	4.83	0	0	
10-21 #1	8.6	0	0	0	0	2.47	0	0	3	10.4	2.47	3	2.94	10.4	30.58	2.47	0	0	
#2	10.1	3	9.3	0	0	3.26	0	0	0		3.26	12	2.21	37.2	82.21	3.26	0	0	
10-22 #1		No Fishing																	
WEEKS TOTAL	46.6		19.5	3.1		3.4	36.8		10.4					188.7	488.26			0	0
8-31	718.0	0	0	0	5	100.7	25.66	0	277	77508	35.66	11	2.58	1221.5	571.47	35.66	0	0	0
9-1	668.0	0	0	0	2	15.2	87.78	0	81	616.4	87.78	3	3.77	22.8	85.96	87.78	0	0	0
9-2			No Fishing																
WEEKS TOTAL	1386.0		0	0	115.9		0	0	18367.2					244.3	657.93			0	0

Longliner Example

Mothership Example

GENERAL DIRECTIONS FOR WRITING RADIO MESSAGES

The following abbreviations are to be used in formatting your radio messages:

- A represents area
- DG represents days on grounds
- D represents a decimal point (put in each catch figure, even if tonnage is a whole number; i.e. 125 mt should be sent as 125D0P8).
- P represents the numerical check which is the sum of the actual value of the digits in the weight shown for the species.
- / represents the equivalent of a comma in a sentence.
- /// represents the equivalent of a period in a sentence.
- STOP means "end of message".

The following line of information should be written as the first entry of any radio message: *from a ship in the Bering Sea or Gulf of Alaska:*

NOJ DE vessel call sign MSG CATCHREP K

This line identifies the message to the receiving Coast Guard station as a catch report from a foreign vessel. The next four lines identify the receivers (TO: ____, ATTN: ____, INFO: ____) and the sender (FROM: ____) of the message, in that order. The "TO:" line should always read: "RUSS NELSON/ NWAFC/ SEATTLE WA". The "ATTN:" line is addressed to your contracting agency.

Use the following abbreviations for contractors:

Oregon State University: OSU
 University of Washington: UW
 Frank Orth and Associates: ORTH

The "INFO:" line should read: "NMFS/ AK REGION/ JUNEAU AK" for those fishing in Alaskan waters (BSA and GDA); and "NMFS, NW REGION, SEATTLE WA" for those fishing off the Wash. Ore. or Calif. coasts (WOC).

entered. Use the following three letter abbreviations for the month: JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC. Then, give the nation whose quota the catch will be applied against. Next list the inclusive dates of the days on grounds in the area, the statistical area, and the number of observer days on grounds.

Determine the number of observer days on the grounds (DG) by statistical area for the week. This is simply the number of calendar days during the seven-day period (Sun-Sat) spent in each area. Both fishing and non-fishing days are counted. Days spent in transit, transferring cargo, or sitting out rough weather are considered normal days on the grounds. Do not include phrases informing us of these normal activities. The only time a day is not a day on grounds is when the ship is fishing and you don't sample, or when the foreign ship is in port.

If the ship traverses an area in which it does not fish, then add to your radio message the date, area, days on grounds, and reason. (Example: Aug 18/ A62/ DG 1DOP1/ traversing/). If the vessel fishes in two areas in one day, divide the day proportionally to the actual time spent in each area. For example, if on your vessel, 40% of the day occurred in Area 51 and 60% in Area 52, then 0.4 of the day is attributed to Area 51, and 0.6 of the day to Area 52. Likewise, if the vessel fishes directed (independent; from its foreign allocation) and operates in a joint venture (from the U.S. allocation) on the same day, divide the day proportionately by time.

During your first week on board each vessel, you will only include the number of days beginning with your first day of sampling. The week that you get off a ship, days on grounds should end with your last sampling day. Days on grounds for all other weeks will add up to 7 or should be accounted for in the message. The ship's captain is required

to accurately report changes in fishing area and should therefore be able to provide you with the GMT time of the area change. In a proper radio message, all seven days will be accounted for and each area entered will only be listed once (~~exception: longliners give shallow and deep information for each area~~). ~~Note for longline observers: If you have a shallow set and a deep set on the same day, extrapolate the catch data separately; but attribute the day on the grounds to the depth at which most of the fishing was done. (See the longliner message example which follows).~~ If your vessel does not fish during a week, send a message informing us of that. If this occurs after you have begun sampling, send a message with the heading and Para 1 through DG as normal. Then include a phrase such as "no fishing/STOP". If a period of no fishing occurs in the week(s) before you've started sampling or after you have completed sampling and wrapped up your gear, send a message with the heading and a phrase such as: "NO FISHING FOR THE WEEK OF JUN 2-8/ STOP."

This is an example of a radio message showing everything you have learned up to this point:

NDJ DE vessel call sign MSG CATCHREP K

TO: RUSS NELSON/ NWAFC/ SEATTLE WA

ATTN: OSU (if you were contracted by Oregon State Univ.)

INFO: NMFS/ AK REGION/ JUNEAU AK (for BSA and GOA)

NMFS/ NW REGION/ SEATTLE WA (for WOC)

FROM: Your name/ vessel name/ vessel permit number/ 59-40N 177-59W SEP 14

TRANSFERRED TO TORA MARU 0200 SEP 8/ PARA 1/ JA-85-0383/ SEP 12/ ALL JAPAN

CATCH/ ~~DEC~~^{SEP} 9-12/ A52/ DG 4DOP4/

After this information, the message should list the names and weights of each species report group (by area) in the same order as is given in the list of report group abbreviations for that region. Species with zero catch do not need to be reported. Lastly, give a total tonnage by area. This completes the

species composition portion of the radio message for all vessel types with the exception of longliners (see the "Additional Instructions by Vessel Type" section and the longliner radio message example).

The following is an example of the heading and first paragraph of the sample radio message we have been progressively writing:

This message was sent from Jane Observer on the Tora maru (call sign: 7DDT; permit number: JA-85-0383); (Please Note: This message corresponds to the RM-1 example for the same dates on the preceding pages.)

NOJ DE 7DDT MSG CATCHREP K

TO: RUSS NELSON/ NWAFC/ SEATTLE WA

ATTN: OSU

INFO: NMFS/ AK REGION/ JUNEAU AK

FROM: JANE OBSERVER/ TORA MARU/ JA-85-0383/ 59-40N 177-59W SEP 14

TRANSFERRED TO TORA MARU 0200 SEP 8/ PARA 1/ JA-85-0383/ SEP 12/ ALL JAPAN

CATCH/ SEP 9-12/ A52/ DG 4DOP4/ SQU 11D53P10/ TURB 0D07P7/ OFLAT 0D52P7/

POLL 135D86P23/ CDD 42D77P20/ SAB 2D85P15/ POP 2D69P17/ DRCK 0D66P12/

HER 0D02P2/ DTH 0D09P9/ NON 0D94P13/ TOTAL 198DOP18///

Paragraph 2 which follows is a summary of the incidence of prohibited species information for the week. Begin paragraph 2 with "PARA 2", then give the nation to whom the catch quota will be attributed, followed by the inclusive dates of the days on grounds in that area, the statistical area, and the sum of Column A from Form RM-3. Lastly, list the species report groups--both numbers and weights. Use the following abbreviations. Report ~~all six species groups in the order given, even if none are seen.~~

Abbreviations

Meaning

HW	sum of Column A, from Form RM-3
REDKNG	Red King Crab
BLUKNG	Blue King Crab
DTHKNG	Golden & Couesi King Crab
BTAN	Bairdi Tanner Crab
DHTAN	Opilio, Angulatus, & Tanneri Tanner Crab

(cont.)

<u>Abbreviations</u>	<u>Meaning</u>
HBT	Pacific Halibut
CHIN	Chinook Salmon
OTHSAAL	The other four species of salmon
NOS	sum of Column D
WT	sum of Column Y

Identify your first day of sampling in the radio message: 1) on each new vessel, or 2) when the vessel you're on changes fishing operations from joint venture to directed and vice versa, or 3) ~~when the vessel moves from Alaskan waters to waters off the coasts of Washington, Oregon and California.~~ Use the following code at the end of your first two catch messages, "IDS no. day". "IDS" stands for "Initial Day of Sampling". The IDS date is important to the observer program's data organization and, therefore, repeat the IDS date in your second species composition radio message to insure that it is received correctly. (Note that the "days on grounds" for the first week begins with this day. Example: if you start sampling on a GMT Thursday, days on grounds will total 3 days for that week.) ~~Now let's add the second paragraph to the radio message example:~~

~~NOJ DE 7DDT MSG CATCHREP K~~

~~TO: RUSS NELSON/ NWAFC/ SEATTLE WA~~

~~ATTN: OSU~~

~~INFO: NMFS/ AK REGION/ JUNEAU AK~~

~~FROM: JANE OBSERVER/ TORI MARU/ JA-85-0383/ 59-40N 177-59W SEP 14~~

~~TRANSFERRED TO TORI MARU 0200 SEP 8/ PARA 1/ JA-85-0383/ SEP 12/ ALL JAPAN~~

~~CATCH/ SEP 9-12/ A52V DB 4DOP4/ SQU 11D53P10/ TURB OD07P7/ OFLAT OD52P7/~~

~~POLL 135DB6P23/ CDD 42D77P20/ SAB 2DB5P15/ PDP 2D69P17/ DROCK OD66P12/~~

~~HER OD02P2/ OTH OD09P9/ NON OD94P13/ TOTAL 198DOP18///~~

~~PARA 2/ ALL JAPAN CATCH/ SEP 9-12/ A52/ HW 146DOP11/ BTAN NOS 696DOP21/~~

~~OTHAN NOS 68DOP14/ HBT NOS 20DOP2 WT 92D40P15/ CHIN NOS 9DOP9///~~

~~IDS SEP 9/ STOP~~

3) when the
is a change
of year,
from Dec. 31
to Jan. 1st

Example of a Radio Message sent from a vessel fishing Joint-Venture
in the WOC Coast Hake Fishery

Shows: JV operation; reporting discards; Para 3; message sent Sunday.

NOJ DE RYCE MSG CATCHREP K

TO: RUSS NELSON/ NWAFC/ SEATTLE, WA

ATTN: OSU

INFO: NMFS/ NW REGION/ SEATTLE WA

FROM: JOE OBSERVER/ RATMANOVA/ UR-85-0078/ 43-27N 129-52W JUN 10

PARA 1/ UR-85-0078/ JUN 9/ ALL US CATCH/ JUN 3-9/ A71/ DG 7DOP7/ HAKE 86D93P21/

JACK 13D01P5/ JACK DIS 1D02P3/ POP 1D87P16/ POP DIS 0D27P9/ RF 4D86P18/

RF DIS 0D54P9/ FLAT DIS 1D43P8/ SAB 4D76P17/ OTH DIS 0D42P6/ NON DIS 0D24P6/

TOTAL 115D35P15///

PARA 2/ ALL US CATCH/ JUN 3-9/ A71/ DG 7DOP7/ HW 63D44P17/ HBT NOS 5DOP5

WT 5D47P16/ CHIN NOS 22D3P7 ///

PARA 3/ TOTAL CODENDS DELIVERED 37DOP10/ WOC MAMM OP0/ STOP

SPECIAL DAILY RADIO MESSAGE

While you are out at sea, you may receive a message that asks you to begin sending daily radio messages. This is most apt to occur when your vessel's nation is approaching a species quota. These messages are to be sent in addition to your normal weekly radio message, and are to be sent daily. This daily message is similar to PARA 1 of the weekly catch report, except instead of giving the week-ending-date, give the day's date that the catch is for and label the date as such. Each day's catch is for a GMT day.

Example of a Daily Radio Message

This is an example of a daily radio message sent from a vessel using the heading containing the noon position 55-11N 148-33W. The message is sent June 11, and the catch is from GMT day June 10.

NOJ DE vessel call sign MSG CATCHREP K

TO: Russ Nelson/ NWAFC/ Seattle Wa

ATTN: UW

INFO: NMFS/ AK REGION/ JUNEAU AK

FROM: Your name/ vessel name/ and vessel permit number/ 55-11N 148-33W JUN 11

PARA 1/ VESSEL PERMIT NUMBER/ JUN 10 DAILY CATCH/ ALL JAPAN CATCH/ A63/

DB1D0P1/ SQU 1D21P4/ FLAT 2D17P10/ POLL 22D43P11/ COD 0D22P4/ SAB 0D02P2/

ATKA 1D04P5/ POP 0D21P3/ DR0CK 0D28P10/ HER 0D01P1/ OTH 1D06P7/ NON 2D14P7/

TOTAL 30D79P19/ STOP

2:13:1971

Please return after completing RM forms

Instructions for filling out forms RM-2 (radio message species composition) and RM-4 (radio message prohibited species)

READ THESE INSTRUCTIONS COMPLETELY AND MAKE SURE YOU FOLLOW THEM EXACTLY. INCORRECT FORMS WILL BE RETURNED AND YOUR CHECKOUT MAY BE DELAYED.

When observer radio messages are received in Seattle, these messages are coded and entered into the computer system and are used to estimate each nation's catch to date. It is, therefore, important for the observer to verify and clarify the radio message data upon returning to Seattle to make certain that no mistakes have occurred in transmission. If you have kept a copy of the radio messages you gave to the radio officer or captain, it should take only a few minutes to fill out these forms. Separate forms must be filled out for each ship. The RM-2 form is filled out from the RM-1 form, and the RM-4 form is filled out using data from the RM-3 form.

On your RM-2 form, you must account for all seven days in each week, except possibly your first and last week on each vessel. On each vessel, days on ground start the first day you sample. From then on, every day in an area is included in days on grounds, whether the boat was fishing or not. The only exceptions to this would be for a day when the boat fished, but you did not sample or for a day the vessel was in port. That day is not included in days on grounds, and the catch for that day is not included in the weekly catch. That day still must be accounted for on the RM-2 form. Indicate the area, the fact that you did not sample and why, and the number of days.

If your vessel fished in the same area on two separate occasions in the same week, this data must be combined. There can only be one set of data for each area for the week (exception: longliners shallow and deep).

If there are any differences between the RM-2 and RM-4 forms and the corresponding radio messages which you sent, these must be indicated. Place an asterisk (*) in the right-hand margin of each line that is different.

IN FILLING OUT RM-2 FORMS:

Column 1: Indicate whether your ship fished joint venture or independently. J = joint venture catch F = foreign catch

Columns 3-12: Fill in the permit number of the ship to which this message pertains (ignore A's and B's). If you were on a longliner, column 9 of the permit number is changed to 6 when you are reporting shallow water catches and remains a zero (0) for reporting deep water catches.

Columns 14-21: The date always refers to Saturday's date, the ending date for the week the ship fished, regardless of the actual date you stopped sampling or fishing.

Columns 23-25: Sub-area in which the ship fished.

Columns 27-29: Species code of the species group caught in that area (use the following codes).

01 - SQU	<u>Gulf</u>	18 - WIDOW	
02 - YELL (Bering only)	SLPRF	20 - THRN (Gulf only)	
03 - OFLAT and FLAT	DEMRF	21 - TURB (Bering only)	
05 - POLL	PELRF	22 - FLAT DIS	
06 - COD		23 - SAB DIS	ONLY FOR JV
07 - SAB		24 - POP DIS	
08 - ATKA		25 - OROCK DIS	WASHINGTON AND
09 - HAKE		26 - OTH DIS	
10 - JACK		27 - JACK DIS	OREGON
11 - POP (SEE BELOW) (Bering only)		28 - SBELL	
12 - OROCK		29 - YTAIL DIS	
13 - ARROW (Bering only)		30 - WIDOW DIS	
14 - HERR (Bering only)		99 - OTH	
16 - SNAMTS		- NON	
17 - YTAIL		- TOTAL	

* SPECIES CODE 11-POP REPRESENTS S. alutus ONLY IN THE BERING AND COAST BUT REPRESENTS ALL 5 STANDARD ROCKFISH GROUPS IN THE GULF.

DO NOT BOTHER TO ENTER THE NONALLOCATED (NON):

Columns 31-38: Weight caught in metric tons. Use the same number of decimal places sent in the original radio message.

Columns 40: Days on grounds to nearest tenth of a day.

Column 57: Fill in the target species for the week and/or area. If 20% or more of the catch is YELL, ARROW, TURB, or OFLAT write Y (TRGYELL). If flatfish, other than halibut, make up less than 20% write 0 (TRGOTH).

Columns 61-64: Fill in the company code for your particular JV company/ foreign company combination.

Columns 71-72: ~~Indicate your contracting agency:~~
FB - Frank Orth
OS - Oregon State University

Skip a line after each week.

The example on the next page shows 1) how to handle deep/shallow water catches (longliners only), 2) an area change in the middle of the week and, 3) how to indicate a day the ship fished, but you did not sample.

FILLING OUT RM-4 FORMS:

Column 1: Indicate whether your ship fished joint venture or independently. J = joint venture catch F = foreign catch

Columns 3-12: Fill in the permit number of the ship to which this message pertains (ignore A's and B's). If you were a longliner, column 7 of the permit number is changed to a 6 when you are reporting shallow water catches and remains zero (0) for reporting deep water catches.

Columns 14-21: The date always refers to Saturday's date, the ending date for the week the ship fished, regardless of the actual date you stopped sampling.

Columns 23-25: Sub-area in which the ship fished.

Columns 27-29: 3 digit species code

002 - King crab
003 - Tanner crab

004 - C. bairdi
005 - Other tanner crab

006 - Blue King crab
007 - Red King crab
008 - Other King crab

101 - Halibut
222 - King salmon
220 - Other salmon

Columns 31-38: Haul weight in metric tons to the nearest hundredth.

Columns 40-46: Estimated number caught to the nearest tenth.

Columns 48-55: Estimated species weight in kg to the nearest hundredth.

Column 57: Fill in the target species for the week and/or area. If 20% or more of the catch is YELL, ARROW, TURB, or OFLAT write Y (TRGYELL). If flatfish, other than halibut, make up less than 20% write Q (TRGOTH).

Columns 61-64: Fill in the company code for your particular JV company/ foreign company combination.

Columns 71-72: Indicate your contracting agency:
FO = Frank Orth
OS = Oregon State University

Unlike previous years those prohibited species not seen during a given week should not be reported. If tanner crab were not seen during a week then they would not be included in the radio message. If you do not see any prohibited for an entire week you still must report a haul weight (HW).

SKIP A LINE AFTER EACH WEEK

The example on the next page shows a typical RM-4 form.

TRANSFERS AND DISEMBARKATIONS

SECTION II: ADDITIONAL DUTIES AND INFORMATION

Page

Obtaining Information on Product Recovery Rates.....	212
Form 8 Worksheet (Product Recovery Rate and Unit Weight Tests).....	214
Form 8 - Product Recovery Rates.....	215
Adjusting the Ships Estimate.....	221
Prohibited Species Guidelines.....	225
Observations of Marine Mammals.....	229
Form 10 - Marine Mammal Incidental Catch Data.....	233
Form 11(A) and 11(B) - Marine Mammal Sighting and Effort Form.....	236
Tagged Fish and Crab.....	245
Observing for Net-Scarred Salmon.....	247
Spawning Pollock Study.....	249
Logbook Entries.....	252
Coast Guard Boarding Report.....	254
Doubling Up - More Than One Observer Per Ship.....	256
Duties of Lead Observers.....	258
Extra Activities for the Bored or Ambitious Observer.....	259
Form 12 - Vessel Data Form.....	260
Obtaining Information on Fishing Gear.....	262
Final Report No. 2.....	264
Observer Return and Completion of Duty.....	279
Observer Evaluation.....	283

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". Vessel officers usually make use of recovery rates to estimate the weight of a catch from the tonnage of products produced from that catch by using the following equation:

$$\frac{\text{Product Weight}}{\text{Recovery Rate}} = \text{Whole Weight (before processing)}$$

Coast Guard boarding officers also utilize recovery rates to check whether the fishing logs accurately represent the weight of the fish used to make the products in the holds.

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, and the vessel type may all have a bearing on the recovery rate of a particular species.

Since there is a need to find out what recovery rates are being used, observers are being asked to record the rates used on their vessels, and 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 representative 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.) 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 roe). The weight of the product divided by the weight of the fish before processing is the recovery ratio.

$$\frac{\text{Product Weight}}{\text{Fresh Weight}} = \text{Product Recovery Rate}$$

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.

Each observer will be running weekly tests for product recovery rates and also conducting tests for determining unit weights. The testing guidelines are outlined below on the "Form B Worksheet". Record only the "lowest" average PRR test value and the "highest" average PRR test value and the lowest and highest unit weight test values on the Form B 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 B instructions that follow.)

Form 8 Worksheet
(Product Recovery Rate and Unit Weight Tests)

PRODUCT RECOVERY RATE TESTS:

- 1) Run PRR tests on primary products once per week minimum.
- 2) Run PRR tests on secondary products when they occur.
- 3) Each PRR test will consist of three samples of at least 20 normal size fish, (25 - 50 cm), or 10 big fish, (>50 cm) per sample.

Species: _____ Product: _____

Sorting Criteria: _____

Date: ___/___/___ / Haul No.: _____
Mo. Day Yr.

<u>Sample</u>	<u>No. of fish</u>	<u>Product wt.</u>	<u>(divided by)</u>	<u>Whole wt.</u>	<u>=</u>	<u>PRR</u>
1st	_____	_____	_____	_____	_____	_____
2nd	_____	_____	_____	_____	_____	_____
3rd	_____	_____	_____	_____	_____	_____
					Average =	_____

Date: ___/___/___ / Haul No.: _____
Mo. Day Yr.

<u>Sample</u>	<u>No. of fish</u>	<u>Product wt.</u>	<u>(divided by)</u>	<u>Whole wt.</u>	<u>=</u>	<u>PRR</u>
1st	_____	_____	_____	_____	_____	_____
2nd	_____	_____	_____	_____	_____	_____
3rd	_____	_____	_____	_____	_____	_____
					Average =	_____

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.

<u>Unit Type</u>	<u>No. of Units Sampled</u>	<u>Total Wt. - Container Wt.</u>	<u>=</u>	<u>Unit Wt.</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Blank form 8

Comments on obtaining
data from ship's personnel.

Observers aren't
required to do PRR
tests or unit weight
determinations

FORM 8 PRODUCT RECOVERY RATES

Page 1 of 1Cruise Number

1	2	3
5	3	2

Vessel Code

4	5	6	7
N	S	5	4

Year

8	9
8	4

Month

10	11
0	7

Area

12	13
5	2

Species Name	Species Code			Description of Product	Product Code		H/M	Vessel Data				Observer Data			
	14	15	16		17	18		19	Percent Recovery			Unit wt. to .1 kg			
									20	21	22	24 - 27	28	29	30	32 - 35
Pollock	2	0	1	Surimi	3	6	M	.25	10.0	.	.	.	.
↓ (large fish)	↓	↓	↓	"	3	6	M	.34	10.0	.	.	.	.
Pollock (large fish)	2	0	1	dorsal fillets	3	0	H	.65	15.0	.	.	.	.
Pollock (large fish)	2	0	1	skinless fillets	3	2	H	.40		.	.	.	.
Pacific Cod	2	0	2	headed & gutted	1	3	M	.50	.	.54	15.4	.	.		
↓	↓	↓	↓	"	1	3	M	.60	.	.60	.	.	.		
Pacific Cod	2	0	2	fillet - skin on one side	3	1	H	.43	.	.	.	.	.
Pacific Ocean Perch	3	0	1	headed & gutted	1	3		.60	.	.	.	.	.
Harlequin Rockfish	3	2	3	"	↓	↓		.62	.	.65	.	.	.		
Sharpchin Rockfish	3	0	4	"	↓	↓		.62	.	.	.	.	.
Other Rockfish	3	0	0	"	1	3	↓	.60	.	.	.	.	.
Sablefish	2	0	3	headed & gutted with pect. girdle	1	5	H	.70	.	.70	14.8	.	.		
Atka Mackerel	2	0	4	frozen whole	1	0	H	1.00	.	.	.	.	.
Greenland Turbot	1	0	2	headed & gutted	1	3	H	.55	.	.59	15.1	.	.		
Flathead Sole	1	0	3	frozen whole	1	0	H	1.00	.	.	.	.	.
Other flatfish	1	0	0	headed & gutted	1	3	H	.70	.	.	.	.	.
Octopus		6	0	gutted	5	1		.80	.	.	.	.	.
Squid		5	0	mantles	5	2		.50	.	.	.	.	.
"		5	0	tentacles	5	3	↓	.30	↓	.	.	.	.
All skates		9	0	skate wings	2	6	H	.30	15.0	.42	.	.	.		
All other fish & waste	9	0	1	fish meal	4	0	M	.20	20.0	.	.	.	.
All other fish & waste	9	0	1	fish oil	4	1	M	.05	.	.	.	.	.

Comments: The ship provided a range of figures for surimi and headed, gutted Pacific Cod, so only the high and low values are entered here. A rotary saw was sometimes used for heading the turbot as well as the cod, but cutting by hand was more common. Observer recovery figures were based on approx. 70 kg of each species (whole wt) and the unit weight was based on 15 trays of each species.

Codes Used for Product Recovery Form BProduct Codes (column 17-18)

- 10 Whole fish (the recovery rate would be 100%)
 5 Fish with roe removed only
 11 Gutted only
 19 Headed (but not gutted)
 12 Headed and tail removed
 7 Pre-dressed - gutted, only part of head removed by diagonal cut (P. Cod specialty product. This product applies only to cod. If you have this product for another species, talk to the debriefer upon your return.)
 13 Headed and gutted
 17 Headed and gutted, stomachs included
 18 Headed and gutted, roe included
 15 Headed and gutted, pectoral girdle included
 16 Headed and gutted, pectoral girdle and roe included
 14 Headed and gutted, tail removed
 9 Headed and gutted, tail removed, roe included
 4 Headed and gutted, tail and skin removed
 28 Headed and gutted, skinned; tail and fins removed
 8 Headed and gutted, fins clipped by scissors (tail on)
 6 Tooshka - headed, gutted, fins clipped, tail removed (a Soviet product)
 30 Dorsal fillet - The head and guts have been removed by a long diagonal cut, leaving the upper portion of the body, most of the backbone, and the posterior ventral portions (see sketch-these are made only from roundfish, not flatfish).
 35 Otoshimi - type of minced fish flesh used for breaded fish sticks; also a component of surimi before washing and dehydration.
 36 Surimi - a product made from minced fish flesh mixed with sugar, polyphosphate, and other ingredients. Let the debriefer know if you did your own product recovery determination. Write a description of your work in report two. If the ship occasionally adds a few cod to the pollock when making surimi, record it only as pollock. (Record cod or Atka mackerel surimi if they are using these species exclusively to make surimi.)
 37 Kirimi - (steaks) vertical slices made from headed and gutted fish (usually for yellowfin sole); (see sketch)
 38 Caudal peduncle - caudal fin removed (usually for yellowfin sole on the Japanese mothership, Kashima); (see sketch)
 34 Punched section - body section stamped out by means of a punching machine (usually for yellowfin sole on the Japanese mothership, Kashima)
 60 Bills and stomach lining (Korean product usually made from Pacific cod)
 20 Heads
 3 Cheeks - (usually of turbot)
 21 Pectoral girdle - a section of the throat and pectoral girdle
 22 Livers 66 Canned Livers (Soviet Product)
 23 Stomachs
 24 Ovaries - roe
 25 Testes - milt
 40 Fish meal (use species code 901--misc. fish)

Codes Used for Product Recovery Form B (continued)

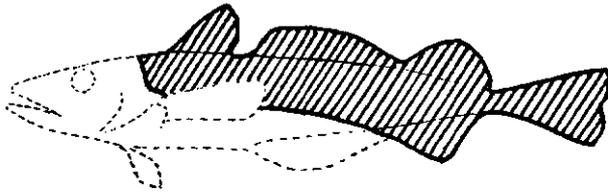
- 41 Fish oil (use species code 901--misc. fish)
 42 Bone meal
 32 Skinless fillets
 29 Skinless fillets, ribbed section removed (see sketch)
 33 Deribbed skinless fillets - (ribs lifted out - flesh not removed)
 31 Fillets with skin on one side
 39 Deribbed fillet with skin on one side
 43 Butterfly fillet - dorsal fillet with backbone and tail removed (see sketch)
 44 Tailless and finless dorsal fillet (used on dogfish shark)
 45 Salted dorsal fillet, backbone partially removed, tail present
 *(Spanish P. cod product)
 46 Salted dorsal fillet, backbone partially removed, tail removed
 *(Portuguese P. Cod and pollock product)
 26 Skate wings (There are no skate fillets.)
 27 Skate - tips of wings, nose and tail removed
 50 Whole squid or octopus
 51 Gutted squid or octopus, beak removed
 52 Head or mantle of octopus or squid
 53 Arms or tentacles of octopus or squid
 54 Skinned squid or octopus
 65 Canned fish
 61 Fish skin
 80 Snail meats (for snailpot vessels only)
- Processing Codes (H/M) - (Column 19)

H = Product was primarily processed using hand labor (cutting or filleting by hand).

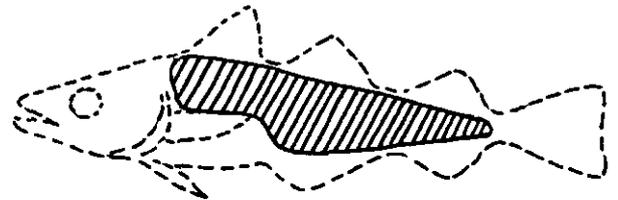
M = Product was primarily processed by machinery (includes cutting with a rotary saw).

<u>* Salt cod and pollock</u>	Codes before <u>Salting</u>	Codes after <u>Salting</u>
Portuguese (dorsal fillet, no tail)	44	46
Spanish (dorsal fillet, with tail)	30	45

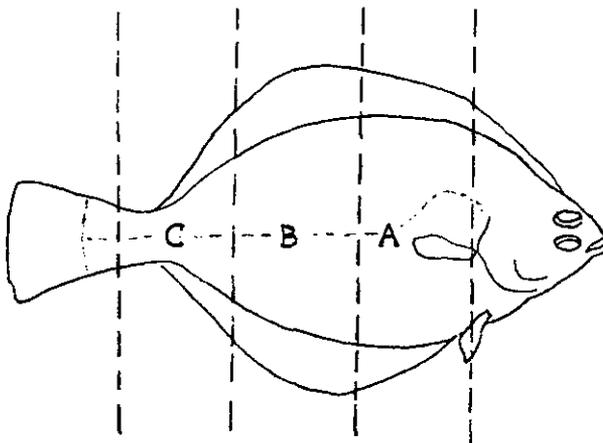
Sketches of Various Product Types Listed on Previous Pages:



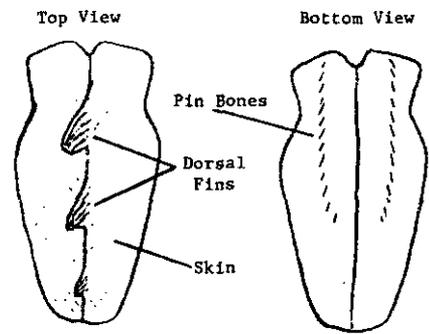
dorsal fillet from Pacific hake



skinless fillers, ribbed section removed



Kirimi steaks (A & B) and caudal peduncle (C) cut from yellowfin sole.



Butterfly fillet from pollock (backbone, tail and pectoral girdle removed)

ADJUSTING THE SHIP'S ESTIMATE

It may be necessary for the observer to adjust the ship's estimate because of nonreported species in the ship's catch weight estimate. A common nonreporting problem arises from the fact that ~~foreign~~ vessels are not required to report the catch of species in the "nonallocated" group. (For a definition of this group for the particular area you are fishing in, see the list given in "Reporting Groups for Species Composition Radio Messages" in the RADIO MESSAGES

section.) If an adjustment is made, ~~mark the catch data forms 11, 1L, 2, or 2 record # how it was done in your log book, along with the original ship's estimate and your observer estimate, and observer estimates are legible and clearly defined.~~

In deciding whether or not to adjust the ship's estimate, the magnitude of the underestimation ~~should~~ ^{may} be taken into account. If the species in the nonallocated group and any other nonreported species make up more than ~~1%~~ ^{1%} of the catch in any particular haul, then that haul ~~should~~ ^{may} be adjusted and its adjustment factor, as defined below, would be ~~1~~ ^{1.01} or more. You can judge whether the nonreported species makes up more than ~~10%~~ ¹ of the catch of a haul by examining the RM form (Refer to "Form RM - For Independent Stern Trawlers and Joint Venture Vessels" in the Radio Message section). Observers should not compare the ships estimate and the observers estimate in deciding whether or not to adjust. The decision to adjust the ship's estimate can be made on a haul-by-haul and day-by-day basis or all the hauls in an entire cruise may be adjusted.

In some unusual instances, your sample weight may exceed the ship's estimate for that haul. This would only happen because you had actually weighed the entire catch. This sometimes occurs on small trawlers when the

catch is less than one metric ton. If this happens, it would be logical to use your actual weight as the adjusted ships' estimate.

The following information will explain how to adjust the ship's estimate:

Longline vessels

This is the most common vessel type to require an adjustment of the ship's estimate. A high percentage of the catch in a set is often made up of nonallocated species such as rattails and halibut. You must look at your species composition data for that set and determine whether the nonallocated species or other nonreported species make up ¹~~10~~% or more of the catch. If they do, then you would adjust the ship's estimate for a given set, by using the following formulas:

$$\text{adjustment factor} = \frac{\text{observer's total species composition sample weight}}{\text{weight of reported species in species composition sample}}$$

$$\text{corrected ship's estimate} = \text{original ship's estimate} \times \text{adjustment factor}$$

Record each adjustment factor in your logbook. On form 1045 (Refer to the "Longliners" section) enter the corrected ship's estimate in the columns for total catch, (col. 39-41), and the original ship's estimate in columns 73-75.

The corrected ship's estimate is the figure that you should also use on all of your other forms requiring the ship's estimate (i.e., whole haul sample weights on Form ⁴⁵₃, haul weights and total daily catch on radio message forms). If you are filling out an old form 10, which is missing columns 73-75, the observer's estimate goes in the unmarked columns 67-69, and the original ship's estimate should be written in the margin next to column 69.

Stern trawlers

As for longline vessels, the first step is to look at your species composition data for each sampled haul and determine whether the nonallocated and nonreported species make up ¹10% or more of the catch. If they do, then you would adjust the ship's estimate for that haul by using the same formulas given in the previous longline vessel section.

Correct each haul individually using your sampling data for each haul, and write the adjustment factors in your logbook. To calculate a factor for the hauls that you did not sample, sum the adjusted ship's estimate for the hauls you sampled that day and divide the resulting figure by the sum of the original ship's estimates for those hauls. This will yield an adjustment factor for the day which is weighted by the size of the sampled hauls. Use this factor for the day to adjust the ship's estimates of the hauls that you did not sample that day.

From the Form 2 example in the manual:

Sampled hauls for 9/13/83

<u>Haul #</u>	<u>ship's estimate</u>		<u>adjustment factor</u>	<u>adjusted ship's estimate</u>
111	22.0 MT	x	1.65 MT	36.30 MT
113	+11.0 MT	x	1.42 MT	+15.62 MT
Totals	33.0 MT			51.92 MT

(51.92 divided by 33.0 = 1.57, the adjustment factor you should use to correct hauls 110 and 112 on 9/13/83 which you did not sample)

If you whole-haul sample for species composition, the sample weight is dependent on the ship's estimation of the catch. Since you are counting and weighing all of the nonreported species for the haul, add the total weight of the nonreported species to the ship's estimate to obtain the adjusted haul weight. This may then be used as the sample weight for both species

composition and incidence of prohibited species as well as the corrected ship's estimate on Form 2. Divide the corrected ship's estimate by the original ship's estimate to get the adjustment figure, which is used in calculating the figure by which non-sampled hauls can be adjusted.

Similar computations may be necessary to adjust the ship's estimate if you partial whole-haul sample. In addition, sample size must be adjusted by taking the appropriate percentage of the ship's reported catch estimate and adding the actual weight of the nonreported species in your sample. ^{You may} ~~Remember,~~ ^{adjust the ship's estimate any time it does not reflect} ~~do not bother to adjust sample weights or ship's estimates unless the~~ ^{the actual weight or composition of the total catch.} ~~nonreported species make up 10% or more of the catch.~~ If you change the sample weight, make sure that the adjusted sample weight does not exceed the adjusted ship's estimate on Form 2.

On Form ^{US} 2, enter the adjusted ship's estimate in the columns for total catch (Col. 49-54). ~~If you are filling out an old form 2, which is missing the columns 70-75, the observer's estimate goes in unmarked columns 64-69, and the original ship's estimate should be written in the margin next to column 69.~~

Joint ventures

The preferable way to correct a joint venture ship's estimates would be to adjust the catch for each codend separately, following the directions for stern trawler observers. If this is not possible, follow the directions for longline observers, calculating a single adjustment factor based on all of the species composition data for the day and use this to adjust the total daily catch.

PROHIBITED SPECIES GUIDELINES

rewrite

PROHIBITED SPECIES GUIDELINES

Over the years, fishery observers have been expected to serve more and more as advisors to the captains of their host vessels. Observers are instructed that if they see a violation, they are to remind the captain of the fishing regulations. One of the stipulations of the regulations is that the catch of prohibited species must be minimized. In the Bering Sea/Aleutian Islands region, the directed foreign trawl fishery has additional restrictions in the form of prohibited species allowances which force the foreign fleets to stay below particular limits on the number/weight of prohibited species, otherwise they will be closed out of the fishery. In some joint-venture fisheries, voluntary prohibited species guidelines have been established.

Observer radio messages are used to estimate the total number and weight of the prohibited species that have been taken in each fishery up to a certain date. An information gap of one to two weeks is unavoidable due to the wait to send weekly radio messages, the transfer of the data to our computer system, and the running of the computer report. Due to the ability of large fleets to take a large amount of prohibited species in a short amount of time, it may not be possible for NMFS to give a foreign fleet much notice before a fishery is closed.

It was thus thought appropriate for observers to warn ship's captains when the catch of prohibited species is excessive. In order to get some idea of what constitutes a high catch of prohibited species, the following table of incidence rates was prepared. The figures given are the average numbers of prohibited species taken per metric ton of groundfish by fishery. The numbers circled constitute average rates that are generally considered to be high, and should give observers an indication of which rates to watch carefully.

PROHIBITED SPECIES GUIDELINES

Target species	Salmon	Halibut	Tanner Crab	King Crab
Bering Sea Trawl Fisheries				
Pollock	0.020	0.300	1.400	0.200
Yellowfin sole	0.001	0.800	2.900	0.300
Turbot	0.030	1.300	11.400	1.500
Bering Sea Longline Fisheries				
Pacific cod	0.001	6.700	1.000	0.050
Turbot	0.001	1.000	1.900	1.500
Bering Sea Joint-Venture Fisheries				
Pollock	0.300	0.010	0.050	0.001
Yellowfin sole	0.004	3.000	2.000	2.000
Atka mack/P.cod	0.003	1.000	0.001	0.010
Gulf of Alaska Trawl Fisheries				
Pollock	0.100	0.500	0.040	0.004
Gulf of Alaska Longline Fisheries				
Pacific cod	0.001	19.400	0.300	0.020
Gulf of Alaska Joint-Venture Fisheries				
Shelikof Pollock	0.030	0.001	0.001	0.001
Other Pollock	1.700	0.800	0.100	0.003
Mixed bottomfish	0.200	10.400	6.100	0.600

Observers should not be overly concerned if the guideline is exceeded for an individual haul or longline set. The incidence rate of prohibited species in some fisheries is extremely variable from set to set. In these cases, the observer should look at the average incidence rates over the period of a day, a several day period, and possibly even a week. The frequency of high incidence rates is thus important in your decision as to whether or not to caution the captain. The following examples may also help in making your decision.

1) Monitoring fisheries with circled incidence rates on the guideline table:

a) Situation in which the guideline incidence rate is exceeded on occasional

hauls but the vast majority of hauls have a very low or zero incidence:

--Calculate the average incidence rate over the period of three days or one week. If the averaged incidence rate does not exceed the guideline rate, *do not be overly concerned. Keep a close watch on the situation, and try to determine if there is any reason behind the high incidence rates in certain catches.*

b) Situation in which the guideline incidence rate is usually not exceeded for individual hauls, but it remains high and the 1-day or 3-day average incidence rate approaches the guideline:

--Warn the captain that the incidence rate is consistently high. Monitor the situation closely and repeat the caution if necessary.

c) Situation in which the one-day or 3-day average incidence rate exceeds the guideline incidence rate:

Inform
 --~~Warn~~ the captain that the incidence rate is high. Monitor the situation closely and keep the captain informed on a daily basis (or in a joint-venture, make sure that both the fisheries representative and the catcher boat captains are aware of the situation).

2) Monitoring fisheries that do not have incidence rates that are circled on the guideline table:

--If the observer notices very high catches of a particular prohibited species for several catches in a row, the observer should check the average daily incidence rate against the rates in the guideline table. The observer should check the average weekly incidence rates for each species group at least once a week, even if no abnormal amount of prohibited species was noticed in the catches. In either case, if the rate is several times the rate in the guideline table, the observer should consider informing the captain. The observer should use some judgement in these cases as some fisheries have very low guideline rates and the observer should not get too worried if the daily incidence rate is .003 even if the guideline rate is .001 for instance.

Please note--observers have the responsibility to inform their captains if the incidence rates of prohibited species are too high but the observer has no authority to order the captain to do anything about it. While the observer might have the knowledge to make some constructive suggestions to the captain about ways in which to avoid taking excessive numbers of prohibited species, it should be clear that these are suggestions only and it is up to the captain to decide what, if anything, he will do regarding the situation.

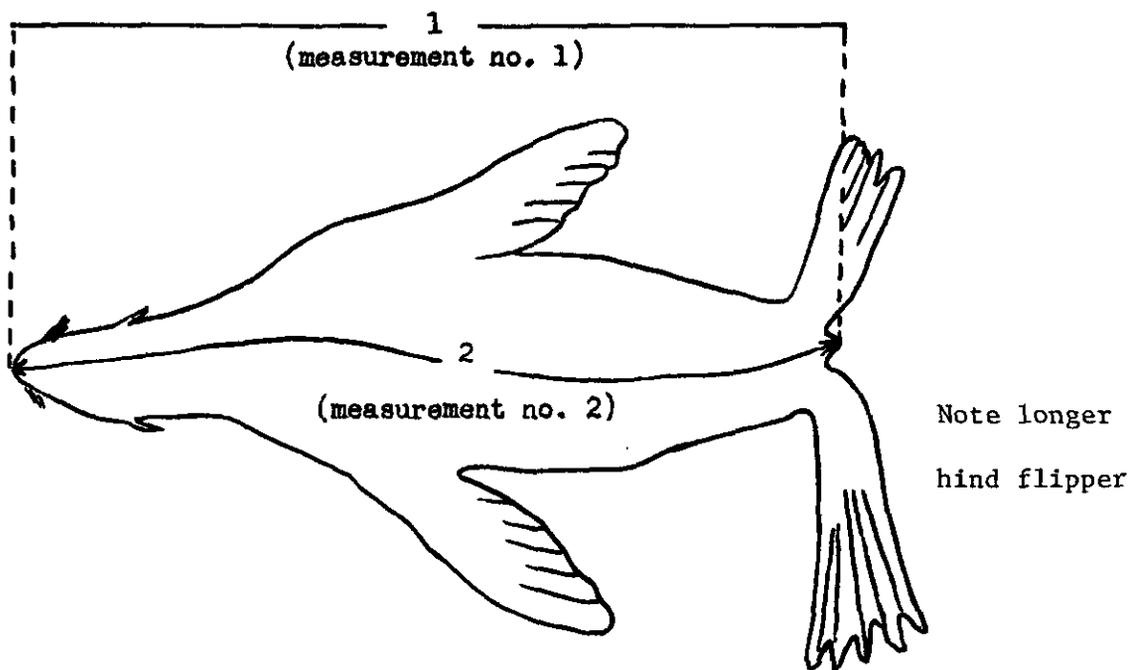
OBSERVATION OF MARINE MAMMALS

Observations for marine mammals are one of the secondary duties of a foreign fisheries observer. Observers should be aware of any mammals caught in the hauls that are sampled, and should try to have crew members inform them if sea lions or other marine mammals are captured during non-sampling periods.

If a dead seal or sea lion appears in the catch, measure either the standard length or curvilinear length of the body using a measuring tape. (Refer to the diagram on the next page.)

~~A voluntary effort which will yield valuable data is the collection of the upper canine teeth from dead seals or sea lions for age and sex determinations. The method of extraction is explained in the following pages. Since age is determined from counting the growth ridges on the root of each tooth, care should be taken not to break or cut off the root of the tooth. The part of the jaw containing the tooth may be brought back, as long as all of the flesh is removed. A label with the date, haul number, location, body length of mammal, ship name, type of ship, cruise number, and observer name should accompany the tooth. Teeth or jaws are the only part of seals or sea lions that are allowed to be brought into the United States by observers. A marine mammal collection permit is in the Appendix. Walrus tusks cannot be used for ageing and should be left with the body. Gloves should be worn when extracting canine teeth because of the risk of infection and disease transmission through contact with marine mammal saliva. Be especially careful to protect and cleanse any open cuts or abrasions on your hands.~~

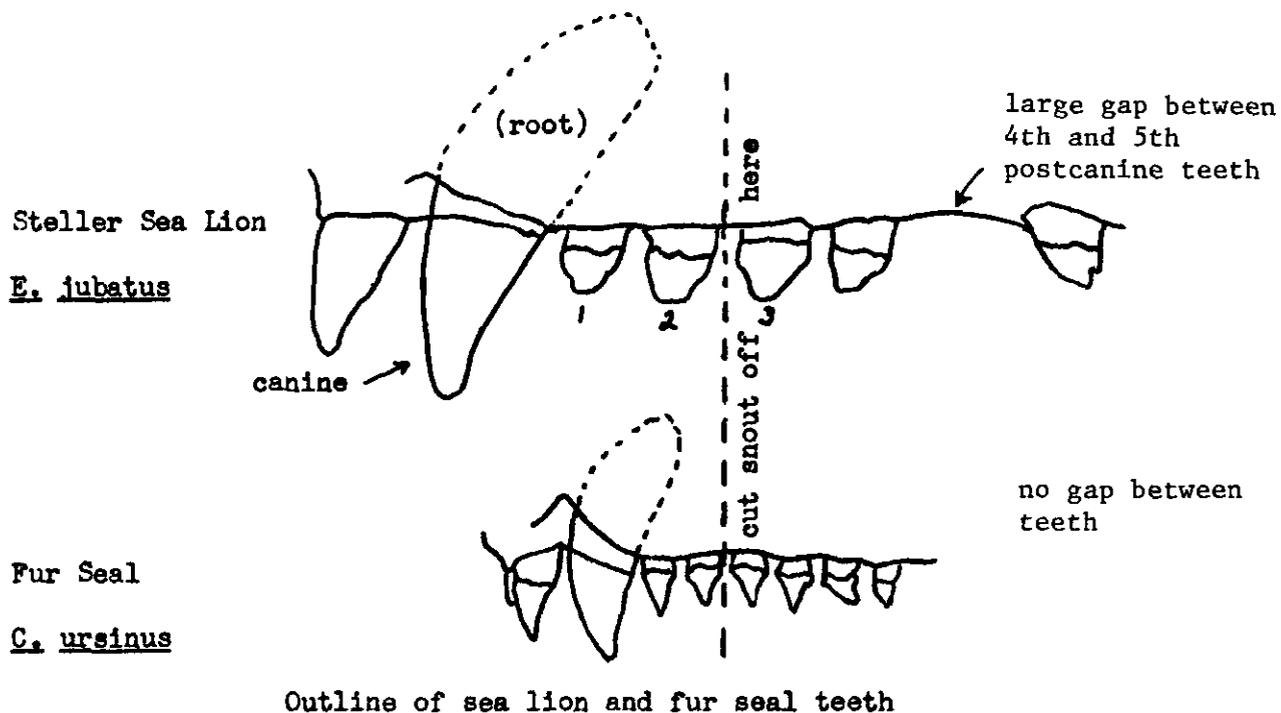
LENGTH MEASUREMENTS OF SEALS AND SEA LIONS



Upper half of diagram is of Steller Sea Lion, lower half is Northern Fur Seal.

Standard Length (measurement no. 1) is the straight-line distance from snout to tip of 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 no. 2 should be taken.

Curvilinear Length (measurement no. 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 snout to tip of tail flesh along back, belly, or side. Record the type of measurement taken. Seals are usually measured with a flexible tape.

IDENTIFICATION ~~COLLECTION~~ OF SEA LION AND FUR SEAL ^S ~~TEETH~~ BASED ON DENTITION

~~The procedure in collecting a tooth from a seal or a sea lion is as follows:~~

- ~~1. Skin and cut off 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. Method of preservation: (use a. or b.)~~
 - ~~a. Boil snout until tooth can be easily pulled and removed. Do not forcibly twist the tooth when removing - twisting will break the tooth.~~
 - ~~b. Boil snout until no more flesh remains on jaws - jaws can then be stoped dry.~~
- ~~4. Do not preserve snout in formaldehyde.~~

IDENTIFICATION OF NORTHERN SEA LIONS AND NORTHERN FUR SEALS

Northern sea lion

In fresh specimens they are light-colored dorsally and brown ventrally. The hair is coarse and short. In long-dead specimens the identification can be verified by checking the upper post canine teeth in the skull. There is an easily observed diastema (molar gap) between the fourth and fifth post canine teeth. This gap does not occur in any other seal or sea lion in the Northeast Pacific.

Adult males weigh from 700 to 1000 kg and reach 3 m in length.

Adult females weigh from 275 to 450 kg and reach 2.0 m in length.

Northern fur seal

In fresh specimens, they are dark grey to black, lighter on the throat with silvery guard hairs and an underlying layer of dense brown fur. In long dead specimens, check the upper postcanine teeth in the skull; there is no molar gap in this species. Hind flippers of this species are about twice as long as in the sea lions.

Adult males weigh from 277 to 318 kg and reach 2 m in length.

Adult females weigh from 36 to 59 kg and may reach 1.2 m in length.

FORM 10-a REMARKS ON MARINE MAMMALS IN THE CATCH

Instructions: Describe problems encountered in observations, identification, specimens collected, percentage of haul observed, discrepancies in reports, etc. Be complete in describing observations of dead or living animals.

ENTRY NO.	DATE	HAUL NO.	REMARKS
2	10/9	6	EXAMPLE - STERN TRAWLER The haul was dumped into the fish bin before it was realized that there was a sealion in it. The sealion was a large aggressive male which had to be shot since there was no safe way to remove it alive. It was 200 cm. standard length. I was unable to remove the canines because the captain was anxious to get it overboard. The live sealion was very weak, but after a few minutes it appeared to recover and was persuaded to leave. The crew threw the dead sealion overboard before I had a chance to measure it.
4	10/9	9	The whale was 4 meters long and was in an advanced state of decomposition. It was a toothed whale but I was unable to note any other important features.
7	10/10	15	EXAMPLE - MOTHERSHIP The fishing manager said that he would call me whenever a mammal is found in the bins so that I can at least note it on this side of Form 10 when I am not sampling, and I can obtain length measurements and teeth if it is dead. During the course of the day I am quite sure that I would have been aware of any mammals in at least 1/4 of the catch, so I entered 90 tons as the tonnage observed. (All later tonnages were estimated similarly.) The dead sealion was a male; its standard length was 195 cm. Both canine teeth were removed intact by boiling the snout.
6	6/14		
1	6/14		
6	6/19		

FORMS 11(A) and 11(B) - MARINE MAMMAL SIGHTING AND EFFORT FORMS

^{This}
~~These forms~~ ^{is} ~~are~~ designed to gain information about marine mammals sighted other than those 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 feel free to make copious notes and illustrations when reporting a sighting of a species which you have not previously encountered during the cruise. Records of species which you have not previously encountered or fully documented will probably not be verifiable at a later date.

Instructions for filling out Marine Mammal Sighting Form 11(A)

(* = 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 names.
2. DATE - Note proper sequence (yr./mo./day)
(7-12)
- TIME - Time of sighting is logged when the animal is first seen.
(13-16) All times are logged in GMT.
3. LATITUDE - To tenths of minutes, if possible.
(18-23)
4. LONGITUDE - To tenths of minutes, if possible. Place E or W in box
(24-30) 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. 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. 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.

Important things to look for when attempting to make an identification are:

(Note and circle characteristics on back of Sighting Form)

1. Shape and size of dorsal fin and its position on the body. If possible, also note size and shape of tail and flippers.
2. 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."
3. General shape of body (slender or robust).
4. 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?
5. Color pattern on fins and body (stripes, spots, patches, mottling, etc.).
6. 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?
7. Scars and scratch marks.

6. NUMBER SIGHTED - 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.)
(37-40)
7. BEHAVIOR - Record primary behavior observed. For example, the most 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
 - Roostertailing
 - Slow-rolling
 - Riding stern wake
 - Milling
 - Approach vessel-veer away
 - Slow roll-roostertail-slow roll

Additional notes on behavior can be made in the comments field.

8. ANGLE FROM BOW - Consider the ship a 360 degree circle when recording sighting angle; dead ahead being 000 degrees and dead astern being 180 degrees. ~~Round to the nearest 10 degrees. 045 degrees, or broad on the starboard bow, would thus be logged as 05 in boxes 47-48. 290 degrees would be logged as 29.~~
9. INITIAL SIGHTING DISTANCE - Note it in nautical miles, yards, or meters, whichever you are most comfortable with. Convert to 10's of meters and place in boxes ⁵⁰⁻⁵² ~~47-51~~. Remember that boxes ~~47-51~~ are right justified (e.g., 100 meters = 10 in boxes ~~47-51~~ ⁵⁰⁻⁵²).
10. VISIBILITY - Note 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.
14. SURFACE WATER TEMPERATURE - In degrees Centigrade. If below freezing, place a "-" in box ⁵¹ ~~51~~. Temperature is placed in boxes ~~54-55~~ ⁵⁴⁻⁵⁵ ₅₅₋₅₆.
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.

BEHAVIOR
COMMENTS

- 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.

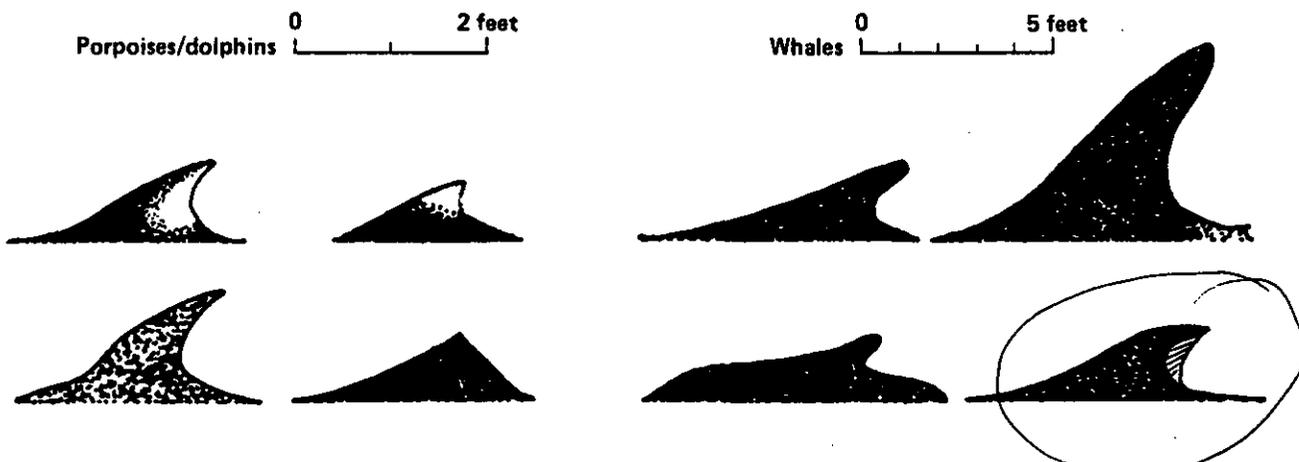
Remember, if you identify the animal, say how you did it.
(e.g., Sperm whale - 35 ft., large square head, no snout, spout at end of head and leaning forward).

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?

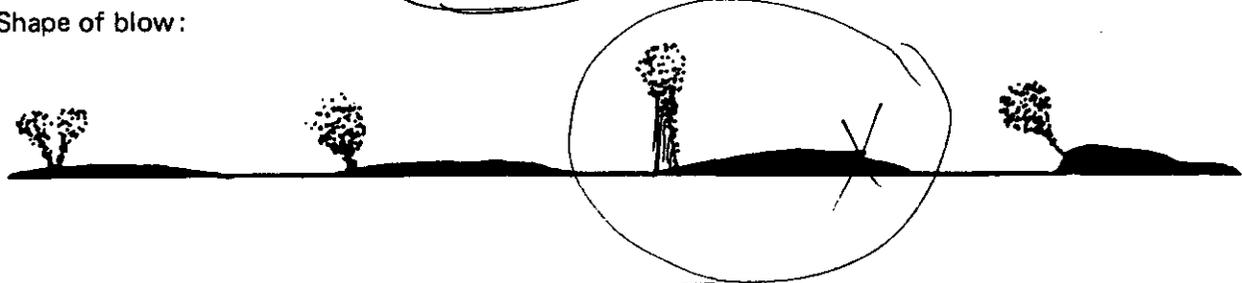
Note how close the animal approached the vessel.
Were the marine mammals attracted to the ship by the net retrieval? Were they feeding off discarded fish and fish parts? Are these mammals possibly the same ones that you have previously reported seeing?

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:



Shown 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

Instructions for filling out Marine Mammal Sighting Effort Form 11(B)

Some observers want to do extra mammal work, and one possibility is the taking of marine mammal transit observations and recording them on marine mammal sighting effort forms. Effort forms are a record of continuous marine mammal sighting effort when the distance covered by the ship can be calculated from a beginning and ending position. Effort forms are to be filled out when the ship is not pulling a net and is in a straight line transit. Any marine mammal sightings during an effort period would be recorded on a sighting form (11 A).

Fill out the same information as you do on the sighting form. (Columns 1-6, 17, 52, and 56-62, are to be left blank.) In addition, there is one other item to fill in--transit flag (column 63).

Transit Flag - This is the method of recording effort. At the beginning of your marine mammal watch, fill in the name, vessel, date, time, position, and environmental conditions, and place a "1" in box 63 (Transit Flag). When you end a watch (i.e. go below, change course more than 5 degrees, change cruising speed more than 3 knots, or if the wave height or visibility change), also fill out the above information and place a "2" in box 63. Thus, at the end of a day, there may be many watches framed by transit flags--each signifying a period of constant search, course, speed, wave height, and visibility.

Transit observations should be at least 20 minutes in duration. Do not maintain effort forms if your vessel is drifting or making very slow headway (e.g. while the ship is towing a net). Log mammals seen during these periods on the sighting forms (11 A) and make note of the vessel's activity in the

Each transit should not exceed one hour in length. If you continue to watch for mammals after one hour start a new transit line on the form.

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. 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, yellow, plastic tube implanted just below the first dorsal fin. Obtain the otoliths and scales of these fish, and store them dry in an envelope to protect them from light which tends to fade the marking chemical. These samples, along with the accompanying data on date, position of capture, etc. will be forwarded to the Nanaimo laboratory after your return.

Tags from yellowfin sole, halibut, cod, pollock, and other fish will also be forwarded to the appropriate tagging agency.

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.

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 the 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).
8. Time and date of capture.
9. Capture location (latitude and longitude).
10. Capture depth.

LOGBOOK ENTRIES

The observer logbook is not intended to be a personal diary but a record book of data not noted on any of the forms, ~~and a place to document circumstances and information concerning any possible violations of fishing regulations.~~ Include in here 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. Changes in sampling procedure, sampling problems, calculation of bin dimensions and densities, a detailed description of unidentified species, and conversations with the captain or officers on fishing strategy are all appropriate entries. Observer catch estimates, labeled with the date, haul, or set number should be recorded here, along with a description of how the estimate was obtained. It is also a good idea to keep a copy of all messages sent and received. Short comments on hauls sampled can go in the "remarks" section of Form 3, but additional explanation on anything unusual, such as a high percentage of rockfish in a hake ship trawl, or comments on hauls not sampled, can be entered in the logbook. Some observers have noted details on factory processing, or on the biology of the target species. Very little, for instance, is known about jack mackerel - what part of the water column do they concentrate in? Other observers have noted a high incidence of tumors on pollock in certain areas of the Bering Sea. At the end of the cruise, important entries should be summarized and entered in the final report.

~~It is essential that all suspected violations be fully documented in the logbook as soon after the occurrence as possible. Even if you can rely on your memory of the event, it is important that it be written down as soon as the problem is discovered. 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 any vessel(s) on the inside cover of 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 as to whether a fisheries violation has been committed.~~

COAST GUARD BOARDING REPORT

The U.S. Coast Guard has asked observers to provide them with some feedback concerning Coast Guard boardings. They do not use this information to discipline any particular ship or person but they do use it to correct problems and as a "suggestion-box" for improvements.

If you are boarded by the Coast Guard during your cruise, refer to this form at the time of the boarding so that you can collect the needed information to fill out a "Coast Guard Boarding Report".

EXTRA ACTIVITIES FOR THE BORED OR AMBITIOUS OBSERVER

Some observers have found extra time on their hands, whether because of receiving extra help in sampling, or because of the schedule of that particular ship. If you should find yourself in that position, and you wish to gather more information that would be of use, the following activities would be most beneficial:

1. Sample more hauls (sampling periods) for species composition and the incidence of prohibited species.
2. Increase the amount of catch sampled during a sampling period (larger sample size).
3. Make more observer total catch weight estimates.
4. Take pictures of yourself at work or of the factory processing.

Sometimes there are long periods when no fishing is done, so the observer has been unable to sample. At these times, some observers have inquired more about the operation of the ship or about processing and fishing methods, and have consequently brought back some interesting information in their reports. Some information may help explain differences in total tonnages or species composition of the catch by vessels of the same size class but different nationality, fishing strategy, or efficiency. If the ship is traveling to another fishing area, you can also make marine mammal transit observations from the bridge (see Observation of Marine Mammals).

Form 12 - Vessel Data Form

Form 12 is provided in a translated version as part of the contents of your translated packet. It should be given to the captain of your vessel at the beginning of your cruise so that he will have time to complete it and return it to you before you leave. After the form has been filled-out and returned to you, check it for completeness and look for any obvious errors. The information on this form will be used to fill out the "Vessel Statistics" portion of the first page of your report-two for that cruise. (Refer to subsequent pages of this manual for a complete description and further details concerning report-two.)

Form 12 - Vessel Data Form

Vessel Name _____

Permit Number _____ Vessel Type _____

Length _____ Width _____ Draft _____

Gross Tonnage _____ Net Tonnage _____

Engine Type _____ Horsepower _____

Year Commissioned _____ Radio Call Sign _____

Company _____

Home Port _____

Personnel: Captain _____

Fishing Master _____

Factory Manager _____

Number of Officers _____

Total Ship Complement _____

OBTAINING INFORMATION ON FISHING GEAR

Observers are provided with ~~translated~~ gear diagrams and asked to have the captain or one of the ship's other officers fill it out. In the past, however, observers have failed to verify or even question some of the information that was recorded, and as a result, due to misunderstanding or carelessness, much erroneous information was obtained.

Refer to "Commonly observed gear dimensions" in the Appendix - so that you can recognize dimensions that are questionable and thus verify them. While it is not expected that observers weigh the trawl doors or measure the total length of the trawl cable (warp length), there are some elements of the gear that can be easily checked. As you watch a haul come in, you can count the number of floats and bobbins and note their shape, approximate size, and material of which they are made. If there is more than one kind of float or bobbin, record each kind separately. Observe the trawl doors - note the shape, approximate dimensions, and the material of which they are made. Dubious headrope and footrope lengths can be checked using a tape measure on an occasion in which the net is not being used. As mesh size is quite important in many instances, check the measurements even if you feel the measurements you are given are reasonable. Refer to "How to measure mesh size" in the Appendix. The figure we want is the stretched measure, not the bar measure. If more than one trawl net is being used, and the dimensions vary, record the specifications of each. Note whether the trawl net has a net recorder and also note the presence of any other recording device such as an instrument to measure the amount of strain on the cables (as from a full net). Hook size and number of hooks per hachi can easily be verified by longliner observers. Refer to "Hook size chart for longliners" in the Appendix. Also pictured on the hook size

Bottom Trawl Net Dimensions And Characteristics

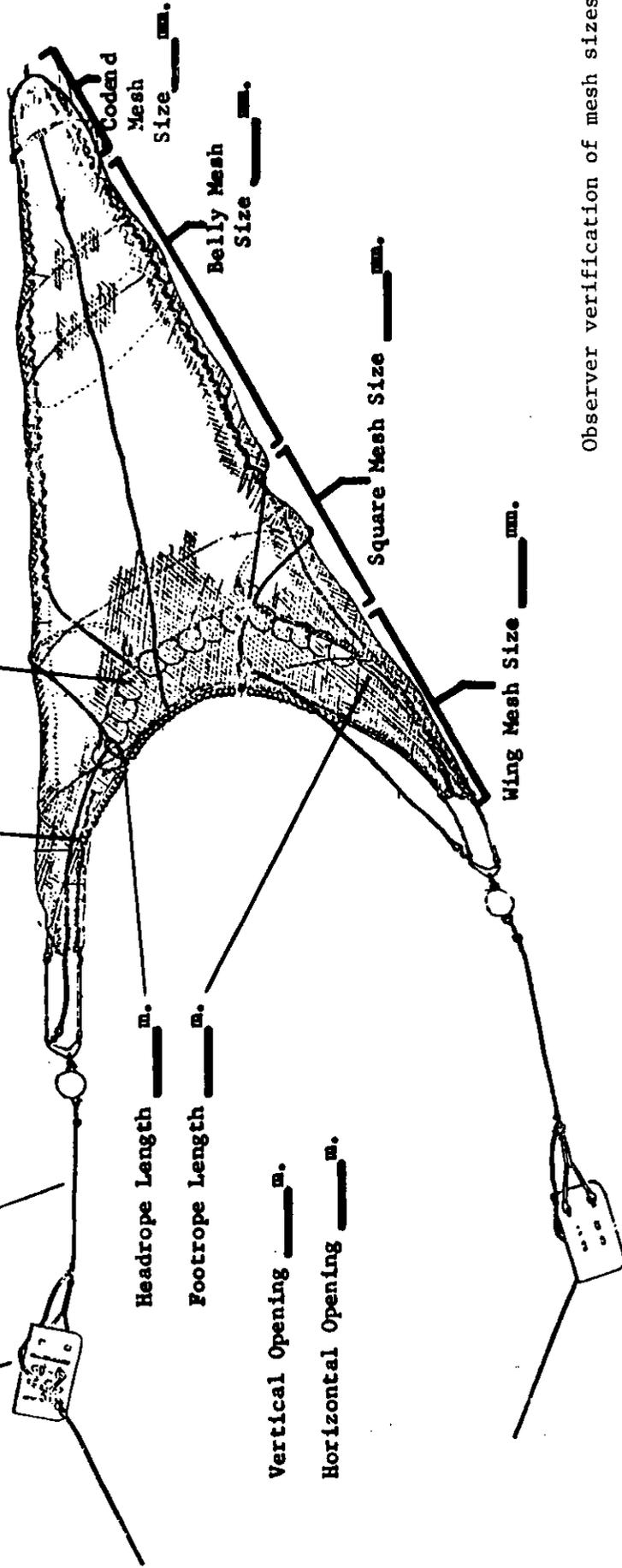
Vessel Type _____ Observation Period _____

Trawl Doors: Shape _____
Material _____ m. x _____ m.
Dimensions _____ m. x _____ m.
Weight _____ kg

Floater: Number _____
Size _____ cm.
Material _____
Shape _____

Dandyline Length _____ m.

Bobbins: Number _____
Size _____ cm.
Material _____
Shape _____



Headrope Length _____ m.

Footrope Length _____ m.

Vertical Opening _____ m.

Horizontal Opening _____ m.

Wing Mesh Size _____ mm.

Square Mesh Size _____ mm.

Belly Mesh Size _____ mm.

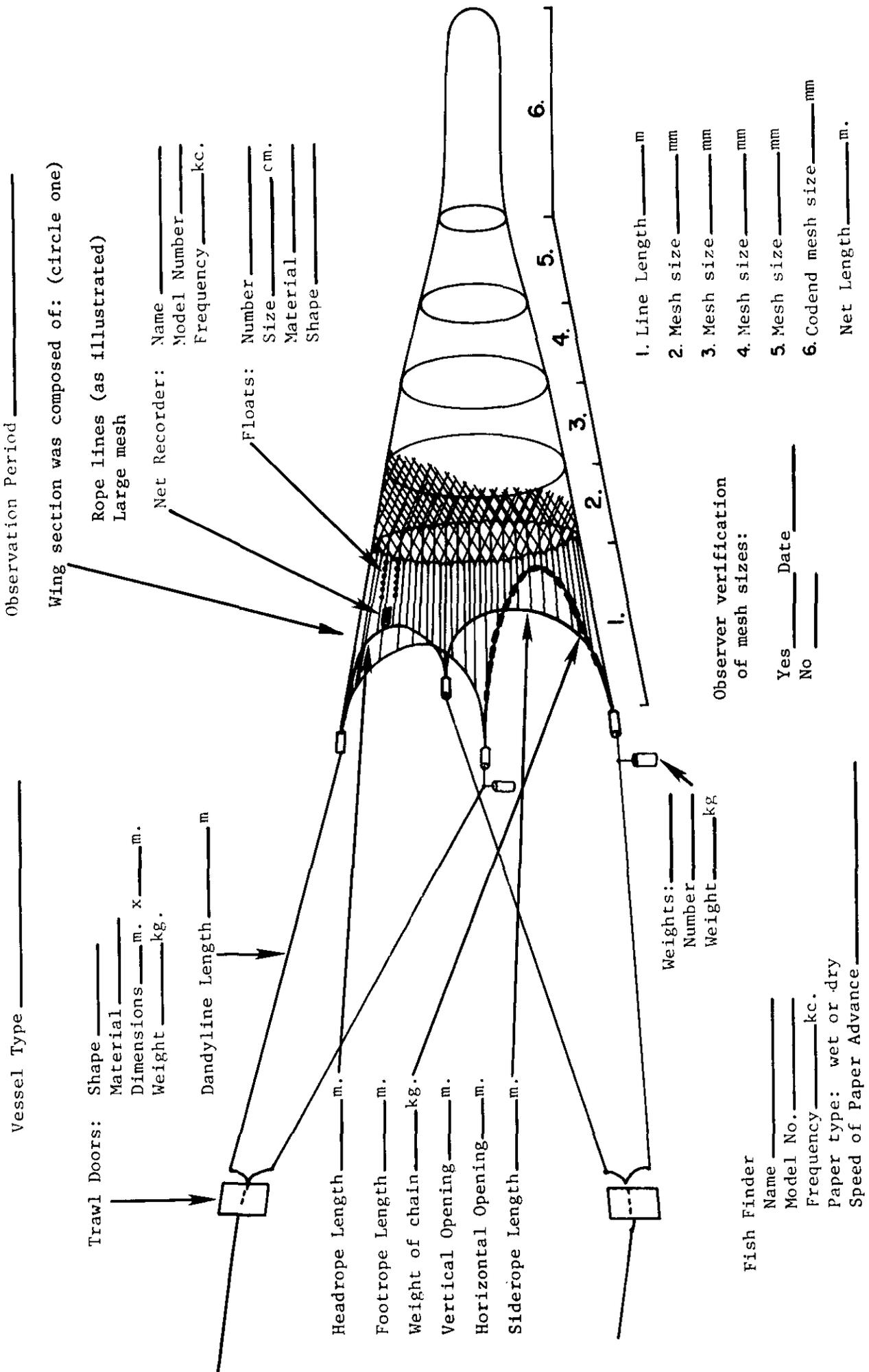
Codend Mesh Size _____ mm.

Fish Finder
Name _____
Model Number _____
Frequency _____ kc.
Paper Type (wet or dry) _____
Speed of Advance _____

Net Recorder
Name _____
Model Number _____
Frequency _____ kc.

Observer verification of mesh sizes
Yes _____ No _____

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 _____

Headrope Length _____ m.
 Footrope Length _____ m.
 Weight of chain _____ kg.
 Vertical Opening _____ m.
 Horizontal Opening _____ m.
 Siderope Length _____ m.

Weights: _____
 Number _____
 Weight _____ kg

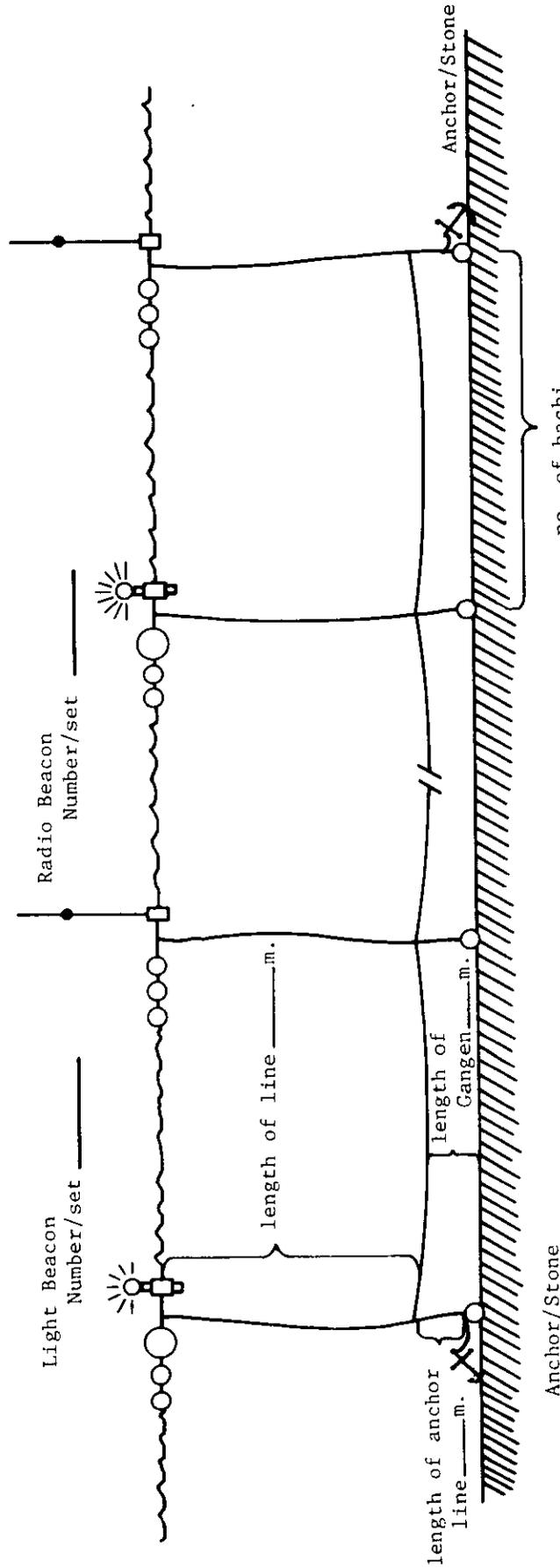
1. Line Length _____ m
 2. Mesh size _____ mm
 3. Mesh size _____ mm
 4. Mesh size _____ mm
 5. Mesh size _____ mm
 6. Codend mesh size _____ mm
- Net Length _____ m.

Observer verification
 of mesh sizes:

Yes _____ Date _____
 No _____

Fish Finder
 Name _____
 Model No. _____
 Frequency _____ kc.
 Paper type: wet or dry _____
 Speed of Paper Advance _____

LONGLINE DIMENSIONS



Average number hachi/set _____
 Average number hooks/hachi _____
 Hook size _____

Hachi Length _____
 Average set length _____ km.
 Breaking strength of gangen _____

chart is a "circle hook." Longline observers should watch for the use of circle hooks. If they are used, draw a diagram of one (to size) and report on its use in Report #2.

When recording the verified information on your report diagrams, modify the diagrams where necessary to more accurately depict the actual gear used. For example, the pelagic trawl diagram has lines in the wing of the net instead of mesh--if the net you observe has large mesh instead, note it and record the mesh size.

FINAL REPORT FORM ~~NO. 2~~

Copies of Final Report ~~No. 2~~ are provided to observers before going out on ~~the foreign~~ vessels so that they can be used as a draft if there is enough time at sea to work on them. Upon return, the drafts should be completed and very neatly written in ink or typed on the final copies of the report form. The reports will not be retyped in Seattle, so make them neat. Use complete sentences, not a telegraphic style, any time comments are requested. Please check spelling, grammar, and sentence structure. Observer reports are continually referred to by many people for a wide variety of reasons, so it is necessary for them to be well written, yet concise. The information revealed by the report is also one way that the observes performance will be evaluated.

The Final Report ~~No. 2~~ example which is given on the following pages is intended to act as a guide in completing the report, and it should serve as an illustration of some of the items that can and should be included in this final report. See also "Logbook Entries" for a list of some of the topics that are of particular interest. Advice to future observers on the host vessel or suggestions for improvement in any aspect of the observer program can also be included in this report. Additional pages can be used for summary graphs, tables, discussion of sampling problems and data bias, observations on fishing technique, special projects, or vessel diagrams.

The reports, along with your data forms, will be the most complete record of what you have done on your cruise as an observer. They will be referred to in the future if any questions arise from your data; and therefore they should be very complete and detailed. ~~Do not make reference to any other documents, such as reports #1 (Refer to the Enforcement Manual) or the observer manual,~~

~~when writing report #2. Reports #1 and #2 will be filed in separate locations and therefore much of the information and explanations will need to be duplicated.~~ Use complete sentences, good grammar and correct spelling. No abbreviations, please.

The report form example illustrates a cruise in which the observer boarded his host vessel via the transit boat from Dutch Harbor and at the end of approximately one month, he was transferred to a second vessel. The report for the second vessel would repeat the first four lines in the itinerary but would give the arrival and departure dates for the second vessel. Other points to note:

1. Contracting Agency - This should be the agency with which you are employed. In the past, this has been the University of Washington, Oregon State University, or Frank Orth and Associates.
2. Enter local and GMT dates and times as indicated on the itinerary page.
3. U.S. Transfer Co. - The name of the agency or company which either took you out to the vessel or brought you back to port. It may be the Dutch Harbor Transit, The Alaska Tug and Salvage Company, the U.S. Coast Guard, or some other organization. If the ship came into dock, write "None, boarded/debarked at dock." If a joint venture catcher boat transports you in or out of a port, write "J.V. catcher boat" and the boat's name.
4. Fill out the gear diagram which most closely resembles the gear used on your host ship, and indicate modifications in the general design where necessary. The otter trawl diagram can be used to describe a pair trawler net, for example.

5. Remember to fill out a "List of Catcherboats for Motherships" form for all motherships. Joint venture observers would only need to list the names of the U.S. catcher boats that fished for their processor.
6. Make vessel and factory diagrams fairly neat - preferably trace them onto plain white paper, 8 1/2" x 11".
7. A copy of a completed "Observer Trip Itinerary" is included in "Section II" of the manual. This form will be filled out by each observer upon their return in addition to the Report 2 itinerary page. The observer trip itinerary is used in cost accounting and bookkeeping.

OBSERVER TRIP ITINERARY *

Observer Name: JOHN BORDEN Contract Agency: U.W.

(Fill out the following itinerary with GMT dates and ship names.)

Port of Departure: DUTCH HARBOR

U.S. Transfer Co. (if any): DUTCH HARBOR TRANSIT JV - July 9 to Aug. 1
Directed - Aug 2 to Aug 4

Depart Port for Vessel: JUNE 5, 1981

Arrival aboard Sampling or Transport Vessel #1: JUNE 5 (1830 GMT) RISING STAR

Depart Sampling or Transport Vessel #1: JULY 9 (1400 GMT)

Arrival aboard Sampling or Transport Vessel #2: JULY 9 (1400 GMT) MYS SVOBODNY

Depart Sampling or Transport Vessel #2: AUG. 4

Arrival aboard Sampling or Transport Vessel #3: AUG. 5 MYS GRINA

Depart Sampling or Transport Vessel #3: AUG. 6

Arrival aboard Sampling or Transport Vessel #4: _____

Depart Sampling or Transport Vessel #4: _____

Arrival aboard Sampling or Transport Vessel #5: _____

Depart Sampling or Transport Vessel #5: _____

Return to Port from Vessel: AUG. 6, 1981 (1030)

U.S. Transfer Co. (if any): DUTCH HARBOR TRANSIT

Port of Return: DUTCH HARBOR

(Leave the following blank; the staff will fill it in later)

Local Date and Time Arrived in Seattle: _____

Date Off Payroll: _____

Observer Days on Ship # _____ : _____ Observer Days on Ship # _____ : _____

Observer Days on Ship # _____ : _____ Observer Days on Ship # _____ : _____

Observer Days on Ship # _____ : _____ Observer Days on Ship # _____ : _____

* THIS FORM WAS FILLED OUT USING THE INFORMATION FROM THE FIRST PAGE OF THE EXAMPLE REPORT 2 ON THE FOLLOWING PAGES.

Report #2

CRUISE # 025

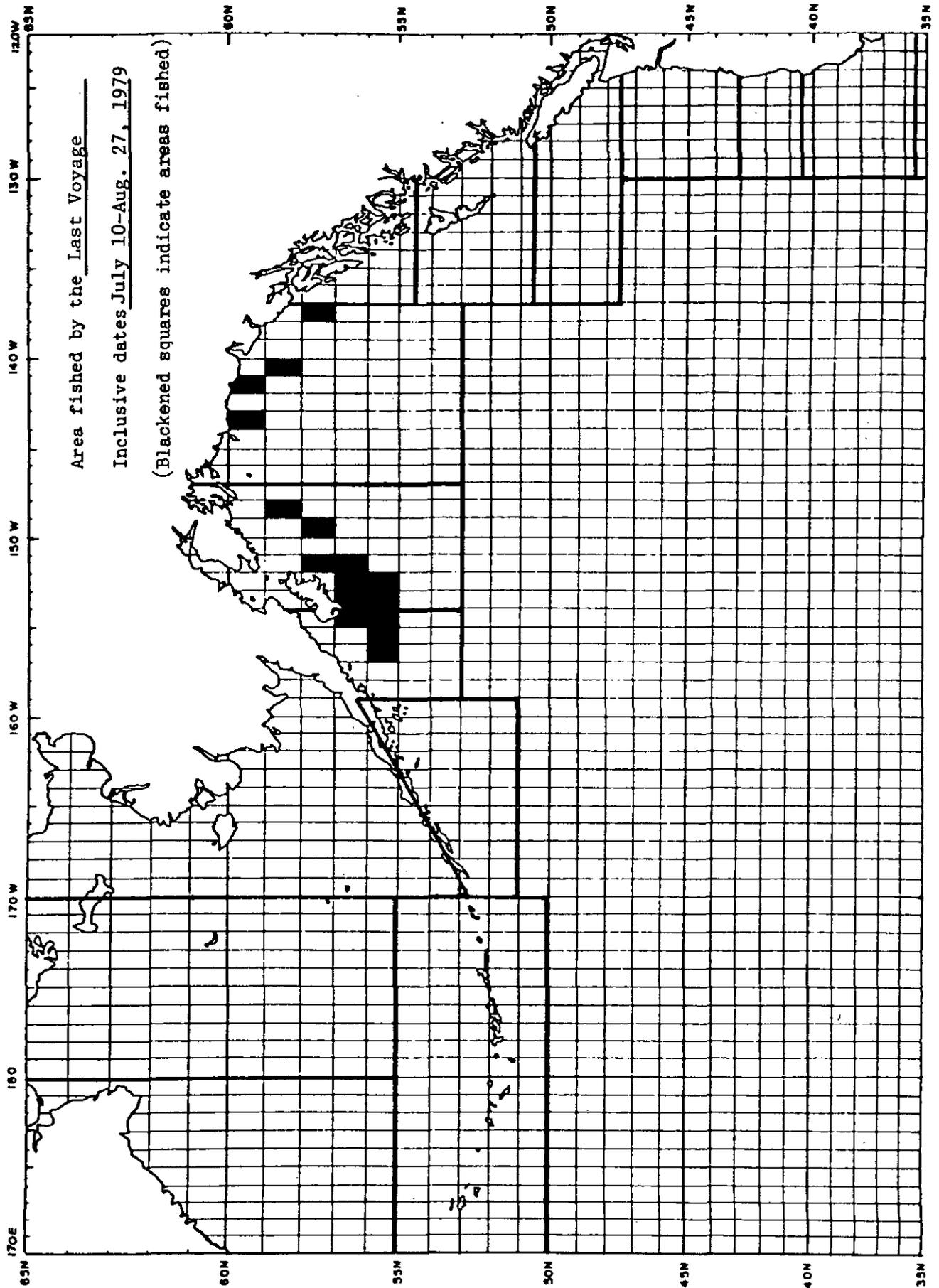
VESSEL CODE RS15

Vessel Name The Rising StarObserver John BordenContracting Agency Univ. of Wash., FRIItinerary : (Local dates and time)Depart Seattle June 3, 1981 (18:05) Return Seattle August 7, 1981 (23:35)Depart Port for Vessel June 5 (9:30) Return to Port from Vessel Aug. 6, (10:30)Port of Departure Dutch Harbor Port of Return Dutch HarborU.S. Transfer Co. Dutch Harbor Transit U.S. Transfer Co. Dutch Harbor TransitArrival Aboard Vessel June 5 (18:30) Depart Vessel July 9 (14:00)Dates Not Sampled (if any, and reasons why) June 21-22, transporting cargo;July 5, rough seas - no fishingDate Sampling Began June 6, 1981 Date Sampling Ended July 8, 1981Total # Days Sampled 30Sampling on Other Ships : Cr.# 31Vessel Name Mys SvobodnyDates Aboard July 9 - Aug. 4, 1981Name and Dates Aboard Ships Used as Transport Only : Mys Grina, Aug. 5 - Aug. 6Customs Check : Location Dutch Harbor Date Aug. 6, 1981 Time 12:30
(Local dates and time)Vessel Statistics Permit # UR-81-9995 Vessel Type Large stern trawler (BMRT)Length 83.31 m Width 14.03 m Draft 5.65 mGross Tonnage 2336.0 Net Tonnage 842.0Engine Type Diesel Horsepower 2000 H.P.Year Commissioned 1975 Radio Call Sign EJDSCompany Korsakovskaia Baza Okeanicheskogo RybolovstvaHome Port Korsakov, Sakhalin Island, USSR

Name and position of officers important in fishing operation, factory, sampling :

Captain Vladimir Petrenko Ivan Timoshenko, vessel managerBoris Ksheminskyi, factory manager# Officers 22 #Crew 44 #Processing 26 Total Ship Complement 92

GMT dates and time



List of Catcher Boats For Mothership

Mineshima Maru

Vessel Type Pollock Mothership

Observation Period 9/5 - 11/12/78

Observers George Jones

Vessel Name	Hull No.	Permit No.	Vessel Owner	Gross Tons	Horse Power	Length (m.)	Date Commissioned	No. In Crew
Kaiko Maru #8	109537	JA-77-0090	Nakazimalshizo Shoten Marunon Suisan Co.	124.79	1300	31.46	10-71	19
Ebisu Maru #21	102586	JA-77-0091	Kaiun Suisan Co.	124.66	1200	31.49	11-70	19
Kaiun Maru #25	116697	JA-77-0092	Showo Suisan Co.	124.53	1400	31.57	01-74	19
Shosei Maru #15	110037	JA-77-0094	Shuichi Nishimura	124.50	1300	31.20	09-71	19
Mitsu Maru #50	109535	JA-77-0095	Sato Gyogyobu	124.10	1300	31.51	09-71	19
Heikyu Maru #25	110034	JA-77-0098	Nippon Suisan	124.59	1300	31.21	09-71	19
Hakurei Maru	110939	JA-77-0018	"	214.46	1400	36.50	05-71	13
Shuyo Maru	109752	JA-77-0110	"	154.51	1200	34.95	08-70	14
Eiyo Maru	109753	JA-77-0111	"	194.12	1200	34.95	08-70	13
Koyo Maru	108837	JA-77-0112	"	194.49	1200	34.95	06-70	14
Fukuyo Maru	108838	JA-77-0113	"	194.28	1200	34.95	07-70	13
Katori Maru	108863	JA-77-0114	"	194.69	1200	34.95	07-70	14
Katsuki Maru	108864	JA-77-0115	"	194.66	1200	34.95	07-70	13
Aoba Maru	108865	JA-77-0116	"	194.76	1200	34.95	09-70	14
Wakaba Maru	108866	JA-77-0117	"	194.97	1200	34.95	09-70	13
Washima Maru	111168	JA-77-0122	"	204.86	1200	36.54	11-71	14
Toyoshima Maru	111169	JA-77-0123	"	204.53	1200	36.50	11-71	13
Oroha Maru	111081	JA-77-0010	"	214.65	1400	36.50	06-71	14
Kureha Maru	111082	JA-77-0011	"	214.67	1400	36.50	07-71	13
Hokkai Maru	110938	JA-77-0012	"	214.77	1400	36.50	05-71	14
Hokko Maru #77	116712	JA-77-0100	Hokkogyogyo Co.	349.62	3000	51.54	09-76	26
Hokko Maru #57	116695	JA-77-0101	"	348.77	2800	56.00	11-73	25

Danish Seiners

Pair Trawlers

Stem Trawlers

Bottom Trawl Net Dimensions And Characteristics

Vessel Type Large Stern Trawler Observation Period July 21 - August 28, 1981

Trawl Doors: Shape Rectangular, concave
Material Steel
Dimensions 3.8 m. x 2.4 m.
Weight 4000 kg

Floats: Number 45
Size 36 cm.
Material plastic
Shape spherical

Bobbins: Number 23
Size 53 cm.
Material Steel
Shape spherical

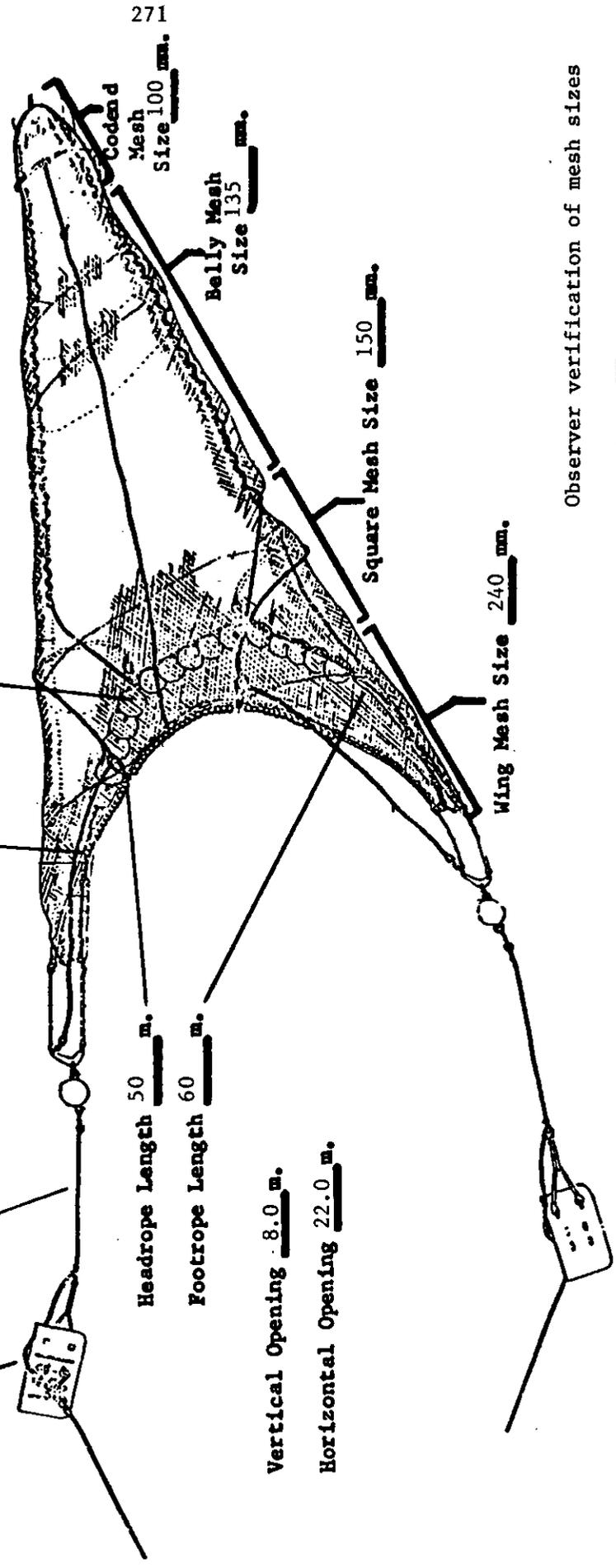
Dandyline Length 100 m.

Headrope Length 50 m.

Footrope Length 60 m.

Vertical Opening 8.0 m.

Horizontal Opening 22.0 m.



Fish Finder
Name Sanken
Model Number TV-16
Frequency 28, 80, 194 kc.
Paper Type (wet or dry)
Speed of Advance 12mm/min

Net Recorder
Name Furuno
Model Number FNR-100
Frequency 50 & 100 kc.

Observer verification of mesh sizes

Yes XX No

PELAGIC TRAWL NET DIMENSIONS AND CHARACTERISTICS

Vessel Type Large Stern Trawler

Observation Period July 16 - August 15, 1981

Wing section was composed of: (circle one)

Trawl Doors: Shape Rectangular
 Material Steel
 Dimensions 2.4 m. x 5.2 m.
 Weight 1500 kg.

Ropelines (as illustrated)
 large mesh

Net Recorder: Name ELAC-LAZ
 Model Number 28445
 Frequency 30 kHz. kc.

Floats: Number 20
 Size 22 cm.
 Material Aluminum
 Shape Sphere

Dandyline Length 80 m

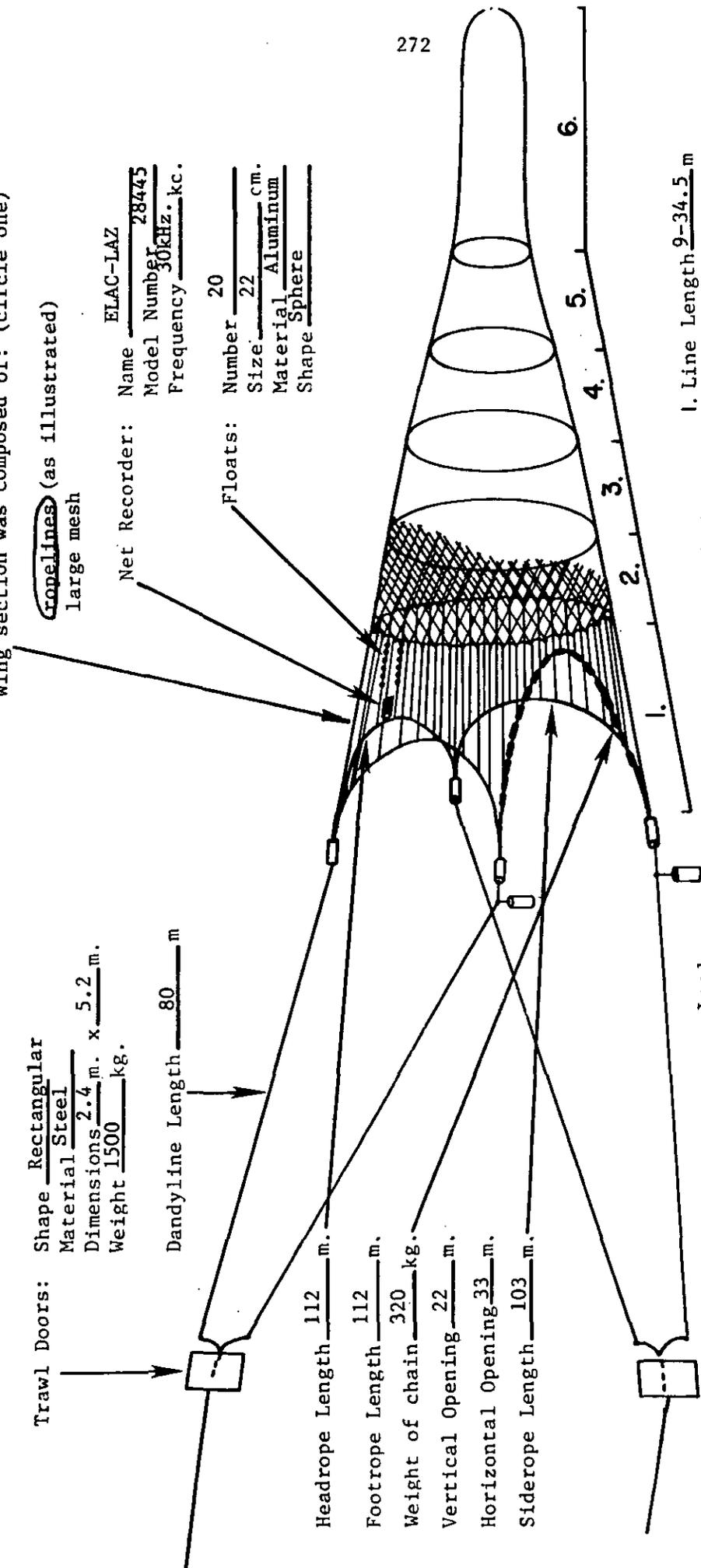
Headrope Length 112 m.
 Footrope Length 112 m.
 Weight of chain 320 kg.
 Vertical Opening 22 m.
 Horizontal Opening 33 m.
 Siderope Length 103 m.

Weights: Lead _____
 Number 2
 Weight 1000 kg

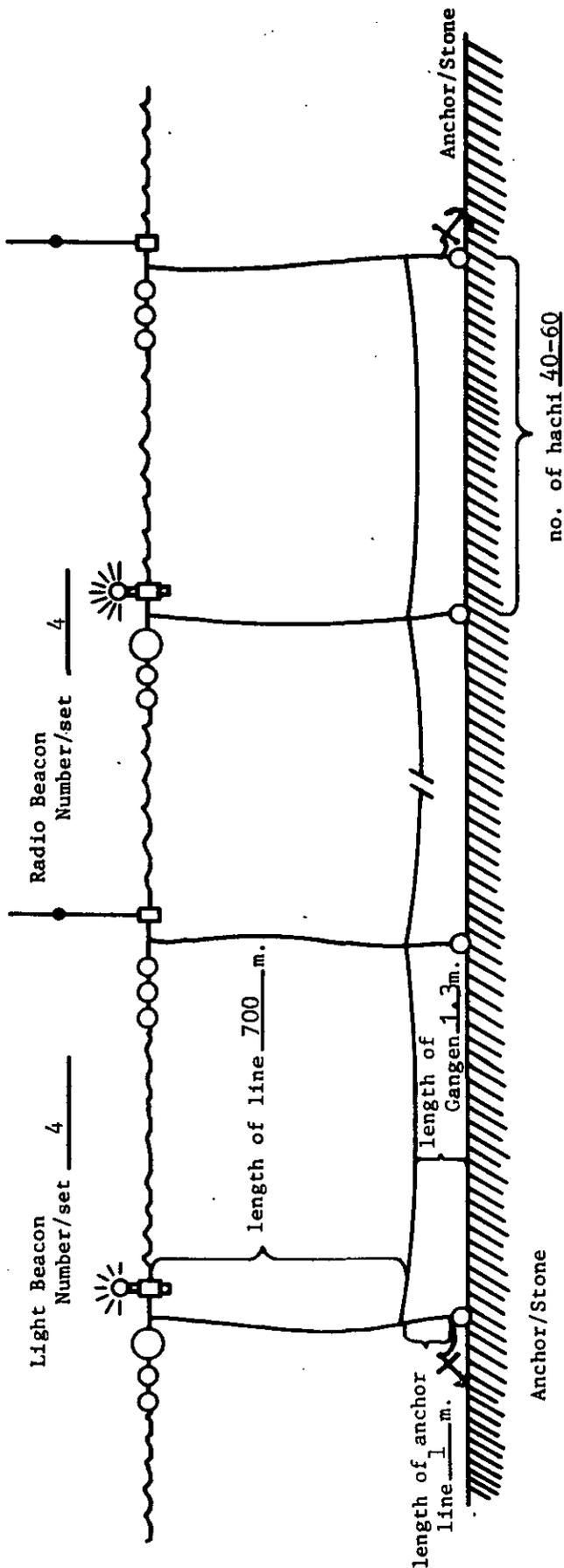
Fish Finder Name ELAC - Superlodar
 Model No. LAZ-44 119
 Frequency 50 kHz. kc.
 Paper type: wet or dry
 Speed of Paper Advance 1 cm/min

Observer verification of mesh sizes:
 Yes XX Date 7/20/81
 No _____

1. Line Length 9-34.5 m
2. Mesh size 600 mm
3. Mesh size 800 mm
4. Mesh size 400 mm
5. Mesh size 200 mm
6. Codend mesh size 120 mm
 Net Length 65.2 m.



LONGLINE DIMENSIONS



Hachi Length 95 m
 Average set Length 39.9 km
 Breaking strength of gangen 30 kg
 Average number hachi/set 400
 Average number hooks/hachi 40
 Hook size #8

no. of hachi 40-60
 length of anchor line 1 m.
 length of line 700 m.
 length of Gangen 1.3 m.
 Light Beacon Number/set 4
 Radio Beacon Number/set 4

Explanation of sampling procedures and problems; validity of data results:

Be sure to mention:

1. How is the "Total Catch" figure on form 1, 1L, 2, or 2JV derived?
2. If ships estimates were adjusted, how were the adjustments made?
3. How were the observer estimates of haul size made?
4. How was species composition and prohibited species sampling accomplished?
5. Discuss how biological data (i.e. length frequencies, sexing, etc.) were taken and explain any special projects.

General comments and conclusions; use additional pages as necessary to comment on problems, observations. Suggested entries:

6. Report the use of any innovative net design, navigational equipment, fishing strategy, or processing machinery.
7. Recount any unusual occurrence such as an accident or injury at sea.
8. Describe anything unusual concerning the catches.
9. Report anything that you feel the next observer or NMFS should know.
10. Describe any sampling problems and suspected violations.

(The following are guidelines for answering the report #2 questions listed above:)

QUESTION #1

Is the "total catch" figure coming from a summation of the weights recorded on "Section 2 - Catch" of the fishing logs or from the estimate recorded on "Section 1 - Effort"? Are there any species not included in the estimate? If so, which ones and why aren't they included?

QUESTION #2

A detailed description should be given any time the observer adjusted the ship's haul estimates. The formulas and sample calculations that were used should be shown, even if the "standard" manual method was used. Please do not make reference to the manual. A variety of people read these reports and they may not have access to the manual. You may make reference to your logbook for specific calculations and adjustment factors.

If some other "non-standard" method was used in adjusting the ship's estimates, give a thorough explanation and show some sample calculations or formulas. Also explain your reasons for using a method different than the one given in the manual.

Explanations should include why the estimates were being adjusted, what species or species groups were not being included in the estimates, and an estimate of percentages involved.

QUESTION #3

If the weight of fish was determined by volume and density of fish in the bin then the following should be answered:

- were the dimensions of the bin determined or at least checked by the observer?
- how many bins were there and did the observer check all or only some of the bins?
- how was the height of fish in the bin determined; were measuring tapes, measuring strips, or boards of equal width used?

If the weight of fish was determined by the volume and density of the codend then the following should be explained:

- were actual measurements made every time or were average measurements used?
- was a measuring tape used or standard reference points?
- what formula was used?

For any type of volume and density estimate the observer should explain how the density was determined and how often. The average density and range of densities should also be included.

Any other methods of estimating haul size should be thoroughly explained. Give your reasons for choosing this method and a sample of any calculations used.

QUESTION #4

This section should explain the who, what, when, where, why, and how of your sampling procedure. If your methodology changed with time, target species, or any other factor be sure to give explanations for each procedure used. Any method other than our "standard" basket sample or whole haul method should be thoroughly explained and justified. Below are some of the questions that should be explained in your answers.

WHO

- who collected the fish used for the samples; did an assistant and/or the observer collect the baskets of fish for basket sampling?
- if whole haul or partial whole haul sampling was done, who collected the non-target species?
- was the crew trusted to collect the non-target species?
- was the observer able to supervise the collection of all fish?
- how was the observer able to verify that everything was correctly collected?

WHAT

- what general type of sampling method was used (basket, whole haul, partial whole haul, or some other type of sampling)?

Explanations should be given for both species composition and prohibited species sampling unless they were both done simultaneously. Actual sample sizes should be given; for basket sampling the number of baskets or approximate weight sampled should be indicated. The methods used for calculating sample weights for partial whole haul samples is very important and should be well explained. Of course, for whole haul sampling the sample weight will be the ship's non-adjusted or adjusted estimate.

WHEN

- when were hauls sampled?
- were hauls sampled throughout the day; it is strongly suggested that observers construct a bar graph as shown in the manual. This is a good way to demonstrate and check that hauls are being sampled from all times of the day.
- were the hauls sampled immediately or did the observer have to wait due to delays in the processing or the dumping of the haul?
- was sampling conducted throughout the dumping or processing of the haul or from one particular section of the bin or codend?

WHERE

- where was the sampling done?
- were samples collected on the deck or in the factory?
- were the fish collected from a certain bin or conveyor belt?
- were fish collected in one area and moved to another area to be counted and weighed; factory diagrams can be very useful in this section and can be referred to.

WHY

- why was the sampling site chosen?
- why was the particular method of sampling chosen; factors frequently considered here are: the species diversity of the haul, the frequency of hauls, haul size, dumping and processing procedures, factory layout, assistance, and the ability to get high quality samples.

HOW

- how were the fish actually collected for the samples; from the codend, bin, or conveyor belt?
- were the fish shoveled, scooped, picked up by hand or allowed to fall from a codend or bin?
- how did the observer insure that the samples were collected in a random and unbiased manner?

QUESTION #5

Briefly explain how the biological data were collected and how any special projects were carried out. The detail of the description will vary with complexity of the project. As a minimum, we would like to know how the sample, usually fish, was collected, how the data were collected, any unusual occurrences or deviations from the standard methods, and the validity of the data.

QUESTION #6

- the new computerized surimi plants.
- new navigational equipment; especially on small trawlers.
- any information about the ship's fishing strategy.
- any new net designs or modifications to prevent the catch of prohibited species, sablefish, or rockfish.
- blowout panels or catch indicators being used on American catcher boats.
- the dumping or "bleeding" of codends.

QUESTION #7

- any injuries to the observer or crew members.
- any major emergencies or dangerous situations on the vessel: fires, major breakdowns, ammonia leaks, electrical malfunctions, or fights among the crew.

QUESTION #8

- any unusual or uncommon species.
- any unusually large or small catches.
- any unusual diversity or lack of diversity in the catches.
- any species found outside their normal range.

QUESTION #9

- living conditions and food aboard the vessel.
- tips for the next observer on things to bring to sea
- any problems with sampling or interactions with the crew.
- any conditions or situations that may endanger the observer.
- joint ventures: what was it like working with a joint venture representative and the U.S. catcher boats?

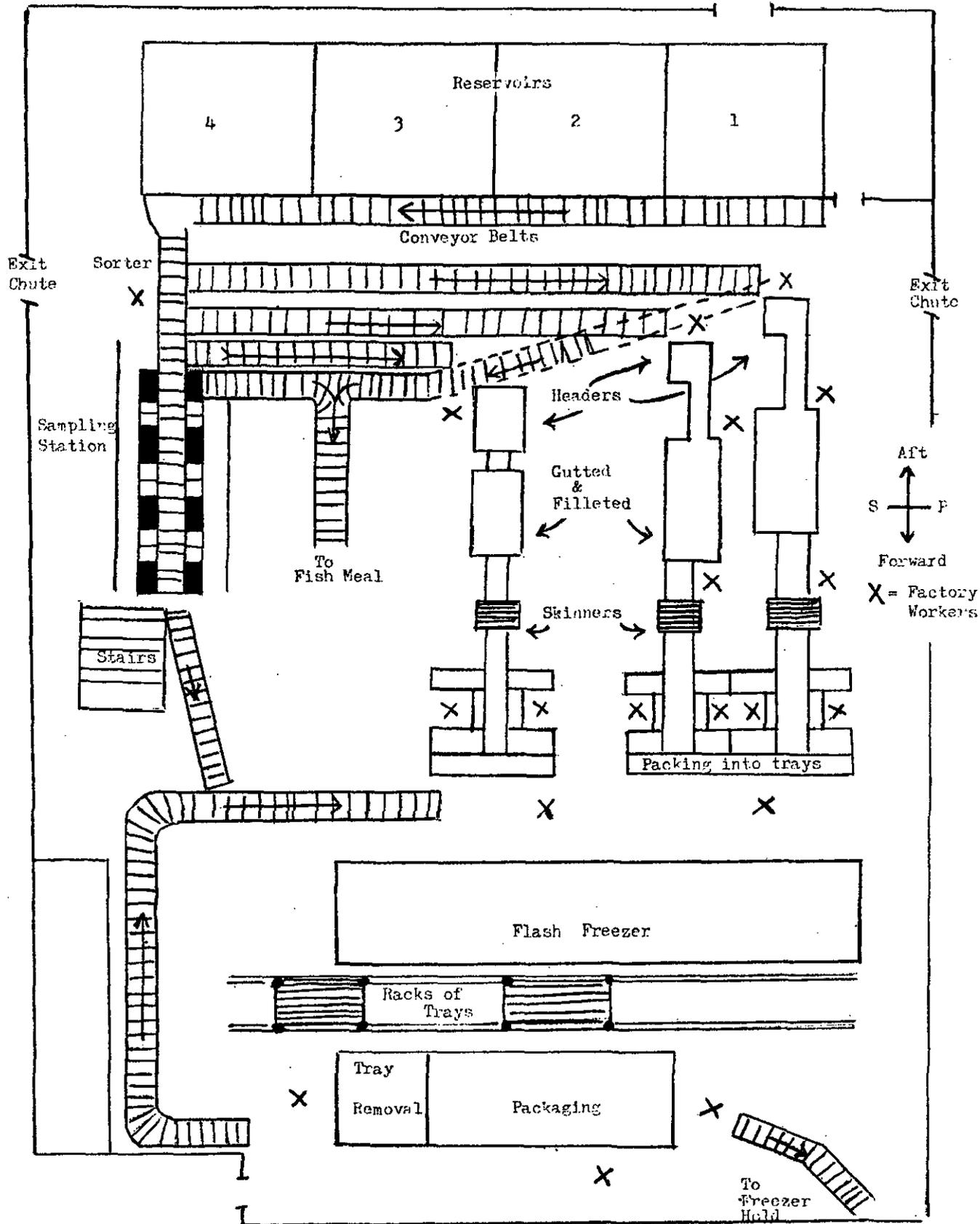
QUESTION #10

Any potential violations should also be described here. Any information on presorting or sampling interference is especially important. Also, anything else that may affect the validity of the data.

FACTORY LAYOUT
OF SEA CHALLENGER

(Tool Room)

Karen Teig



OBSERVER RETURN AND COMPLETION OF DUTY

As previously mentioned in "Transfers and Disembarkations," disembarkation arrangements are made between logistics personnel and the vessel, fishery agency, or fleet commander, and the observer should be informed of the plans. Due to the difficulties inherent in making the arrangements, however, the observer often is not given much advance notice, so be prepared when the time draws near. Continue sampling as long as it is practical, but allow enough time to pack your gear. Return all borrowed items and equipment, doublecheck your inventory list to make certain that you do not leave anything of value behind, remember to get the information on the last hauls (Data Forms ^{US} 1, ~~1, 2~~, or ^{US} 2~~34~~) especially if you sampled that day, and pack all water-sensitive items (especially data forms) in plastic bags. If the ship is going to be unable to meet the arranged disembarkation schedule, have the captain send a message as soon as possible with the new estimated time of arrival. Refer to "Radio-Telephone Procedure" in the Appendix for the correct procedure used in notifying the Coast Guard or port of your arrival at the pilot pickup point. The Appendix also contains charts of commonly used ports in Alaska (Dutch Harbor, Kodiak, and Seward) showing the pilot pick-up points. If the transfer boat does not appear as scheduled, contact them according to the embarking/disembarking directions in the section "Transport to the Ship"--Section I.

Upon arrival in the port, ^{make or} ~~remember to report to the nearest Customs office (see "Customs")--Section I.~~ Confirm your plane reservations, and arrange accommodations for yourself if you are unable to fly out the same day. You have an obligation to return directly to Seattle as soon as possible. Report to your contractor (either in person, or by phone) immediately upon your return or according to their instructions.

Following your return to Seattle, you will continue to be paid for ^{about} five working days. On return, you have an obligation to your contractor to complete all paperwork and be available to answer any questions concerning your data. The list below indicates some of the duties to be accomplished after your return:

The following should be complete at the time of your initial interview with NMFS debriefing staff:

1. If you had an injury while at sea, report it to the contract organization and the debriefing staff, even if you expect no further problems from it. A form will need to be filled out as a record of your injury.
2. Times for gear check-in will be arranged daily. All gear should be clean, and metal parts should be oiled. The equipment will be inspected for cleanliness and damage. Point out any malfunctioning items of equipment, rips in the raingear or holes in the boots. Attach a note to the item explaining the problem.
3. During initial debriefing someone will glance over your forms to catch obvious errors in filling them out and to answer any questions you may have. At this time, point out any problems you had in sampling, any fishing violations, or anything unusual about the cruise. Be prepared to take notes during the interview. This will save a great deal of time later during the debriefing process. Cruise numbers and vessel codes will be given to you at this time if you have not already received them.
4. Turn in any salmon scales other than king salmon. Make sure that they are mounted properly in plastic slides and that your initials are on the paper envelopes. These scales will be looked at and the species of the salmon will be verified.
5. Any radio messages that were not sent at sea should be completed and turned in to debriefer immediately.
6. Enter all observer estimates of catch in the designated column of Form ^{US or ZU} ~~11, 2 or 2IV~~, opposite the proper set or haul. (Remember to include in the final report a description of how the ship estimates and observer estimates are made, possible reasons for any discrepancies) ~~and percentage difference between the ship and observer estimates.~~

The following should be complete before you return to NMFS with your corrected data and reports:

1. The RM-2 and RM-4 forms should be filled out correctly (radio message keypunch forms for species composition and prohibited species). If you need to correct any of your previously sent radio messages, enter the corrected radio messages on the keypunch forms and indicate in the margins that these are changes. If your last radio message did not include data from your final days on board, enter this information on the keypunch forms and label this as "last days' data." Turn in your radio message worksheets with your RM-2 and RM-4 forms. Be sure that they are easily understandable and completely filled out. Don't forget cruise numbers, vessel codes and page numbers, put your name, the ship name and your contractors name on the first page of each form.
2. Add the cruise number and vessel codes to all of the forms and fill out the second number in the page numbering system if you have not done this already.
3. Glance over each data sheet to see that they are filled out correctly. All arrows, leading or trailing zeros, species codes, etc. should be in place. The data forms should be in perfect condition when they are turned in after the initial debriefing.
4. Write your name, the ship's name and contractor's name at the top of the first sheet of each group of data forms. This information should thus be written at the top of the first sheet of Forms 1, ~~10~~¹⁰, ~~2~~², 3, ~~7~~⁷, 8, 9, ~~10~~¹⁰, 11, and radio-report worksheets for each ship. If you need information from your data forms to complete your reports, tabulate or copy the data you need before turning in the forms. (Remember to fill out the map page of Report #2 before turning in your data.)
5. Separate your collections of otoliths by cruise if you have not already done so. Each box should contain samples from only one vessel and only one species. The otolith vials, rubber-banded in groups of ten, should be arranged by number within each box. Using a permanent felt-tip marker, write the following information on the ends of the boxes so that it can be easily read while the boxes are stacked.

Observer's name	Species name
Ship name	Vial numbers ___ through ___
Contractor's name	Box ___ of ___
Cruise number and vessel code	Area(s)
Month(s) of cruise and year	

(If you have 3 boxes of a given species for one cruise, mark them Box 1 of 3, Box 2 of 3, etc.)

After your salmon species identification has been verified and the scales have been returned to you, put them back into the original paper envelopes. Salmon scale packets should be separated into groups by cruise and species. A slip of paper bearing the same information as above should be attached to each group of scale packets.

Turn in the boxes of otoliths, packets of scale envelopes, and completed Form 9's at the same time. Leave them on the table in the debriefing room. These will be checked for proper organization and labeling. (Remember to fill in the area on each page of Form 9. Use only the two digit area codes.)

- ~~6. Complete writing Report Form #1 (Enforcement Report). Neatly print it on new report forms in ink. Add your radio message and ship's log comparison sheets to the report. Be sure to follow the section in the enforcement manual on "Writing Better Reports". If an affidavit was written, hand in a rough draft as soon as possible.~~
7. Finish writing the Report Form #2 and print it on new report forms in ink. The miscellaneous forms associated with Report #2 should also be turned in at this time. Be sure to refer to the section of the sampling manual on "Final Report No. 2". Do not leave for your home until someone has had a chance to look at it and approve it. Also turn in your logbook and observer trip itinerary form at this time.
8. A pre-keypunch check must be performed on all data forms before you leave.
9. Turn in any other supplies--calculators, books that were not turned in earlier. Clean up your work space before leaving at the end of each day.
10. Former observers have an obligation to answer questions that may turn up later as the data is being processed. Before leaving make sure that your contractor has a phone number where you can be reached and a permanent mailing address.

All observer 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.

APPENDIX

ADFG Charts - List of Sampling duties for Domestic Fisheries Observers

	<u>Page</u>
Sampling Flow Chart.....	288
Complete Listing of Sampling Duties.....	289
Relationship of Ship time to GMT.....	290
Conversion Tables - Pounds to Kilograms.....	290
Relationship of Pacific Halibut Lengths (cms) to Weights (kgs).....	291
Sexing Fish.....	294
Sex Determination for Select Target and Incidental Species.....	296
Length Measurement for Various Species.....	297
Otolith and Scale Collection for Select Species.....	298
Approximate Location of the Otoliths and the Cuts for Removal.....	299
How to Determine Sex and Remove Otoliths from Jack Mackerel.....	300
Location of Preferred Scale Sampling Zones.....	301
How to Collect Fish.....	302
Species Needed For Teaching Collection.....	303
Specimen Collection Forms.....	304
Permit for the Collection and Importation of Marine Mammal Specimens.....	306
Commonly Observed Gear Dimensions.....	308
How to Measure Mesh Size.....	309
Hook Size Chart for Longliners.....	310
Radio Communications.....	311
Radio Telephone Procedure.....	313
Charts of Alaska Ports	
Dutch Harbor.....	316
Kodiak.....	317
Seward.....	318
Calculation Guidelines: The Rounding Rule.....	319
The 54 Most Common Mistakes on Data Forms.....	320
Typical Arrangement of Vessel's Officers.....	322
Intercultural Communicating.....	323
Medical Diagnostic Chart (MDC).....	335
A Blank Copy of Each Form - - - - -	

Cardiopulmonary Resuscitation (CPR)..... 343

Directions for Helicopter Evacuation..... 344

Map of Western NOAA Western Regional Center
and Observer Program Facilities..... 345

Glossary..... 347

DIFFERENTIATION FIELD KEY FOR SALMONIDS

- A. Very small scales, Zone A scales average two millimeters across. Large blotchy spots on back and tail.....Pink Salmon, *O. gorbuscha*
or
- A. Scales are not small, on adult fish they are generally three millimeters or more across.....B.
- B. Slender body shape, not deep bodied. Short head. Square-ended tail,Steelhead, *S. gairdneri*
or
- B. Deeper bodied, good sized head, and tail is less square-ended, more forked.....C.
- C. Tail is black or dark, no silver streaks or color. No spots on tail and tail is deeply forked.....Sockeye or Red, *O. nerka*
or
- C. Tail has some silver coloration.....D.
- D. Large pupil, pupil is predominately noticeable - the iris is less so. Peduncle is slender. No spots on tail or back. Zone A scales are round, not oval, and circuli are only on one-half of scale.....
.....Chum or Dog, *O. keta*
or
- D. Pupil is not particularly large, Zone A scales are oval and circuli cover approximately two-thirds of scale. Spots are present on tail and back.....E.
- E. Black spots are on the back and both lobes of the tail. When the peduncle is grasped, the tail fin rays remain spread and do not collapse easily. Black coloration in the mouth - black gums and tongue.....Chinook or King, *O. tshawytscha*
or
- E. Spotting, tail fin and coloration not as above.....F.
- F. Spots are on the back and only the upper lobe of tail fin. The peduncle is very large and when grasped towards the tail, the tail will fold or collapse. There may be some black color in the mouth but the gums and tongue won't be all black.....Coho or Silver, *O. kisutch*
or
- F. Still stuck? These characters are the ones most commonly cited by those familiar with high seas salmon. Individuals will vary though, and all characters (not just the ones listed here) need to be considered for some fish.** Do not rely on any one character if you have reached this point and are still not sure. Be sure to collect a good scale sample for later verification of your identification.

** For further reference see: Pacific Fishes of Canada by Hart, pages 106 - 135, and A Field Guide To Pacific Coast Fishes by Eschmeyer, pages 75 - 79.

HAVING TROUBLE IDENTIFYING A ROCKFISH ?

(If so, follow the directions below!)

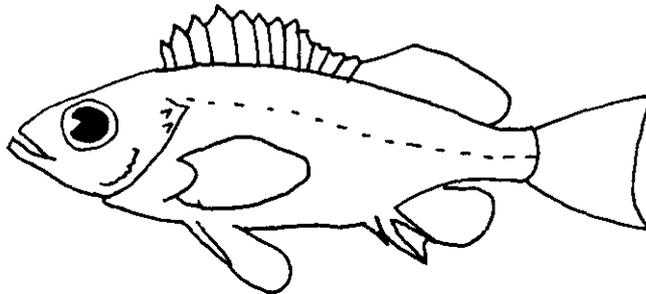
This form serves several functions. First, it may actually help you identify the fish you have, by directing you to answer questions that will guide you to the characters most useful in identifying it. Secondly, if you still can not identify the fish this way, it will provide your debriefer with a wealth of information, perhaps enough for an identification.

Are you sure it is a Rockfish? yes no probably

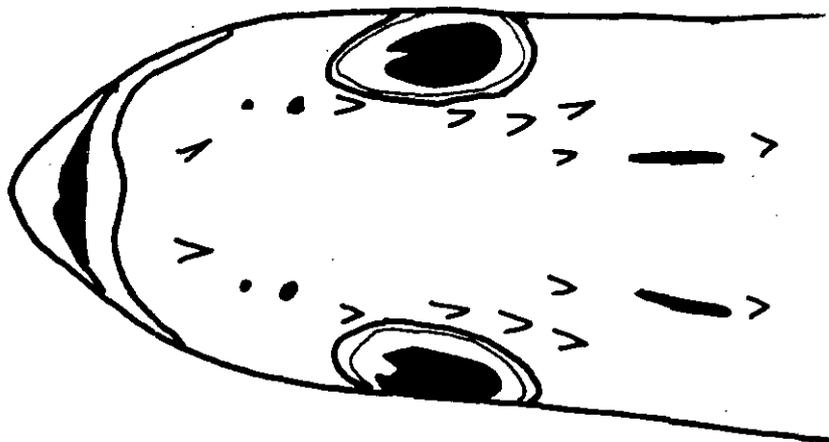
Remember that Sebastolobus is not in Hitz "Field Identification of the Northeastern Pacific Rockfish (Sebastodes)". Check the rockfish section of the species id to make sure it is a Sebastes.

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

Please fill in the color and any pattern, stripes, freckles, bars, light areas etc. Sympheseal 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.



Which rockfish species are you confused between?

What characters would help distinguish between these species?
Use all your books, Hart, Hitz, Eschmeyer and the Species ID
manual, when answering this question.

Which of these characters does the fish you have exhibit?

Which of those fish do you think this specimen most likely is?

Why are you not sure?

Which fish in Eschmeyer looks the most like your fish?

Plate number: _____ Common name: _____

Scientific name: _____

Please fill in the following meristic characters.

Dorsal fin spines:

Dorsal fin rays:

Anal fin spines:

Anal fin rays:

Pectoral fin rays:

Pelvic fin spines:

Pelvic fin rays:

Gill rakers--upper arm:

Gill rakers--lower arm:

Freeze the fish and bring it back, if you can't do that then take
a picture of it.

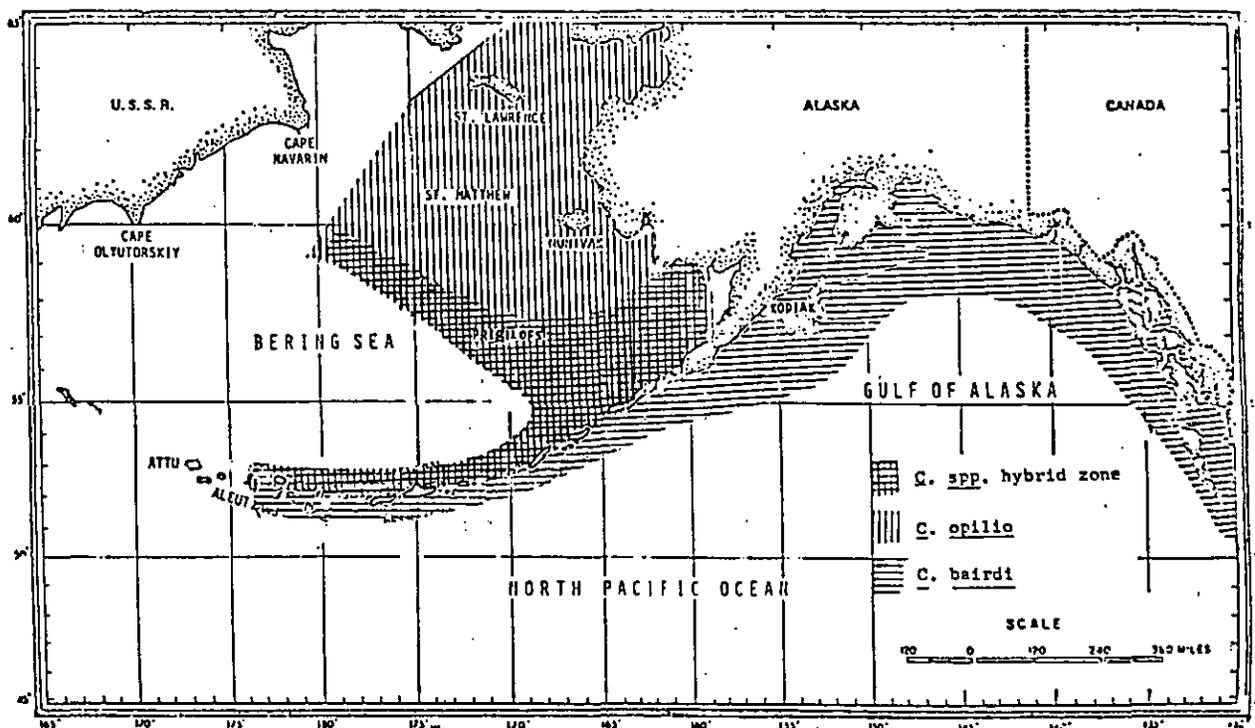
A GUIDE TO THE FIELD IDENTIFICATION
OF BERING SEA TANNER CRABS

Hybrid 47 code

INTRODUCTION

Although the hybridization between Chionoecetes bairdi (Rathbun) and C. opilio (Fabricus) has been recognized and accepted by scientists, there has been considerable disagreement over the field identification of the two species and their hybrid. The following material was prepared to aid National Marine Fisheries Service (NMFS) survey personnel with the identification of Bering Sea Tanner crabs. This material is derived from the close examination of numerous specimens and several hundred manhours of field observation.

C. bairdi is more abundant in the southeastern Bering Sea while C. opilio is present throughout the eastern Bering Sea (Figure 1). An overlap in the distribution of the parent species results in hybridization. The hybrid is characterized morphologically by variable characters intermediate between the parent species and physiologically by lower fecundity and a dimeric protein system.



CHARACTER VARIATIONS AND SPECIES CHARACTERS

EYE COLOR:

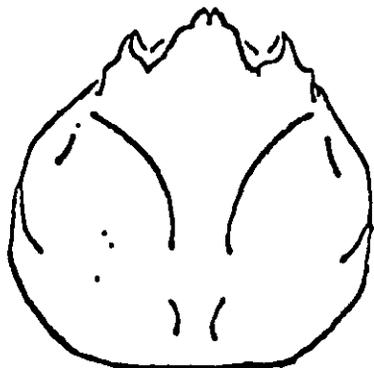
1. Red 2. Green 3. Varigated red and green

C. opilio - 2 typical, 1 rare.
C. hybrid - 3 typical, 1 and 2 frequent.
C. bairdi - 1 typical, 2 infrequent.

CARAPACE SHAPE

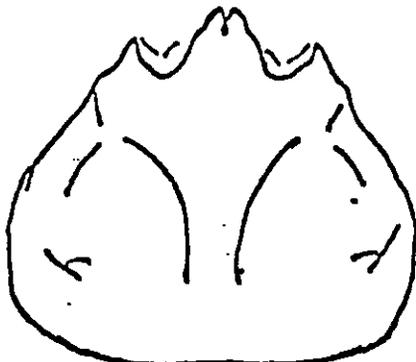
EPISTOME

1.



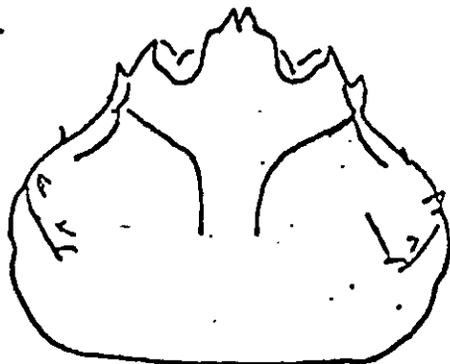
Carapace slightly rounded.
Width/length ratio about 1.05 to 1.20
No variation observed - C. opilio.

2.



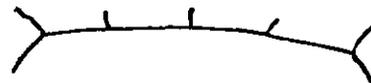
Carapace slightly wider than long.
Width/length ratio about 1.20 to 1.27
No variation observed - C. hybrid.

3.



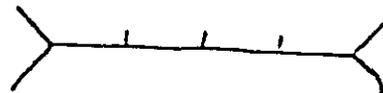
Carapace noticeably wider than long.
Width/length ratio greater than 1.27
No variation observed - C. bairdi.

1.



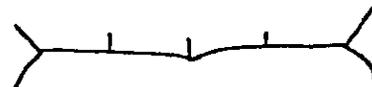
Slightly arched

2.



Flat

3.



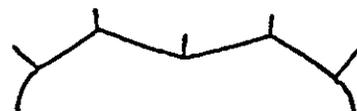
Flat with point in center

4.



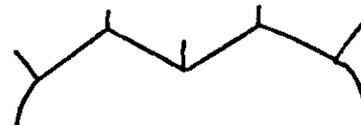
Shallow notch

5.



Moderate notch

6.



Deep notch

Epistome:

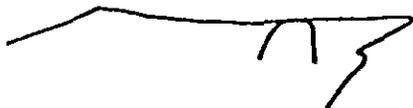
C. opilio - 2 typical, 1 frequent,
3 common in females

C. hybrid - 4 and 5 typical, 6 frequent

C. bairdi - 6 typical, 5 frequent

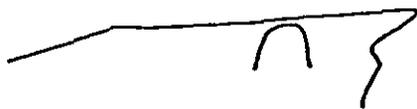
ROSTRUM (Lateral view)

1.



Flat, dorsal anterocephalic region of carapace superior to rostrum tip. Angle of inclination to 15° .

2.



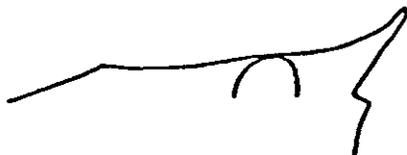
Angle of inclination 15° to 25° . Rostrum tip superior to cephalic region of carapace.

3.



Angle of inclination 25° to 35° .

4.



Sharp, steeply inclined. Angle of inclination $> 35^{\circ}$.

Rostrum, lateral view:

C. opilio - 2 typical, 1 frequent

C. hybrid - 2 typical, 1 and 3 frequent

C. bairdi - 3 typical, 4 frequent

ROSTRUM (Dorsal view)

1.



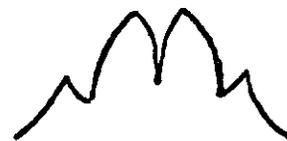
Blunt. Outer margin rounded, inner margin rounded with shallow inner notch.

2.



Blunt. Outer margin rounded, inner margin sharp. Notch, moderate to deep.

3.



Sharp. Outer and inner margins slightly rounded. Variable in degree.

4.



Sharp, angular. Outer and inner margins sharply defined. Triangular in shape and appearance.

Rostrum, dorsal view:

C. opilio - 1 typical, 2 frequent

C. hybrid - 2 typical, 3 frequent

C. bairdi - 4 typical, 2 and 3 frequent

PTERYGOSTOMIAN SPINES

CARAPACE MARGIN

1.



Small, closely spaced.
(C. opilio)

2.



Small, showing slight enlargement posteriorly. Posterior spines may deteriorate into spinate tubercles.

3.



Moderately pronounced. Strong spines exhibit noticeable enlargement with increasing distance between individuals. Posterior spines tuberculate to definite.

4.



Pronounced. Strongly spined with increasing distance between spines. Posterior three or four spines noticeably enlarged. (C. bairdi)

1.



Smooth.

2.



Slightly scalloped.

3.



Moderately scalloped.

4.



Strongly scalloped.

Pterygostomian spines:

C. opilio - 1 typical, no variation observed

C. hybrid - 2 and 3 typical, 1 common along northern edge of hybrid zone

C. bairdi - 4 typical, 3 frequent

Carapace margin:

C. opilio - 1 typical, 2 frequent

C. hybrid - 2, 3 and 4 common

C. bairdi - 4 typical, 3 frequent

=====

TRAWL WEB SAMPLE DATA FORM

=====

VESSEL _____ COUNTRY _____ OBSERVER _____

CRUISE NO. _____ VESSEL CODE _____

=====

SECTION 1:

IF SAMPLE IS AVAILABLE (fill out Section 1 only).

SAMPLE NO. _____ (attach a tag with the sample no. written on it, to the netting sample and place tagged sample, along with this form, in the plastic bag provided.)

DATE _____

COUNTRY & COMPANY where netting was made _____

PART OF TRAWL where netting was from _____

NEW OR USED, approximate age _____

CATCH (what fish was the trawl used for) _____

=====

SECTION 2:

IF SAMPLE IS NOT AVAILABLE (fill out Section 1 and 2).

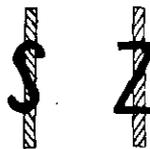
MATERIAL: POLYETHYLENE NYLON OTHER _____

COLOR _____

TWINE TYPE: Z TWIST S TWIST BRAIDED OTHER _____

TWINE SIZE: DIAMETER _____ NUMBER OF STRANDS _____

MESH TYPE: KNOTTED KNOTLESS

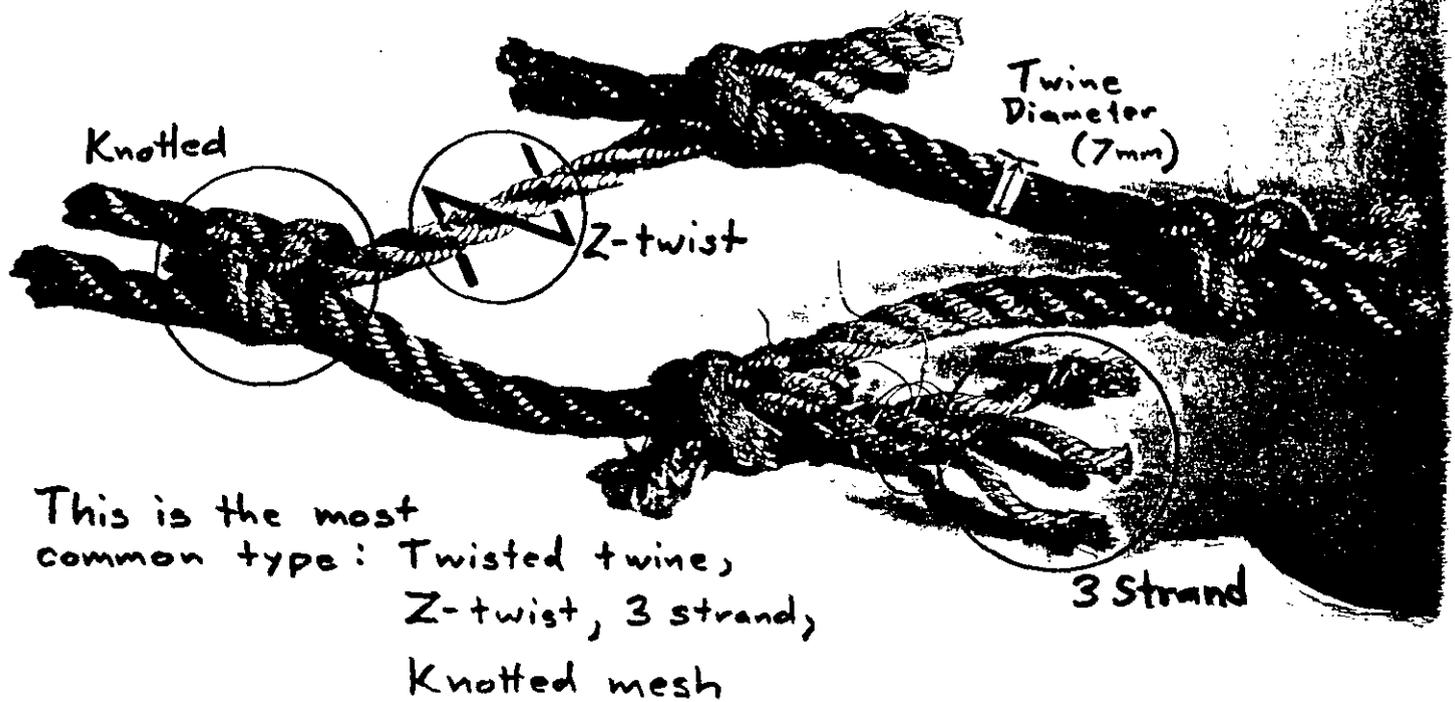


directions of twist

MESH SIZE (stretched mess): _____

=====

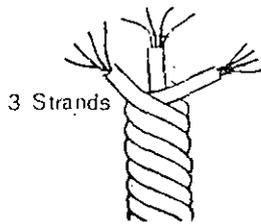
COMMENTS:



1. Direction of Twist

Z Type: Twisted from the Left to the Right

S Type: Twisted from the Right to the Left

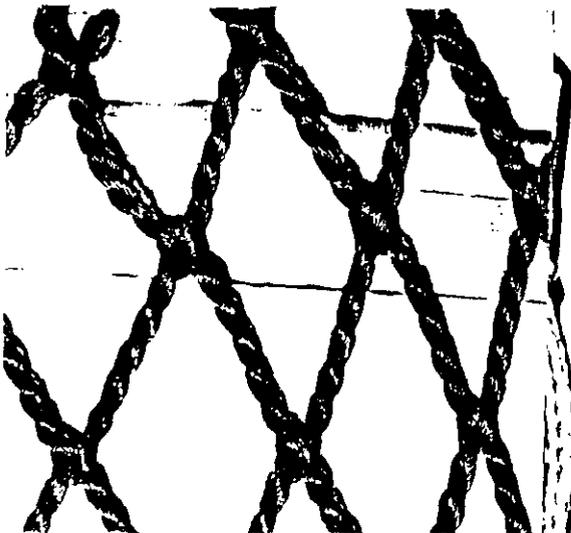


"Z" Type

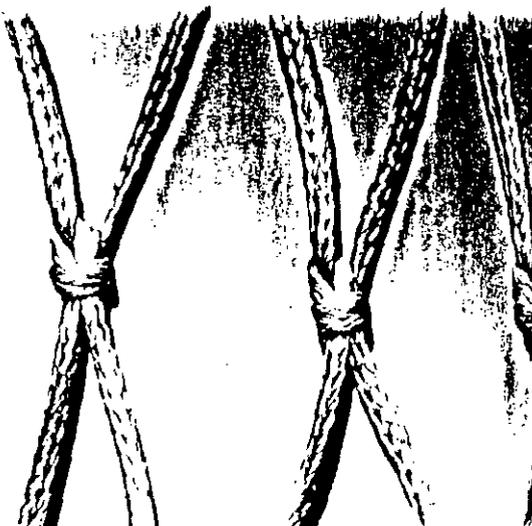


"S" Type

Twisted, Knotless



Braided, Knotted

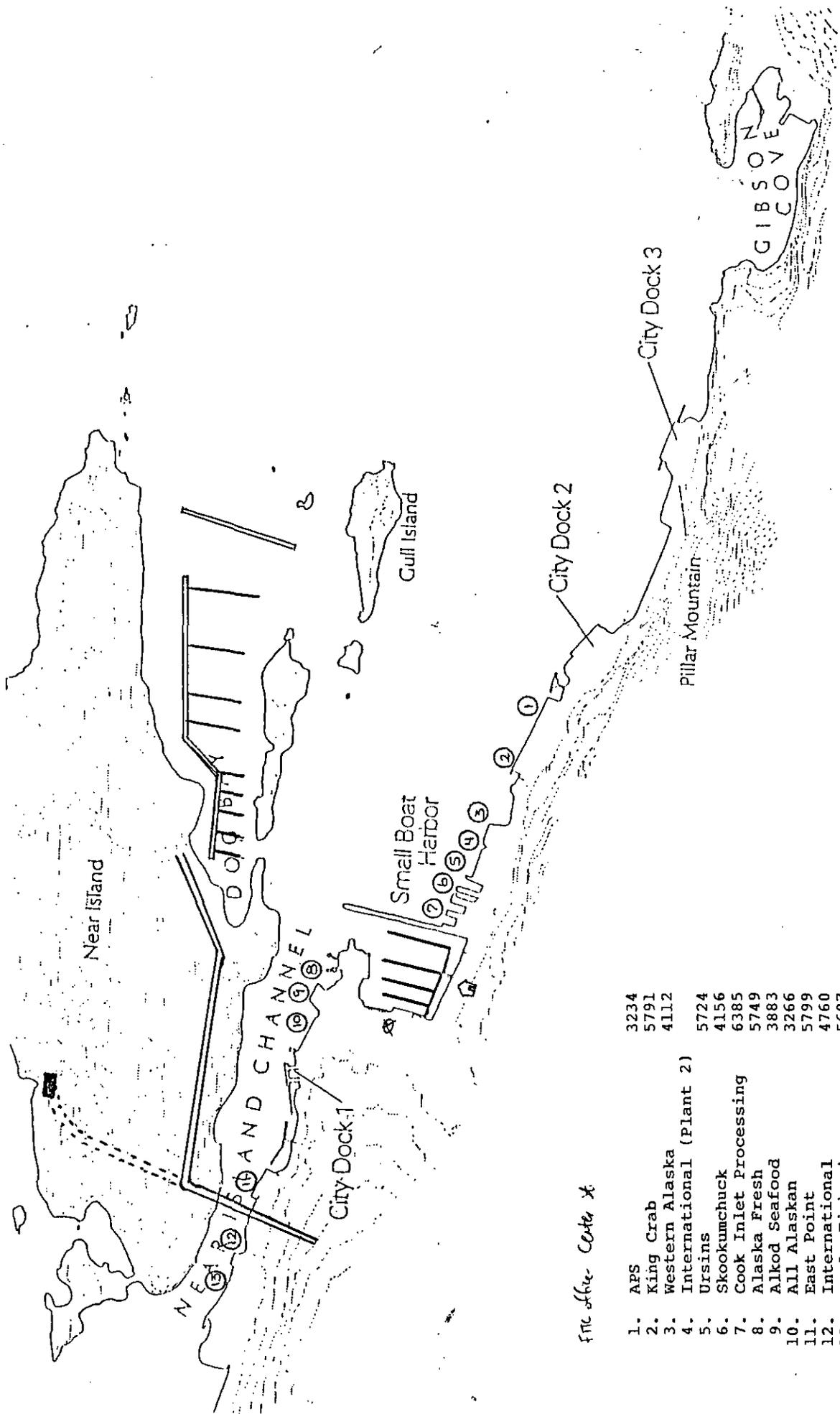


Raschel



Kodiak Processors

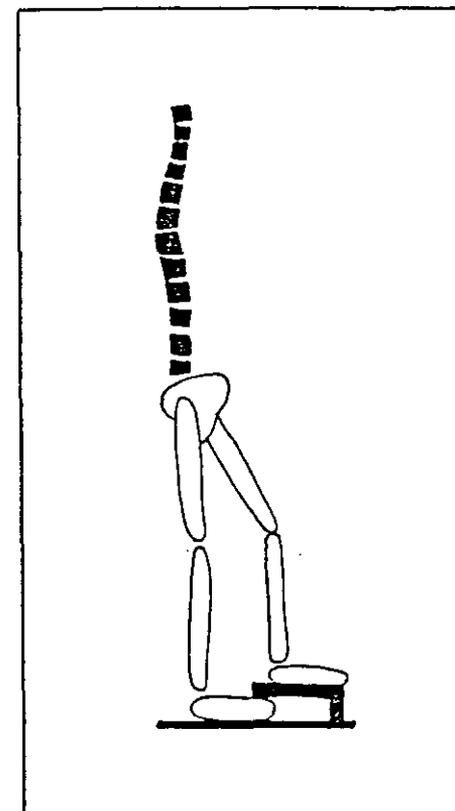
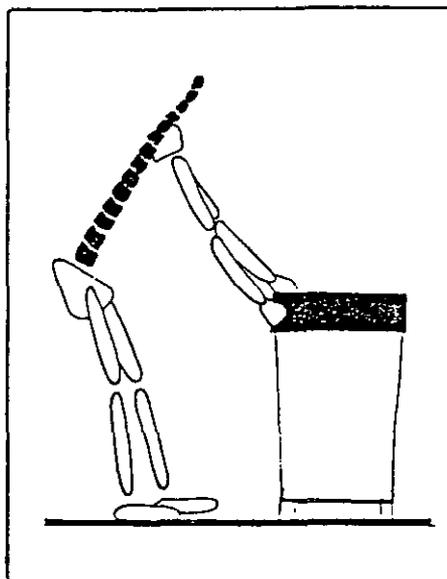
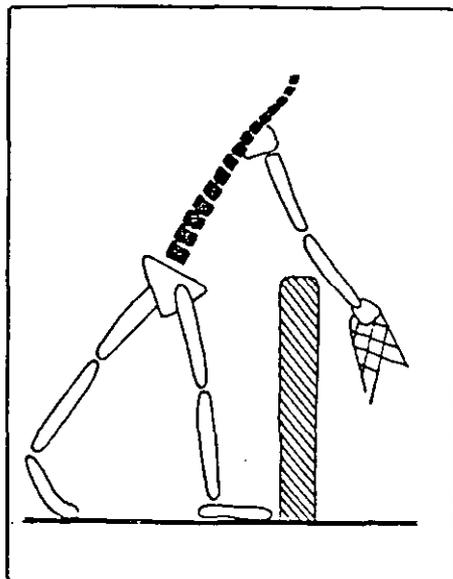
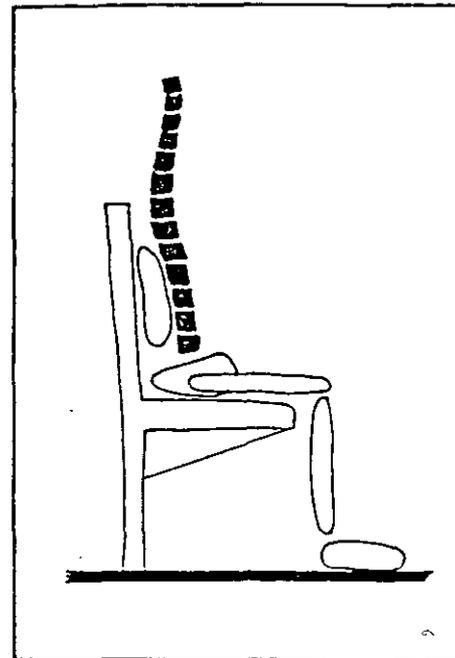
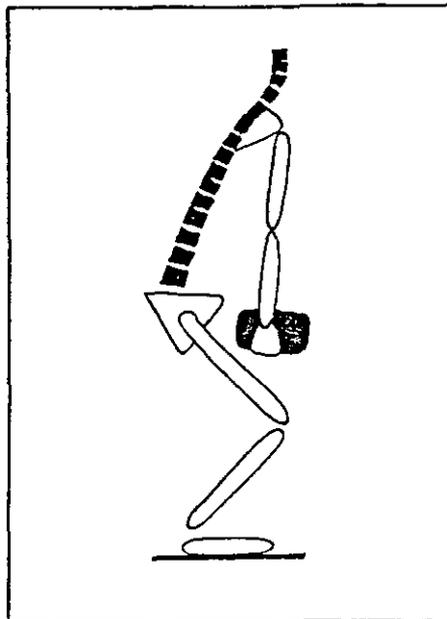
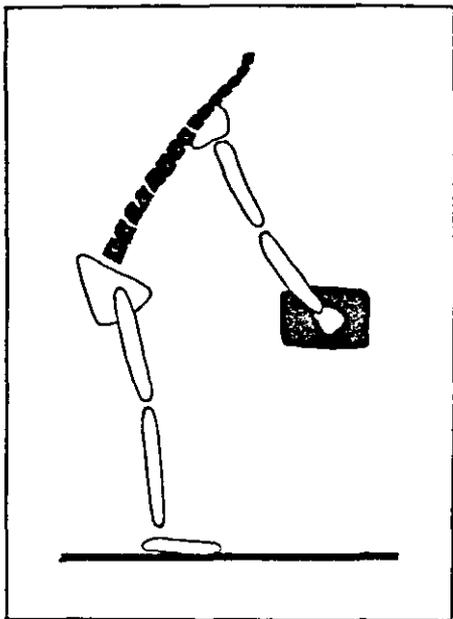
<u>Plant</u>	<u>Manager</u>	<u>Telephone</u>
Alaska Fresh Seafoods, Inc. PO Box 647 Kodiak 99615	Dave Woodruff	486-5749
Alaska Pacific Seafoods, Inc. PO Box 1126 Kodiak 99615	John Sevier	486-3234
Alkod Seafood, Inc. PO Box 648 Kodiak 99615	Jim Baglien Ray Spagnola	486-3883
All Alaskan Seafoods, Inc. PO Box 646 Kodiak 99615	Tim Blott (Mel Morris)	486-3266
Cook Inlet Processing PO Box 2639 Kodiak 99615	Phillip Friedrich	486-6385
Eagle Fisheries, Inc. 812 Marine Way Kodiak 99615	Gary Taylor	486-5607
East Point Seafood Company PO Box 1637 Kodiak 99615	Jim Major	486-5799
International Seafoods PO Box 2977 Kodiak 99615	Neil Shuckerow	486-4760
Kodiak King Crab, Inc. PO Box 1457 Kodiak 99615	Stuart Lutton	486-5791
Ursin Seafoods, Inc. PO Box 492 Kodiak 99615	John Wilcomb	486-5724
Western Alaska Fisheries, Inc. PO Box 2367 Kodiak 99615	Ken Allread (Skip Green)	486-4112



*File of the Center **

- | | |
|----------------------------|------|
| 1. APS | 3234 |
| 2. King Crab | 5791 |
| 3. Western Alaska | 4112 |
| 4. International (Plant 2) | |
| 5. Ursins | 5724 |
| 6. Skookumchuck | 4156 |
| 7. Cook Inlet Processing | 6385 |
| 8. Alaska Fresh | 5749 |
| 9. Alkod Seafood | 3883 |
| 10. All Alaskan | 3266 |
| 11. East Point | 5799 |
| 12. International | 4760 |
| 13. Eagle Fisheries | 5607 |

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.

LIST OF SAMPLING DUTIES FOR DOMESTIC FISHERIES OBSERVERS

Every Haul, Delivery, or Set:

- 1. Obtain haul, delivery or set data

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

- 1. Sample for species composition of catch. 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. You may have different sample weights for different species, therefore you may also sample the whole haul for obvious species like shark and large skate or species of interest like sablefish.
- 2. Estimate catch weight by the most accurate method available to you.

Biological data from prohibited species -

- 3. Sex and identify to species, all the salmon, king and Tanner crab in your sample if possible, or take a random subsample for sexing.
- 4. Take length measurements of all halibut, salmon, king and Tanner crab in your sample. Subsample if necessary when incidence rates are high. A subsample should be of at least 20 fish or crab.
- 5. Determine the viability of all halibut, king and Tanner crab in your sample if possible; or take a random subsample; or sample specifically for viability at another time. (Presented in order of preference.)
- 6. Collect scales from salmon in your samples for species confirmation.
- 7. Check salmon for missing adipose fins, and other fish and crab for tags. If you collect a tag be sure to record all pertinent data as requested in Foreign Fisheries Observer Program (FFOP) manual.

Every Day:

- 8. Take length measurements of 150 randomly selected fish per day. 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.
- 9. Otolith/scale collection - Choose a sampling species from those listed on page 115 of the FFOP manual. We would prefer collections from species and areas not commonly fished by the foreign and joint venture operations such as Gulf of Alaska pollock, sablefish, and POP. *don't try for stratified, just get random collection on short cruise 2-3 days.*

if short on time, do not sex fish.

*Target Species
POP only if on Rockfish boat*

Per Cruise: (not in order of priority)

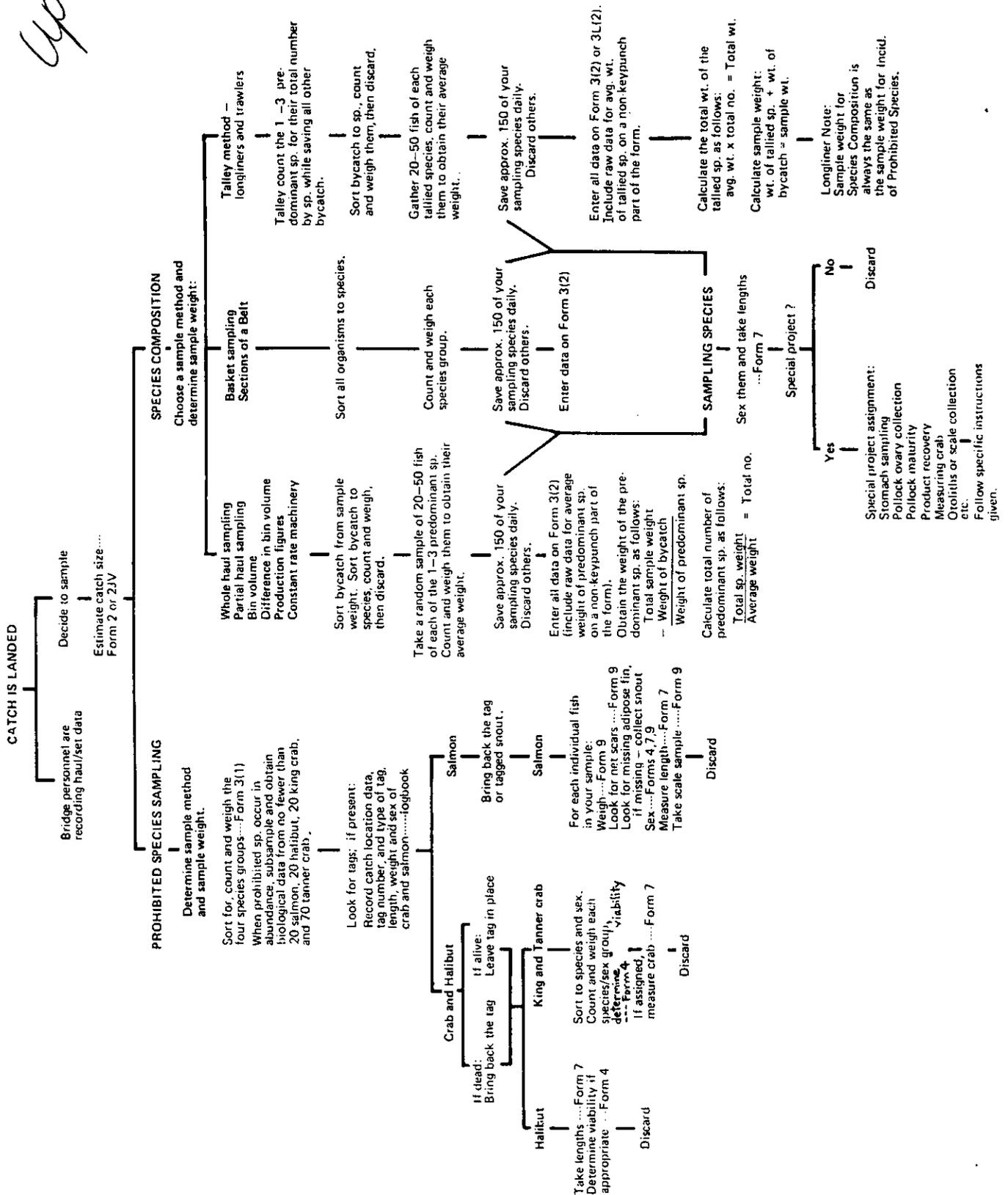
- Evaluate the accuracy of the vessel's catch weight estimations and report on their method.
- Describe the fish processing products. Obtain product recovery rates ← *Ask, don't test yourself.*
- List what species are discarded.
- Make gear, factory and, if pertinent, weather deck diagrams.

Detail incidences of net discarding and obtain net samples if possible. Calculate radio 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).

Complete report including itinerary sheet, vessel diagram, gear diagram, and map of areas fished. Give complete answers to information asked for in report questions, plus anything else you feel would be helpful to staff members or future observers.

form 12 gear form

Update



get James's list - update

COMPLETE LISTING OF SAMPLING DUTIES

Every Haul, Delivery or Set:

1. Haul, delivery or set data -- Form 2, 2JV, or 1L.
2. Monitor for compliance to U.S. fishing regulations.

Sampled Hauls, Deliveries or Sets:

1. Observer estimate of catch weight (does not have to be done for every sampled haul and can be done for unsampled hauls) -- Form 2, 2JV, or 1L.
2. Species composition -- Form 3(2) and 3L(2).
3. Incidence of prohibited species -- Form 3(1) and 3L(1).
4. Species composition by sex for king crab, Tanner crab, and salmon -- Form 3(2)
5. Halibut, king crab and Tanner crab viability -- Form 4.
6. Probability of marine mammal predation on halibut -- Form 4.
7. Check salmon for net-scars and take scales for aging -- Form 9.
8. Check salmon for missing adipose fin, and other fish and crab for tags.
9. Record species descriptions if needed in logbook.
10. RM and RM-3 radio message worksheets.
11. Incidental catch of marine mammals -- Form 10.
12. Collect canine teeth from dead marine mammals.

Every Day:

1. Approximately 150 length measurements and sex of sampling species (target and/or other species) -- Form 7.
2. Lengths and sex of salmon -- Form 7.
3. Lengths of halibut -- Form 7.
4. Special project assignment-(complete according to directions).
5. RM-1 radio message worksheet.
6. Logbook entry.

Each Week:

1. Product recovery rate and unit weight tests --Form B Worksheet.
2. Fishing logs/RM-1 comparison sheet.
3. Send radio message.
4. Sampling proportion graph (see "Observer Objectives").

Per Cruise:

1. Product recovery rate and unit weight summaries -- Form B.
2. Vessel statistics (see translated packet) -- Form 12
3. Gear diagram (see translated packet).
4. Fill out net-scarred salmon form.
5. Complete report #1 (Enforcement Report)
6. Complete report #2 (Cruise Report)

Upon Occurrence:

1. Spawning pollock -- Form 6.
2. Incidental catch of a marine mammal -- Form 10.
3. Marine mammal sighting -- Form 11A.
4. Marine mammal transit watch -- Form 11B.
5. Tagged Fish or Crab -- logbook.
6. Coast Guard boarding report.

Relationship of Ship Time to GMT

SHIP TIME						GMT
+12	+11	+10	+9	+8	+7	
1200	1300	1400	1500	1600	1700	0000
1300	1400	1500	1600	1700	1800	0100
1400	1500	1600	1700	1800	1900	0200
1500	1600	1700	1800	1900	2000	0300
1600	1700	1800	1900	2000	2100	0400
1700	1800	1900	2000	2100	2200	0500
1800	1900	2000	2100	2200	2300	0600
1900	2000	2100	2200	2300	0000	0700
2000	2100	2200	2300	0000	0100	0800
2100	2200	2300	0000	0100	0200	0900
2200	2300	0000	0100	0200	0300	1000
2300	0000	0100	0200	0300	0400	1100
0000	0100	0200	0300	0400	0500	1200
0100	0200	0300	0400	0500	0600	1300
0200	0300	0400	0500	0600	0700	1400
0300	0400	0500	0600	0700	0800	1500
0400	0500	0600	0700	0800	0900	1600
0500	0600	0700	0800	0900	1000	1700
0600	0700	0800	0900	1000	1100	1800
0700	0800	0900	1000	1100	1200	1900
0800	0900	1000	1100	1200	1300	2000
0900	1000	1100	1200	1300	1400	2100
1000	1100	1200	1300	1400	1500	2200
1100	1200	1300	1400	1500	1600	2300

Beginning of new day

During daylight savings time, Seattle is +7; Anchorage, Kodiak, and Dutch Harbor are +8.
 During the remainder of the year (standard time), Seattle is +8; Anchorage, Kodiak, and Dutch Harbor are +9.

the hauls, codends, or sets are attributed to the proper GMT day on the total catch forms (Forms ^{1US or 2US} 1, 1L, 2 or 2VL).

The dates on the sampling data forms (species composition, incidence of prohibited species, length frequency, etc.) must correspond to the dates on the total catch form. Species composition data from an independent fishing haul with a "nets off bottom" time of 0000 GMT would be entered on a new sheet of Form 3, since it would be the first minute of a new day.

Daylight hours will not correspond to the GMT day; and most ships also keep track of "ship time", in addition to GMT. This may cause a little confusion when you first board your vessel, but you will soon adapt to thinking in two time zones simultaneously. Ship time ^{will usually be Alaska} ~~may be local time, the time in~~ daylight savings time (ADST) ^{or Alaska standard time (AST)} ~~Japan, Korea, Siberia, or some other time frame.~~ Do not use ship time or dates on the data forms, ^{except for Form 11A should be filled out in local time (ADST} ~~Since most of the clocks on board may be set to ship time,~~ and meal times, bath times, etc. may be given in ship time, it may be useful to learn how to convert ship time to GMT or vice versa. Compare the times shown by the GMT and ship-time clocks, and refer to the table "Relationship of Ship Time to GMT Time" to obtain the relationship for your particular ship. Once the relation has been ascertained, you should easily be able to convert the times using the table.

Example: In the summer, ships operating off the California, Oregon coast ~~usually~~ use a ship time which corresponds to "+7" on the table. One o'clock (0100) ship time thus corresponds to 0800 GMT time; noon (1200) ship time is 1900 GMT, and 4 PM (1600) ship time is 2300 GMT. In this example, 12:00 PM (1700) June 12th ship time is 0000 June 13th GMT, the start of a new day.

Ships in Alaska may use a +8 or some other time system. (Note: The fishing logs and any other logs, should always be kept in GMT. It is a requirement of the fishing regulations.)

TABLE OF EQUIVALENTS

1 inch = 2.540 centimeters	|	1 centimeter = .3937 inches
1 foot = .3048 meter		1 meter = 3.2808 feet
1 foot = .1667 fathoms		
1 fathom = 6 feet = 1.829 meters		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 = 2.205 lb
---------------------	--	-----------------

total catch wt. in lbs \div 2.205 = 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



*add
conversion
factors
listing*

CONVERSION TABLES
POUNDS TO KILOGRAMS

Lb.	Kg.	Lb.	Kg.	Lb.	Kg.
.5	.2	34.0	15.4	77.0	35.0
1.0	.5	35.0	15.9	78.0	35.4
1.5	.7	36.0	16.3	79.0	35.9
2.0	.9	37.0	16.8	80.0	36.3
2.5	1.1	38.0	17.3	81.0	36.8
3.0	1.4	39.0	17.7	82.0	37.2
3.5	1.6	40.0	18.2	83.0	37.7
4.0	1.8	41.0	18.6	84.0	38.1
4.5	2.0	42.0	19.1	85.0	38.6
5.0	2.3	43.0	19.5	86.0	39.0
5.5	2.5	44.0	20.0	87.0	39.5
6.0	2.7	45.0	20.4	88.0	40.0
6.5	3.0	46.0	20.9	89.0	40.4
7.0	3.2	47.0	21.3	90.0	40.9
7.5	3.4	48.0	21.8	91.0	41.4
8.0	3.6	49.0	22.2	92.0	41.8
8.5	3.9	50.0	22.7	93.0	42.3
9.0	4.1	51.0	23.2	94.0	42.7
9.5	4.3	52.0	23.6	95.0	43.2
10.0	4.5	53.0	24.1	96.0	43.6
11.0	5.0	54.0	24.5	97.0	44.1
12.0	5.4	55.0	25.0	98.0	44.5
13.0	5.9	56.0	25.4	99.0	45.0
14.0	6.4	57.0	25.9	100.0	45.5
15.0	6.8	58.0	26.3		
16.0	7.3	59.0	26.8		
17.0	7.7	60.0	27.2		
18.0	8.2	61.0	27.7		
19.0	8.6	62.0	28.1		
20.0	9.1	63.0	28.6		
21.0	9.5	64.0	29.1		
22.0	10.0	65.0	29.5		
23.0	10.4	66.0	30.0		
24.0	10.9	67.0	30.4		
25.0	11.4	68.0	30.9		
26.0	11.8	69.0	31.3		
27.0	12.3	70.0	31.8		
28.0	12.7	71.0	32.2		
29.0	13.2	72.0	32.7		
30.0	13.6	73.0	33.1		
31.0	14.1	74.0	33.6		
32.0	14.5	75.0	34.1		
33.0	15.0	76.0	34.5		

metric ton = 1000 kg. = 2204.6 lb.

meter = 100 cm = 1000 mm = 3.2808 ft.
= .54681 fathoms

foot = .3048 meter = .1667 fathoms

nautical mile = 1.15078 miles (statute mile)
= 1 minute of latitude

statute mile = 5280 ft. = 1.609 km.
(1000 meters = 1 km.)

liter = 1.0567 U.S. quarts

Relationship of Pacific halibut lengths (cm) to
kilograms - round (live) weights

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

(cont'd)

Relationship of Pacific halibut lengths (cm) to
kilograms - round (live) weights (cont'd)

Length (cm)	Kilograms	Length (cm)	Kilograms
146	43.060	198	116.003
147	44.023	199	117.450
148	45.000	200	119.373
149	45.993	201	121.318
150	47.001	202	123.284
151	48.024	203	125.273
152	49.062	204	127.283
153	50.115	205	129.316
154	51.184	206	131.371
155	52.269	207	133.448
156	53.370	208	135.548
157	54.486	209	137.671
158	55.618	210	139.817
159	56.767	211	141.985
160	57.932	212	144.177
161	59.113	213	146.392
162	60.311	214	148.631
163	61.526	215	150.893
164	62.757	216	153.179
165	64.005	217	155.489
166	65.271	218	157.822
167	66.553	219	160.180
168	67.830	220	162.562
169	69.170	221	164.968
170	70.505	222	167.399
171	71.858	223	169.854
172	73.229	224	172.334
173	74.617	225	174.840
174	76.024	226	177.370
175	77.448	227	179.925
176	78.891	228	182.506
177	80.353	229	185.112
178	81.833	230	187.745
179	83.332	231	190.402
180	84.850	232	193.085
181	86.387	233	195.795
182	87.943	234	198.531
183	89.518	235	201.293
184	91.113	236	204.081
185	92.727	237	206.897
186	94.360	238	209.739
187	96.014	239	212.607
188	97.688	240	215.503
189	99.109	241	218.426
190	101.095	242	221.376
191	102.829	243	224.354

(cont'd)

192	104.576	244	227.359
193	106.359	245	230.392
194	108.155	246	233.452
195	109.972	247	236.541
196	111.810	248	239.658
197	113.668	249	242.803
-----		250	245.977

SEXING FISH

During training you will have been instructed on the proper way to determine the sex of various 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 with practice by referring to photos of roundfish and flatfish gonads in the species photo guide. See also the table in the appendix "Sex Determination for Select Target and Incidental Species." In determining sex, it is generally easiest to start with large, mature fish and work down in size to small, immature specimens.

Jack mackerel have been found difficult to sex by some observers because of their large amounts of fatty tissue. Males often have thread-like gonads running through the fat (scrape the thread and look for a small amount of milt coming out of a cut end). Refer to the diagram and instructions in the Appendix: "How to Determine Sex and Remove Otoliths from Jack Mackerel." Thoroughly dissect a few fish and identify the various internal structures so that you know what you are looking for.

Some Japanese have shown observers 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, we recommend that this method not be used. 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. Halibut have a greater likelihood of

surviving upon release, so do try to get them back to the sea as soon as possible (and away from the reach of sea lions if feasible). 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 and obtain the individual lengths, weights, scale samples, and sex before returning the fish. If a salmon is vigorous and has minimal scale loss, then the observer may quickly determine species, weight, and length and return the fish to the sea. Some observers, often as a result of pressuring from anxious crewmen, have been so eager to get salmon overboard that they have neglected to collect the necessary information. The gonads in salmon are up against the dorsal wall of the body cavity close to the backbone. When identifying the sex of salmon, make sure to slit the belly far enough forward to see the rounded sacks which are the ovaries of immature females. Male gonads are frequently two white tubes running right along the back bone.

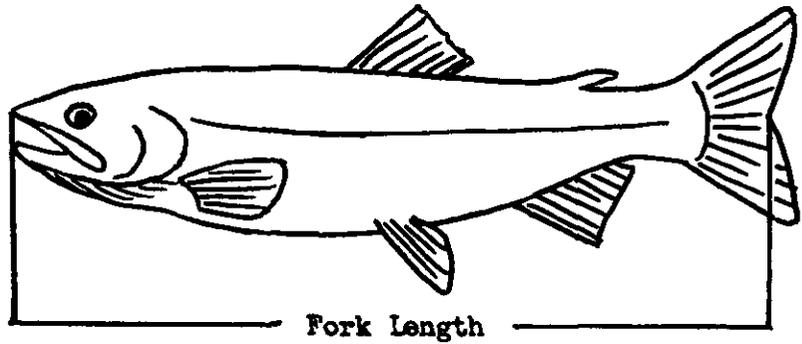
SEX DETERMINATION FOR SELECT TARGET AND INCIDENTAL SPECIES

<u>FEMALE</u>					
Immature ovary	Walleye Pollock (Roundfish)	Pacific Halibut (Flatfish)	Pacific Ocean Perch (Rockfish)	Pacific Hake (Roundfish)	
Gravid ovary	smooth, pink egg sacks; small, opaque eggs smooth, pink egg sacks, greatly en- larged; they fill cavity	triangular with a long tail lobe ex- tending posteriorly same, white, eggs usually visible	firm and yellow to flabby and red and gray firm and yellow; embryos present	pinkish, small eggs not yolked pink, eggs yolked, some eggs translucent to all eggs trans- lucent	
<u>MALE</u>					
Immature testes	white, rippled membrane	same as female with- out tail lobe; pink, fibre texture		same as pollock	
Ripened testes	white to pink ribbon-like folds, enlarged	same as immature male but soft, plump, pink to white and enlarged	all cases will be hard, finger-like projection extend- ing to posterior; white	same as pollock	
Spent testes	white to pink ribbon-like folds	same as immature male		same as pollock	

LENGTH MEASUREMENTS FOR VARIOUS SPECIES

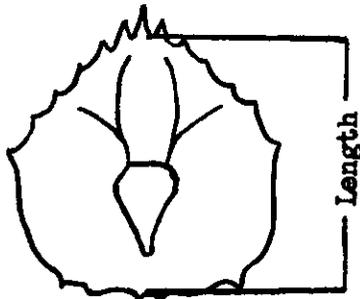
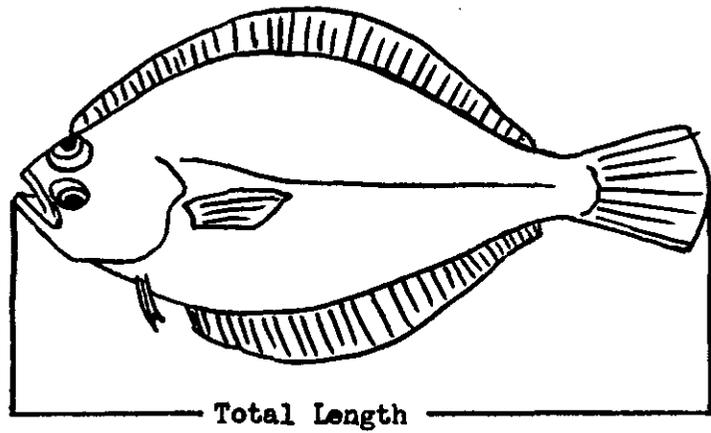
Fork Length Measure:

Roundfish
Rockfish
Salmon

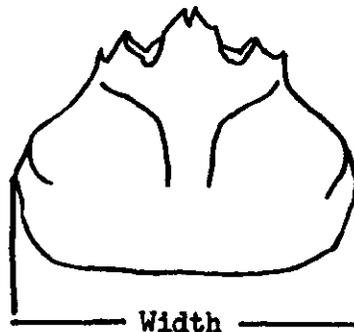


Total Overall Length:

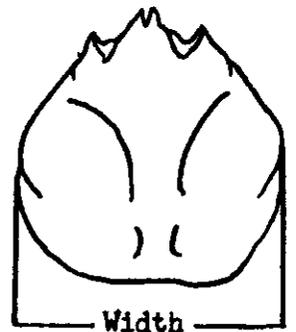
Flatfish
From snout to middle
of tail.



King Crab
Right eye socket to middle
of posterior margin.



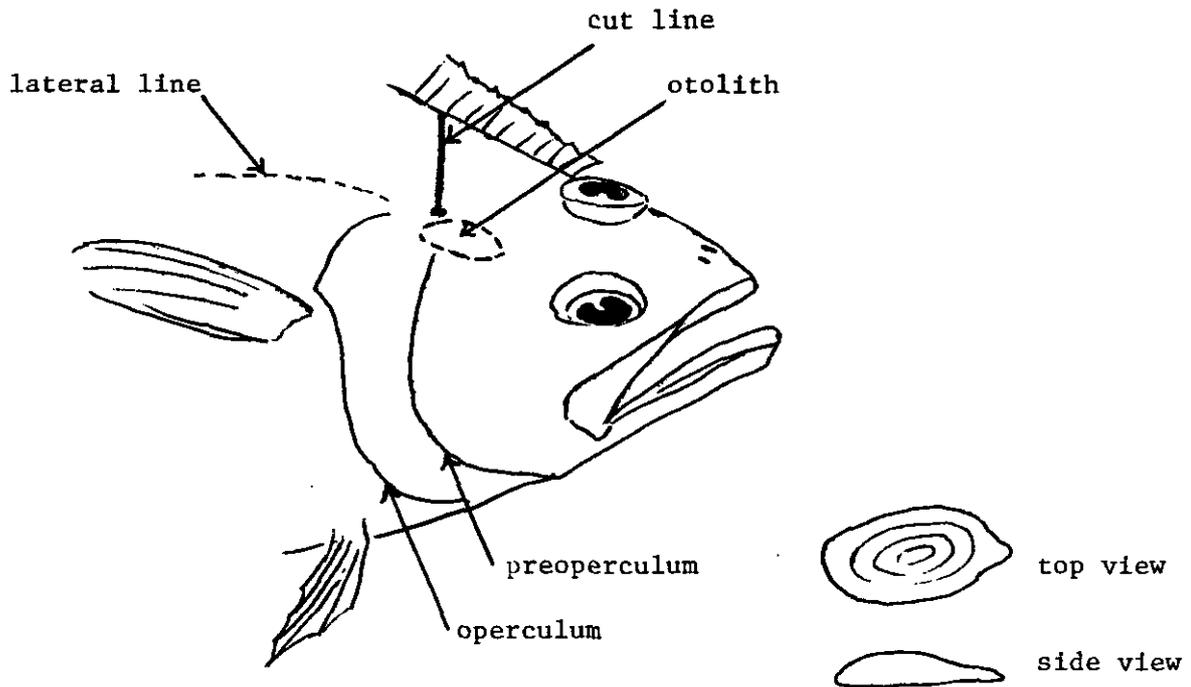
C. bairdi



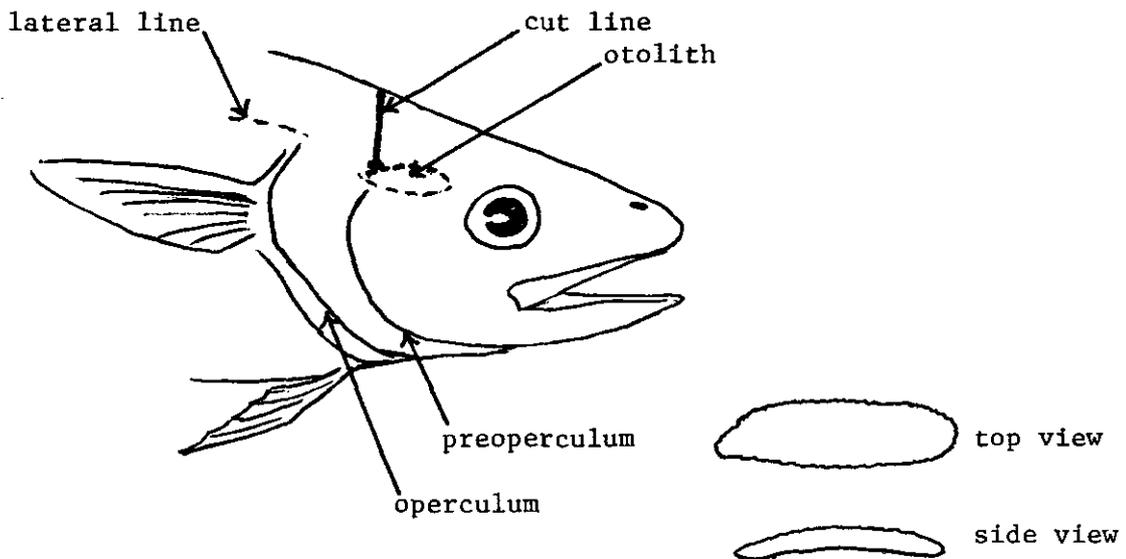
Tanner (Snow) Crab
C. opilio

Otolith and Scale Collection for Select Species

<u>Species</u>	<u>Sample Type</u>	<u>Storage Container</u>	<u>Storage Media</u>
Walleye pollock	Otolith	Plastic vial	50% alcohol 50% water
Yellowfin sole (or other flatfish)	Otolith	Plastic vial	Dry
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



Arrowtooth Flounder
Atheresthes stomias

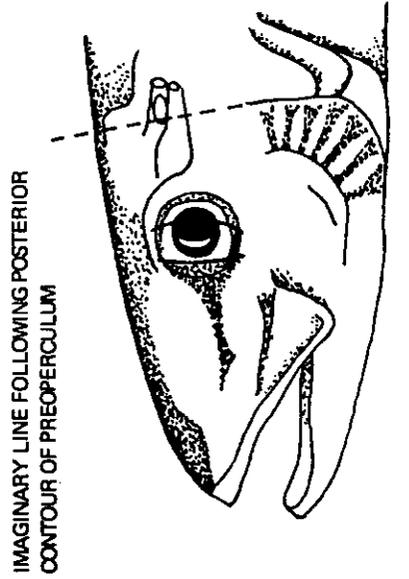
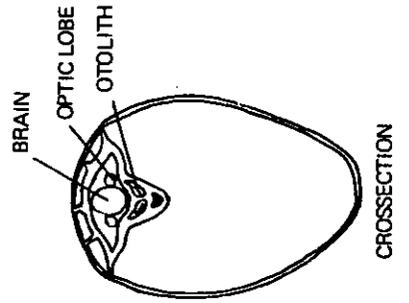
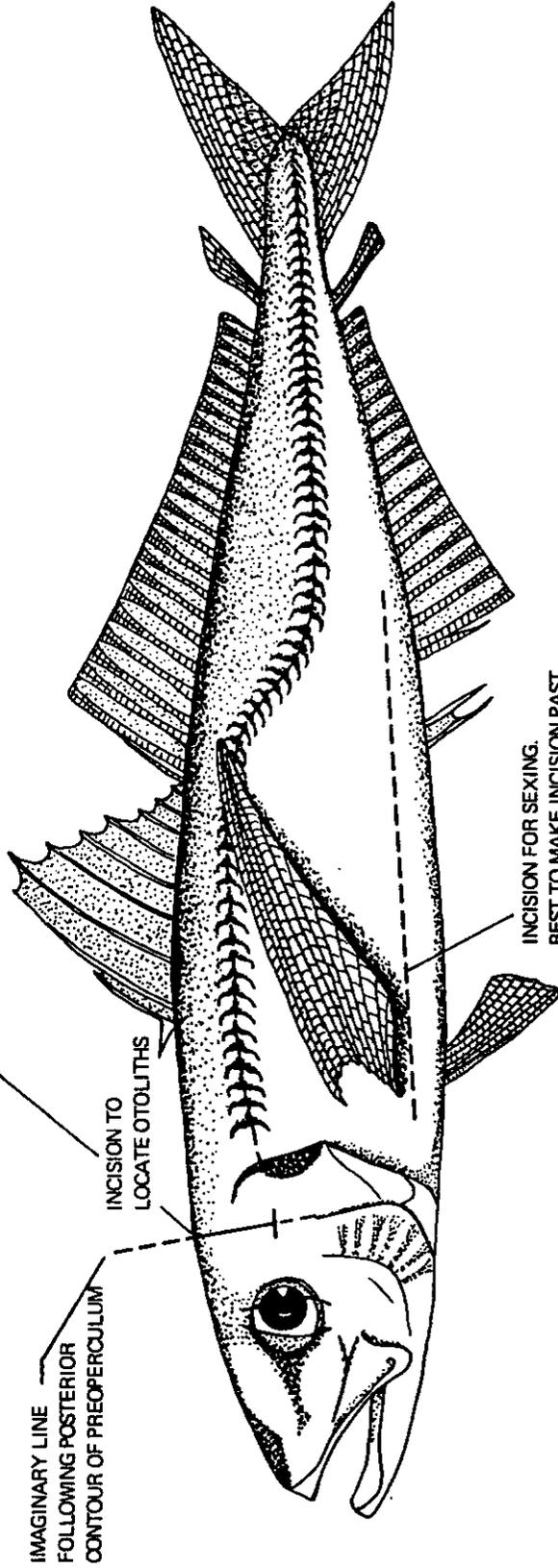


Walleye Pollock
Theragra chalcogramma

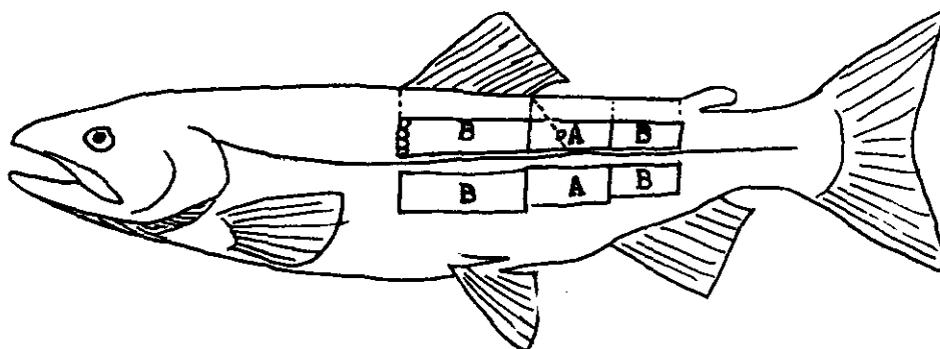
Approximate location of the otoliths (sagittal) and the cut for the removal of otoliths from flatfish and roundfish

HOW TO DETERMINE SEX AND REMOVE OTOLITHS FROM JACK MACKEREL

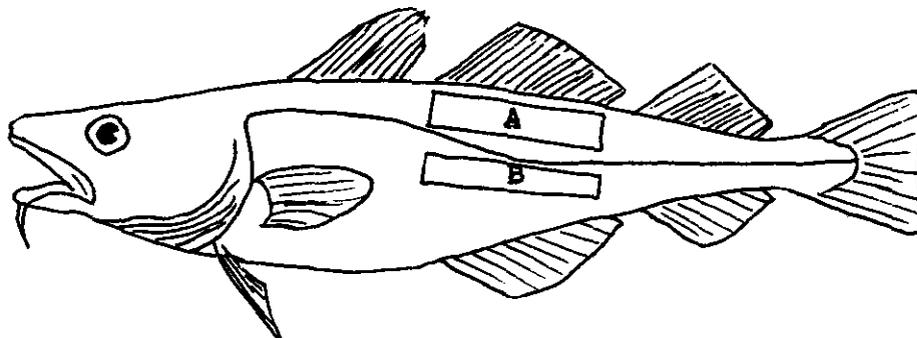
THIS INCISION IS MADE WITH A SHARP KNIFE, MAKING QUICK FORWARD CUTS AND APPLYING STRONG DOWNWARD PUSH. MAKE INCISION DOWN TO A LEVEL 1/4 WAY DOWN THE DIAMETER OF THE EYE.



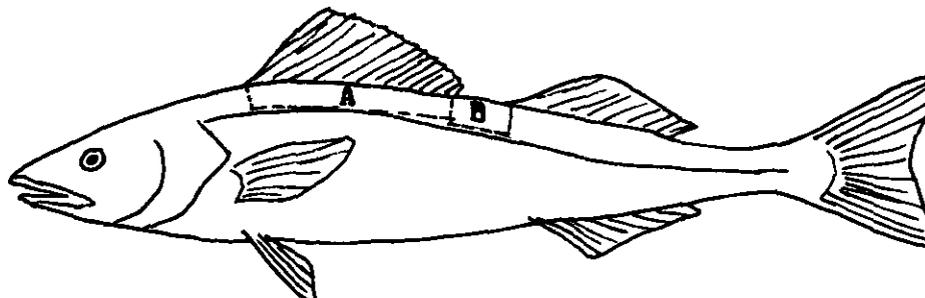
LOCATION OF PREFERRED SCALE SAMPLING ZONES
(Do not take lateral line scales)



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) - If assigned to collect scales, 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 Carolyn know, and/or maybe the ^{Royal Dutch}~~Unisea~~ Inn 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. Tell the aquarium staff you are a NMFS observer 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: _____

NOV - 4 1985



306
UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Washington, D.C. 20235

OCT 29 1985

F/M4:ERJ

Need updated copies

COPY FOR YOUR INFORMATION

Dr. William Aron
Director
Northwest and Alaska Fisheries Center
National Marine Fisheries Service
7600 Sand Point Way BIN C15700
Seattle, Washington 98115

Dear Dr. Aron:

This is in response to your request of October 7, 1985, for modifications to Scientific Research Permits No. E5, E9, 71, 113, 116, 128, 136, and 143 issued to the Northwest and Alaska Fisheries Center. It was received on October 11, 1985.

The attached modifications extend the period of authorized taking under those permits from December 31, 1985, to December 31, 1986.

We have authorized a one year extension only because the research originally proposed has been successively modified for several years without public or Marine Mammal Commission review. A one year extension will allow uninterrupted research while preparing a new application covering present and future research.

If you have any questions in this regard please do not hesitate to contact Wanda L. Cain (202/634-7529), of the Office of Protected Species and Habitat Conservation.

Sincerely,

William G. Gordon
Assistant Administrator
for Fisheries

Enclosure



U.S. DEPARTMENT OF COMMERCE
 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
 NATIONAL MARINE FISHERIES SERVICE

Modification of Permits

Pursuant to the provisions of Sections 216.33(d) and (e) of the Regulations Governing the Taking and Importing of Marine Mammals (50 CFR Part 216), and Section 222.25 of the regulations governing endangered species (50 CFR Part 222), Permit No. E5 issued to the Northwest and Alaska Fisheries Center, National Marine Fisheries Service, 7600 Sand Point Way, BIN C15700 Seattle, Washington 98115, on March 3, 1976 (41 F.R. 10248) as amended February 22, 1979, and December 31, 1981 (46 F.R. 1765); ~~1981 (46 F.R. 1765);~~ Permit No. 128 issued on March 12, 1976 (41 F.R. 11593) as modified September 9, 1976 (41 FR 41736), and December 31, 1981 (46 FR 1765); ~~Permit No. 136 issued on June 15, 14, 1985 (50 F.R. 25734),~~ are further modified as follows:

6. Permit No. 128
 Section B-9 is modified by deleting "December 31, 1985" and substituting therefor the following:
 "December 31, 1986."

These modifications are effective on December 31, 1985.



 William G. Gordon
 Assistant Administrator for Fisheries
 National Marine Fisheries Service

10/29/85
 Date

COMMONLY OBSERVED GEAR DIMENSIONS

Trawl Dimensions	Vertical opening	Horizontal opening (dimensions are in meters)	Headrope length	Footrope length
<u>Japanese</u>				
Dependent stern trawlers	4-9	24-30	36-54	57-65
Pair trawlers	7.5	56	130	148
Danish seiners	7	35	115	128
Large independent stern trawlers	7-27	22-35	50-85	54-90
Small independent stern trawlers	3.5-7.5	12-30	55-65	50-70
<u>Soviet</u>				
Bottom trawl	4.5-8	16-28	31-50	35-60
Pelagic trawl	25-30	35-45	70-120	70-120
<u>Korean</u>	6-7.5	22-40	64-80	75-100
<u>Polish</u>	18-23	20-68	55-112	55-112

308

Japanese Longline Dimensions

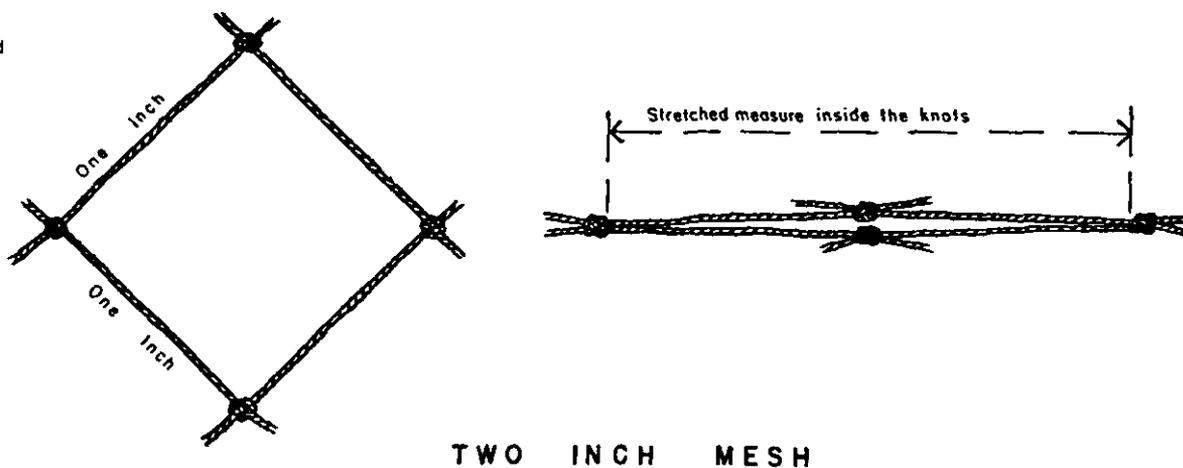
hachi length 70-100 m
 average set length 24-40 km
 breaking strength 20-40 kg
 average number of hachi/set 390-420
 average number of hooks/hachi 35-51

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.

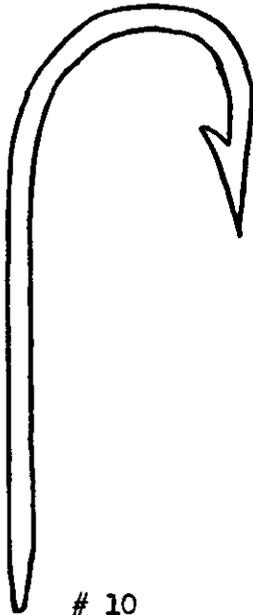
An easier way of obtaining the same measurement (the net does not have to be empty) is to measure the distance between two adjacent knots in a mesh square (the side of a square) and multiply by two. Check several meshes in each part of the net.

W. L. Scofield



A two-inch mesh, open (left) and stretched. This points up variables inherent in web measure and consequent difficulties. Common yardstick is "stretch measure."

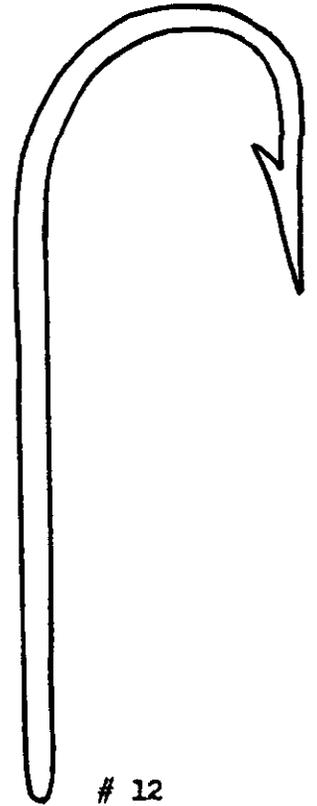
HOOK SIZE CHART FOR LONGLINERS



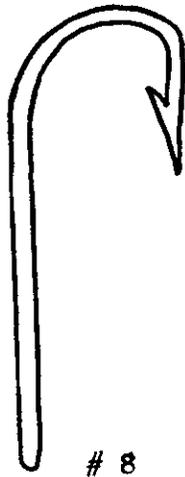
10



11



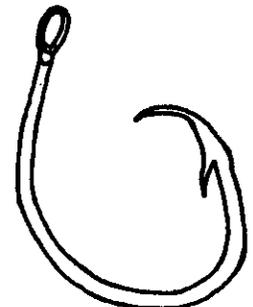
12



8



9



CIRCLE HOOK

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 - "Any Coast Guard Station, Any Coast Guard Station; this is Uniform Uniform Delta Gulf, the Soviet trawler Danko; this is Uniform Uniform Delta Gulf, the Soviet trawler Danko, on channel 16, over."

C.G.- "Uniform Uniform Delta Gulf, trawler Danko, this is Coast Guard Station Coos Bay, over."

You - "Coast Guard Station Coos Bay, this is trawler Danko, shift to channel 8, over."

C.G.- "Trawler Danko, this is Coast Guard Station Coos Bay, shifting to channel 8, out."

You - "This is the Danko, shifting to channel 8, out."

You - "Coast Guard Station Coos Bay, Coast Guard Station Coos Bay, this is the Soviet trawler Danko on channel 8, over."

C.G.-"Trawler Danko, this is Coast Guard Station Coos Bay, send your traffic, over."

You - "Coast Guard Station Coos Bay, this is the trawler Danko. I am an American observer talking for the captain. A Soviet sailor has broken his leg and needs hospitalization. Can you evacuate the sailor? Over."

C.G. - "Trawler Danko, this is Coos Bay. Affirmative. What is your current position? Over."

You - "Coos Bay this is Danko. Position 44 degrees zero 4 minutes north, 124 degrees, 24 minutes west, over." etc.

8. When you call "Any Coast Guard Station, etc. his first response may be:

"Trawler Danko this is Coast Guard Station Coos Bay, shift and answer on channel 11, out."

This means he doesn't want any more talk on the emergency channel. So without broadcasting again on channel 16, switch to 11 and go through the entire routine on eleven.

9. On your day to return to land, your ship will approach the designated port and wait offshore. The people ashore will wait for your radio call before they send the boat out to get you. A typical message is as follows:

~~For ships approaching Dutch Harbor:~~

~~You - "Mrs. Griffin, Mrs. Griffin. This is Juliet Alpha Oscar Foxtrot. Anyo Maru No. 21, the Anyo Maru No. 21 on channel 16, over."~~

~~Her - "Anyo Maru number 21 this is Mrs. Griffin. Shift to channel 8, over."~~

~~You - "Mrs. Griffin, this is the Anyo Maru number 21 shifting to channel 8, out."~~

~~You - "Mrs. Griffin, this is the Anyo Maru number 21 on channel 8, over."~~

~~Her - "Anyo Maru this is Mrs. Griffin. You must be observer Jack Adams, and you must be eager to get off. Where are you, over?"~~

~~You - "Mrs. Griffin, we are underway approaching Dutch Harbor. We will be at the pilot point in one half hour, over."~~

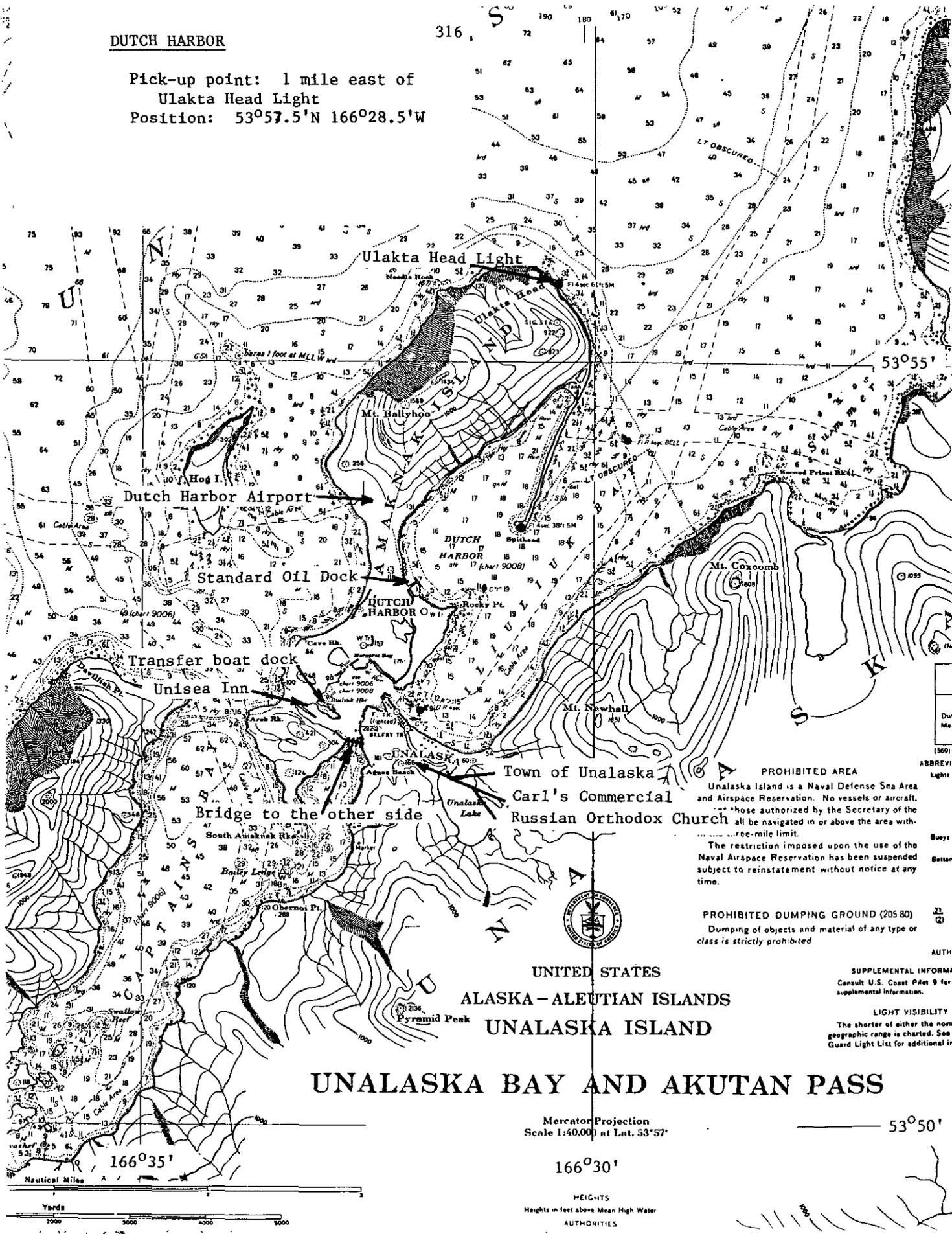
~~Her - "This is Mrs. Griffin. D.K. I'll have the boat come out to get you. You may have to wait for awhile, over."~~

~~You - "This is the Anyo Maru. Roger, we will be waiting. Out."~~

~~Her - "This is Mrs. Griffin, out."~~

DUTCH HARBOR

Pick-up point: 1 mile east of
 Ulakta Head Light
 Position: 53°57.5'N 166°28.5'W



316

53°55'

166°35'

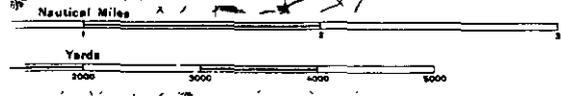
166°30'

53°50'

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

PROHIBITED AREA
 Unalaska Island is a Naval Defense Sea Area and Airspace Reservation. No vessels or aircraft, those authorized by the Secretary of the Navy, shall be navigated in or above the area within a 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.

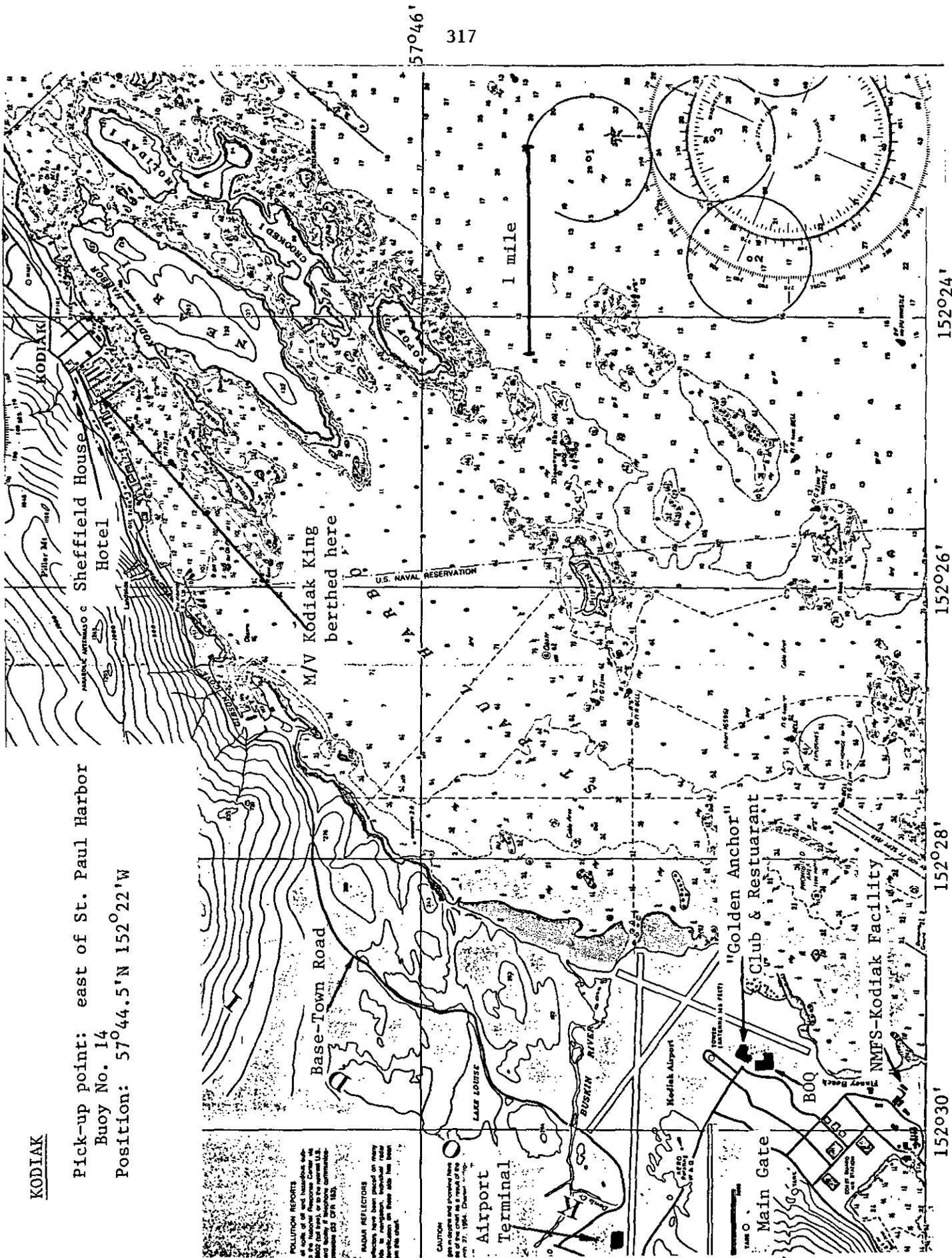
PROHIBITED DUMPING GROUND (205 80)
 Dumping of objects and material of any type or class is strictly prohibited

LIGHT VISIBILITY
 The shorter of either the nongeographic range is charted. See I Guard Light List for additional information.

Dut. Ma. (569)
 ABBREVI. Light
 Buoy
 Bottom
 AUTH. SUPPLEMENTAL INFORMATION. Consult U.S. Coast Pilot 9 for supplemental information.

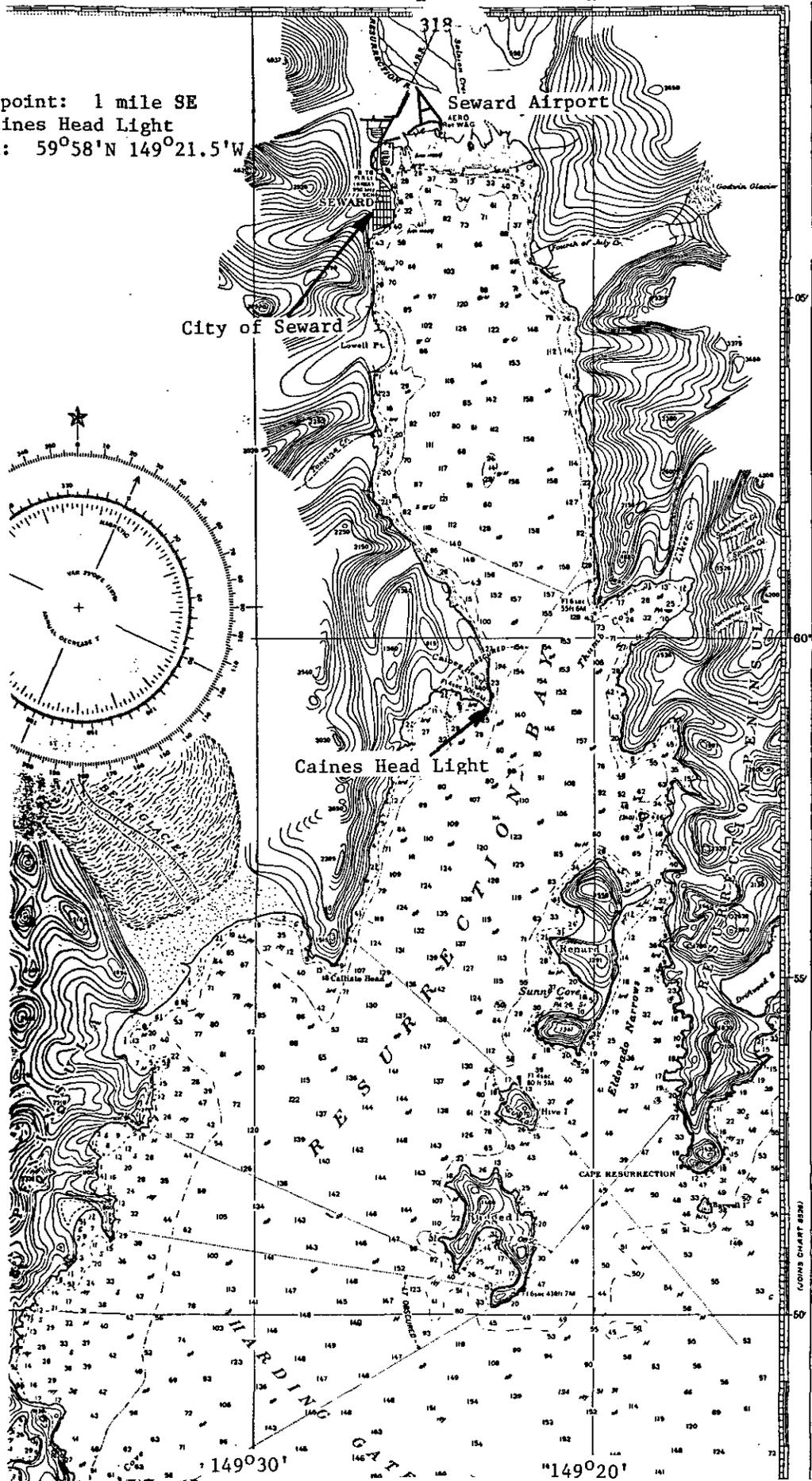
KODIAK

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



CALCULATION GUIDELINES: THE ROUNDING RULE

For in-class work only: The calculated result should be carried out to one more decimal place than your least accurate measurement; and, round as you go.

Example: $380.6 \times 1.22 = 464.33$ and $464.33 \times 0.16 = 74.293$

In all your data: ≥ 5 is rounded up, < 5 is rounded down.

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

However, in consideration of practicality, form constraints, and precedence, follow these guidelines:

Form 2, 2JV, 1, 1L:

Estimates of total catch should be recorded to no more than two decimal places, i.e. .01.

Form 3(1):

Follow the rounding rule when calculating sample weight. Total weight of a species group when the number estimated or weighed is less than 100, is the measured weight. In cases when the number estimated or weighed exceeds 99 individuals the total weight column should reflect the weight of only 99 individuals. This weight is calculated by multiplying the unrounded average weight (full field of calculator) times 99 individuals. Record Sample Weight (mt) and Total Weight (kg) ~~and average weight to two decimal places, on the form.~~
Record average weight to 4 decimal places on the form

Form 3(2):

The only computation on Form 3(2) is for the number of predominant species in large samples, or the number and weight when two or three species predominate. Average weight should be used and recorded to two decimal places; percentage by weight of the predominant species should be calculated and rounded to two decimal places - the nearest whole percent.

Form RM and RM-1:

When computing the weight by species in column D, round and record the result to the nearest .001 mt. Tonnages of .00049 or less may be recorded to the nearest .0001 and carried through the calculations to the summary for the week. All weights in the radio message should be reported to either two or three decimals consistently.

Form RM-3:

Follow the instructions in the manual; the decimal places are specified.

The Most Common Mistakes on Data Forms

Form 1 ~~USK~~, or 2US:

1. Latitude, longitude, or on/off bottom time recorded with greater than 60 minutes.
2. Using 2400 for nets on/off bottom 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.
~~Also, missing sea codes and water temps. on non-fishing days.~~
5. Overlapping haul times; overlapping on and off bottom times of one haul or between hauls.
- ~~6. Omitting the trailing zero in water temperatures.~~
- ~~7. On Form 1 or 1L, entering catch weight to more than one decimal place.
Also, on form 2, recording the haul weight to more than two decimal places~~
8. Positions that are too far from the previous position to be plausible during the time recorded--the ship could not travel that fast.
9. Recording 0000 as retrieval time, computer can't handle it, use 0005.

Form 2US

9. Leaving haul number blank on non-fishing days is incorrect; enter a zero.
Also, missing sea codes and water temps. on non-fishing days.
10. Location I.D. (column 23) omitted.
11. No location listed at all -- you should go back to the fishing log and look up the delivery 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.
13. Omitting trailing zeros in ship's and observer's catch estimates and recording them to more than ⁶two decimal places.
- ~~14. Something is wrong when there is >4 hours difference between a catcher boats off bottom time and and the delivery time for a haul.~~

Form 3 (US and 3L(1)):

- ~~15. Omitting trailing zeros in Sample Weight and Total Weight columns.~~
- ~~16. Miscalculating the entry for 99 when greater than 99 individuals were estimated or weighed.~~
- ~~17. Longline observers: Not splitting samples correctly when the number observed is greater than 99.~~
18. Listing prohibited species, whose weight was calculated from the average weight of "actual", as "estimated" (should be listed only as observed).
19. Not having haul numbers or sample numbers in sequence within a day.
20. ~~Numbers and weights of actually measured crab and salmon don't match combined totals of same on Form 4. This is called a "mismatch".~~

Form 3(2) and 3L(2): 3US

21. Numbers and/or weights don't add up correctly, do check your math!
22. Species code listed without data accompanying it.
23. A species code listed twice within a day.
24. Species code doesn't match written name.
25. Species code 900 with a quantity greater than 1.
26. Decimal point not included in every weight figure.

27. A weight listed without a number.
- ~~28. On whole haul samples, "*" written too close to the weight. It obscures the number.~~
29. Recording weights to > two decimal places--the computer won't accept them.
- ~~30. An asterisk not entered by the weight when the weight was obtained by subtraction.~~
31. Haul number doesn't match the date (as listed on Form 2).
32. Not having haul numbers ~~or sample numbers~~ in sequence within a day.
33. Recording a fish species that is out of its normal range or normal depth.
(Bring back a specimen for verification if this is the case.)
34. Not entering salmon, king crab, tanner crab when none were observed.
~~Form 3~~ You must enter them with 0 observed and a weight of 0.0 and enter the tonnage sampled.
- ~~34. Not checking for mismatches with Form 3(1). (See the last item for Form 3(1).)~~
- ~~35. Halibut numbers, weights, or sex included on the form.~~
36. Predation or viability data omitted. (Remember, predation and viability data are for halibut only.)
- ~~37. Putting estimated or calculated weights and numbers on Form 4.~~
38. Recording weights to > two decimal places--the computer won't accept them.

Form 7:

39. Summations incorrect! (Recheck ~~and double check~~ your math!)
40. Reversing the size group and the frequency.
41. Haul numbers and dates don't match Form 2 ~~or Form 1~~
42. Putting estimated lengths on Form 7.

Form 8:

43. More than one digit past the decimal point on unit weights.
44. Incorrect product code.

Form 9:

45. Not writing weights out to two decimal places. Do include trailing zeros!
46. Not grouping sexes together.
47. Numbering pages by area instead of by species.
48. Not separating the otolith collections taken on different boats. (See "General Instructions for Data Forms" section in your manual.)
49. Duplicate otolith or scale number within one species collection.
50. An otolith or scale number is skipped without any note as to why.

Form 10:

- ~~51. Not filling them out.~~
- ~~52. Not filling them out for each haul sampled or viewed.~~
- ~~53. 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:

54. Haul and/or set numbers not matching dates.

Captain / Fishing Master

	Deck	Factory	Bridge	Radio Room	Engine Room	Galley
		Factory Manager	Chief or 1st Officer	Chief Radio Operator	Chief Engineer	
		Assistant Manager	2nd Officer	2nd Radio Operator	2nd Engineer	
322	Bosun (or Bossman)	2nd Assistant	3rd Officer		3rd Engineer	Chief Steward
	Able Seamen	Chief Worker	4th Officer		Oilers	Chef
	Sailors	Factory Crew			Motormen	Kitchen Crew

INTERCULTURAL COMMUNICATING

This material was condensed from a publication entitled
"Intercultural Communicating"
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You are about to have one of the most rewarding experiences of your life. Your new insights and your broadened understanding of other people can be invaluable to you throughout your life. This paper is not intended to teach you about a specific culture. Rather, it will help you see that much of what you feel and the way that you are, is largely due to your American culture, and that the world does not revolve around your system of values, beliefs, and attitudes.

As you enter a new environment, you will encounter many variations in language, food, dress, customs, religion, and basic attitudes.

People in each culture have unique traits and it is normal for them to feel that their particular way of doing things is better than any other. [This is called "ethnocentrism".] Perhaps when you see things done differently, you will catch yourself thinking, "Back home we know how to do it right." If you then ask yourself, "But why is it right?" you will probably be forced to say, "I don't know; it's just better." This is a normal reaction to your own upbringing.

Getting along in another culture will be easier when you understand that other's traits and attitudes are not necessarily right or wrong, better or worse--they may just be different.

imitate, you will communicate more effectively with people around you, and you will be able to establish pleasant relationships.

In Summary:

Intercultural encounters may require a degree of sensitivity not needed in situations involving similar cultures. In every culture certain feelings or assumptions influence how a member of that culture will act, and they determine what roles he will assume and what values he will place on certain things, events, and ideas. These feelings and assumptions may not necessarily be right or wrong, not even better or worse; they may just be different.

There are differences between intercultural encounters. Your "style" may or may not be effective in an intercultural setting. As you anticipate an encounter, the challenge is to familiarize yourself with the ways of the people in the other culture, so as to enhance rather than hinder communication.

Adjusting to a new culture can be a powerful learning tool. Although you may suffer temporary frustration, discomfort, and anxiety, these feelings can facilitate self-understanding and personality development. Because you must deal with the situations yourself, you will learn. Half the battle of cultural adjustment is won if you realize you will experience it. And the other half is won by using your cultural sensitivity to learn and make the adjustment a positive experience.

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 "frame work" for which you will later fill in the "details". The frame work on your "MDC RADIO WORK SHEET AND FLOW CHART", consists specifically of numbers 7 through 13. The information within these numbers begins to paint the picture. For example: 30 yr. old /male/145 lbs. (65.9 kg.)/ 5 ft. 7 in. (165 cm.)/ medium build/ no allergies/ no medications///. Please note that what is underlined would be in your radio message and that the metric information is not being used. (It would be improper to use the English Standard System with a Japanese doctor however.) (1.0 kg = 2.2 lbs.) (100 cm = 3.28 ft.) This "frame work" 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. Numbers 14 through 18 are observation questions of "what's happened" (#'s 7-13 are to whom), and numbers 19 through 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 0300 GMT/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 agent's name and address in the U.S. and the vessel owner's name and address. All of this extra information is necessary to expedite travel and personnel transfers and to inform family members.

The procedure and interpretation of the worksheet is as follows:

Numbers 1,2 and 3: Contained in the heading of the radio message.

Numbers 4 and 5: Self-explanatory.

Number 6: Very important, don't forget it.

Numbers 7-11: Can be estimated when there is a lack of good communication.

Numbers 12 and 13: Very critical, must be exact!

Number 14: Self-explanatory.

Number 15: 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 (ie: 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.

Number 16: Fill this 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 (ie: 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.

Numbers 17 and 18: Self-explanatory, basic observations that shouldn't need further elaboration.

Numbers 19 through 25: The vital signs, these are the indicators of the patient's present physiology. Essentially, to record the vital signs all you need other than your good judgment is a watch with a second hand and a flashlight. Number 19, a patient's Level Of Consciousness (LOC) is generally described in terms of Alert, Vocal, Pain or Unconscious. Determining a patient's LOC is standard. 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 do the trick) then this should be noted differently than the state of Unconscious, since it denotes a higher state of consciousness.

Number 20: You will need a flashlight for this one. Open both eyes, shine the light into one eye from the side of the face (not directly into the eye from the front of the face), look into the other eye. Both pupils should constrict equally, quickly, and simultaneously. If you have any doubts, repeat this procedure and compare results with those of people around you.

Number 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.

Number 22: Without a blood pressure cuff, accurate B-P information is unavailable. However, 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 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 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.

Number 23: Filling out the information on lungs and respirations should be self-explanatory. In the event that you don't have a stethoscope, then 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.

Number 24: Skin perspiration, color and temperature is monitored by sight and touch. This should not present any problems, do not confuse skin temperature with body temperature.

Number 25: Place a thermometer in the patient's mouth or armpit and record your findings. To convert centigrade to fahrenheit use the equation given on the worksheet.

The flow chart which follows is simply an update of Numbers 19 through 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 look something like the following, with subsequent radio messages updating the patients condition as necessary.

NDJ DE vessel call sign MSG MDC

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 0300 GMT/ 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 HARD 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 AGENT, CHICKEN'S OF THE SEA, SEATTLE, WA/ VESSEL OWNER, TAIKUM
FROMDACEE, SEOUL, KOREA///

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 _____ (GMT) _____
- (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
- | | | | |
|---|---|--------------------------------------|--|
| <input type="checkbox"/> Airway | <input type="checkbox"/> Abdominal Pain (general) | <input type="checkbox"/> Fracture | <input type="checkbox"/> Swelling |
| <input type="checkbox"/> Cardiac Arrest | <input type="checkbox"/> Upper Left Quadrant | <input type="checkbox"/> Burn | <input type="checkbox"/> Bleeding |
| <input type="checkbox"/> Head | <input type="checkbox"/> Upper Right Quadrant | <input type="checkbox"/> Poisoning | <input type="checkbox"/> Alcohol On Breath |
| <input type="checkbox"/> Soft Tissue | <input type="checkbox"/> Lower Left Quadrant | <input type="checkbox"/> Seizure | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Chest Pain | <input type="checkbox"/> Lower Right Quadrant | <input type="checkbox"/> Psychiatric | _____ |

(16) TYPE OF BLEEDING

- | | | | | |
|------------------------------------|-----------------------------------|-------------------------------|--------------------------------|--------------------------------|
| <input type="checkbox"/> Profuse | <input type="checkbox"/> Internal | Blood in the: | | |
| <input type="checkbox"/> Shallow | | <input type="checkbox"/> Eyes | <input type="checkbox"/> Ears | <input type="checkbox"/> Vomit |
| <input type="checkbox"/> Pulsating | | <input type="checkbox"/> Nose | <input type="checkbox"/> Mouth | <input type="checkbox"/> Urine |
| <input type="checkbox"/> Steady | | | | |

(17) LOCATION OF INJURIES

- | | |
|-------------------------------------|--|
| <input type="checkbox"/> Head/Face | <input type="checkbox"/> Upper Extremities |
| <input type="checkbox"/> Neck/Spine | <input type="checkbox"/> Abdomen |
| <input type="checkbox"/> Chest | <input type="checkbox"/> Pelvis |
| <input type="checkbox"/> Back | <input type="checkbox"/> Lower Extremities |

(18) TREATMENT

- | | |
|--|---|
| <input type="checkbox"/> Cleared Airway | <input type="checkbox"/> Wound Care |
| <input type="checkbox"/> Oxygen | <input type="checkbox"/> Splint |
| <input type="checkbox"/> CPR | <input type="checkbox"/> Neck/Spine Immobilized |
| <input type="checkbox"/> Controlled Bleeding | <input type="checkbox"/> 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
- Dilated (Enlarged)
- Constricted (Small)
- NON-REACTIVE

(21) PULSE (#'s & quality)

- XX Beats per minute
- Strong
- Steady
- ~~Bounding~~
- Weak
- ~~Theeady~~
- Irregular

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.



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)



343

Breathing

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.

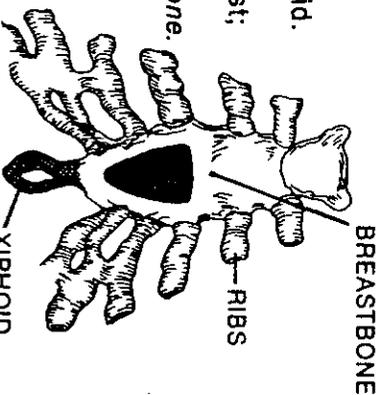
Child/Infant 80-100 times per minute.

ONE PERSON — give **2 BREATHS** after **15 CHEST COMPRESSIONS**. Chest

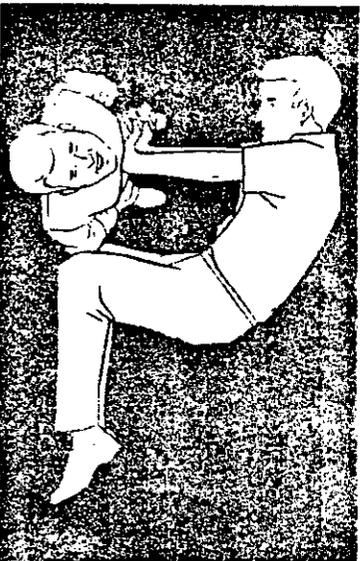
compressions are done at a rate of 80 times per minute.

TWO PERSONS — Give **1 BREATH** during the upstroke of each 5th **CHEST COMPRESSION**.

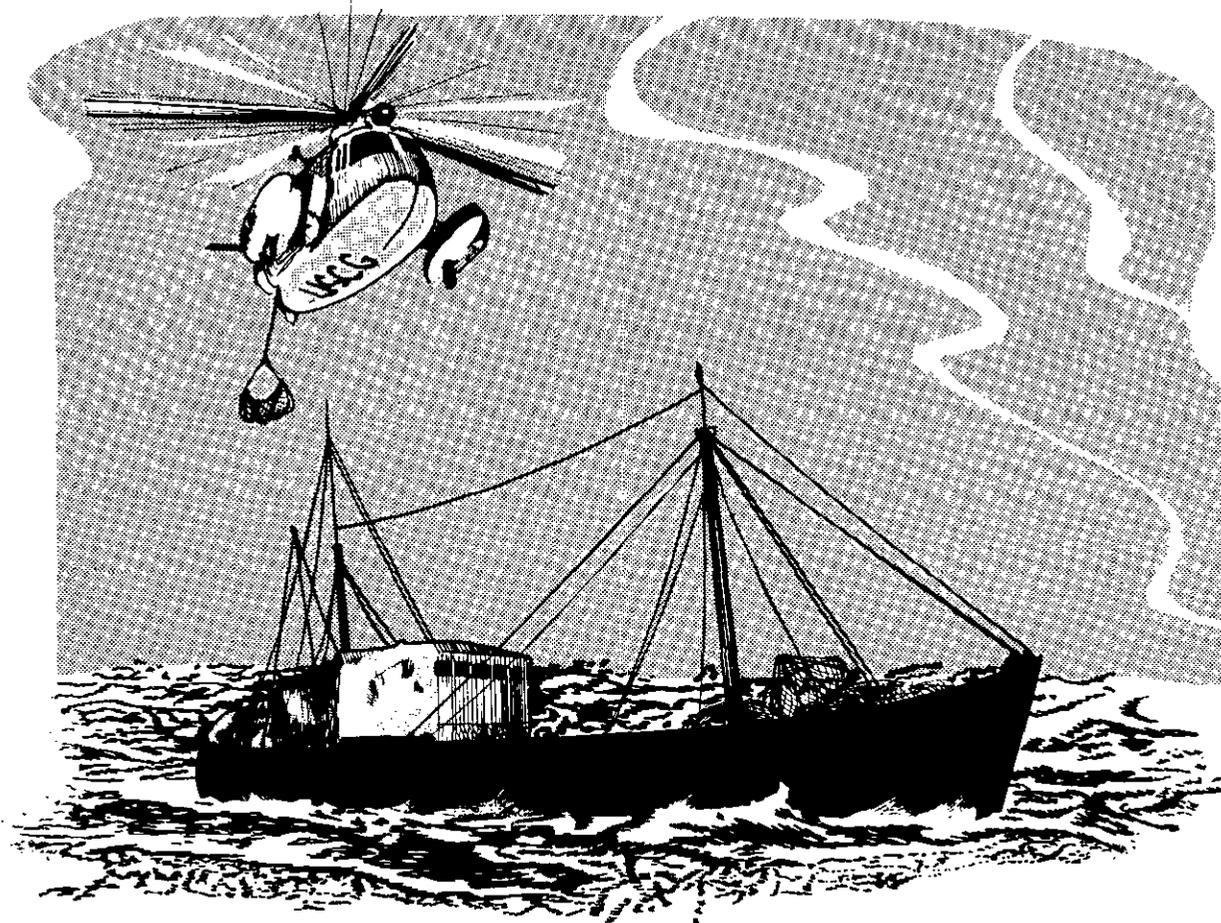
Chest compressions are done at a rate of 60 times per minute.



Circulation



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.

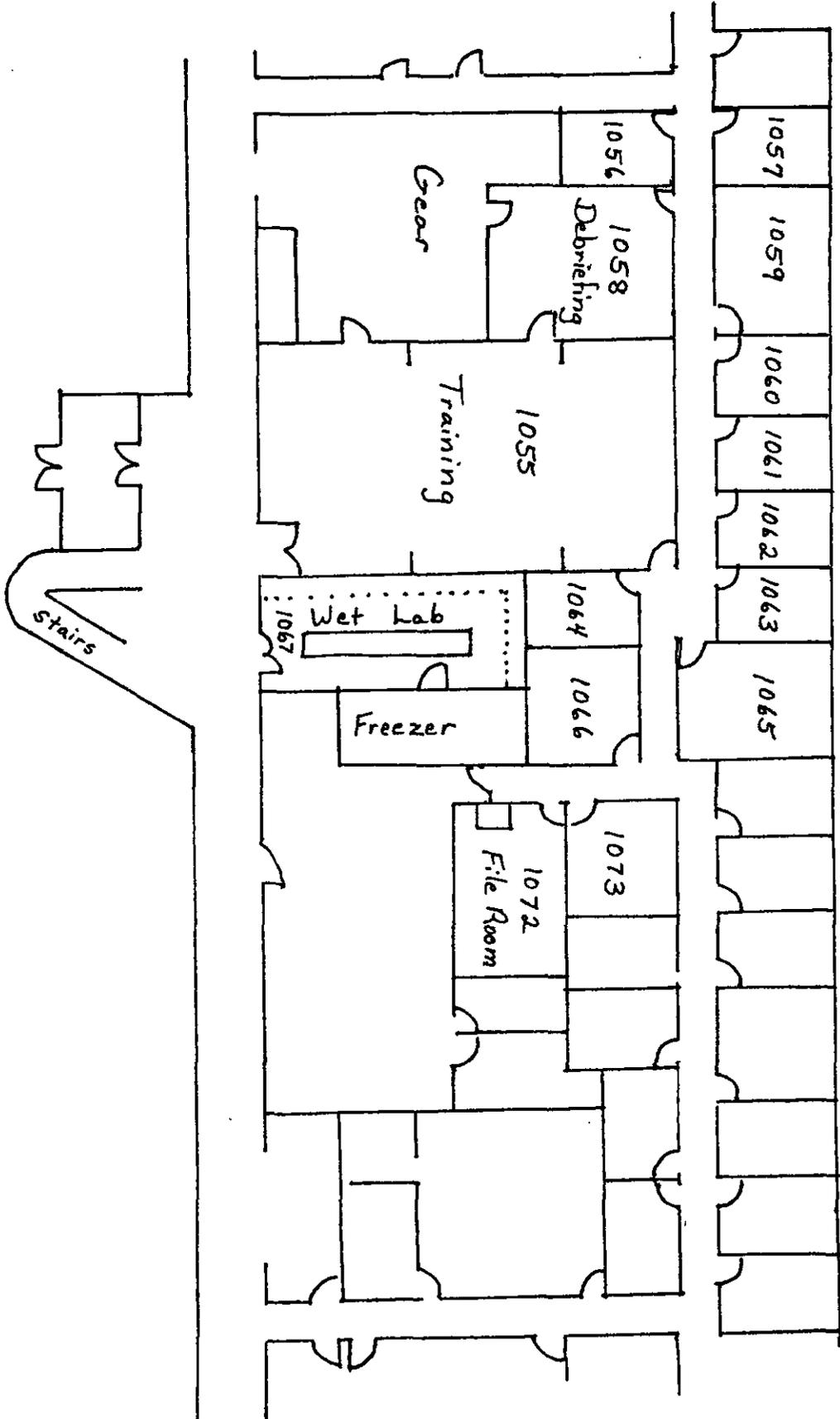
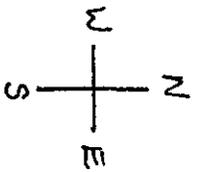
PREPARE FOR ARRIVAL:

- ▲ 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.

Debriefing Room
Telephone
526-4212



Observer Program Facilities, Building 4 ground floor

Glossary

Aft - towards the stern of a vessel

Benthic - living in direct relation with the bottom

Bin - a large compartment built into a ship for holding fish

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.

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.

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.

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.

Compliance - in accordance with the fishing regulations.

Dependent stern trawler - a stern trawler that delivers its catch to a mothership for processing.

Directed - a vessel fishing independently, under its own nation's quota.

Disembark - to get off a vessel.

EEC - Exclusive Economic Zone (see FCZ).

Embarkation - to board a vessel.

FCZ - Fisheries Conservation Zone; the 200 mile limit.

Flatfish - fish which are laterally compressed and who orient themselves in the water with their lateral surfaces or sides towards the surface and bottom.

Forecastle - the forward part of a ship where sailor's quarters are located.

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. Large Japanese stern trawlers are either freezer trawlers or surimi trawlers. Fresh weight - the weight of the whole fish (or animal) as it was when alive.

FUS - Fully Utilized Species.

Gallows - the large upright framework that spans the trawl deck; used for suspending or supporting.

Gangen - the leader line, about a meter in length, tied into a longline with a hook tied to it's free end.

Gantry - see gallows.

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.

Gill rakers - bony toothlike structures on the anterior edges of the gill arches. For protection or straining out food.

Gunnel or Gunwale - the upper edge of the side of a boat.

Hachi - 1) a flat, broad, circular basket onto which a longline is coiled, or 2) the length of longline which can be coiled onto the basket. In the U.S. longline fleet the hachi is called a "skate". Hachi is also the Japanese word for the number 8.

Hatch - an opening in a deck or bulkhead of a ship.

Haul - a catch of fish from one tow of a net

Independent 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 several months at sea without support.

Joint Venture - a cooperative fishing/processing effort between vessels of different nationalities.

Lee, Leeward - the side protected from the wind, opposite the "windward" side

Master - fishing master and/or captain.

Mothership - a processing vessel whose fish come from dependent catcher boats.

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.

Peritoneum - the lining of the gut cavity

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.

Radio Call Sign - four letters and numbers which are an international identifier of a vessel.

Rostrum - a bony or calcareous extension on the snout of a fish.

Regenerated scale - a fish scale which has grown in to replace one that was lost.

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.

Surimi - minced fish meat paste usually produced from pollock.

Trawl - the towing of a mesh net behind a vessel to catch fish.

Vessel Code - A code used only by the observer program to identify a ship.

Wing - the sides off a trawl net near the opening, usually with larger mesh
than the rest off the net.

Zulu - another name for GMT.

Form 12 a- Vessel Data Form

Vessel Name _____

Permit Number _____ Vessel Type _____

Length _____ Width _____ Draft _____

Gross Tonnage _____ Net Tonnage _____

Engine Type _____ Horsepower _____

Hull Number _____ Registration Number _____

Year Commissioned _____ Radio Call Sign _____

Company _____

Home Port _____

Personnel : Captain _____

Fishing Master _____

Factory Manager _____

No. Officers _____ No. Fishing Crew _____ No. Processing _____

Total Ship Complement _____

FOREIGN FISHING OBSERVER
MARINE MAMMAL SIGHTING FORM

* DO NOT FILL IN BOXES PRECEDED BY AN ASTERISK

CRUISE NO. _____

VESSEL CODE _____

1. OBSERVER NAME _____ VESSEL NAME _____
RECORD ID *

1	2	3	4	5	6

2. DATE (Yr./Mo./Day) & TIME (local) OF SIGHTING

7	8	9	10	11	12

13	14	15	16

3. LATITUDE (degrees/minutes/10ths)—N/S

18	19	20	21	22

N
23

4. LONGITUDE (degrees/minutes/10ths)—E/W

24	25	26	27	28	29

30

5. SPECIES _____
Common name Scientific name *

33	34

 TENTATIVE *

35

6. NUMBER SIGHTED _____ ± _____
C.I. *

36

37	38	39	40

7. BEHAVIOR _____ *

45	46

8. ANGLE FROM BOW

47	48	49

 9. INITIAL SIGHTING DISTANCE _____

10's of meters

50	51	52

10. VISIBILITY _____ 11. WAVE HEIGHT (meters) _____ 12. VIS CODE

53

13. WEATHER _____ (& WIND SPEED) 14. SURFACE WATER TEMP. (° C) ±

54

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.

=====

TRAWL WEB SAMPLE DATA FORM

=====

VESSEL _____ COUNTRY _____ OBSERVER _____

CRUISE NO. _____ VESSEL CODE _____

=====

SECTION 1:

IF SAMPLE IS AVAILABLE (fill out Section 1 only).

SAMPLE NO. _____ (attach a tag with the sample no. written on it, to the netting sample and place tagged sample, along with this form, in the plastic bag provided.)

DATE _____

COUNTRY & COMPANY where netting was made _____

PART OF TRAWL where netting was from _____

NEW OR USED, approximate age _____

CATCH (what fish was the trawl used for) _____

=====

SECTION 2:

IF SAMPLE IS NOT AVAILABLE (fill out Section 1 and 2).

MATERIAL: POLYETHYLENE NYLON OTHER _____

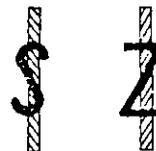
COLOR _____

TWINE TYPE: Z TWIST S TWIST BRAIDED OTHER _____

TWINE SIZE: DIAMETER _____ NUMBER OF STRANDS _____

MESH TYPE: KNOTTED KNOTLESS

MESH SIZE (stretched mess): _____



directions of twist

=====

COMMENTS:

REPORT #2 CRUISE # _____ VESSEL CODE _____

Vessel Name _____

Observer _____ Contacting Agency _____

Itinerary : GMT Dates and Times Except Where Noted.

Depart Seattle _____ Return Seattle _____

Other Cruise #'s CR# _____ CR# _____ CR# _____

Vessel Name _____

Dates Aboard _____

Name and Dates Aboard Ships Used as Transport Only _____

Depart Port For Vessel _____ Return to Port from Vessel _____

Port of Departure _____ Port of Return _____

Transfer Boat _____ Transfer Boat _____

Arrive Vessel _____ Depart Vessel _____

Any Dates Not Sampled and Reason _____

Date Sampling Began _____ Date Sampling Ended _____

Total Number of Days Sampled _____ Total number of days at sea _____

Customs Check: Location _____ Date _____ Time _____

Vessel Statistics Permit# _____ Vessel Type _____

Length _____ Width _____ Draft _____

Gross Tonnage _____ Net Tonnage _____

Engine Type _____ Horsepower _____

Year Commissioned _____ Radio Call Sign _____

Company _____

Home Port _____

Name and position of important personnel in fishing operations, factory, sampling

Captain _____ JV Representative _____

Total Ship Complement _____ Number Processing _____

Explanation of sampling procedures and problems; validity of data results:

Be sure to mention:

1. How is the "Total Catch" figure on form 1, 1L, 2, or 2JV derived?
2. If ships estimates were adjusted, how were the adjustments made?
3. How were the observer estimates of haul size made?
4. How was species composition and prohibited species sampling accomplished?
5. Discuss how biological data (i.e. length frequencies, sexing, etc.) were taken and explain any special projects.

General comments and conclusions; use additional pages as necessary to comment on problems, observations. Suggested entries:

6. Report the use of any innovative net design, navigational equipment, fishing strategy, or processing machinery.
7. Recount any unusual occurrences such as an accident or injury at sea.
8. Describe anything unusual concerning the catches.
9. Report anything that you feel the next observer or NMFS should know.
10. Describe any sampling problems and suspected violations.

Please fill the following with information on ship conditions.

Target species _____

Approximate haul size _____

Observer's room was: Small _____ Adequate _____ Roomy _____

Observer's bunk was approximately how long? _____

Ship's bath: Private _____ or Shared _____

Bath Availability: Daily _____ or other(describe) _____

Laundry: By hand _____ By machine _____ By ship's steward _____

Drinking water: Good _____ Poor _____ Requires boiling _____ Bottled only _____

General cleanliness: Clean _____ Adequate _____ Not Clean _____

Presence of cockroaches? _____ Rats or mice? _____

Electical supply: Voltage _____ Adapter needed?(describe) _____

Video Player? _____ VHS? _____ BETAMAX? _____ SUPERS? _____ Video camera? _____

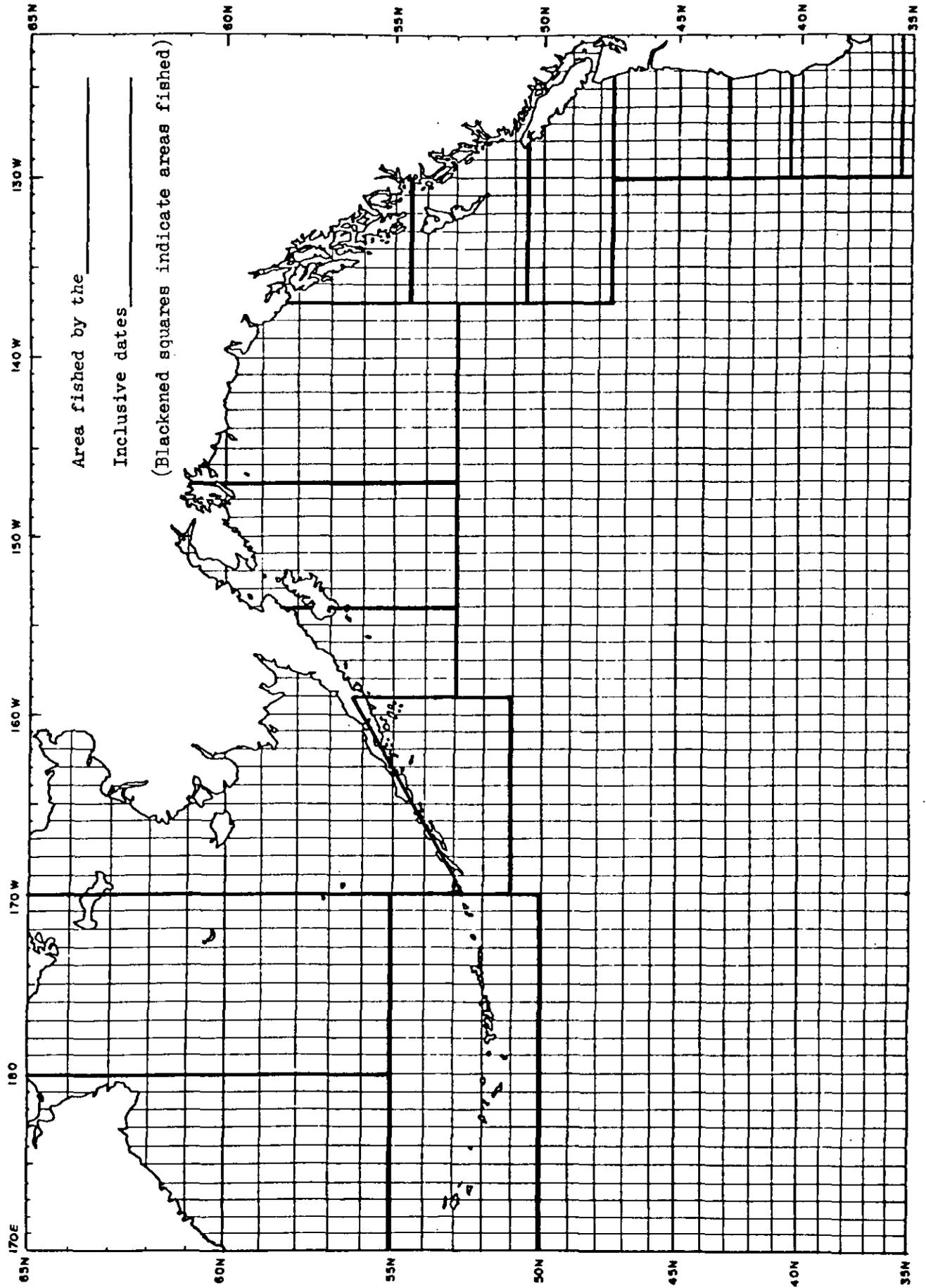
Typical meals:Breakfast _____

Lunch _____

Dinner _____

Other _____

Was the quality and availability of food sufficient? If not, please explain.



1988 Domestic Observer Program Vessel Participation Agreement

Observer _____
 Name of Vessel _____
 Name of Owner _____
 Mailing Address _____
 Corporate Tax ID or Social Security Number _____

The vessel owner (Contractor) agrees to allow a University of Alaska observer to collect data on catch rate, fishing locations, species composition and incidental catch of prohibited species from approximately _____ to approximately _____ in accordance with the terms outlined herein.

1. The Contractor will carry a University of Alaska employee as an observer during the period of this agreement.
2. The Contractor will provide space for the observer to carry out his/her duties on board a seaworthy vessel manned by a skipper possessing adequate experience in the waters in which the vessel will be operated as well as a sufficient number of capable crewmen to carry out the successful completion of the fishing operation.
3. University of Alaska observer duties do not include any legal enforcement responsibilities or the duties of a crew person on a fishing vessel and they are not to perform crew duties on a voluntary basis. The Contractor will direct the observer accordingly.
4. The University of Alaska will accept responsibility for employment-related injury and illness of the observer through its Workers' Compensation Program.
5. The University of Alaska hereby agrees to indemnify and hold harmless the Contractor, its officers, agents and employees, from and against all claims, demands, judgments, costs and expenses (including reasonable attorney's fees) which may arise by reason of injury to any person or damage to any property attributable to the negligent acts or omissions of the University of Alaska, its officers, agents and employees, in connection with the performance of this contract.
 The Contractor hereby agrees to indemnify and hold harmless the University of Alaska, its Board of Regents, its officers, agents and employees, from and against all claims, demands, judgments, costs and expenses (including reasonable attorney's fees) which may arise by reason of injury to any person or damage to any property attributable to the negligent acts or omissions of the Contractor, its officers, agents and employees, in connection with the performance of this contract.
6. The Contractor shall provide to the University of Alaska proof of and keep in effect during the term of this agreement Protection and Indemnity Insurance with minimum limits of \$500,000 per occurrence for personal injury (including death) and property damage. This insurance policy is to be issued by an insurance company acceptable to do business in the State of Alaska. Should the insurance currently in effect require a rider in order to cover the observer while on board the vessel, the University of Alaska will cover the cost of such rider as described herein.

Nothing in this agreement is construed to relieve the vessel owner of his negligence or the negligence of his crew or of his vessel to other third parties, or for damage to his own vessel.

Contractor, by the signature of its authorized representatives, hereby acknowledges that he has read this agreement, understands it, and agrees to be bound by its terms and conditions.

Vessel Owner or Master _____
 Date _____

University of Alaska Representative _____
 Date _____

Insurance information:

Name of Insurance Carrier _____

Cost of rider to cover observer \$ _____

Amount of Protection and Indemnity coverage \$ _____