

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

Manual for Biologists  
Aboard Domestic Groundfish Vessels

1990

[Revised December 1990]

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## PREFACE

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

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## ROLE OF THE OBSERVER IN THE DOMESTIC FISHERIES OBSERVER PROGRAM

As American harvest of groundfish resources replaced the foreign and joint venture fisheries, domestic observer programs were implemented to provide biological data to take the place of the data base formerly provided by the Foreign Fisheries Observer Program. The re-authorization of the Marine Mammal Protection Act of 1972 mandates observer coverage of 20 - 35% of groundfish trawlers to monitor incidental take of marine mammals but this coverage requirement will be superseded by a domestic observer program created by amendments to the Bering Sea and Gulf Of Alaska Groundfish Fishery Management Plans. Under the new program, there is a 100% observer coverage requirement on all vessels 125 feet or greater in length and 30% coverage on vessels from 50 - 125 feet, 100% of shoreside processing plants receiving more than 10,000 metric tons (mt) of groundfish annually and 30% coverage of plants receiving from 1,000 to 10,000 mt annually. Though the stocks of fish are now harvested by U.S. vessels, the need for observers to make independent observations of the fishing operations has not changed.

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

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

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

Another important use of observer data is to obtain estimates of the percentage of

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

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

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

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

## OBSERVER DUTIES AND PRIORITIES

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

1. Record daily fishing effort and catch rate information. Special instructions will be issued describing methods of obtaining these estimates and how your estimates of catch should be used.
2. Record species, numbers, and viability of incidentally-caught marine mammals and occurrence of marine mammals in the fishing areas.
3. Determine the species composition of the catch according to specified instructions.
4. Record the numbers, and weights, of certain "prohibited species" in the catch as per instructions. These species include, but may not be limited to: king crab, Tanner crab, halibut and salmon.
5. Send a summary of this information (items 1 - 4) to Seattle weekly.
6. Obtain biological data and samples on target and other species as directed. This may include length frequencies, sexes, otoliths or scales for ageing, stomach content samples, or other information as requested.
7. Observe the compliance or lack of compliance to U.S. fishing regulations and document instances of violations when observed.
8. Prepare a final report for the vessel which includes complete answers to report questions that are pertinent.

## CONFIDENTIALITY OF OBSERVER DATA

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

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

## STANDARDS OF OBSERVER CONDUCT

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

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

1. Observers must diligently perform their assigned duties.
2. Observers must accurately record their sampling data, write reports, and report honestly any suspected violations that are observed. Falsification of observer data will be grounds for decertification.
3. Observers must keep all collected data and observations made on board the vessel or in the processing plant confidential according to the Federal guidelines on confidentiality.
4. Observers must refrain from engaging in any illegal actions or any other activities that would reflect negatively on their image as professional scientists, on other observers, or on the observer program as a whole. These actions or activities include, but are not limited to:
  - a) excessive drinking of alcoholic beverages (however, if the vessel or shoreside facility maintains a stricter alcoholic beverage policy for its employees, then the observers must comply with said policy);
  - b) use or distribution of illegal drugs; and
  - c) physical or emotional involvement with vessel or shoreside processing plant personnel.

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

## CONFLICT OF INTEREST STANDARDS

### A NMFS-certified observer:

1. must be employed by an independent contracting agent certified by NMFS to provide observer services to the industry;
2. may not have a financial interest in the observed fishery;
3. may not have a personal interest in the vessel or shoreside facility to which he or she is assigned;
4. may not solicit, accept, or receive, directly or indirectly, a gift, whether in the form of money, service, loan, travel, entertainment, hospitality, employment, promise, or in any other form, that is a benefit to the observer's personal or financial interests, under circumstances in which the gift is intended to influence the performance of official duties, actions or judgement.

## SPECIAL CAUTION ON DEPARTMENT

### As a fisheries observer:

1. You must abide by the standards of conduct developed by your hiring contractor.
2. When conflicts or sampling problems occur which affect your attempts to get unbiased samples of the catch (presorting of fish for example), you can usually work it out by talking with the crewmen, factory foreman or deck boss. If this doesn't help, talk to the captain and ask him to help you but don't be demanding in your attitude. Present a case which shows you have thought about both sides. Listen and consider their objections. Negotiate compromises as long as they don't interfere with your ability to get good data. If talking fails, contact your contractor or the Observer Program office for arbitration.
3. Maintain a friendly but professional demeanor to vessel personnel. Your behavior should be governed by remembering that, politically, you are highly visible. Before acting in any given situation, be mindful of the diplomatic nature and sensitivity of your position. Tactful, mature handling of problems is expected. Remember, you are on the job 24 hours per day.
4. Do not offer, even if asked, any authoritative advice on what a vessel can and cannot do under terms of the permit under which they are operating. If you know the answer to a question about fishing regulations, answer the question with a qualifying statement such as, "I think...". If you are not sure, admit it and refer the captain to the Code of Federal Regulations (CFR) book or to the NMFS Regional Office in Juneau.
5. Consumption of alcoholic beverages by observers at sea is prohibited. Remember that your conduct must be above reproach at all times. While in port, drinking a glass of wine or beer with a meal or having one or two drinks while relaxing during off hours is

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

6. Observers should never accept gifts, (even of fish to take home), as this may appear to compromise your impartiality. You may not accept payment for any work you perform for the vessel (or plant, company, owner, or operator) during your employment as an observer. any act which could be construed as acceptance of a bribe, such as responding favorably to an offer of future employment, must be avoided. Work on developing the large perspective of the arena you're in. What you say or do in the context of a private conversation may seem perfectly reasonable at the time, but how would it appear when written in a formal report?
7. An obvious point (but one of extreme importance) is the prohibition of any sexual activity while deployed as an observer. Besides the personal danger of sexually transmitted diseases, involvement with another person detracts from your involvement with your work. Also, understand that an intimate relationship will be general knowledge in a short period of time. Vessels and fishing ports are very close knit communities; secrets are stock-in-trade. If NMFS observers develop relationships with other observers or with members of the industry they are there to observe, it erodes the respect and professional credibility of the individuals involved and that of all observers. No one is exempt from this, no one operates in a vacuum. Observers after you are subject to the precedents you set. This program's credibility rides with each and every observer. If a person you meet is special enough to warrant paying this terrible price, consider then, that the whole situation should be handled with respect and developed at an appropriate time. To act unprofessionally is purely self-indulgence and grounds for de-certification.
8. As an observer you will abide by all rules and regulations relating to the conduct of the host vessel. You shall not utilize, for any purpose other than obtaining required data, any species which the governing federal or state permit prohibits the vessel from fishing for or retaining, including especially salmon, halibut, crab, and marine mammals. (This includes eating them in the ship's mess, if served.) Do not accept or transport any item violating laws relating to endangered or protected species. There is a copy of a permit in the appendix of this manual which does allow you to bring back sea lion or fur seal canine teeth for age analysis by the National Marine Mammal Laboratory. However, no specimen materials may be taken from walrus.
9. If your host vessel is boarded by the Coast Guard, do not attempt to interfere with their activities, or those of NMFS enforcement agents, in any way. You may let them know that you are aboard, then stand by. Do not allow boarding officers to draw you into a discussion of your observations in front of vessel personnel. Tactfully suggest that if they wish to ask you any questions you'll be in your cabin (or go to some other place that's private).
10. Once you are aboard your sampling ship, avoid making visits to other vessels.

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

11. Consider safety first in everything you do.

#### RESPONSIBILITIES OF VESSEL AND PLANT OPERATORS

An operator of a vessel must:

1. Provide, at no cost to the observer or the United States, accommodations on a participating vessel for the observer which are equivalent to those provided for crew members of the participating vessel;
2. Maintain safe conditions on the vessel for the protection of the observer during the time the observer is on board the vessel, by adhering to all U.S. Coast Guard and other applicable rules, regulations, or statutes pertaining to safe operation of the vessel and by keeping on board the vessel:
  - a) adequate fire fighting equipment;
  - b) one or more life rafts capable of holding all persons on board; and
  - c) other equipment required by regulations pertaining to safe operation of the vessel.
3. Allow the observer to use the vessel's communication equipment and personnel on request for the transmission and receipt of messages
4. Allow the observer access to and the use of the vessel's navigation equipment and personnel on request to determine the vessel's position;
5. Allow the observer free and unobstructed access to the vessel's bridge, trawl or working decks, holding bins, processing areas, freezer spaces, weight scales, cargo holds and any other space which may be used to hold, process weigh, or store fish or fish products at any time.
6. Notify the observer at least 15 minutes before fish are brought on board for fish and fish products are transferred from the vessel to allow sampling the catch or observing the transfer, unless the observer specifically requests not to be notified;
7. Allow the observer to inspect and copy the vessel's daily fishing logbook, daily cumulative production logbook, transfer logbook, and any other logbook or document required by regulations, information from which will be kept confidential by the observer under Federal guidelines;
8. Provide all other reasonable assistance to enable the observer to carry out his or her duties;

9. Move the vessel to such places and such times as may be designated by the contractor, as instructed by the Regional Director, for purposes of embarking and debarking the observer;
10. Ensure that transfers of observers at sea via small boat or raft are carried out during daylight hours, under safe conditions, and with the agreement of the observer involved;
11. Notify the observer at least three hours before an observer is transferred so the observer can collect personal belongings, equipment, and scientific samples;
12. Provide a safe pilot ladder and conduct the transfer to ensure the safety of the observer during the transfer; and
13. Provide an experienced crew member to assist the observer in the small boat or raft in which the transfer is made.

A manager of a shoreside processing facility must:

1. Maintain safe conditions at the processing facility for the protection of the observer by adhering to all applicable rules, regulations, or statutes pertaining to safe operation and maintenance of the processing facility;
2. Accept and provide for an observer, at no cost to the observer or the United States, for the purposes of complying with the Observer Plan;
3. Notify the observer on a daily basis of the planned facility operations and expected receipt of groundfish.
4. Allow the observer to use the processing facility's communication equipment and personnel on request for the transmission and receipt of messages;
5. Allow the observer free and unobstructed access to the processing facility's holding bins, processing areas, freezer spaces, weight scales, warehouses and any other space which may be used to hold, process, weigh or store fish or fish products at any time;
6. Allow the observer to inspect and copy the shoreside processing facility's daily cumulative production logbook, transfer logbook, and any other logbook or document required by regulations, information which will be kept confidential by the observer under Federal guidelines; and
7. Provide all other reasonable assistance to enable the observer to carry out his or her duties.

## PROHIBITED ACTIONS

No person may:

1. Forcibly assault resist, oppose impede, intimidate, or interfere with an observer;
2. Interfere with or bias the sampling procedure employed by an observer, including sorting or discarding any catch before sampling; or tamper with, destroy, or discard an observer's collected samples, equipment, records, photographic film, papers, or personal effects without the express consent of the observer;
3. Prohibit or bar by command, impediment, threat coercion, or by refusal of reasonable assistance, an observer from collecting samples, conducting product recovery rate determinations, making observations or otherwise performing the observer's duties; or
4. Harass an observer by conduct which has sexual connotations, has the purpose or effect of interfering with the observer's work performance, or otherwise creates an intimidating, hostile, or offensive environment. In determining whether conduct constitutes harassment, the totality of the circumstances, including the nature of the conduct and the context in which it occurred, will be considered. The determination of the legality of a particular action will be made from the facts on a case-by-case basis.

## PREPARATION AND DEPARTURE

### COMMUNICATIONS

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

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

The following list of phone numbers is supplied for your reference. These individuals should only be contacted if you are unable to contact your contractor.

#### Observer Program Staff in Seattle:

Russ Nelson (supervisor) (206) 526-4194  
Janet Wall (supervisory assistant) (206) 526-4195  
Bob Maier (program manager) (206) 526-6195  
Angela Dougherty (debriefing) (206) 526-4192  
Karen Teig (training) (206) 526-4191  
Mike Brown (training) (206) 526-4191  
Gear Office (206) 526-

### THE TRAINING PERIOD

The observer who requires certification training will spend approximately two and one half weeks in Seattle for orientation and training. Training will consist mainly of learning how to identify common species of fish and crabs found in the Bering Sea and Northeast Pacific,

explanations of the sampling procedures, and familiarization with groundfish fishing regulations. The following outline lists some of the activities covered during the training period. The outline is not necessarily complete and the items are not necessarily given in the order that they will be presented.

### Domestic Observer Training Syllabus

#### Day 1

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

#### Day 2

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

#### Day 3

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

#### Day 4

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

#### Day 5

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

#### Day 6

Correction of homework.

Considerations and requirements for sampling shoreside delivery vessels.

Collecting biological information from Tanner crab, king crab, halibut and salmon in samples: weights and lengths, viability, sex, and salmon scale sampling.

Collecting data on tagged fish and crab.

Identification of *Sebastes* and *Sebastolobus* (rockfish) and other species: lecture, slides and laboratory session presented by U.W. ichthyologist.

#### Day 7

Vessel reporting requirements, production logbooks, ADF&G Fish Tickets.

Obtaining vessel production information and product recovery sampling.

Formatting weekly catch messages, (Catch Message Forms A and B) (lecture, classroom exercise and homework).

Safety video

#### Day 8

Correction of homework and assignment of 2nd data exercise.

Transmission of weekly and daily catch messages.

Identification of flatfish species: lecture, slides and laboratory session presented by U.W. ichthyologist.

#### Day 9

Length frequency sampling, (form 7US).

Otolith and scale sampling, (form 9US).

Fish dissection and otolith removal: slides and lab practice.

Species identification of crab: slides and classroom practice.

Safety video

#### Day 10

Safety videos and discussion on hypothermia, medical emergencies at sea, fire control and sea and shore survival.

Medivacs, radiotelephone procedures and preparation of a medical diagnostic chart.

Checkout of survival suits.

Survival suit and life-raft water practice.

#### Day 11

Correction of 2nd exercise homework

Receive special project instruction.

The Marine Mammal Protection Act, Exemption System and the observer's role

Recording information on marine mammals: as incidental take, (form 10); sightings, (form 11).

Guest Lecture: Program Manager from the High Seas Driftnet Observer Program showing slides on identification of marine mammals at sea.

#### Day 12

Longline and pot fishing vessels: Slides of gear and fishing methods, sampling longline catches and recording data; computation of total catch.

Species identification of salmonids and lab practice review

Day 13

Species identification exam.

Guest Lecture: Dr. Aron, Director of Alaska Fisheries Science Center.

Day 14

Plant sampling - onshore and aboard floating processors.

Marine Mammal watches for plant observers.

Gear issue: familiarization and care of equipment, gear check-out and calibration of scales.

Day 15

Final Exam.

Observer's logbook entries, methods of documentation.

Guest speaker: Debriefing supervisor discusses data review process and final reports.

Preparation for first day aboard.

Travel rules and parting information from contractors.

Review of previous cruise reports and reading files.

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

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

After completing their trip at sea, the observers return to Seattle and are required to work with their contracting agency until their data forms have been properly completed and their cruise reports have been accepted by NMFS. Observers are normally paid for five full working days after their return to Seattle.

### OBSERVER CLOTHING AND EQUIPMENT

NMFS will provide the scientific observers with adequate rainproof clothing and boots. All equipment necessary for the collection of biological data will be similarly provided. The observer is responsible for the transport and return of the sampling gear issued. If the observer goes out on a number of short cruises during the same trip, it may be possible to arrange for the replacement of torn raingear or lost equipment between cruises.

Observers will provide their own personal clothing, warm work clothes for wearing under

raingear, toilet articles including a towel, and other items of a personal nature. Unless otherwise informed, the vessel upon which the observer is to be stationed will be expected to provide adequate quarters and meals. It is expected that the vessel captain will allow the observer an adequate and safe space in which to carry out the sampling duties.

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

### Personal Items Supplied by Observer

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

#### Work clothes--minimum number and type

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

#### Other items or articles

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

#### Optional/Recommended Items

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

## Sampling Gear Provided by NMFS

### To be packed loose in baskets:

Baskets (2 to 6) with at least one wooden lid  
Set of castors or wheels for one or two baskets  
Rope (one length, approximately 15 - 20 feet)  
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)  
Plastic bags for salmon snouts (5)  
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)  
Otolith 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)  
Thumbtacks and paper clips (1 container)  
Forceps (1, or 2 if assigned to collect age structures)  
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 batteries

The following items will be checked out either before or during gear issue:

Sleeping bag (1)  
Survival suit, signal light, whistle (1 each)  
Life vest (with whistle)  
Rain pants and jacket (1 set)  
Boots (1 pair)  
Rubber gloves (3 pair)  
Manila folder containing:  
    Carbon paper (10 sheets)  
    Graph paper (2 - 5 sheets)  
    Shipping Label for basket (1)  
Data forms (important! - check for completeness!)  
Calipers (1) - for those who are to measure crab  
Otolith vials (200-600) - for those who are to collect age structures  
Vial block (1) (if collecting otoliths or cod scales)  
Liter bottle of alcohol for roundfish or glycerol for flatfish age structures (1)  
Squirt bottle for alcohol (1) (if collecting otoliths or cod scales)  
Stopwatch (an optional item for motherships or c/p vessels > 250 feet)  
Extra calculator batteries (if appropriate)  
Safety goggles (for observers on longliners, optional item for others)  
Earplugs (2 pair) (optional, issued on request)

The following gear will be handed out during training class:

Observer Sampling Manual (1)  
Mechanical Pencil (1) with extra lead  
Calculator (1)  
Book - Hitz (1)  
Book - Eschmeyer (1)  
Species identification manual (check for completeness)  
Marine mammal guide  
Book - Hart (Optional, issued on request)  
Laminated photo guide (optional, issued on request)

Vessel Data Forms for 3 months:

Form 1US .....	20
Form 2US .....	20
Form 3US (for trawlers) .....	150
Form 3US (for longliners) .....	150
Shoreside Boat Sampler's Prohib. Talley .....	3
Species Description Forms (3 types) .....	20 ea.
Form 7US .....	45

Form 9US .....	5
Form 10US .....	10
Form 11 .....	15
Catch message Form A .....	50
Catch Message Form B .....	30
Plain white paper for misc. fax messages .....	6

**Port Sampling Forms      No. of Pages per Month:**

Form A .....	10
Skipper Interview Form .....	10
Prohibited Species Summary Form .....	3
Form 8 Product Recovery Rates .....	3
Form 8 Worksheet .....	20

**Vessel Reports:**

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

### Preparation and Care of Sampling Equipment

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

1. 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).
6. *Keep your otolith alcohol in your room. Sometimes crew members consume alcohol which has been left at the work station.*

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

Do not give away any gear or books. 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. The laminated photo guide cannot be replaced; they originally cost over \$50 each in materials alone.

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

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

Vessel assignments are arranged by your contractor with the vessel owner. Logistic arrangements are also made by your contractor. Observers must be aware that fishing schedules are often changed by weather, mishap, or fishing success and are often the cause for changes in observer schedules. If you find out that the ship you are on is planning to leave the fishing area unexpectedly, transmit a message explaining the matter. Do not make changes in your schedule yourself. Observer coverage of vessels is a large logistical "net". Movement in one part affects the whole and your contractor has logistical perspective that you cannot see.

### Shipment of Gear

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

On the flight to the embarkation port, carry the observer training manual in your carry-on luggage. (Some extra sampling supplies are kept at Dutch Harbor in the event that the airline loses your baggage; manuals are not kept at Dutch Harbor, however, because it is too difficult to keep up with changes.) On the return journey from the ship, carry the completed data forms with you. If these forms are lost, your whole trip is essentially wasted. Some observers have had their otolith alcohol confiscated by the airlines because we do not have a blanket permit for the transport of alcohol. If the airline personnel do not permit you

to take the alcohol, do not argue--dump the alcohol, rinse the container if necessary, and when you get to your destination, purchase rubbing alcohol to replace the ethyl alcohol that was dumped. Inform the debriefing staff upon your return and note on the top of the Form 9's that rubbing alcohol was used as the preservative.

#### Expenses Incurred While Traveling

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

#### Transport to the Ship

Normally, airplane flights are arranged so that an observer arrives at the embarkation port at least one day in advance. *This is often necessary since the weather is notoriously bad in certain parts of Alaska, and flights are often postponed.* Delays caused by weather may be unavoidable, but it is important that the observer not be the cause of delays by missing the flights, or having his equipment miss the plane. If you miss your flight, notify your contractor immediately, and make new arrangements, on another airline if necessary. Notify your contact person if your arrival date is affected. If you are going to miss your pick-up time at port, notify your contracting agency as soon as possible.

Upon arrival at the embarkation port, follow your contractor's logistics instructions and *stay in contact.* Let your contractor or agent know of your whereabouts so that they can contact you if there is a last-minute change of plans. Since Dutch Harbor and Kodiak are so heavily used by observers, there may be an NMFS employee to aid you and/or your contractor may have a permanent contact in port to help with logistics.

#### Embarking/Disembarking Through Dutch Harbor

Observers flying into the airport who have Carolyn Griffin as their Dutch Harbor contact person will be met by her or her assistant. Otherwise, ask your contractor about transportation in Dutch. Room reservations are usually made in advance, often at the Unisea Inn or Royal Dutch Inn. You will need to keep yourself informed of changes in vessel schedules, so make sure that you periodically check the hotel desk for messages and keep in touch with your contact person, especially on your day of embarkation. When returning to Dutch Harbor, call your contractor or contact person as soon as you can.

Useful Phone Numbers for Dutch Harbor:

Carolyn Griffin  
P.O. Box 308  
Dutch Harbor, Ak. 99692  
(907) 581-1529 (home phone)

Unisea Inn (907) 581-1325  
Royal Dutch Inn (907) 581-1636

ARRIVAL ABOARD THE SHIP

Living Conditions Aboard Vessels

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

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

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

On catcher/processors there will be someone designated as medic who will treat minor illnesses and injuries connected with life at sea. On shoreside delivery vessels there will

probably be a first aid or EMT's (Emergency Medical Technician's) kit aboard and the most able person to deal with an emergency will surface or, by default, the skipper must take responsibility. When serious injuries or illnesses occur, it is up to the captain to decide when (or if) to return to port. Interim treatment and the decision to interrupt fishing can be aided by calling the Coast Guard and relaying symptoms to a medic or doctor.

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

**Take some seasickness medication along even if you don't plan on using it.**

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

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<sup>1</sup>Excerpt from: Psychology of Sailing, by Michael Stadler, PhD. International Marine Publishing Co., Camden, Maine. Copyright 1987.

<sup>2</sup>Excerpt from: Motion Sickness, by Wayne Haack. An article in Sea Kayaker magazine, Summer 1986.

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

"Try not to think about seasickness, put it out of your mind, force yourself to think of other things.

Take heart and build up your confidence.

Practice releasing the tension in your muscles; as soon as you begin to feel apprehensive try and relax (desensitization).

Avoid unpleasant smells (especially tobacco, damp clothing, and vomit). Stay away from the galley

Below deck: lie down, keep your eyes closed.

In the saloon: fix your eyes on a freely suspended object.

Seek out cool, fresh air and take calm, deep breaths.

Where possible, keep away from enclosed spaces, go up on deck.

Reduce the amplitude of the motion stimuli: keep amidships or astern, avoid the fo'c'sle berth.

Try not to sit and let yourself be rocked passively back and forth with the motion of the boat.

When standing, avoid leaning against anything, stand erect and make active compensatory movements to keep your balance.

Try to move your head as little as possible.

'Lock' onto the horizon; watch the swell and anticipate the movement of the waves

Participate in the normal duties on board.

At all events see a job through to the end; do not give up on it."

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

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. The Coast Guard will also notify the Observer Program office and keep them advised.

### Safety Aboard Vessels

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

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

2. During your first talk with the captain, ask him to explain to you what to do in the event of a major emergency such as a fire aboard the ship, a serious collision with another vessel, or other conditions which might require abandoning the ship.
3. Observers are required to wear a hard hat, life vest or other flotation and steel-toed rubber boots when on the trawl deck for any reason. (If life vests are worn under your rain jacket, they will stay cleaner.)
4. Be cautious whenever wading through fish since fish spines (especially rockfish) can penetrate rubber boots and cause painful wounds to the feet.
5. Apparel with loose strings or tabs should be avoided, as they might become caught in the equipment or belts.
6. Don't run aboard ships, particularly up stairwells. Slipping, tripping, and falling are the most common sources of observer injury. These accidents often happen when an observer is in a hurry. Specifically, watch out for slick spots where the deck is wet and oily or frozen, step carefully over the half-foot combing rising from the bottom of metal latch doors and passageways, and look out for low overheads in vessel stairwells and watertight doors.
7. The observer should not stay outside on the aft deck during rough seas. An observer has been swept forward over the winches by waves sweeping up the stern ramp. When the observer is outside, he/she should remain in full view of a second party at all times.
8. Cables that break under strain frequently kill sailors. Whenever a cable is subjected to tension, stand in a place where a backlash would not hit you. If your sampling station is on deck, do not work while a trawl is being set or retrieved, interrupt your work to go to a safe place during the process. When nets are being hoisted off the deck, stand well clear. Heavy nets have fallen near observers when the suspending cables parted.
9. When working near the exit chutes in the factory floor, where bycatch and factory offal wash out, the observer should be extremely cautious not to slip and fall in the wash of bilge water.
10. Observers are cautioned not to pry loose any fish caught in the chinks of slat or rubber conveyors, since this may result in getting a finger or hand mangled in the machinery.
11. Factory processing areas are crowded with machinery, electrical lines, and conveyor belts. It is often difficult to get to the area where an observer needs to sample because of the maze of equipment. Climbing over, under and around heading, filleting, and skinning machines on oily and wet floors especially at sea in rough weather is extremely hazardous. Observers must watch carefully where they step and

where they grab for handholds.

12. The observer should notify or have the skipper notify the U.S. Coast Guard should an injury or illness occur to him/her which requires immediate hospitalization.
13. Treat all minor cuts, especially those on hands, with antiseptic to avoid infection from fish slime. Poisoning from fish slime is called cellulitis and is a form of staph infection. Should a staph infection be left untreated and allowed to develop, your lymphatic system becomes involved and the threat to your health becomes much more far-reaching than simply a pair of inoperative hands. Wash hands thoroughly after sampling in a solution of very hot water and an antiseptic such as betadine or providone iodine (1-2 oz. per qt. of water). Disinfectants such as Clorox, Lysol or Purex tend to sap your skin's natural chemicals and prolonged use may make you even more vulnerable to fish poisoning.
14. Take extra precautions against infection, such as new gloves, when collecting specimens from marine mammals. As these animals have similar biological systems to our own, organisms which infect them can infect us. "Seal finger" is a fungal infection of the hands which can easily be contracted.
15. Ask ship personnel which water sources are safe to drink. Some ships have lines containing water for washing and not drinking.

#### Safety in At-Sea Transfers

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

There are no hard and fast rules for allowable safety limits during transfers. Conditions such as vessel size, swells versus waves, current and impending weather, good lighting, 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 by an anxious or impatient captain. Whenever possible be preceded or accompanied by a crewman. Always go with an experienced crewman if you are transferring in a small boat or raft. If boarding a small skiff or inflatable boat, see that the engine has been started and warmed up, and that there are oars stowed as a backup. As general guidelines, do not transfer at dusk, in darkness, or in any other low visibility conditions. Transfers involving a small boat or raft should never be carried out at night. Observers should not transfer when the sea state is two meters or more.

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 rope lines or cargo nets. Observer baskets have been lost overboard because they were thrown between ships without lines attached.
4. Given a choice between using a Jacob's rope ladder or a gangway (accommodation walkway), to board a ship, in most cases use the Jacob's ladder since the use of a rigid gangway in rough seas can be extremely hazardous to the observer and to the transfer boat.
5. If a cargo net, transfer basket, or cage is used to transfer observer or baggage, make sure that a line is attached to the conveyance from both vessels for greater control and to reduce swinging. The observer should maintain a crouched (knees bent) position as opposed to sitting or standing with straightened legs, to avoid back injury. Be sure to wear your hardhat in addition to your lifevest when using this mode of transfer. Keep your arms, particularly elbows and fingers, inside the conveyance when transferring

#### First Days On Board

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

1. Tell the captain that you want to routinely see the ship's fishing logs.
2. Inquire as to how to send the weekly catch messages.
3. Ask to be informed, in advance, of changes in the fishing schedule so that you may adjust your schedule accordingly.
4. Ask to be notified if any marine mammals are found in the catches. If possible, sightings of marine mammals would also warrant notifying the observer.
5. After having done your own survey of safety equipment and instructions ask the captain additional questions. Ask about the location and operation of the EPIRB(s) on board; what are the procedures on board in case of emergency such as fire; Where is the VHF radio and how does it operate; what are the working channels of nearby vessels; are there any hazards that you should be aware of?

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

1. When the deck is inactive, perhaps on the way to the fishing grounds, make measurements which will aid you in estimating codend dimensions. Then watch the net retrieval and handling. Decide when and where you will need to take additional measurements and who to enlist for help.
2. Watch how and where the codends are opened and how thick and fast the fish are dumped. Look to see if the crew does any sorting on deck and whether different hauls are mixed in the tanks.
3. Notice where the catch is sorted by species and size and what is the destination of fish on each line of conveyor belts. What products are being made?
4. Consider the location of your sampling station. Remember, you have to be present at or ahead of any sorting area. If at all possible, avoid having to haul baskets of fish long distances or up or down stairs. Basically, you need a place where you can gather your samples, have a few baskets of fish around you and a place to hang your scale. Adequate lighting will be necessary and you'll need to locate the nearest hose for cleaning yourself and your area.
5. Try collecting one or more baskets of fish. Familiarize yourself with the species being caught, start writing species descriptions and practice using the keys. Practice sexing the target species and/or other species that will have to be sexed for your work.
6. Work out routines for sorting, weighing, and counting fish.
7. Get started with the most obvious methods for making catch weight estimations and determining sample weights. Then after your work is underway, consider variations or other methods which may improve your sampling or be contingency plans should the catch composition change.

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

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

## OBSERVER OBJECTIVES AND GENERAL INSTRUCTIONS

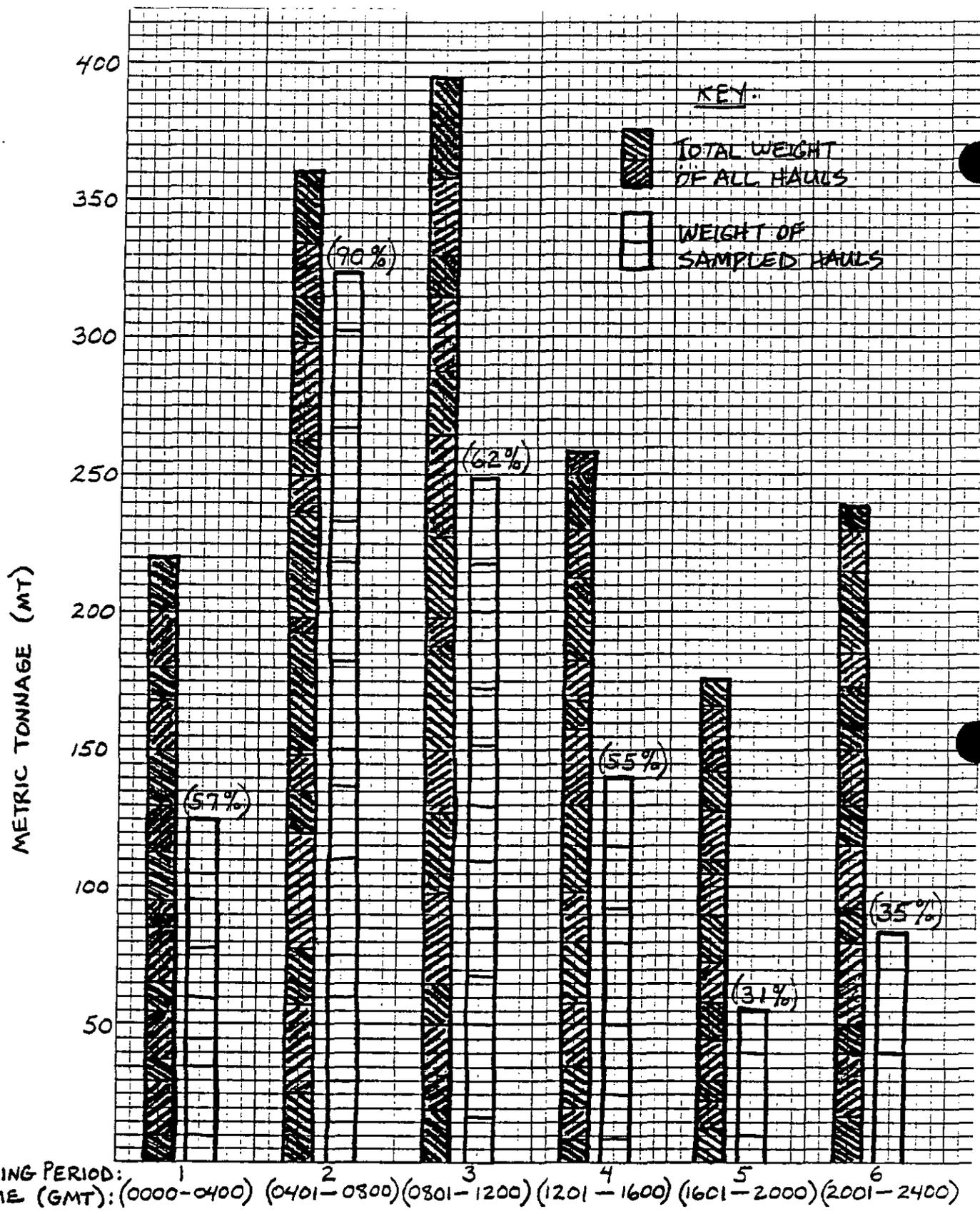
The main work objectives of observers are to record any incidental take of marine mammals, make independent estimates of catch size, determine the catch composition, figure out the incidence of specified prohibited species in the catch, collect biological data on the prohibited, target and other species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

Since ship design and procedures vary from ship to ship, 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 or more 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. We stress the taking of representative samples of all data collections. Accuracy is important in all aspects of the work, including: the physical sampling, recording the data on plastic sheets, transposing the data on the plastic sheets to the final paper copy, and correctly calculating totals and extrapolations for the weekly catch reports. The need for representative, unbiased sampling and accuracy cannot be over stressed.

## OBSERVER WORK SCHEDULE AND WORKLOAD

Not only must an observer strive to obtain representative samples of a certain haul or during a given sampling period, but the observer should also select sampling periods so that the catch sampled is representative of the daily and weekly catch. Fish will usually lie or school close to the bottom during daylight hours. Consequently, during the day they are more easily located with sonar and catches will be greater than at night when the fish rise up in the water column and scatter to feed. Since many vessels will fish and process catch around the clock, the observer should rotate his/her schedule to allow for sampling at different times of the day within each week aboard. Changes in gear, fishing methods, depths and areas of fishing can result in very different catches. Therefore, care should be exercised so that all or most of the observation and sampling is not done during the same time period. The majority of an observer's efforts should correlate with the time periods or tows that land the majority of catch. For example, if 20% of the daily catch is brought aboard from 8 a.m. to 12 noon, 20% of the total sampling should be done during this period. Similarly, if only a small tonnage is brought aboard between 1 a.m. and 5 a.m., the observer may decide to sample that time period only once every two to three days. Many observers sample enough (greater than 60% of the tonnage landed), that these concerns are met as a matter of course. Those that are sampling 50% or less of the tonnage landed will have to monitor their work more closely.



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

The bar graph 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 indicate the tonnage landed during that period and the open bars stand for the tonnage of the sampled hauls (not the tonnage sampled). 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 a running tally for each time period more convenient.

Once a given tow 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 will vary according to the type of vessel, the number of hauls per day, catch size and composition. 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 and they were still orienting themselves to their job. Specific directions on taking different kinds of samples are given in the appropriate section.

## SAMPLING DUTIES FOR DOMESTIC FISHERIES OBSERVERS

### **Every Haul, Delivery, or Set:**

Obtain haul, delivery or set data (Form 1US or 2US)

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

1. Record any incidental take of marine mammals (form 10US).
2. Sample for species composition of catch (Form 3US), 2-3 times daily if the ship is making 4 to 6 hauls per day; if the ship averages more hauls per day, sample more hauls; if the ship averages fewer hauls per day, you may sample fewer hauls but increase your sampling weight if possible. In your sampling, do not leave out any species or species group, such as sampling only for prohibited species. Try to sample the whole catch for king crab, Tanner crab, halibut and salmon if possible. 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.
3. Estimate haul weight (Form 2US) from as many hauls as possible, but aim for at least 3 per day--estimates should be made of some hauls that were not sampled as well as of sampled hauls.

**Biological data from prohibited species:**

4. Sex and identify to species, all the salmon, king and Tanner crab in your sample if possible, or take a random subsample for sexing (form 3US).
5. Take length measurements of all halibut, and salmon in your sample (form 7US). Subsample, if necessary, when incidence rates are high. A subsample should be of at least 20 fish. Measure king and tanner crab only if given this as a special project.
6. Determine the viability of all halibut, king and Tanner crab in your sample if possible; or take a random subsample; or sample specifically for viability at another time (form 3US). (The choices for viability sampling are presented in order of preference.)
7. Collect scales from salmon in your samples for species confirmation and ageing (form 9US).
8. Check salmon for missing adipose fins or other fin clips or marks, and other fish and crab for tags. If you collect a tag be sure to record all pertinent data as requested in the "Tagged Fish and Crab" section of this manual.

**Every Day:**

9. Take length measurements of 150 randomly selected fish per day (form 7US). Lengths should be taken of the target species unless you are also collecting otoliths of a sampling species other than the target species. Remember that the otolith collection must be a subset of the length frequency collection. If it is not possible to measure 150 fish per day, try to do at least 70 per day. You may have to forego sexing the fish.
10. Otolith/scale collection - If given this assignment, choose a sampling species according to the directions given later in this manual (form 9US).

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

**Per Vessel: (not in order of priority)**

Evaluate the accuracy of the vessel's catch weight estimations and report on their method of estimating. List what species are discarded (see vessel report questions). Describe the fish processing products. Record the product recovery rates they use, if any.

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

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

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

## GENERAL INSTRUCTIONS FOR DATA FORMS

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

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

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

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

## CRUISE NUMBERS AND VESSEL CODES

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

## 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 3's on a cruise, then the first sheet will be page 1 of 58 and the last sheet will be page 58 of 58. Form 9's are further subdivided by species so that you may have a page 1 of 10 for king salmon scales, a page 1 of 3 for coho salmon scales and a page 1 of 32 for pollock otoliths.

## CALCULATION GUIDELINES: THE ROUNDING RULE

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

### In all your data:

$\geq 5$  is rounded up,  $< 5$  is rounded down.

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

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

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<sup>3</sup>Excerpt from: Principles and Procedures of Statistics With Special Reference to the Biological Sciences, by Robert G. D. Steel and James H. Torrie. Copyright 1960 by Mc Graw-Hill Co.



## OBTAINING CATCH AND EFFORT DATA FROM TRAWLERS

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

This form summarizes fishing effort and total catch by haul for catcher-only trawlers, catcher/processor trawlers and motherships. Obtain the data for these forms from the ship's logs from vessel personnel, and from direct observation. Logbook information may need to be adjusted if it is not recorded according to instructions below. Check carefully to see that no errors are made in copying the data to the forms and that the data are reasonable. Points to note:

1. Collect Form 2US data for the entire period you are aboard. Make certain that you have all of the hauls recorded 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 are assigned during your trip. The vessel code is **not** the radio call sign but is an observer program code given to each vessel. Keep the data for each vessel separate and get your cruise number and vessel code(s) from your contractor before debriefing.
3. Place a check mark in the far left column to indicate which hauls you sampled. (Observers may also want to indicate, with the letters MM, which hauls were monitored for the incidental catch of marine mammals)
4. A given haul number should be used only once - no duplicates. The haul numbers should usually be in numerical sequence. Observers on pair trawlers and mixed gear types may need to skip haul numbers and if this is done, an explanation should be written on the head of the form. Haul numbers must be in ascending order. Make sure that the haul numbers do not exceed 3 digits. (If the haul number recorded in the fishing log is 1657, for instance, then drop the first digit and call the haul 657. This will enable you to more easily compare your data with the ship's.) All hauls must be recorded unless there was a gear malfunction resulting in a zero catch. If a zero catch is not due to a gear malfunction then the haul must be recorded. A haul number must be assigned to every haul. If you reach number 999, the next haul should be "1", not "0." Haul number "0" means a nonfishing day.
5. Enter the gear type: (based on the configuration of the gear, not where it's fished)
  - 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 - A net designed to fish off-bottom. Wings may be of very large mesh or composed of lines. The net should not be equipped with

chafing gear, rollers, or bobbins, and is designed to minimize drag.)

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

Leave this column blank temporarily if the gear doesn't fit the above categories.

7. Enter the gear performance code:

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

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

- 1 - Most of the processing is done on board the catcher vessel (a catcher/processor). The products are placed in a freezer hold and the trip usually lasts more than a few days.
- 2 - The ~~catch is delivered to a mothership at sea for processing~~ <sup>vessel is a</sup>
- 3 - Utilized catch is delivered to a shorebased processing plant. The trip usually lasts no more than 3 to 4 days and in the meantime the catch is kept on ice.
- 4 - The vessel is a floating processor which is processing catch delivered from catcher boats.
5. *The catch is delivered as bait to other fishing vessels.*

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

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

10. If there were no hauls on a given day (due to bad weather, mechanical breakdowns, traveling etc.) enter the Alaska Local Time (ALT) 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. Enter the ADF&G statistical area corresponding to the noon position in columns 73 - 78. All days at sea must be accounted for in this manner.
11. For mothership observers, information on gear type and performance, retrieval location, fishing times and/or fishing duration, fishing and bottom depth, and average towing speed has to be obtained from the catcher boat skipper. This may be accomplished by talking to the skipper on the VHF radio after the delivery is complete, that is, when they are no longer busy coordinating the delivery maneuvers. If the skipper is not cooperative in providing the above information, try at least to get his estimate of fishing duration.
12. The location entered should be the haul retrieval position - the location of the ship when a particular haul is begun to be retrieved, i.e. when the winches begin bringing in the cable. (For a mothership the location entered may be a delivery position if retrieval positions are not available.) Check the latitude and longitude for all positions entered on 2US to make sure that they are reasonable - i.e., 58°63' does not exist; double check positions that indicate large movements if you have not been aware of any. The first digit of longitude (1) is understood, so record only the following digits. Each haul must have a position. On nonfishing days, record ALT noon position in these columns.
13. The time system used (on this and all other forms) should be Alaska Local Time and dates. From the last Sunday in April through the summer to the last Sunday in October, entries should be made according to daylight savings time. Time recorded should be in the 24-hour system.
14. A haul is assigned to a day according to the time the net is begun to be retrieved from the fishing level (nets off bottom time), which is not necessarily the same day the net was set or the day that you sample. Thus, hauls retrieved before 0000 hours are attributed to the previous day, and hauls retrieved on or after 0000 hours are assigned to the next day. For mothership observers who can't get retrieval times from catcher boats, estimate the day of retrieval to the best of your ability.
15. 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.
16. All 2400-hour notations should be changed to 0000 hours. If this occurs in the "nets off bottom" time, the date should be changed accordingly.
17. Double check haul times to see if they are reasonable times for your vessel. An overlap in haul times for two hauls is an obvious error.
18. Record both the "nets on/off bottom" times (cols. 34-41) and the fishing duration in minutes (cols. 42-45). You will use the sum of the duration entries to report fishing

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

19. The average fishing depth (cols 46-49) and average bottom depth (cols 51-54) can be recorded in either fathoms (more likely) or meters, depending on 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 and 55).
20. Record the average trawl speed to tenths of a knot in columns 56-57.
21. Retained catch: this is the amount of round weight of any fish, in whole or part, (in metric tons, not pounds or short tons--see Table of Equivalents) that is retained aboard the ship. This figure should always be filled in for unsampled as well as sampled hauls, and must be recorded to two decimal places. 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 converted from pounds to metric tons). Daily production totals may have to be divided based on deck estimate proportions or observer extrapolations from sample data could be used if production figures are not available. Use your judgement as to how to obtain the most accurate data. Give a complete description in your report of how these figures were obtained.

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, if you are the shoreside delivery boat observer, 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.

22. 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). Instructions for adjusting for non-utilized species are in the following section.

23. Observer's estimate: this will be an estimate made independently from any ship or plant information. Record your estimate of the hauls that you observe. This will usually be a codend or bin-depth estimate (instructions and information on making estimates of catch weight follow). Record the weight estimate to two decimal places.
24. 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 to determine the correct area. The ADF&G statistical area must correspond with the latitude and longitude entered in the location columns.
25. The "Vessel Code" columns (and the "List of Catcher Boats" at the top of the form) are for mothership observers only. If you are on a catcher/processor or catcher boat, leave these areas blank. Mothership observers may request the vessel codes for the catcher vessels delivering to your ship along with the weekly catch message if needed. If a catcher/processor is operating as a mothership and also fishes for itself, enter the word "self" in columns 79 - 82 for those tows made by the processor.
26. Leading zeros should be in the dates (cols 12 & 14) and the times (cols 34-41) only, as needed.
27. Skip a line after each day.
28. Any notes, or comments (other than notes for nonfishing days) should be placed in a part of the form that is not keypunched.

### FISHING LOGS AND ESTIMATION OF CATCH RATES

A skipper will keep several types of records or logs. A skipper may keep a fishing log for himself or his company and there are logs required by NMFS and ADF&G for fishery management. Your normal procedure is to obtain information on the fishing effort from these ship's logs, from vessel personnel, and by direct observation and accurately record it on your Haul Form 2US. **All of the tows made while you are aboard must be recorded on your haul form whether you sampled them or not.**

The observer must cross-check all data for accuracy. The correct haul/date correlation, retrieval position, duration, and total catch weight are especially important items--without this information the observer's sampling data cannot be used. After a week's worth of data, or for each page, check the "Nets off bottom" time of the last tow of each day. The tow cannot span midnight and be the last tow. Check any change in degrees of latitude and longitude. Unless the minutes indicate the position is close to the next degree, changes of degree would mean long distances traveled or a recording error. Use the ADF&G statistical area numbering system to check the ADF&G area number against the latitude and longitude. Look at each whole page of form 2US for "holes" where data may be missing.

The skipper will make a deck or "hail weight" estimate of each catch by direct observation of the volume of fish in the net or in the fish bins. This is entered in proper

column of their Daily Cumulative Production Logbook for NMFS and may be utilized by an observer for "Official Total Catch" (or OTC) on form 2US **only if it is the best estimate of catch weight.** As an observer, you will also make **independent** estimates of total catch to use as the OTC or to use to evaluate the accuracy of the logbook entry or skipper's information. Some ships may maintain accurate records of production information which can be used to calculate the "Retained Catch" figure and, when combined with information on discarded fish, for "Official Total Catch". The observer must evaluate these sources of information and choose or derive the **best estimates of catch weight to enter on form 2US as "Official Total Catch."** Remember, total catch on Form 2US should be the weight of everything that is caught--whether it is utilized or not.

#### Skipper's Deck Estimates

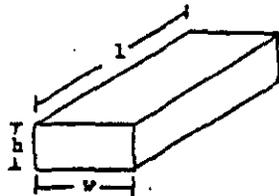
The skipper or mate on watch will make a deck estimate by looking at the codend and count the number of bands full of fish. The codend of the net has reinforcing and hauling bands around it at regular intervals. The amount of fish between each band can be added as a consistent unit of weight. The person making an eyeball estimate will take into account the number of full bands plus the adjustments for the last band which often contains a bit more fish and the first band(s) which is deflated as the fish are not compressed and slide forward. Also, like any mesh bag, when the net is very full the mesh will expand and bulge and there will be more tonnage per band. The appearance of the net coupled with the net maker's specifications and past experience with delivery weights or the number of cases put up per haul can make "estimates by eye" very accurate. On the other hand, skipper's deck estimates can be wildly optimistic and/or pessimistic if he is casual about it.

Observer estimates of total catch are an important part of the reason you are there, so you should do your best to get good data. Always make substantiated estimates of catch weight even if you are using the skipper's estimate for OTC. When observer estimates are made, record them in columns 68 - 72 on form 2US even if this estimate is also utilized as the "Official Total Catch". Observers should estimate the weight of several hauls per day, those that are sampled and some that are not sampled. If the observer's catch estimates are being used as the official total catch because they are the most accurate, the observer should try to estimate all of the catches brought in while the observer is aboard. If this is not possible, use your observer estimates in combination with data from the ship. Some techniques for estimating haul weights are as follows.

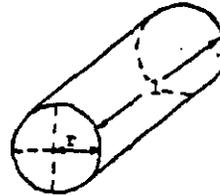
#### Observer Estimates of Codends

As scientists, observers must have data to verify their estimations. Codend measurements are taken to determine volume ( $m^3$ ) and volume is multiplied by weight per volume  $mt/m^3$  (density) to derive an estimate of the catch weight. The first step in the estimation of the volume of fish in the codend is to decide which geometric shape a particular codend most closely resembles: a rectangular solid, a cylinder, an ellipsoidal solid, a semi-ellipsoidal solid, or perhaps a combination of two of these shapes. Determine the needed dimensions for volume calculation of the chosen solid. Then measure the codend of fish or use known dimensions to gauge the net size using, for instance, pre-measured deck lengths; height to your shoulder, nose or whatever; or other standards of reference. When a net of fish has

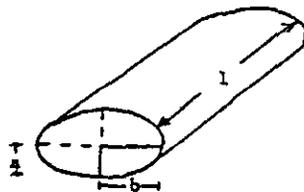
more of a long cone shape, it will be necessary to measure the volume of fish in several banded sections and add them together instead of treating the whole codend as a single unit. Calculate the volume in cubic meters using the appropriate formula, then multiply the volume times the density, obtained as explained below, to obtain the metric tonnage of the catches.



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

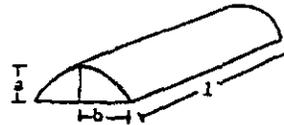


Cylinder  
Volume =  $\pi \times \text{radius}^2 \times \text{length}$   
 $V = \pi r^2 l$

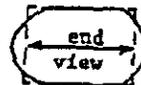
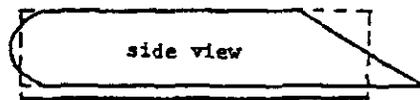


Ellipsoidal solid  
Volume =  $\pi \times \text{short radius} \times \text{long radius} \times \text{length}$   
 $V = \pi abl$

( $\pi = 3.1416$ )



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



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

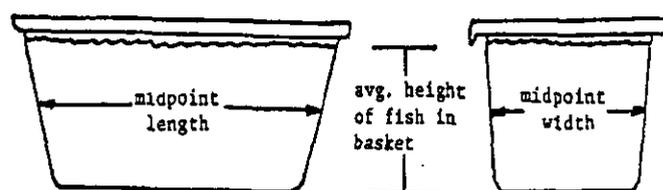
The deck crew will often have orders or for their own reasons will want to empty the net as quickly as possible. They may be reluctant to allow an observer time to make the needed measurements. Prepare for this possibility by making sure the skipper is aware of your needs and by being ready to get your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

## Density Sampling

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

Density is variable and should be derived from random basket samples for each sampled haul. Average density values for the day or area should be calculated and used for catch weight estimates of unsampled hauls. A minimum of four baskets should be used to calculate density. First obtain the volume of fish in the sampling baskets, (or some other small container which is larger than a basket but not larger than a cubic meter), such that fish weight and volume can be accurately determined. The basket sides are sloped slightly, so use the midpoint width and length measurements. Remember that the midpoint is half the distance from the bottom to the level **of fish** in the basket (or other container) not necessarily to the top of the basket. It is important to fill all the baskets to the same level. It is also important to examine the way that the fish are packed in your basket or small container and make sure that it approximately duplicates the way that the fish are packed in the fish bin or codend. For instance, if you have very large fish in your basket, such as Pacific cod or turbot, they may not be laying flat on top of each other as they would in a large fish bin. The density of the fish in the basket will be less than the density of fish in the bin because there are more spaces or air pockets between the fish in the basket. It may be appropriate to lay or settle the fish into the container but do not compact or smash the fish in an attempt to duplicate the force in the codend. Your resulting density value would be too subjective. A better solution would be to find a larger container or have one built. To calculate the volume of the basket, use the following equation:

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



After the volume of an average basket is calculated, you need to obtain the average weight of four or more baskets. Be careful to take a random sample of the catch and to fill all your baskets consistently to the same level. Then simply divide the average weight of a basket

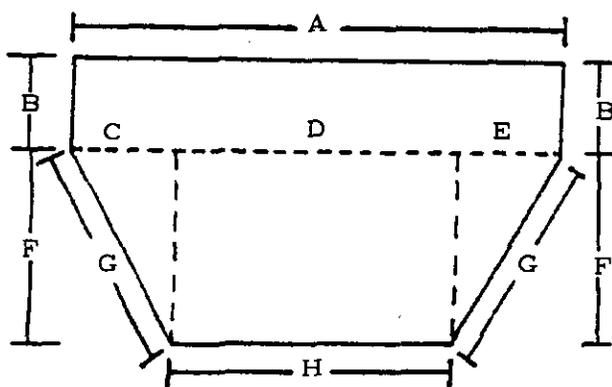
by the average volume of a basket to calculate the density value for that haul. Using the volume of the fish in the codend or live tank and the density of those fish, you can calculate a total catch weight estimate. Remember:

$$\text{Volume of fish (m}^3\text{)} \times \text{density (mt/m}^3\text{)} = \text{weight of fish (mt)}$$

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

#### Observer Estimates by Bin Volume

Measure the fish bin into which the fish will be emptied to obtain the volume in cubic meters. If the fish bin is shaped like a rectangle or square, it would be relatively easy to calculate the volume. Simply multiply the floor area (length x width) by the height of fish. However, many fish bins are irregularly shaped, in which case the floor area of the bin must be broken into sections which can be easily measured. The example below shows how one fish bin was broken into shapes easily calculated or measured to obtain floor area.



#### Useful Formulas You May Need

Area of a circle =  $\pi r^2$     Circumference =  $2\pi r$     ( $\pi = 3.1416$ )

Area of a square or rectangle = length x width (In diagram above:  $A \times B$ )

Area of a triangle =  $\frac{1}{2}$  base x height (In diagram above:  $\frac{1}{2} E \times F$ )

For bin floors with a conical shaped depression: Volume of a right angle cone =  $\frac{1}{3}\pi r^2 h$

The height of fish in the bin is the third dimension needed to determine volume. If the bin is sided with common width boards of known dimension, use the height of each board to

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

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

#### RETAINED AND TOTAL CATCH DATA FROM PRODUCTION FIGURES

Catcher/processor vessels are required to report retained product information and the amounts of discarded species in addition to the haul data and deck estimates in the Daily Cumulative Production Logbook for NMFS. A count of the number of units of each product produced by the factory for each haul or each day will be reported to the bridge. A unit of product would be a tray of fish packed for freezing or a bag of fish meal.

$$\text{Number of Product Units} \times \text{Average Unit Weight} = \text{Total Weight of Product}$$

A product recovery rate (pr) or a conversion factor can then be applied to the product tonnage to estimate the round weight of catch going into that product line. A recovery rate represents the proportion of the organism that is used in any given product. Recovery rates are expressed as a percent or as a ratio. Headed and gutted cod may have a recovery ratio of .62 to 1, or 62% recovery, while fish frozen whole would have a recovery ratio of 1.00 to 1, or 100% recovery. The product weight divided by the product recovery ratio equals the fresh weight of the fish used to make the product. [Note: A conversion factor is the reciprocal of the recovery ratio and is **multiplied** by the product weight to obtain the round or fresh weight of the fish). A conversion factor is always greater than 1. To convert a conversion factor to a recovery rate, or vice versa, divide the number 1 by one of them to obtain the other.]

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

$$\text{Product Weight} \times \text{Conversion Factor} = \text{Whole Weight of fish used to make the product}$$

The retained product information in the ship's logbook could be useful to observers except that the information is entered **by production day**. Observers will need product information **by haul** to estimate the round weight (also termed: whole or fresh weight) of the retained catch for each haul. Except in the case of surimi or fish meal production, the observer

may be able to obtain production data by haul by requesting it. If catches are not mixed together when dumped into the live tank, production tallies by haul may be made. Observe the handling of fish through the processing line(s). If fish from different tows are kept separate, watch the clean-up of one catch and the starting of the next. If product counts by haul are feasible, discuss your information request with the factory manager. Alternatively, the observer could find out which hauls are attributed to each "production day" and divide the day's production data by the proportion of each haul based on deck estimates. Example:

Hauls 14 - 17 (roughly) went into production on a day when 30 tons (t) of surimi was put up. Surimi has an average product recovery ratio of .15 (as of 1/91).

30 mt of surimi + .15 prr = 200.0 mt round wt. of pollock went into production.

Haul No.	Deck Est.	% of Day's Catch	Retained Catch/Haul
14	45 t	45/150	60.00 t
15	30	30/150	40.00
16	55	55/150	73.33
17	<u>20</u>	<u>20/150</u>	<u>26.67</u>
	150 t	100%	200.00 t

Retained catch weight can now be entered on form 2US. Remember, retained catch, converted to round weight, must be entered on form 2US for every haul. On shoreside delivery vessels, observers use delivery weight instead of the day's production round weight to estimate the retained catch by haul.

An accurate total catch weight may be calculated using the retained catch weight and adjusting for the non-utilized, discarded fish using the observer's sample data. Discards normally consist of prohibited species, bycatch species and undersized and damaged target fish. If you count and/or weigh all of a discarded species in a haul, as is often the case with prohibited species, simply add the total weight of the non-utilized species to the round weight of retained catch for that haul.

round weight of retained fish + total weight of discarded fish = total catch

When the observer cannot weigh all of the discarded fish in the whole haul, the proportion of the retained fish weight in the species composition sample to the weight of retained fish in the haul can be used to extrapolate the weight of the total catch:

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

To obtain total catch for hauls which you did not sample, calculate an adjustment factor for the day (see example below) and multiply the retained catch for the unsampled haul times the adjustment factor for that day. If you observed the catches to be very different in composition, and have samples of each type, you might calculate different adjustment factors from different samples and apply the most appropriate factor to hauls you observed but did not sample.

sum of calculated total catch weights  
 for the sampled hauls for the day  
 ----- = adjustment factor for the day  
 sum of the retained catch estimates  
 for the sampled hauls for the day

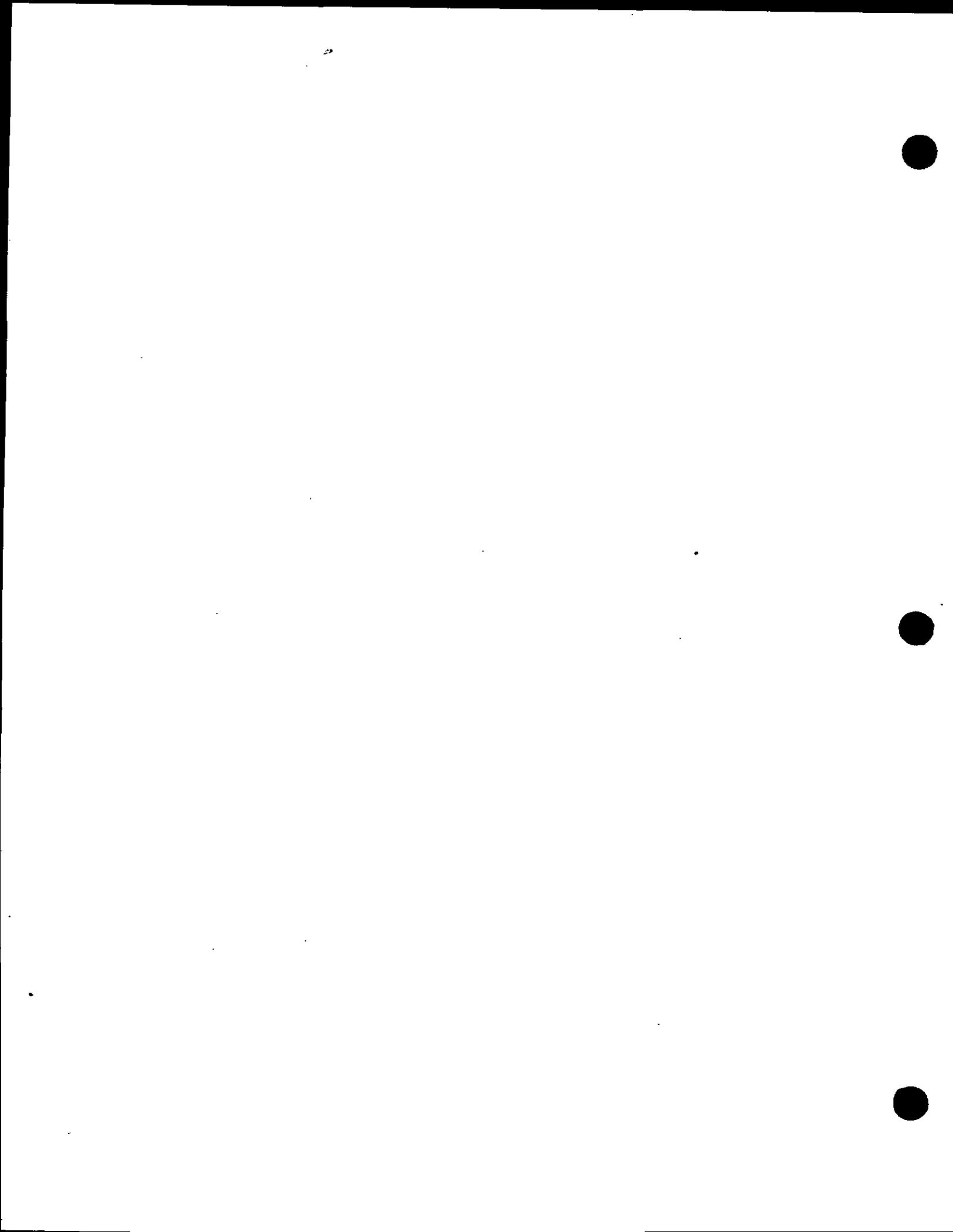
adjustment factor x retained catch est. for = total catch est.  
 for the day a nonsampled haul for that haul

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

16.00 + 20.00 + 12.00	48.00		
-----	=	-----	= 1.0390
15.80 + 19.90 + 10.50	46.20		
			1.0390 x 7.94 = 8.25
			and
			1.0390 x 17.92 = 18.62

In summary remember, official total catch must also be filled in for every haul (record it to two decimal places). This is the weight that you will use for catch reports. Basing OTC on back-calculations of retained catch plus the observer's estimates of the weight of discarded species **may** be the most accurate figure. Failing this, 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 **and/or** use your estimates of total catch if you feel they are more accurate. 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.

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



FORM 3US-SPECIES COMPOSITION

Example 1

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

Worksheet

Species:	Pollock	Salmon shark:	concomus	wt. est.	was
No. weighed:	206	about	200 lbs -	rounded	to 90 kg.
Wt. of above:	88.6				
Avg. weight:	.43				

Other calc., comments: Whole haul sampled for prophis and sp. comp.  
Bycatch wt. = 308.52 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	13	14	15	16	17	18
								8	7	0	9	1	0	1	0	1	

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

Species name	x %	Species code			ST	Number				Weight (in kg. w/ decimal pt.)	Sample weight (in kg. w/ decimal pt.)	Viability					
		20	21	22		24	25	26	27			28	29	30-40	41-51	Number excellent	
(Keypunch check)	X	9	9	9	X	3	7	2	2	1	16000.0	16000.0	2	2	3	4	4
POP		3	0	1	W					1	.45	16000.0					
Redbanded rf		3	0	8						1	5.0						
Darkblotched rf		3	1	1						2	1.3						
Rougheye rf		3	0	7						1	3.2						
Shortspine th. hd		3	5	0						2	4.5						
Sablefish		2	0	3						3	72.6						
Arrowtooth fl		1	4	1						2	5.0						
Rox Sale		1	0	5						6	1.45						
Alaska Plaice		1	0	6						1	4.1						
Salmon shark		6	6							1	90.0						
Tanner crab unid.	U	3								5	62	89.5					
Opilio Tanner	M	5								3	.43						3
Opilio Tanner	F	5								1	.17						1
Bairdi Tanner	M	4								3	2	5.44		6	5		18
Bairdi Tanner	F	4								5	9	8.7		15	16		23
Pacific Halibut	U	1	0	1						2	6.2			1	1		
King Salmon	M	2	2	2						1	1.62						
King Salmon	F	2	2	2						1	2.1						
King Salmon	U	2	2	2						1	1.76						
King crab	U	2								0	0.0						
Pacific lamprey		7	9							2	1.4						
Squid		5	0		V					5	3.6						
Pollock		2	0	1	W	3	6	4	8	4	15691.48	16000.0					

FORM 3US-SPECIES COMPOSITION

Example 2

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

Worksheet

Species:	Pcod						
No. weighed:	30	+	82 counted	only =	112		
Wt. of above:	106.2	+	290.28	=	396.48		
Avg. weight:	3.54						

Other calc.; comments: Whole haul sampled for prohibited species. Basket sampled for species composition. Pcod were subsampled for number and wt.

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
									8	7	0	9	1	0	1	0	3

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

Species name	x of 5	Species code			ST	Number				Weight (in kg. w/ decimal pt.)		Sample weight (in kg. w/ decimal pt.)			Viability								
		20	21	22		24	25	26	27	28	29	30-40	41-51	Number excellent			Number poor			Number dead			
(Keypunch check)		9	9	9								Haul wt.											
Pacific halibut	U	1	0	1	W					1	5.0	20000.0									1		
Tanner crab unid.	U	3								0	0.0												
King crab unid.	W	2								0	0.0												
King salmon	M	2	2	2						4	12.6												
King salmon	F	2	2	2	V					3	9.3												
Chum salmon	F	2	2	1	W					1	1.96	20000.0											
Arrowtooth fl		2	0	3	B					2	2.6	582.37											
Sablefish		1	4	1						1	1.85												
Pollock		2	0	1	V					3	24	181.44											
P. cod		2	0	2	B					1	12	396.48	582.37										

# Example 3

## FORM 3US—SPECIES COMPOSITION

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

### Worksheet

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

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

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

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

Species name	Sex	Species code	ST	Number																Weight (in kg. w/ decimal pt.)	Sample weight (in kg. w/ decimal pt.)	Viability								
				19	20	21	22	23	24	25	26	27	28	29	30-40	41-51	52	53	54			55	56	57	58	59	60			
(Keypunch check)	X	999	X															520.7	12000.0	20			38			67				
Pacific Halibut	U	101	B															3.6	537.1											
Red King crab	M	13																6.1		10			3			1				
Red King crab	F	13																.70		4			2							
Opilio Tanner	M	5																9.2		5			16			39				
Opilio Tanner	F	5																6.1					10			20				
Bairdi Tanner	M	4																1.1					3			3				
Bairdi Tanner	F	4																1.0		1			4			4				
Salmon unid	U	220																0.0												
Arrowtooth fl		141																89.1												
flathead sole		103																160.2												
rock sole		104																26.4												
yellowfin sole		140																200.5												
rex sole		105	V															16.7												
skate unid.		90	B															16.4	537.1											

FORM 3US—SPECIES COMPOSITION *Example 4*

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

Worksheet

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

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

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

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
									8	7	0	9	1	1	1	0	5			

Species name	Sex	Species code	ST	Number					Weight (in kg. w/ decimal pt.)	Sample weight (in kg. w/ decimal pt.)	Viability										
				19	20	21	22	23			24	25	26	27	28	29	30-40	41-51	Number excellent		
(Keypunch check)	X	9 9 9	X					7	1	8	757.6	18620.0	2			5			26		
Salmon unid.	U	220	W							0	0.0	18620.0									
King crab unid.	U	2	↓							0	0.0	18620.0									
Pacific halibut	U	101	W							2	247.0	18620.0	2			4			20		
Bairdi Tanner	M	4	B							1	.32	510.6						1			
Baird. Tanner	F	4	I							6	1.89										6
Pollock		201	I							6	75.478.93										
P.cod		202	I							4	21.4										
POP		301	I							2	1.49										
Dusky rf.		330	I							1	1.04										
Northern rf.		303	I							1	.84										
Shorthead rf.		326	I							1	2.6										
Squid		50	V							2	1.23										
Jellyfish		35	B							1	.86	510.6									

## 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. Strive for data that is representative of the catch by collecting random, unbiased samples.
2. When sampling for species composition, you must also sample for the incidental catch of halibut, salmon, king crab and Tanner crab and vice versa.
3. The weight of the groundfish catch which was sorted for the sample is the "sample weight". It may be obtained by actually counting and weighing the whole sample or if the entire catch was thoroughly sorted, the sample weight will be the official total catch weight.
4. Each prohibited species group: halibut, salmon, king crab and tanner crab may be whole-haul sampled or basket sampled. The composition of the rest of the catch, (target species and other bycatch **as a group**), may be either whole-haul sampled or basket sampled.
5. The sample is sorted according to species or species groups, and the weight of each group is recorded.
6. The number of individuals of each species or species group is counted and recorded.

### FORM 3US - INSTRUCTIONS FOR RECORDING SPECIES COMPOSITION DATA

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

1. Enter the date, and haul number. (The cruise number and vessel code will normally be given to you during debriefing.) Remember that the date of the sample should correspond to the information on Form 2US. The date should thus be the day the trawl began to be hauled in.
2. Group the species in your species composition samples by the sample size, starting with the largest sample size first. Whole-haul sample data first (if any), basket sample data secondly.
3. List each species or species group by their common name and the corresponding code from the alphabetically arranged Species Code List in the "Reference Section" of this

manual. Look up a species under its group name--rockfish, sculpin, sole, etc. Most fish, especially the commercially important species, should be identified to species, if possible. See also the section on Species Identification which precedes the Code List.

4. You cannot have two sample weights for any species. Each species (except those whose listings are by sex) may only be listed once for each haul.
5. All Tanner crab, king crab, or salmon should be listed separately by species and sex whenever possible. Pacific halibut should be listed with "U" for sex unknown. (Do not sex halibut, even the dead ones.) For **these species only**, record an "M", "F", or "U" in column 19. If large quantities of one of the crab or salmon species groups are seen, it is permissible to take a random subsample of the group and record all of the individuals in the subsample by species and sex. Either count or weigh all of the remaining members of the group and apply an average weight (from your subsample totals) to get the weight or number, and record these as (Tanner crab/king crab/salmon) unid. and unknown sex. Make sure that no individual is recorded twice on the forms (none of the subsample should be reported in the larger group of unidentified individuals). (See 3US example 1, Tanner crab for an illustration of how to record the data in this type of a subsample situation.)
6. In column 23, indicate the sampling type for each sample size. For species that you whole-haul sampled, use "W"; for basket sampling data use "B". **Partial haul sampling is no longer allowed.** Whenever the sum of the species weights is less than the official total catch weight, designate the sample as "B".
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 and trailing zero. If you whole-haul sampled for the species composition, the sample weight should be the same as the official total catch estimate (cols. 63-67 on the Form 2US). 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). Logically, the sample weight can equal but never exceed the official total catch weight. Yet this is an easy mistake to make when using an un-rounded weight which is a conversion from pounds to kilograms (2US is in metric tons and 3US is in kilograms). Whole-haul sample weights should be recorded to the nearest ten kilograms.

Please note: if an observer is 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 haul sample data.

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) If the observer counted more individuals of a species than he/she 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 cod were handled on Form 3US example 2). Similar entries should be made for the reverse situation when you, for example, weigh large quantities of small Tanner crab, and must extrapolate a total number.
  - b) When whole-haul sampling for composition, the samples for average weight of target species must be recorded in the worksheet area of the form. See the Form 3US example 1 for pollock and the instructions for "Recording Whole-Haul Sampling..." in the following section on "Methods".
  - c) Individuals whose weight is estimated can be entered on the worksheet as in Form 3US example 1 for salmon shark. If you feel a non-weighed individual is of a different size than those that were weighed, enter an estimate on the "wt of above" line just below the number estimated. Include the **total** number observed and the **combined weight of the actual and estimated individuals** on the keypunched form below. (Note: For halibut there is a statistically valid length/weight relationship that can aid you in estimating the weight of large individuals, (see Reference Section), length/weight relationships cannot be predicted for other species.)

Note in the comments section the type of sampling you used, number of baskets taken, density values, and anything unusual about the catch or sampling.
11. Check to see whether or not each of the prohibited species groups was represented on the form. It is necessary to have some indication of how much catch was monitored for each of the prohibited species groups--halibut, king crab, Tanner crab, salmon/steelhead. **If no individuals of that species group were observed, then the observer should enter that group name, species code (use codes 2, 3, 101, 220), sample type, sample weight, 0 for the number, and 0.0 for the weight.** (See the 3US examples 1, 2, 3, and 4.)
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 Reference Section. 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).

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 catch report 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 non-observed prohibited species groups.

## METHODS OF SPECIES COMPOSITION SAMPLING

There are a number of different ways the above information can be obtained. The sampling methods you choose are dependent on the diversity and size of the catch, the shipboard setup and your time and energy. Basket sampling is the most common means of sampling when the catch is reasonably diverse. When one or two species predominate in the catch and there are very few other species, it may be possible to sample the whole haul to determine composition. Frequently observers are able to sample the whole catch for prohibited species and basket sample for species composition. These methods will be discussed in detail; it is up to you to decide which methods provide the most accurate information in your particular situation, and to devise a sampling scheme which will provide **complete** species composition data for any sampled haul.

### Basket Sampling

The objective is to obtain a random, unbiased sample from a particular catch such that the relative amounts of species in the sample will reflect their proportion in the haul. When random sampling, this is not always achieved within each haul but from the many samples taken within an area/week, a reflection of the relative species proportions should be apparent. Never should you "hand-pick" a "representative" sample based on your visual estimate of the composition. In the course of your work you will be collecting baskets of fish for various purposes. However, when employing "basket sampling" for species composition, this means that your sample is limited to the organisms collected at random which you actually weighed and/or counted. 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 getting assistance from a crewman on the deck to hold a basket into the flow of fish as they fall from the net into a hatch opening in the deck. Another good method is to hold the basket where unsorted fish are falling from the live tank to a conveyor belt, or from one conveyor belt to another. Yet another technique is to find or design a diverter board for the conveyor belt. This is a board hinged into the side of the conveyor belt trough capable of blocking the fish flow along the conveyor belt, thereby allowing the catch to spill off the conveyor belt into a basket. Sometimes the boards of a fish bin can be raised, allowing fish to spill out from a lower layer of fish into a basket, but be careful, this could be a size selective method.

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

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

As a guideline, when basket sampling for species composition, try to collect a minimum of 8 - 10 baskets of fish or at least 300 kg. At times, on domestic vessels, some of your basket samples may be smaller. Be sure to record in your logbook any difficulties you encounter.

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.

As explained in the notes for form 3US regarding the worksheet part of the form, observers may subsample a species for average weight and multiply the average weight times the remaining ones which were counted only. Conversely, with organisms such as brittle stars or jellyfish it might be easiest to weigh them all and divide the total species weight by their

average weight to obtain an estimate of their number. At least thirty to fifty organisms must be sub-sampled for average weight.

### Whole-Haul Sampling

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 (bycatch) species. This happens very frequently on vessels fishing for pollock. Whole-haul sampling means that the entire unsorted catch passed by you at one point and you were able to see, and pull out, all bycatch organisms for counting and weighing later. In a pure pollock fishery, catches will normally be whole-haul sampled which results in samples that may be indicative but the danger is that accuracy may suffer. In this program we place a high value on thorough, accurate sorting.

When whole-haul sampling, the sample weight will be the official total catch weight from form 2US, converted to kilograms. When converting from pounds to kilograms or metric tons, be sure to use the catch weight figure rounded to hundredth's of a metric ton or to tens of kilograms or the sample weight (in kilograms) with more decimal places, may exceed the total catch weight by a small amount. The analysis program will flag this as an error.

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

Bycatch species (which include any prohibited species) that have been sorted out of the entire catch, must then be counted and weighed. Their numbers and weights are entered on the form 3US first with a sample type designation of "W". The observer should then randomly obtain a couple of baskets of the predominant species (or a minimum of thirty to fifty fish if they are large, like cod), and count and weigh them. This sub-sample data must be entered on the worksheet portion on the form and used to calculate an estimate of the total number of the predominant species. This is a very common sampling method, and the recording of the data from this type of sampling is illustrated in the first example form 3US.

The sample and sub-sample method above may be expanded to include the situation of whole-haul sampling when two species dominate the catch but the extrapolation may not be carried to more than two species. If more than two species are present in large numbers in the catch, then basket sample. The predominant species are not necessarily species the vessel was

fishing for or "targeting" on. For example, when fishing for pollock, vessels will occasionally tow through clouds of jellyfish and when fishing on the ocean bottom for turbot, they will sometimes pick up lots of brittle stars. Example calculations are explained below.

### Recording Whole-Haul Sampling With One Or Two Predominant Species

These are the calculations which accompany the Form 3US example number 1 data for haul 101. In haul 101 a single species, pollock, is predominant. Remember - each of the four prohibited species groups must have at least one line of entry included with the rest of the bycatch in whole-haul samples.

1. Enter the number and weights of the incidental species (bycatch) which were obtained from the whole haul. Also enter the OTC weight, in kilograms, on the 999 line and again the sample weight column below since it is the sample weight.
2. The weight of the dominant (usually the target) species is obtained by subtracting the summed weight of the bycatch from the official total catch weight (OTC) which is to say, the total sample weight.

$$16000.0 \text{ kg} - 308.52 \text{ kg} = 15691.48 \text{ kg}$$

(sample wt) - (bycatch) = (wt of pollock in sample)

3. The numbers, weight, and calculated average weight of the dominant species obtained from a subsample **must be put on the worksheet area at the top of the form. Be careful:** average weight = weight ÷ number, **not** the other way around!

$$\frac{88.6 \text{ kg (wt. of pollock in subsample)}}{206 \text{ (number of pollock in subsample)}} = .43 \text{ kg (calculated average weight of pollock)}$$

4. Divide the total weight of the pollock (obtained by step 1) by the calculated average weight to obtain an estimated total number of pollock (using the unrounded average and rounding the result to the nearest whole number). Enter the estimated total number and the total weight, as obtained by subtraction, of the dominant species in the appropriate key punch columns.

$$15691.48 \text{ kg (wt. of pollock)} \div \frac{88.6}{206} = 36483.57652 \text{ or } 36484 \text{ (number of pollock)}$$

When two species (no more!) are dominant in the catch such that their relative amounts by weight can be determined by random basket sample of about six baskets, their combined weight in the catch, obtained by subtraction, may be divided by species based on relative weights in a subsample.

1. Subtract the total combined weight of the bycatch species from the sample weight. The figure you obtain will be the combined weight of the two major species in the haul. Here is an example calculation for a catch containing predominantly pollock and Pacific cod:

$$20000.0 \text{ kg} - 94.6 \text{ kg} = 19905.4 \text{ kg}$$

(sample wt) - (bycatch) = (combined wt of pollock & cod in total catch)

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

the subsample yielded:

$$151 \text{ pollock} = 117.2 \text{ kg}$$

$$20 \text{ P. cod} = \underline{20.4 \text{ kg}}$$

$$\text{Total subsample weight} = 137.6 \text{ kg}$$

$$\frac{\text{kg pollock in subsample}}{\text{total subsample wt}} = \frac{117.2 \text{ kg}}{137.6 \text{ kg}} = .85 \text{ (85\% pollock by weight)}$$

$$\frac{\text{kg P. cod in subsample}}{\text{total subsample wt}} = \frac{20.4 \text{ kg}}{137.6 \text{ kg}} = .15 \text{ (15\% P. cod by weight)}$$

Then multiply the combined weight of pollock and Pacific cod in the haul by the percentages of both species that were calculated from the sub-sample weights.

$$.85 \times 19905.4 = 16919.59 \text{ kg} = \text{wt. of pollock in whole haul}$$

$$.15 \times 19905.4 = 2985.81 \text{ kg} = \text{wt. of P. cod in whole haul}$$

Record the above two figures on the data form opposite each species.

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

$$16919.59 \text{ kg} \div \frac{117.2 \text{ kg}}{151} = 21799 \text{ estimated number of pollock, when rounded to a whole number.}$$

$$2985.81 \text{ kg} \div \frac{20.4 \text{ kg}}{20} = 2927 \text{ estimated number of Pacific cod, when rounded to a whole number.}$$

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

**Remember, that after you have completed the above calculations all the species weights must still add up exactly to the whole haul weight in kilograms**

### 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.

### OBJECTIVES AND PRIORITIES OF COMPOSITION SAMPLING

When good scientific methodology is used in sampling commercial catches, we expect that the samples will be representative of the total groundfish catch of the observed vessels. Observer's species composition samples must be collected such that (ideally) every fish in the catch has an equal opportunity of landing in the observers sample. To accomplish these objectives you must develop a routine from the whole-haul and basket sampling methods just described. It is up to you to devise a sampling technique which provides the most accurate information for your particular situation. If you feel you must deviate from the methods described in this manual, contact this program's Seattle office for consultation and document your procedures fully. Remember, you must have defensible 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 those assisting you to sort.

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.

4) Allocate your time appropriately. Sampling a catch should usually take two to three hours. 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 may be all right if there are only three hauls per day, but if your ship is hauling four to six catches per day, you should reduce your sample size and increase the number of samples per day. A deciding factor is whether there is stratification or patchiness in the distribution of species within a haul. As this makes representative sampling more difficult, in these cases it is appropriate to devote more time sampling each haul. On the other hand, when there are obvious differences between tows and uneven species distribution is not a problem then it would be best to reduce the sample size and sample more catches.

5) Believe in the scientific method of random sampling and in the "long run" accuracy of it. As a result of reducing your sample size, you may find that a species whose occurrence is "patchy" is over-represented in some of your samples and under-represented in others. Over time and many samples, the level of occurrence will closely approximate the true value (assuming random samples). Remember that in many analyses your data will be merged with all other observer's data in that area, year, month and vessel type classification. **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.**

## PROHIBITED SPECIES INCIDENCE SAMPLING AND BIOLOGICAL DATA COLLECTION

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

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

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

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

### PROHIBITED SPECIES SAMPLING

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

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

1. Presorting of the prohibited species by crew members on the trawl deck as the catch is emptied into the live tank may cause a problem for you if you were counting on sampling them in the factory. You may make the best of this situation by trying to whole-haul sample for prohibited species on deck and take advantage of the crews sorting effort. However, you

must work with them on deck to oversee the operation as their sorting efforts are likely to be haphazard. The skipper is likely to object to the delay caused by sorting on deck and this would be your opportunity to explain that it is all or nothing and thereby get the captain to order his deck crew not to pre-sort. **Always watch the dumping of a net you are going to sample to prevent presorting.**

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

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

Tanner crab, king crab and salmon must be grouped by species for catch message forms. If you sort from the catch an enormous amount (>300) of say, Tanner crab, and cannot separate them all into species groups, from your sub-sample you will need to figure out the percentage by number of C. bairdi Tanner crab and other Tanner crab. Record this calculation on the worksheet part of Form 3US. This percentage can then be applied to the remainder of the unidentified Tanner crab to divide them into C. bairdi and other Tanner crab groups for your catch message form. The sub-sample should also be worked up for other biological information required.

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

5. Sometimes a vessel will accidentally pick up a crab pot that has been snagged by the trawling gear. This incident would be recorded as a gear performance code two on form 2US

(see instructions for the form). Also, note that you **do not count any crab that may be in the pot as part of your sampling for the incidence of King and Tanner crab**. You should note the incident in your logbook and include a description of the pot and identifying numbers, if any.

### BIOLOGICAL DATA COLLECTED FROM PROHIBITED SPECIES

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

1. sex - except for halibut; designate halibut sex as "U"
2. measurements - measure the fork length of salmon and halibut; measure crab only if assigned to do so.
3. viability - for halibut and crab only; entries of salmon viability will have to be erased.

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

#### Collecting Data From Salmon and Steelhead

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

- (a) Species identification--the six species which may be encountered are -- king, chum, sockeye, pink, coho, or steelhead.
- (b) Sex--determine the sex of each salmon; only live salmon that have minimal scale loss should not be sexed, but listed as "unknown" sex. When the observer is not sure of the sex of a salmon or does not have enough time to sex it, the sex should also be listed as "unknown."
- (c) Numbers of salmon/steelhead--determine numbers by species and sex groups.
- (d) Weight--record the individual weights if scale samples are to be taken; if scale samples are not taken of all fish, obtain the total weight by species and sex group for those fish whose scales were not sampled.

- (e) Length--the fork length of each salmon found in the sample is recorded to the nearest whole centimeter on Form 7US, (see "Length Frequencies" in a following section). Length measurements are grouped by species and by sex, and are recorded in ascending order.
- (f) Scale samples--the purpose of taking scale sample is primarily for confirming the observer's identity of the salmon, therefore, observers should take scale samples of the first 20 salmon of each species identified during the deployment period (regardless of the number of vessels the observer was on). The scale samples and data forms will also be used for ageing. Follow the collecting instructions in "Scale Samples and Random Stratified Otolith Samples" in a following section. Do not collect scales from salmon that are not part of your prohibited species sample unless they were tagged salmon.
- (g) Check for missing adipose fin, fins that are clipped, brands, and tags. Salmon with these types of marks may also have been tagged with a coded wire in the snout. Follow the directions in the section on "Tagged Fish."

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

#### Collecting Data From King and Tanner Crab

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

- (a) Species identification--species which could be encountered are red, blue, brown, and Lithodes couesi king crab; Chionoecetes bairdi, C. opilio, C. hybrid, C. angulatus, and C. tanneri Tanner crabs.
- (b) Sex--determine the sex of each crab. When the observer is not sure of the sex of a crab or does not have enough time to sex it, the sex should also be listed as "U" for unknown."
- (c) Numbers of king/Tanner crab--determine numbers by species and sex groups.
- (d) Weight--record the total weight by species and sex group.
- (e) Check for Tags--follow the directions in the "Tagged Fish and Crab" section.
- (f) When given as a special project: Viability--an estimate of the survival chance of each crab. This estimate is based upon an appraisal of the condition of the crab upon release to the sea. Refer to the guidelines on sampling viability of halibut. Apply those same instructions when sampling for the viability of crab. Definitions of "excellent," "poor" and

"dead" condition are given in the Reference Section following a similar table for halibut. Viability and lengths of crab should be collected only by observers assigned this task as a special project.

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

#### Collecting Data From Halibut

The following information should be collected from halibut obtained from the 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 (Reference Section or in the Appendix) to obtain the corresponding weights. (The total weights of halibut should include these table weights as well as scale weights.) When possible, however, halibut should be weighed instead of using the length-weight table.
- (c) Lengths--take lengths of all those in your sample except, when faced with many halibut, measure a minimum of 20 and a maximum of 100 halibut per haul or set. Do not measure more than 20 halibut if they are alive and in good condition. Lengths are recorded to the nearest whole centimeter.
- (d) Viability--an appraisal of the condition of the halibut as it would be if the crew were releasing them to the sea.  
[Note: Do not sex halibut, not even the dead ones. The data will not be used and so it would be a waste of your time.]

#### Viability of Halibut

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

were from the sampled haul or set. Remember, viability sampling should not take precedence over sampling for their incidence and obtaining the other biological information needed.

Using the tables in the Reference Section giving the definitions of "excellent," "poor," and "dead", note the number of halibut in each category. Do not guess the condition of halibut that you do not personally examine. If the sample of halibut that is checked for viability is a subsample of the incidence of prohibited species sample, make certain that the subsample is a representative one.

## SPECIES IDENTIFICATION

All commercially important fish and invertebrates must be identified to species. In the radio message section of this manual, under "Report Groups" for the Bering Sea and Gulf of Alaska, all the allocated categories, (those other than NON), can be considered commercially important and should be identified to species with four exceptions from the "Other Fish" category. From the Other Fish category, only sharks, eulachon and capelin need to be identified to species. All prohibited fish and crabs must also be identified to species. It is more important that observers spend their time working on proper identification of species of commercial interest, such as flatfish and rockfish, than to spend time on fish that no one targets on, such as eelpouts or sculpins.

To verify identifications, each observer is required to fill out species description forms for the first sighting during a trip of any fish or invertebrate keyed out to species. There are separate forms for rockfish, flatfish and other or miscellaneous species.

On species composition forms, do not use categories such as "flatfish unidentified" or "rockfish unidentified" unless the fish has been mangled to the point that that is all that can be determined. 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" and carefully fill out a species description form in complete detail. If you are able to determine their identity later, (perhaps with a staff member's help during debriefing), then substitute the species name and code in place of "rockfish A" and "rockfish B" on your forms. If you do not get a positive ID on them later, then you must group them under "rockfish unidentified", (or "rockfish - unident.") on your forms, and combine their numbers and weights. Remember, a species code may only be listed once on any page (or day) of form 3US.

Most of the species of the non-allocated report group (except for the prohibited species) have been listed simply by family in the Species Code List on the following pages. Example families are: eelpouts, poachers, greenlings, lumpsuckers, pricklebacks and rattails. (Note: sculpins have been grouped into four genera. If you are not sure which genus a sculpin belongs to or you do not have time to key it out, then use the "sculpin - unident." code.) If you have the interest or knowledge and the time, and you would like the information on these non-target fish listed by species in your data, fill out a species description form. When your identification is verified by a staff member, they will give you the appropriate species code.



ROCKFISH SPECIES DESCRIPTION FORM

Species Name: \_\_\_\_\_

Date of Capture: \_\_\_\_\_

Haul or Delivery Number: \_\_\_\_\_

Position of Capture (Lat. & Long.): \_\_\_\_\_

Depth of Capture: \_\_\_\_\_

Length: \_\_\_\_\_

Weight: \_\_\_\_\_

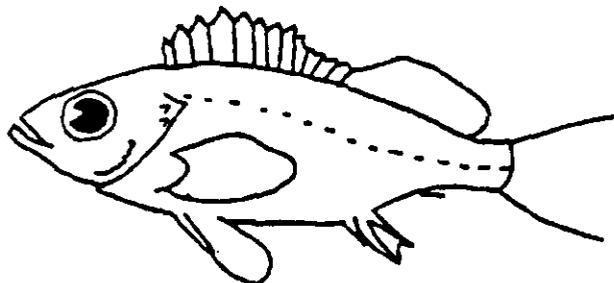
Was an example of this species brought back? Yes No

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

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

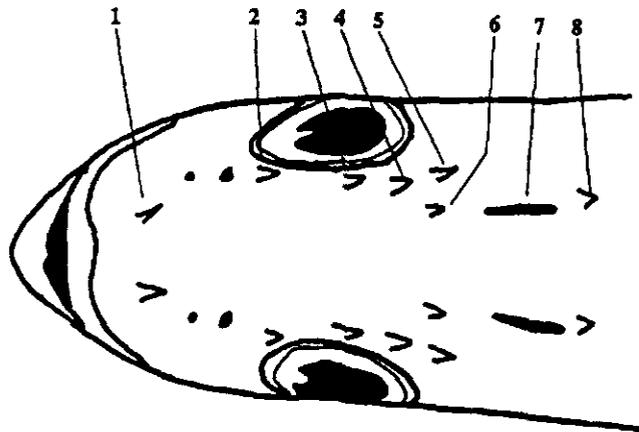
What color category of Hitz's would you place it in?

Please sketch any pattern, stripes, freckles, bars, light or dark areas etc. Draw the shape of the anal fin and include any 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. Also, remember that some spines are very difficult to find.

Strength of Head Spines: WEAK OR STRONG





FLATFISH SPECIES DESCRIPTION FORM

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

Was an example of this species brought back? Yes No

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

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

Is the flatfish right eyed or left eyed? \_\_\_\_\_

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

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

Please answer the following questions:

What is the general tail shape?



Does the fish have an accessory dorsal branch (ADB) of the lateral line?

\_\_\_ Yes (If so, remember to sketch it in.)  
 \_\_\_ No

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

Relative to the lower eye, the maxillary ends:

- \_\_\_ forward of orbit
- \_\_\_ below anterior part of orbit
- \_\_\_ below pupil of eye
- \_\_\_ below posterior part of orbit
- \_\_\_ below posterior margin of orbit or beyond

In regard to mouth symmetry; the maxillary is:

- same length on eyed and blind sides
- slightly asymmetrical
- dramatically asymmetrical

What is the preoperculum shape?

- rounded
- angled

Anal spine present?

- Yes
- No

What is the shape of the lateral line over the pectoral fin?

- flat
- arched
- curved
- highly arched

What is the shape of the posterior margin of the pectoral fin (on the eyed side)?

- rounded
- angular
- pointed or extended (i.e. upper rays longer than lower rays)

Please make the following counts:

Dorsal fin rays: \_\_\_\_\_

Gill rakers on the 1st arch:

Anal fin rays: \_\_\_\_\_

upper arm: \_\_\_\_\_

pectoral fin rays: \_\_\_\_\_

lower arm: \_\_\_\_\_

pelvic fin rays: \_\_\_\_\_

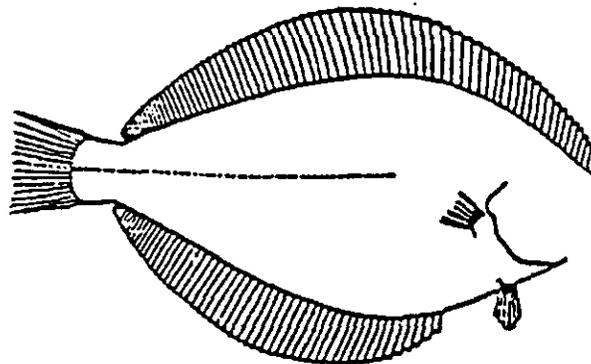
total: \_\_\_\_\_

Gill rakers on the 2nd arch:

upper arm: \_\_\_\_\_

Finish the sketch below as best you can. Make sure to draw in the important features of the flatfish. Include the following in your drawing:

- general head shape
- size and shape of mouth
- shape of the end of the tail
- lateral line (include any arch and ADB)
- shape of preoperculum
- size and shape of pectoral fin -- placement of eyes



Comments: \_\_\_\_\_

\_\_\_\_\_

MISC. SPECIES DESCRIPTION FORM

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

Was an example of this species brought back? Yes No

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

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

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

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

Dorsal fin spines: \_\_\_\_\_ Gill rakers--upper arm: \_\_\_\_\_  
Dorsal fin rays: \_\_\_\_\_ Gill rakers--lower arm: \_\_\_\_\_  
Anal fin rays: \_\_\_\_\_ Gill rakers total: \_\_\_\_\_  
Anal fin spines \_\_\_\_\_  
Pectoral fin rays: \_\_\_\_\_  
Pelvic fin spines: \_\_\_\_\_  
Pelvic fin rays: \_\_\_\_\_

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

Comments and Additional Notes:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Draw Specimen on Reverse Side



SPECIES CODE LIST

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

19 CRAB, TANNER, ANGULATUS  
 4 CRAB, TANNER, BAIRDI  
 5 CRAB, TANNER, OPILIO  
 47 CRAB, TANNER, BAIRDI/OPILIO HYBRID  
 18 CRAB, TANNER, TANNERI  
 3 CRAB, TANNER - UNIDENT.  
 23 CRAB, TELMESSUS  
 53 CRINOIDS - UNIDENT.  
 248 CUSK-EEL - UNIDENT.  
 660 CUTLASSFISH - UNIDENT.  
 144 DAB, LONGHEAD (SANDDAB)  
 679 DAGGERTOOTH  
 799 DRAGONFISH - UNIDENT.  
 690 DREAMER - UNIDENT.  
 250 EELPOUT - UNIDENT.  
 91 EGG CASE, SKATE - UNIDENT.  
 34 EGGS, SNAIL  
 601 EULACHON, (CANDLEFISH)  
 901 FISH - UNIDENT.  
 100 FLATFISH - UNIDENT.  
 210 FLATNOSE, PACIFIC (CODLING)  
 146 FLOUNDER, ARCTIC  
 141 FLOUNDER, ARROWTOOTH  
 145 FLOUNDER, BERING  
 147 FLOUNDER, KAMCHATKA  
 142 FLOUNDER, STARRY  
 660 FROSTFISH, (CUTLASSFISH)-UNIDENT.  
 390 GREENLING - UNIDENT.  
 80 GRENADIER, (RATTAIL) - UNIDENT.  
 430 GUNNEL - UNIDENT.  
 77 HAGFISH - UNIDENT.  
 660 HAIRTAILS, (CUTLASSFISH)-UNIDENT.  
 206 HAKE, PACIFIC  
 102 HALIBUT, GREENLAND (TURBOT)  
 101 HALIBUT, PACIFIC  
 767 HATCHETFISH - UNIDENT.  
 611 HERRING, PACIFIC  
 902 INVERTEBRATE - UNIDENT.  
 418 IRISH LORD - UNIDENT.  
 33 ISOPOD  
 207 JACK MACKEREL  
 35 JELLYFISH - UNIDENT.  
 2 KING CRAB - UNIDENT.  
 608 KING-OF-THE-SALMON, (RIBBONFISH)  
 700 LAMPFISH - UNIDENT.  
 75 LAMPREY - UNIDENT.  
 785 LANCETFISH, LONGNOSE  
 700 LANTERNFISH - UNIDENT.  
 54 LEECH, BRISTLEWORM, POLYCHAETES  
 45 LIMPET - UNIDENT.  
 603 LINGCOD  
 14 LITHODID - UNIDENT. (RACE)

CHIONOECETES ANGULATUS  
 CHIONOECETES BAIRDI  
 CHIONOECETES OPILIO  
 CHIONOECETES HYBRID  
 CHIONOECETES TANNERI  
 CHIONOECETES SP.  
 TELMESSUS CHEIRGONUS  
 CRINOIDEA  
 OPHIDIIDAE  
 TRICHIURIDAE  
 LIMANDA PROBOSCIDEA  
 ANOTOPTERUS PHARAO  
 MELANOSTOMIIDAE  
 ONEIRODIDAE  
 ZOARCIDAE  
  
 GASTROPODA  
 THALEICHTHYS PACIFICUS  
 OSTEICHTHYES  
  
 ANTIMORA MICROLEPIS  
 LIOPSETTA GLACIALIS  
 ATHERESTHES STOMIAS  
 HIPPOGLOSSOIDES ROBUSTUS  
 ATHERESTHES EVERMANNI  
 PLATICHTHYS STELLATUS  
 TRICHIURIDAE  
 HEXAGRAMMIDAE  
 MACROURIDAE  
 PHOLIDAE  
 MYXINIDAE  
 TRICHIURIDAE  
 MERLUCCIUS PRODUCTUS  
 REINHARDTIUS HIPPOGLOSSOIDES  
 HIPPOGLOSSUS STENOLEPIS  
 STERNOPTYCHIDAE  
 CLUPEA HARENGUS PALLASI  
  
 HEMILEPIDOTUS, SP.  
 ISOPODA  
 TRACHURUS SYMMETRICUS  
 SCYPHOZOA  
 LITHODES AND PARALITHODES SP.  
 TRACHIPTERUS ALTIVELIS  
 MYCTOPHIDAE  
 PETROMYZONTIDAE  
 ALEPISAURUS FEROX  
 MYCTOPHIDAE  
 ANNELIDA  
  
 OPHIODON ELONGATUS  
 LITHODID CRAB UNIDENT.

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

303	ROCKFISH, NORTHERN	SEBASTES POLYSPINIS
301	ROCKFISH, PACIFIC OCEAN PERCH	SEBASTES ALUTUS
335	ROCKFISH, PYGMY	SEBASTES WILSONI
343	ROCKFISH, QUILLBACK	SEBASTES MALIGER
322	ROCKFISH, 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, ROUGHEYE	SEBASTES ALEUTIANUS
304	ROCKFISH, SHARPCHIN	SEBASTES ZACENTRUS
318	ROCKFISH, SHORTBELLY	SEBASTES JORDANI
326	ROCKFISH, SHORTRAKER	SEBASTES BOREALIS
350	ROCKFISH, SHORTSPINE THORNYHEAD	SEBASTOLOBUS ALASCANUS
310	ROCKFISH, SILVERGRAY	SEBASTES BREVISPINIS
315	ROCKFISH, SPLITNOSE	SEBASTES DIPLOPROA
328	ROCKFISH, 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	ROUNDFISH - UNIDENT.	
203	SABLEFISH, (BLACK COD)	ANOPLOPOMA FIMBRIA
220	SALMON - UNIDENT.	ONCORHYNCHUS, SP.
221	SALMON, CHUM (DOG)	ONCORHYNCHUS KETA
222	SALMON, KING (CHINOOK)	ONCORHYNCHUS TSHAWYTSCHA
225	SALMON, PINK (HUMPBACK)	ONCORHYNCHUS GORBUSCHA
224	SALMON, RED (SOCKEYE)	ONCORHYNCHUS NERKA
223	SALMON, SILVER (COHO)	ONCORHYNCHUS KISUTCH
40	SAND DOLLARS	ECHINOIDEA
670	SAND LANCE, PACIFIC	AMMODYTES HEXAPTERUS
136	SANDDAB - UNIDENT.	BOTHIDAE
144	SANDDAB, LONGHEAD	LIMANDA PROBOSCIDEA
137	SANDDAB, PACIFIC	CITHARICHTHYS SORDIDUS
239	SANDFISH	TRICHODON
614	SARDINE, PACIFIC	SARDINOPS SAGAX CAERULENS
607	SAURY, PACIFIC	COLOLABIS SAIRA
660	SCABBARDFISH,(CUTLASSFISH)-UNIDENT.	TRICHIURIDAE
29	SCALLOPS, CLAMS, MUSSELS, OYSTERS	PELECYPODA
400	SCULPIN - UNIDENT.	COTTIDAE
431	SCULPIN, GYMNOCANTHUS - UNIDENT.	GYMNOCANTHUS, SP.
418	SCULPIN, IRISH LORD - UNIDENT.	HEMILEPIDOTUS, SP.
440	SCULPIN, MYOXOCEPHALUS SP.	MYOXOCEPHALUS SP.
433	SCULPIN, TRIGLOPS - UNIDENT.	TRIGLOPS SP.
Note:	Many other genera and species of sculpins are present. Group these others under sculpin unidentified.	
55	SEA ANEMONE - UNIDENT.	ACTINIARIA
41	SEA CUCUMBER - UNIDENT.	HOLOTHURIOIDEA
689	SEA DEVIL - UNIDENT.	CERATIIDAE
54	SEA MOUSE, BRISTLEWORM, LEECH	ANNELIDA

43	SEA ONIONS - UNIDENT.	UROCHORDATA
58	SEA PEN, SEA WHIP - UNIDENT.	PENNATULA
43	SEA POTATO - UNIDENT.	UROCHORDATA
25	SEA SLUG, - UNIDENT.	NUDIBRANCHIATA
56	SEA SPIDER - UNIDENT.	PYCNOGANIDA
43	SEA SQUIRTS, ONIONS, POTATOES, TUNICATES	UROCHORDATA
40	SEA URCHINS	ECHINOIDEA
58	SEA WHIP, SEA PEN - UNIDENT.	PENNATULA
54	SEA WORMS (POLYCHAETES)	ANNELIDA
550	SEABASS - UNIDENT.	SCIAENIDAE
240	SEARCHER, (RONQUIL) - UNIDENT.	BATHYMASTERIDAE
900	SEAWEED	MISC. ITEMS
606	SHAD, AMERICAN	ALOSA SAPIDISSIMA
750	SHANNY, (PRICKLEBACK) - UNIDENT.	STICHAETIDAE
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	CLIDODERMA ASPERRIMUM
115	SOLE, SAND	PSETTICHTHYS MELANOSTICTUS
111	SOLE, SLENDER	LYOPSETTA EXILIS
140	SOLE, YELLOWFIN	LIMANDA ASPERA

26 SPONGE - UNIDENT.  
622 SPOOKFISH - UNIDENT.  
270 SQUARETAIL, SMALLEYE  
50 SQUID - UNIDENT.  
51 SQUID, GIANT  
20 STARFISH - UNIDENT.  
21 STARFISH, BASKET  
22 STARFISH, BRITTLE  
24 STARFISH, SUNSTAR  
226 STEELHEAD  
230 STURGEON - UNIDENT.  
3 TANNER CRAB - UNIDENT.  
209 TOMCOD, PACIFIC  
113 TONGUEFISH, CALIFORNIA  
227 TROUT, CUTTHROAT (SEA RUN)  
807 TUBESHoulder - UNIDENT.  
43 TUNICATES, ASCIDIANS, SEA SQUIRTS  
143 TURBOT - UNIDENT.  
102 TURBOT, GREENLAND (HALIBUT)  
805 VIPERFISH - UNIDENT.  
757 WARBONNET, DECORATED  
762 WEARYFISH, (PAPERBONES) - UNIDENT.  
779 WOLFFISH - UNIDENT.  
780 WOLF-EEL  
760 WRYMOUTH, GIANT  
783 WRYMOUTH, DWARF  
999 Z SUMMATION LINE

PORIFERA  
OPISTHOPROCTIDAE  
TETRAGONURUS CUVIERI  
DECAPODA  
MOROTEUTHIS ROBUSTA  
ASTEROIDEA  
GORGONOCEPHALUS  
OPHIUROIDEA  
SOLASTER SP.  
SALMO GAIRDNERI  
ACIPENSERIDAE  
CHIONOECETES SP.  
MICROGADUS PROXIMUS  
SYMPHURUS ATRICAUDA  
SALMO CLARKI  
SEARSIIDAE  
UROCHORDATA  
  
REINHARDTIUS HIPPOGLOSSOIDES  
CHAULIODONTIDAE  
CHIROLOPHIS DECORATUS  
NOTOSUDIDAE  
ANARHICHADIDAE  
ANARRHICHTHYS OCELLATUS  
DELOLEPIS GIGANTEA  
LYCONNECTES ALEUTENSIS  
CODE FOR FORM 3US ONLY

## DEFINITION OF HALIBUT CONDITION

### Trawl Catches

- (1) Excellent: No sign of stress
  - (a) Injuries, if any, are minor
  - (b) Muscle tone or physical activity is strong
  - (c) Gills are red (not pink) and fish is capable of closing gill cover (operculum) tightly
- (2) Poor: Alive but showing signs of stress
  - (a) Moderate injuries may be present
  - (b) Muscle tone or physical activity is weak
  - (c) Gills are red (not pink) and fish is capable of closing gill cover (operculum)
- (3) Dead: No sign of life or, if alive, likely to die from severe injuries or suffocation
  - (a) Vital organs may be damaged
  - (b) No sign of muscle tone or physical activity
  - (c) Severe bleeding may occur
  - (d) Gills may be pink and fish is not able to close gill cover

### Longline Catches

- (1) Excellent: No sign of stress
  - (a) Hook injuries are minor and located in the jaw or cheek
  - (b) No sign of severe bleeding; gills are red (not pink)
  - (c) No sign of sand fleas
- (2) Poor: Alive but showing signs of stress
  - (a) Hook injuries may be severe, but vital organs are not injured
  - (b) Moderate bleeding may be observed, but gills are still red (not pink)
  - (c) No sign of sand fleas
- (3) Dead: No sign of life or, if alive, likely to die from severe injuries
  - (a) Vital organs may be damaged
  - (b) Sand Fleas may be present (they usually first attack the eyes)
  - (c) Severe bleeding may occur, gills may be pink
  - (d) No sign of muscle tone

## DEFINITION OF KING CRAB AND TANNER CRAB CONDITION

### Trawl and Longline Catches

- (1) Excellent: No sign of stress or dismemberment
- (2) Poor: Alive but showing signs of stress--a few limbs may be missing; minor mouthpart movement may be the only sign of life
- (3) Dead: No sign of life, or if alive, likely to die from major carapace fracture or dismemberments

## USEFUL FORMULAS YOU MAY NEED

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

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

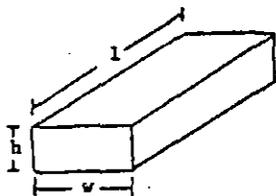
Product Weight x Conversion Factor = Whole or Fresh Weight of fish used for product

Area of a circle =  $\pi r^2$     Circumference =  $2\pi r$     ( $\pi = 3.1416$ )

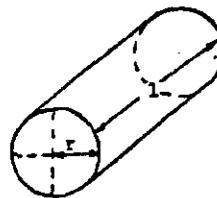
Area of a square or rectangle = length x width

Area of a triangle =  $\frac{1}{2}$  base x height

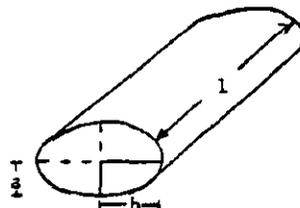
Volume of a right angle cone =  $\frac{1}{3}\pi r^2 h$



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

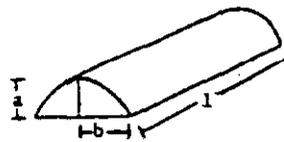


Cylinder  
Volume =  $\pi \times \text{radius}^2 \times \text{length}$   
 $V = \pi r^2 l$

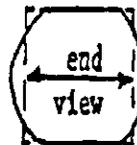
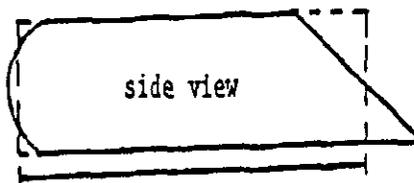


Ellipsoidal solid  
Volume =  $\pi \times \text{short radius} \times \text{long radius} \times \text{length}$   
 $V = \pi abl$

( $\pi = 3.1416$ )



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



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



RELATIONSHIP OF HALIBUT LENGTHS TO WEIGHT (LIVE WEIGHT)

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

RELATIONSHIP OF HALIBUT LENGTHS TO WEIGHT (LIVE WEIGHTS)

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



## LENGTH FREQUENCIES

### FORM 7US--LENGTH FREQUENCY OF MEASURED SPECIES

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

1. Fill in the date. Plant observers: be sure to use the date of delivery, not necessarily the date the fish was measured. Start each day's measurements on a new side of the two sided form. (**Do use both sides of the page!**).
2. Under species name, record the specific common name and the related species code from the same code list as used for Form 3US.
3. Record the haul or set number in columns 19-21. All length frequency data must have a haul number assigned to it. Catcher boat observers who could not collect fish for length measuring at sea must assign a haul number(s) (and corresponding date) to the data collected from the combined hauls delivered to the plant. Choose a haul from the area where most of the fish were caught.
4. Record all those observed for each species by sex, coded "M" for male, "F" for female, and, if no sex is determined or the immaturity of the species makes sex identification impossible, code "U" for unknown.
5. The size group is the length measurement to the nearest whole centimeter for fish and to the nearest 5 millimeters for crab (1-5 mm = 3; 6-0 mm = 8). Record the size groupings in the shaded columns.
6. The frequency is the number observed in each size group. **Include a size group only if there is a frequency of one or more.** Record sequential data horizontally across the form. **List lengths from the smallest to the largest within a species/haul/sex designation.**
7. Start a new row each time there is a change in sex, haul number, or species, or when there are more than seven sizes in a group.
8. In the "keypunch check" columns 23 - 27, simply add all of the numbers in the row (size group and frequencies together) and enter the sum. Be sure to check your work by adding it again to verify your sum.
9. Note that more than one species can be recorded per page as long as each species is identified by name and code. **Skip a line between species unless it means going to a new page.**
10. Note that more than one haul can be recorded per sheet as long as the hauls all ended on the date written at the top of the page. Start each day's measurements on a new

side and use both sides of the form.

11. Leading zeros should appear in the month, and day only (columns 12 and 14 only, as needed). No leading zeros should be written in species code, haul number, size, or frequency columns.
12. To indicate the repetition of a number or letter, such as species code, haul, or sex, draw brackets and arrows as shown in the example form. Do not use ditto marks in key punch columns.

### LENGTH FREQUENCIES OF PROHIBITED SPECIES

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

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

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

### SELECTION OF A SAMPLING SPECIES

All observers are asked to take length frequencies. This includes catcher boat observers as well as processing plant observers -- one does not substitute for the other. The selection of a sampling species for length frequency measurements of about 150 fish per day depends on your assigned special project and the target species of the vessel.

If you are not assigned an age structure (usually otoliths) collection as a special project, your sampling species for length frequencies is the target species of the vessel. If you are assigned to collect age structures, your sampling species for length frequencies will be the same species you take age structures from throughout your sampling work aboard that vessel. There are additional considerations when your sampling species is not plentiful. Refer to the next section.

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

### SPECIAL PROJECTS, SAMPLING SPECIES AND LENGTH FREQUENCIES

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

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

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

If an assigned species is not plentiful, your species composition sample may not contain sufficient fish for a good length frequency sample and you may have to use other methods to get additional fish of that species. In this case, the observer could collect all the individuals of that species from the conveyor belt over a period of time, or use some other method to obtain randomly selected fish from a larger sample population. Be sure to collect the additional fish required in an unbiased manner. If you cannot get 150 fish in a day of the sampling species, take lengths and age structures from those you did collect and, additionally, take approximately 150 lengths of the target species each day.

Try to work with the same sampling species throughout your work on any one vessel or plant, regardless of the area you are fishing. If your vessel should change fishing strategies, move to a different fishing area or if you change ships, then you may choose a new sampling species. However, if you cannot continue the collection of age structures from a sampling species, don't keep a collection of fewer than 50 age structures. Dump it and start a new one. For instance, suppose that you started your sampling species age structure collection in area 513

when the ship was targeting on pollock. After only a few days, the ship moved to area 511 and began yellowfin sole operations. First examine a few catches to see if you could gather 100 - 150 pollock over the course of a day to continue a pollock collection. Also, the skipper might just be searching around and may return to better pollock catches. If this is not the case, you should examine your collection. If you have filled fewer than 50 vials with pollock otoliths, then dump the vials and start over with Pacific cod, a **roundfish** species, which would be present with YFS as bycatch. If you have filled more than 50 vials, then keep the pollock collection and start a new collection of cod otoliths (and scales in the case of cod).

### LENGTH FREQUENCY SAMPLING METHOD

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

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

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

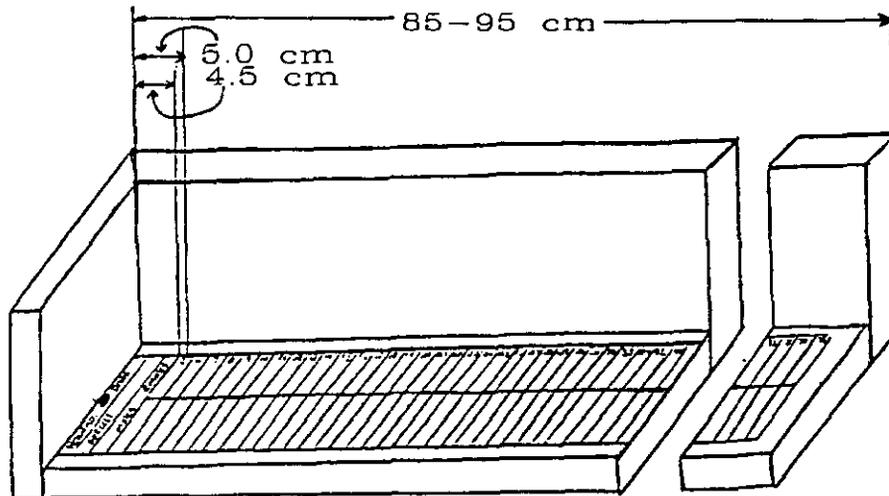
Next, set up a plastic strip on a measuring board, recording on it the haul number, date, and species. Observers on processors and trawlers must keep length frequency data for each tow separate. Record data from different hauls on different plastic strips. The plastic measuring strip is a long, narrow piece of white plastic divided into one centimeter spacings. The strip is attached by thumbtacks to a 3-sided, wood measuring board (bottom, end, and back boards). When using an aluminum measuring board, secure the plastic strip in place by putting a straightened paperclip through a hole pierced in the plastic which matches ones drilled in the aluminum. Re-check the position of the strip in relation to the upright at the end. For species of fish whose length range is less than 75 cm, the strip must be positioned on the measuring board so that the first spacing line is at 4.5 cm from the board across the end and the center of the 5 cm space is at exactly 5.0 cm from the end board. Mark each 10th centimeter strip unit to read 10, 20, 30...etc. For species whose length commonly exceeds 75 cm, the measuring strip may be offset as shown in the illustration following this section. To increase the length of a strip by ten centimeters, for instance, offset the strip so that the first spacing line is at 14.5 cm

from the end board and the center of the first centimeter space is at 15 cm. The tenth centimeter units of the strip may then need to be renumbered accordingly.

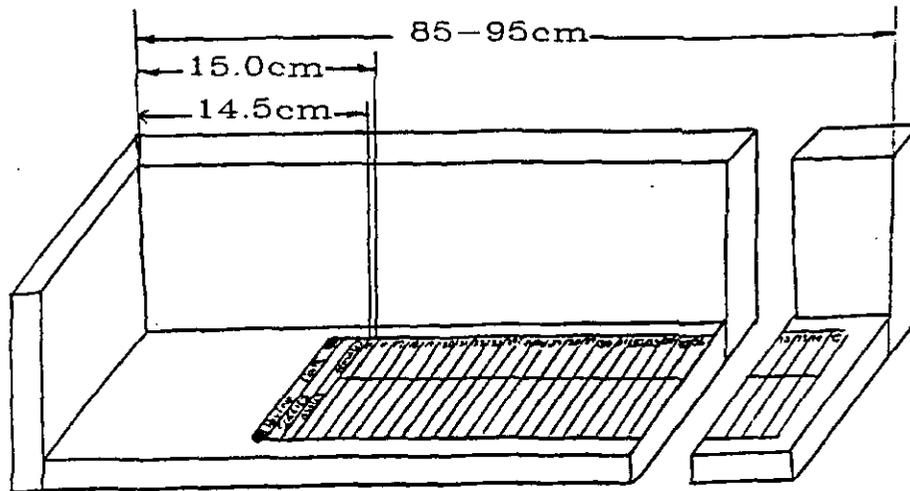
Take one of the baskets of sexed fish. Note that one side or half of the plastic strip is designated for males, and the other half for females. Position each fish on the measuring strip with jaws closed, snout against the end, dorsal surface against the back, and the fish body flat and straight. Spread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

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

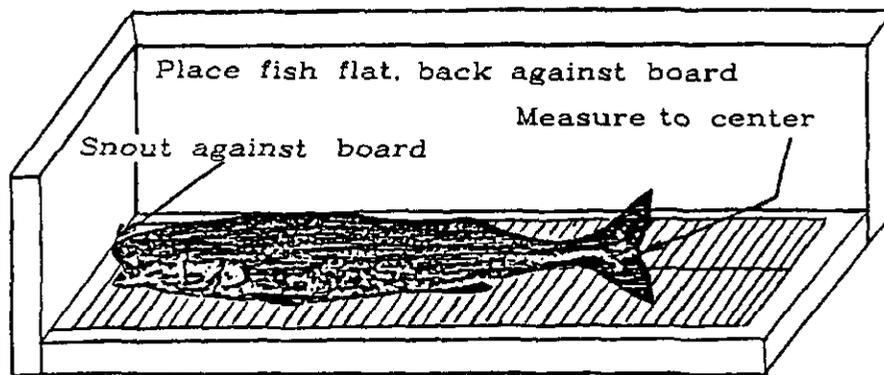
When starting to measure another basket of sexed fish, verify their sex and make sure you are recording their lengths on the appropriate half of the strip. At the end of sampling, the number of pencil strokes per sex, per centimeter length spacing will give the size group's frequency by sex.



Measuring strip set for most fish species.



Strip offset to measure larger fish.



Measurement of a roundfish on measuring board.



## SCALE SAMPLES AND RANDOM STRATIFIED OTOLITH SAMPLES

### FORM 9US INSTRUCTIONS

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

1. Form 9US data sheets are filed separately by species and vessel. To make sure that you don't record coho salmon on the reverse side of a chinook salmon sheet, for instance, keep separate groups of pages for each species. Start with page 1 for each new species.
2. At the top of the form, write the number of the three-digit subarea corresponding to the catches on the sheet. Check the subarea you recorded for the haul/set on either 1US or 2US. If the vessel changes subareas during the day, you will need to use a different sheet to record data from the new subarea. (You may use the back of the previous form.)
3. Fill in the cruise number and vessel code (when known), date, species common name, and the corresponding species code. Start each day's measurements (or subarea if it changes during the day) on a new side.
4. Leading zeros should appear in the month and day only (columns 12 and 14) as needed.
5. Record the specimen type that is being collected:
  - 1--otoliths
  - 2--scales
  - 3--fin rays
  - 4--otoliths and scales
  - 5--otoliths and fin rays
  - 6--scales and fin rays
  - 7--otoliths, scales, and fin rays
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. The fish are obtained from your length frequency samples and a tally sheet is used to ensure that age structures are obtained from no more than 5 fish per cm sex group.
  - 2--random--In this system, although the fish may be from your length frequency sample, no stratification is made by size and sex. Instead, you may be instructed to take age structures from every eighth, tenth, fifteenth (or other) fish to ensure that

the fish selected are a random collection from the population at large. Salmon scale samples are an example of this because scale samples are taken from all of the salmon or a random subsample of all of the salmon.

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

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 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 sequence. (We want to avoid having specimen containers filled at random.) Salmon scale samples are numbered sequentially by species and the data are recorded on separate sets of Form 9US by species.
11. If you board another ship before completing a collection, you can continue with the same sequence of specimen numbers, but keep separate sets of form 9US for the two different vessels.
12. It is best if the specimen data are recorded separately by sex on the form.
13. Record the sex of the fish using "M", "F", and "U" notation (M = male; F = female; U = unidentified).
14. Record the length of the fish to the nearest whole centimeter.
15. The weight is to be filled out to two decimal places. Add trailing zeros where necessary.
16. If you recorded the length of the fish on the Form 7US (which should almost always be the case unless you picked this particular fish from someplace other than your length frequency sample), record a "Y" for "Yes" in column 41. Otherwise, write "N".
17. If you are requested to record maturity stage, record this in columns 42-43. An appropriate maturity scale for the species would need to be provided to you.

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 an individual fish, write your comments small enough to allow the age readers to also record their 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.
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 you should do this at the top of the first sheet for each species.

## RANDOM STRATIFIED OTOLITH SAMPLING

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

A maximum of five pairs of otoliths per sex for each centimeter length group are to be taken for this type of collection (5 males and 5 females of each centimeter group). Do not be concerned if after filling your vials you do not have a complete set of five pairs of otoliths per sex for each centimeter length group that you observed. It is expected that you will have only a scattering of one or two samples from fish whose lengths are at the extremes of the size range you see. The object of this collection is 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 always collected while taking length-frequency measurements by sex from the sampling species. A running tally of your otolith collection on your plastic form 9 helps you keep track of what sizes and sex of fish are needed for your collection. (See an example of the plastic form 9 format on a following page.) Thus a cumulative tally should be maintained for the sampling species, for each collection. (Usually an observer makes only one collection and a collection should be completed on one vessel.) After taking the length measurement, if the fish is of a size and sex needed, weigh the fish with the 2.0 kg or 5.0 kg scale. Record weight, sex, and length on the plastic form 9 next to the vial number in which the otoliths (or otoliths and scales in the case of cod or sablefish) are placed. The otolith vials are to be filled in numerical order and the sexes should be grouped.

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

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

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

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

### OTOLITH REMOVAL

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

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

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

# Plastic Form 9US

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

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

Notice that the sexes are separated. →

Vial No.	Sex	Length	Weight	Hand Select	Running Tally								
					cm	M	F	cm	M	F			
65	M	32	.80		30			60			0		
66	M	40	.95		1			1			1		
67	M	35	.93		2			2			2		
68	M	34	.85		3			3			3		
69	M	34	.80		4			4			4		
70	M	45	.90		5			5			5		
71	M	44	.96		6			6			6		
72	M	35	.80		7			7			7		
73	M	35	.80		8			8			8		
74	M	34	.83		39			9			9		
75	F	34	.90		40			0			0		
76	F	35	.93		1			1			1		
77	F	33	.80		2			2			2		
78	F	42	.95		3			3			3		
79	F	34	.91		4			4			4		
80	F	45	1.05		5			5			5		
81	F	47	1.50		6			6			6		
82	F	43	.95		7			7			7		
83	F	34	.82		8			8			8		
84	F	38	.88		49			9			9		
					50			0			0		
					1			1					
					2			2					
					3			3					
					4			4					
					5			5					
					6			6					
					7			7					
					8			8					
					9			9					

Ooliths and Scales  
 Plastic Form 9  
 Haul/sample No. \_\_\_\_\_  
 Species \_\_\_\_\_

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

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

### SCALE SAMPLES

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

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

#### Directions for collecting scales:

1. Rinse the fish off and/or lightly wipe the area to be sampled with a wet sponge, paper towel, or cloth. This is to minimize contamination of the sample with scales of other fish and to remove slime which can cause scales to rot.
2. Examine the fish and select zone A, B, or other. Record the zone on the envelope. "A" is the preferred zone, "B" is next in preference. Refer to the figures in the Appendix (Location of Preferred Scale Sampling Zones). When there are no scales available in either zones A or B (on either side of the fish) then another area may be used.
3. Pluck salmon scales out with forceps so as to minimize the amount of accompanying mucus. For cod or sablefish, use a clean, thin-edged instrument (knife, scalpel, forceps), scrape within the zone in an anterior direction (toward the head).
4. Wipe off, inside the envelope or vial, 15 to 20 scales that adhere to the instrument. Collect a minimum of five scales. Ensure that samples are clearly labeled and all pertinent information is recorded on the plastic sheets, if necessary.
5. Remove excess scales from the instrument before sampling the next fish.

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

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

## MARINE MAMMALS

### FORM 10US - MARINE MAMMAL INCIDENTAL CATCH DATA

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

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

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

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

#### Form 10A US

1. Fishery no. (col. 1-2) - Leave this code blank for the time being. (The fishery will be determined from the gear type, the area, and the depth fished (from 2US or 1US)).
2. Cruise no., vessel code, year (col. 3-13) - Fill in the cruise number (when known), vessel code and year in the heading; start a new sheet for each new vessel or cruise.

3. Date, haul/delivery/set number (col. 14-20) - Record the date and haul, delivery, or set number for each catch for which you know whether or not marine mammals were deterred or taken. Do **not** put a slash between your entries for month and day.
4. Marine mammal species - Write the common name of the marine mammal species involved. Write "None" if no marine mammals were taken or subjected to deterrence. If you are not sure of the identification, use the broader classification, such as unidentified pinniped or unidentified dolphin/porpoise. If more than one species of marine mammal was involved in the haul, set, or delivery, enter the second species on a separate line.
5. Marine mammal species code (col. 21-22) - Record the corresponding code (see attached table) for the marine mammal species you recorded in #4 above.
6. Number of marine mammals (col. 23-39) - Except for the deterred category, a marine mammal recorded in one of these categories should not appear in any of the other categories--the categories are mutually exclusive. It is possible that an animal that was earlier deterred (or at least subjected to deterrence) might later become entrapped or be lethally removed.
  - a. Deterred: those animals not entrapped that were subjected to harassment such as seal bombs.
  - b. Released or escaped alive (uninjured): those animals that are entrapped, but are released alive or escaped with no apparent injury (no bleeding, swam or dove strongly within a few seconds) and no fishing gear was attached to the animal.
  - c. Released or escaped alive (injured): Those animals that are entrapped, but are released alive or escape with apparent injury (bleeding, obvious trauma, unusually sluggish movement upon release) and/or with fishing gear attached to the animal.
  - d. Freshly dead (entangled or entrapped): Any dead animal brought onboard or released from the gear that is not obviously decomposed or gunshot. (The observers should not worry about how freshly dead the animal is.)
  - e. Unknown condition: Those animals that are entangled or entrapped, but are lost or discarded before the observer is able to judge the animals' condition.
  - f. Decomposed: The animal was entrapped, but it was obviously dead before contacting the fishing gear. Note smell, discoloration, bloating, or external trauma resulting from scavengers.
  - g. Lethal removal (not entangled or entrapped): An animal that is killed (e.g. shot or clubbed) to prevent serious damage or loss of gear, catch or human life, but is not in direct contact with fishing gear.

- h. Lethal removal (entangled or entrapped): An animal that is killed (e.g. shot or clubbed) to prevent serious damage or loss of gear, catch or human life, and is in direct contact with fishing gear.
7. Did you observe MM (Y/N)? (col. 40) - Record "Y" here if you actually saw the animal, and "N" if you did not.
  8. Form 10B (Y/N)? (col. 41) - Record "Y" here if you have also filled out a Form 10B (the back of form 10A US) for this entry; record "N" if you had a marine mammal entry on this line and did not fill out a form 10B. Leave this blank if there was no marine mammal entry on this line.
  9. Column 42 - Leave this column blank.

### Form 10B US

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

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

1. Fishery no., cruise no., vessel code, year, date, haul/delivery/set number, marine mammal species code (col. 1-22) - Copy these data directly from the associated form 10A US (if there was a form 10A entry).
2. Haul sampled for fish (Y/N)? (col. 23) - Code "Y" here if the haul was sampled for fish, and "N" if it was not.
3. Did you observe the marine mammal (Y/N)? (col. 24) - Record "Y" here if you actually saw the marine mammal, and "N" if you did not.
4. Sex (M/F)? (col. 25) - Record the sex of the animal. Code "U" if the sex is unknown.
5. Lengths: curvilinear and/or standard (col. 26-31) - Record the animal's length (in cm) in the appropriate field.
6. Tooth collected (Y/N)? (col. 32) - Record "Y" if you collected a tooth; otherwise record "N". If "N", please indicate in the Remarks section why you did not take the snout or tooth.

7. Photo taken (Y/N)? (col. 33) - Record "Y" if you took photographs; otherwise, record "N".
8. Remarks - Use this area to give features you used to identify the animals to species or species group. If the animal was subjected to a form of deterrent, document the particular circumstances, what deterrent was used, whether or not the animal was deterred, and whether or not the animal seemed to be injured. If the animal was released or escaped alive after being entangled or entrapped, document what happened, what part of the gear the animal was in, and what type of injury or symptoms the animal was displaying (if any) upon release. If the animal was lethally removed, make sure that you document the entire circumstances on these sheets or in your logbook as well as recording any biological data on Form 10B US. Record what you can about the circumstances concerning animals of unknown condition.

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

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

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

DD Common dolphin  
 LO Pacific whiteside dolphin  
 LB Northern right whale dolphin  
 SC Striped dolphin  
 TT Bottlenose dolphin  
 SB Rough toothed dolphin  
 GG Risso's dolphin  
 SL Spinner dolphin  
 SA Spotted dolphin (Central Pacific)  
 SG Spotted dolphin (Eastern Pacific)  
 LH Frasier's dolphin  
 UD Unidentified dolphin/porpoise  
 GM Shortfin pilot whale  
 FA Pygmy killer whale  
 PC False killer whale  
 OO Killer whale  
 DL Belukha; beluga  
 UX Unidentified small whale  
 PM Sperm whale  
 BE Baird's beaked whale  
 ZX Goosebeak whale  
 MS Bering Sea beaked whale  
 ER Gray whale  
 MN Humpback whale  
 BA Minke whale  
 BX Bryde whale  
 BB Sei whale  
 BP Fin whale  
 BL Blue whale  
 BG Black right whale  
 BM Bowhead whale  
 MM *Narwhal*  
 UZ Unidentified large whale  
 UW Unidentified whale  
 UM Polar bear

*Delphinus delphis*  
*Lagenorhynchus obliquidens*  
*Lissodelphis borealis*  
*Stenella coeruleoalba*  
*Tursiops truncatus*  
*Steno bredanensis*  
*Grampus griseus*  
*Stenella longirostris*  
*Stenella attenuata*  
*Stenella attenuata*  
*Lagenodelphis hosei*  
 NE  
*Globicephala macrorhynchus*  
*Feresa attenuata*  
*Pseudorca crassidens*  
*Orcinus orca*  
*Delphinapterus leucas*  
 NE  
*Physeter macrocephalus*  
*Berardius bairdii*  
*Ziphius cavirostris*  
*Mesoplodon stejnegeri*  
*Eschrichtius robustus*  
*Megaptera novaeangliae*  
*Balaenoptera acutorostrata*  
*Balaenoptera edeni*  
*Balaenoptera borealis*  
*Balaenoptera physalus*  
*Balaenoptera musculus*  
*Balaena glacialis*  
*Balaena mysticetus*  
*Monodon monoceros*  
 NE  
 NE  
*Ursus maritimus*





# FORM 10 B US - SPECIMEN DATA AND REMARKS ON MARINE MAMMAL SUBJECT TO DETERRENCE OR TAKEN IN CATCH

Fishery no.		Cruise no.					Vessel code					Year
1	2	3	4	5	6	7	8	9	10	11	12	13

Describe features used in identification; circumstances and effects of deterrents; particulars of entrapment or entanglement; types and extent of injuries; etc.

Date (MO/DAY)		Haul, delivery, or set number		Marine mammal species code		Haul sampled for fish (Y/N)?		Did you observe the MM (Y/N)?		Sex? (M/F)		Lengths			Tooth collected (Y/N)?		Photo taken (Y/N)?			
												Curvilinear (cm)	Standard (cm)							
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	

Remarks

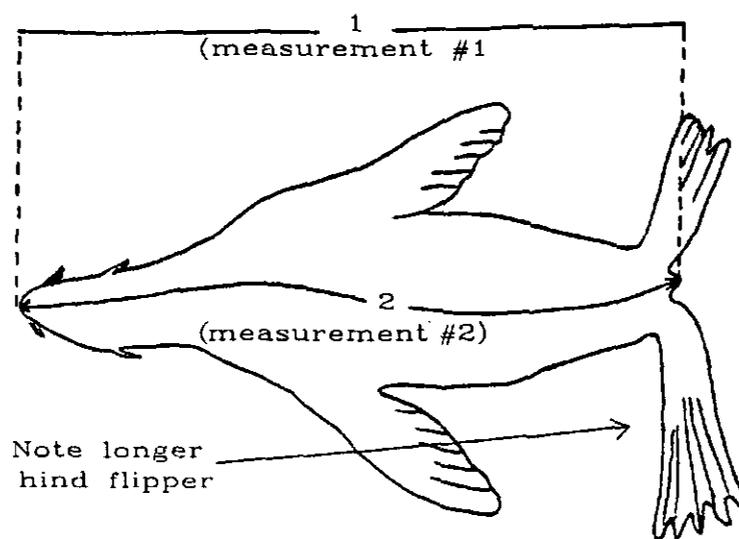
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	

Remarks

14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	

Remarks

## Length Measurements of Seals and Sea Lions

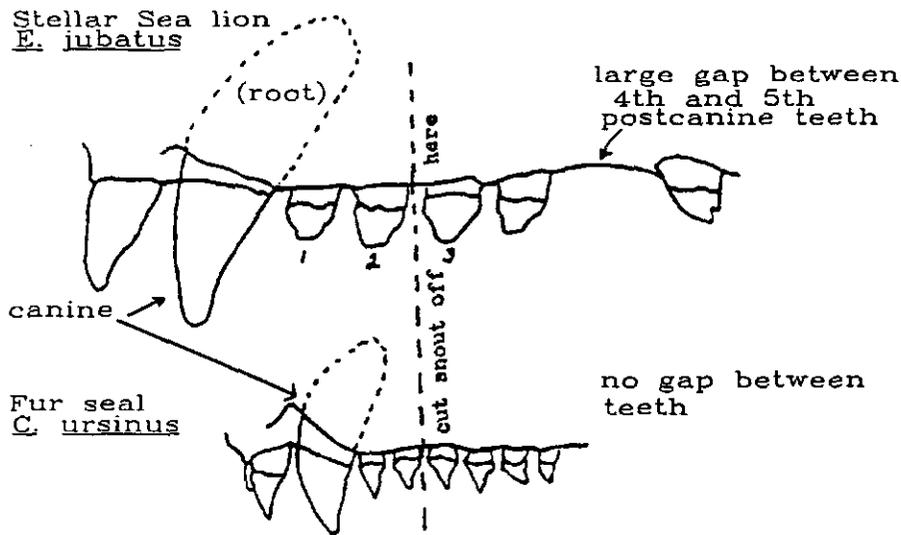


Upper half of the diagram is a Stellar Sea Lion, the lower half a Northern Fur Seal.

Standard Length (measurement #1) is the straight-line distance from the snout to the tip of the tail flesh on the unskinned body, belly up, ideally with the head and vertebral column on a straight line. If rigor has set in, then this measurement probably cannot be taken and measurement #2 should be taken.

Curvilinear Length (measurement #2) is taken when the seal cannot be stretched belly up, as when rigor sets in, or is too heavy to be moved. It is the shortest surface distance from the tip of the tail flesh along the back, belly, or side. Record the type of measurement taken. Seals and Sea Lions are usually measured with a flexible tape.

## Collection of Sea Lion and Fur Seal Teeth



Outline of sea lion and fur seal teeth.

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

1. Skin and cut off the snout, taking care not to damage the root of the canine tooth.
2. To insure that the entire canine root is collected, the snout should be cut off between the 2nd and 3rd post canine teeth (see figure).
3. Methods of preservation: (use a or b)
  - a. Boil the snout until the tooth can be easily pulled and removed. Do not forcibly twist the tooth when removing; twisting will break the tooth.
  - b. Boil the snout until no more flesh remains on the jaws. The jaws can then be stored dry.
4. Do not preserve the snout in formaldehyde.

## FORM 11(A) - MARINE MAMMAL SIGHTING FORM

This form is designed to gain information about marine mammals sighted, other than those subject to harassment or brought up in the fishing gear. Most marine mammal sighting data are valuable, whether or not you were deliberately looking for mammals. Thus, if a crew member points out a mammal to you, or if you merely glance up from your work and see a mammal, write it down, and record the information on the form.

We are interested in all species of marine mammals that you might encounter and will provide an identification guide to assist you in making identifications. If you are unable to positively identify an animal, then please indicate so on the form. Records of unidentified marine mammals tend to lend credence to those records that include identification. Please make a complete description with copious notes and illustrations as necessary, to fully describe any new species of marine mammal sighted. Records of species which are not fully documented and have not been previously encountered, will probably not be verifiable at a later date.

( \* = Do not fill in boxes preceded by an asterisk except as noted.)

1. NAME: In the upper left hand corner of the form, write the observer's and vessel's or plant's names. In the upper right hand corner enter the cruise number and vessel code upon arrival in Seattle. In addition, enter the cruise number and vessel code in columns 65-72 at the bottom of the page.
2. DATE (7-12): Note proper sequence (yr./mo./day)  
  
TIME (13-16): Time of sighting is logged when the animal is first seen. Times may be logged in ALT and must be noted as such, crossing out the GMT notation printed on the form.
3. LATITUDE (18-23): To tenths of minutes, if possible.
4. LONGITUDE (24-30): To tenths of minutes, if possible. Place E or W in box 30, depending on which side of the 180th meridian the sighting occurs.
5. SPECIES: Write in both the common and scientific name of the animals. Do not enter a species name unless you are absolutely positive. If you are the least bit unsure of the animal's identity, enter as "unident. large whale", "unident. porpoise", etc. Remember that an erroneous identification is worse than none at all. If more than one species are sighted at the same time, note the association (if any) in the comments section and fill out a separate sighting form for each species.

Important things to look for and make notes on when attempting to make an identification are: (Make notes under "17. Comments" and circle the characteristics on back of the Sighting Form)

- A. Shape and size of dorsal fin and its position on the body. If possible, also note size and shape of tail and flippers.
- B. Length. Size is difficult to estimate at sea, so if it is convenient, compare unfamiliar animals with a species with which you are familiar. For example--"about size of female Stellar sea lion" or "slightly smaller than adult male killer whale."
- C. General shape of body (slender or robust).
- D. Shape and size of snout. Is it long or short (estimated length in inches)? Is there a definite break between snout and forehead? Is the forehead markedly bulbous?
- E. Color pattern on fins and body (stripes, spots, patches, mottling).
- F. Shape, location, and direction of spout. Is it single or double? Where is spout located on head? Does it lean forward or go straight up?
- G. Scars and scratch marks

6. NUMBER SIGHTED (37-40): If unable to count the animals, estimate the number seen in terms of a range (e.g., 250 + or - 50). For Dall's porpoise, note if you see more roostertails than the actual number of animals that come to the boat. (There is evidence that schools may split up.)

7. BEHAVIOR: Record primary behavior observed. More detailed remarks on behavior can be made in the comments section. Example of frequently observed behaviors are as follows:

- No specific behavior other than in the water
- Following vessel
- Bow riding
- Porpoising
- Attracted by fish nets
- Feeding
- Avoidance
- Nonspecific contact/play
- Slow-rolling
- Riding stern wake
- Milling
- Approach vessel-veer away
- Slow roll-roostertail-slow roll
- Roostertailing

8. ANGLE FROM BOW (47-48): Consider the ship a 360 degree circle when recording sighting angle; dead ahead being 000 degrees and dead astern being 180 degrees.
9. INITIAL SIGHTING DISTANCE: Note 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. Remember that boxes 47-52 are right justified (e.g., 100 meters = 10 in boxes 51-52).
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 (54-56): In degrees Centigrade. If below freezing, place a "-" in box 54. If above freezing, place "+" in box 54. Temperature is placed in boxes 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. **Remember, if you identify the animal, say how you did it, (e.g., Sperm whale - 35 ft., large square head, no snout, spout at end of head and leaning forward).**

Everything that you observed about the animal and used to identify it should be entered. Be liberal with sketches! Use as much room as you need to get everything down (the back of the sheet, if necessary). In addition to details of the animal's appearance, note:

1. Kinds and numbers of other associated animals (fish, birds, squid, mammals, etc.) and their behavior.
2. Anything else you think might be of interest.

**BEHAVIOR COMMENTS:** Be generous with narrative of animal behavior. If there are several animals, are they in a tight school, a loose school, or scattered either singly or in small groups? Do the animals approach the vessel and ride the bow wave? Note their diving behavior. How many times do they blow when they come to the surface? Do they raise their tail flukes when they dive after their last blow? How long do they stay down between each series of blows? Do they leave "tracks" or swirls on the surface when they are submerged? Do they jump (breach) clear of the water? If so, do they jump in a smooth arc or do they sometimes belly-flop, somersault, or spin?

**Note how close the animal approached the vessel.**

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

18. Enter your cruise number and vessel code in columns 65 - 72 as well as at the top of the page.

FORM 11(A)

FOREIGN FISHING OBSERVER  
MARINE MAMMAL SIGHTING FORM

\* DO NOT FILL IN BOXES PRECEDED BY AN ASTERISK

CRUISE NO. \_\_\_\_\_

VESSEL CODE \_\_\_\_\_

1. OBSERVER NAME Charlie Tuna  
VESSEL NAME American Boat

RECORD ID \*

2. DATE (Yr./Mo./Day) & TIME (GMT) OF SIGHTING

YR MO DAY TIME (GMT)  
8 9 10 11 12 0 3 0 0  
7 8 9 10 11 12 13 14 15 16

3. LATITUDE (degrees/minutes/10ths)-N/S

DEGREES MIN. 10ths \* N  
5 4 5 9 4

4. LONGITUDE (degrees/minutes/10ths)-E/W

DEGREES MIN. 10ths E/W  
1 5 7 3 6 8 W  
24 25 26 27 28 29 30

5. SPECIES Unidentified Balenoptera Balenoides sp.  
Common name Scientific name

\*   TENTATIVE \*    
33 34 35

6. NUMBER SIGHTED 7 ± 2

C.I. \*     7  
36 37 38 39 40

7. BEHAVIOR Appeared to be feeding; short shallow dives in a concentrated area

\*    
45 46

8. ANGLE FROM BOW    90  
47 48 49

9. INITIAL SIGHTING DISTANCE 2 statute miles

10's of meters     
50 51 52

10. VISIBILITY 5 statute miles

11. WAVE HEIGHT (meters) 1.5 m

12. VIS CODE \*    
53

13. WEATHER Lt. Rain/Fog; Wind 10k @ 200°  
(& WIND SPEED)

14. SURFACE WATER TEMP. (° C) ±   09  
54 55 56

15. PLATFORM CODE \*     1 9 9 4  
57 58 59 60

16. TIME ZONE \*   \*   0  
61 62 63

17. How did you identify animal(s)? Sketch and describe animal; associated organisms; behavior (include closest approach); comments.

*Straight tall blows, very falcate dorsal fin. 7 ± 2 animals about 2 miles off starboard beam heading slowly away from ship. Observed blows followed by dorsal fin after blow disappeared. Chief Officer pointed out on fish finder, a large concentration of plankton in the area.*



65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

To aid in your identification of whales and porpoises, circle the characteristics corresponding to the features you observed.

Body length (estimation):

< 10 feet

10-25 feet

25-50 feet

50-80 feet

Dorsal fin?

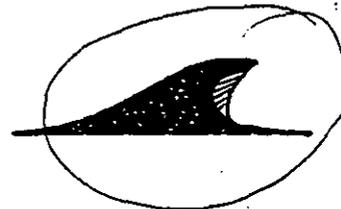
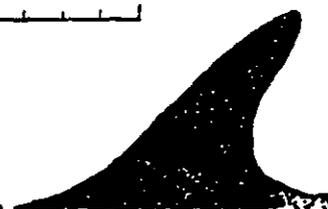
Yes

No

Shape of dorsal fin:

Porpoises/dolphins 0 2 feet

Whales 0 5 feet



Prominent blow?

Yes

No

Number of blows before a long dive:

N/A

1-3

4-7

8-15

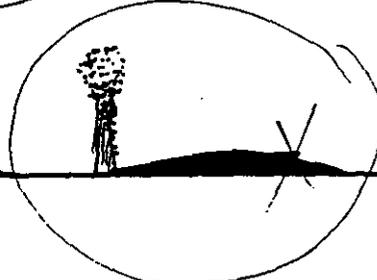
Length of dive:

< 2 minutes

5-7 minutes

10-20 minutes

Shape of blow:



Showed flukes upon dive?

Yes

No

Other behavior characteristics:

No specific behavior  
Following vessel  
Breaching  
Stern riding

Bow riding  
Slow rolling  
Porpoising  
Other

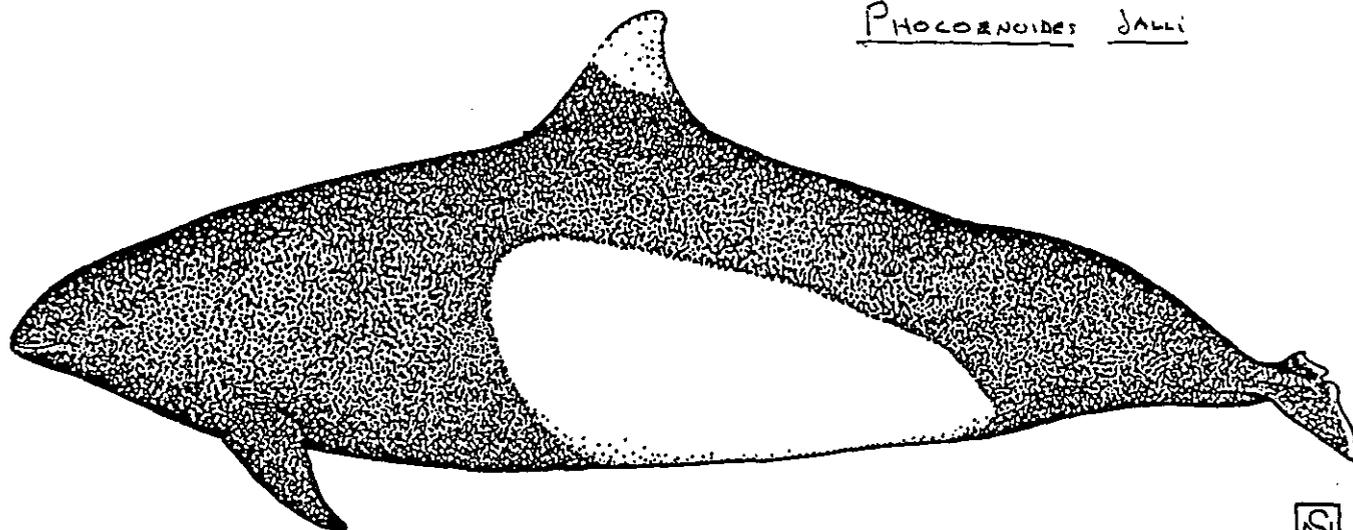
Feeding?

Distinctive markings (scarring, white patches, etc.):

None observed

## DALL'S PORPOISE

PHOCOENOIDES DALLI



LENGTH To 2.2 m. Newborns are approximately 1 m long.

BODY SHAPE Extremely robust body with tiny head and small flukes and flippers. The tail stock has a pronounced keel, exaggerated in adult males.

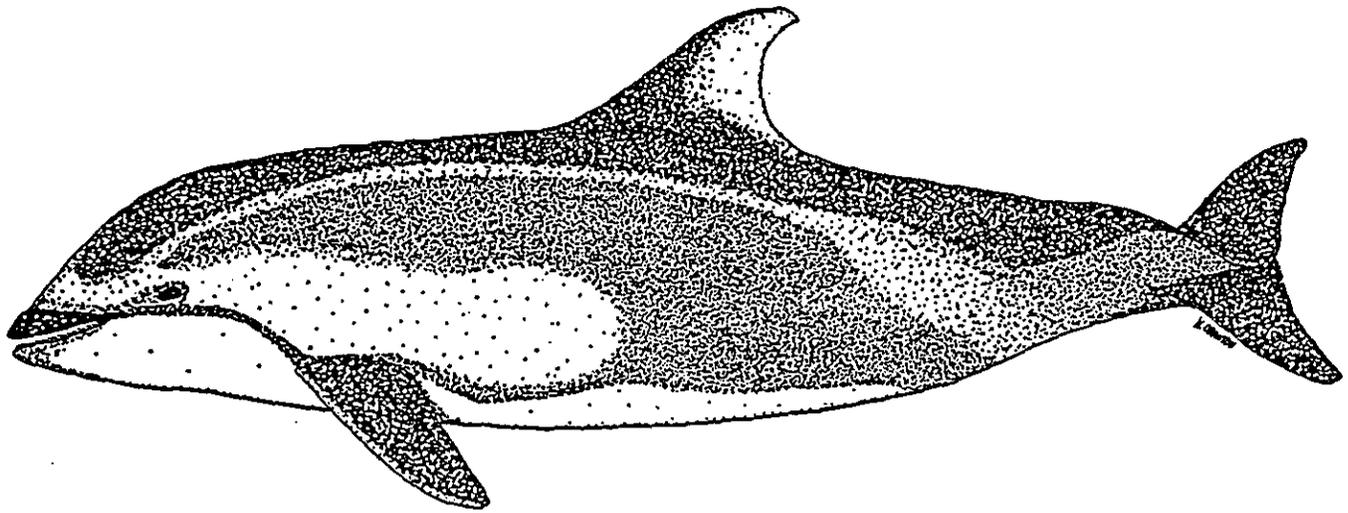
DORSAL FIN Variable in shape, basically low and triangular with a long base. Usually bicolored, dark on lower forward half and white on upper trailing half.

SNOUT/BEAK Forehead slopes steeply to a short poorly defined beak.

COLOR PATTERN Striking black and white pattern is very distinctive. Shiny black body with a large, conspicuous oval white patch at each side. White flank patch begins below dorsal fin in the dalli color type (pictured here), but extends anteriorly to the head in the truei color pattern. Some all black individuals have also been observed.

BEHAVIOR Small bands, usually with only 2-20. Sometimes seen with Pacific white-sided dolphins. Exhibit the distinctive "roostertail" -like splash when surfacing. Almost never porpoises.

PACIFIC WHITE-SIDED DOLPHIN  
Lagenorhynchus obliquidens



LENGTH To at least 2.3 m. Length at birth is 80-95 cm.

BODY SHAPE Chunky, not as robust as Dall's porpoise but heavier-set than striped or common dolphins.

DORSAL FIN tall and strongly recurved, long base, located at mid-back. Dorsal fin has a dark leading edge, the latter 2/3 being white; gives the appearance of a "hook-fin".

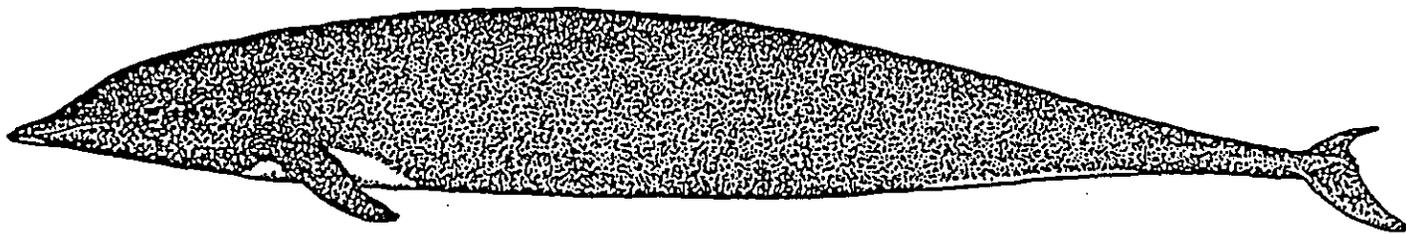
SNOUT/BEAK Head tapers continuously and smoothly, dolphin has only a very abbreviated beak.

COLOR PATTERN Complex. Black back, light gray sides, and white belly. The black back is interrupted on each side of the dorsal fin by a light gray stripe beginning at forehead, curving up and over the head and back, then widening and curving down to the anal area. These stripes are known as "suspenders". The color pattern is highly variable.

BEHAVIOR extremely gregarious, occurring in herds up to several thousand. Groups of less than 200 are more common. A temperate water species.

NORTHERN RIGHT WHALE DOLPHIN

LISSODELPHIS BOREALIS



LENGTH Maximum length of adult males is 3.0 m, females to 2.3 m. At birth from 80-100 cm.

BODY SHAPE Long and slender, tapered anteriorly and posteriorly. The extremely narrow tail stock has no keel.

DORSAL FIN None--the only small cetacean in the North Pacific without a dorsal fin.

SNOUT/BEAK Virtually no forehead or chin. Short beak is very indistinctly set off by a faint area above the mouth. Has a white tip on the end of the lower jaw.

COLOR PATTERN Body is all black on back and sides; variable white pattern ventrally. This white extends from the tail to the head, with a widening in the thoracic area. Calves are much lighter, cream to light gray.

BEHAVIOR Gregarious--seen in herds of more than 100 animals. Often mixes with Pacific white-sided dolphins. Not usually found in waters warmer than 19°C.





## GENERAL DIRECTIONS FOR OBSERVERS ON LONGLINERS

Longline boats may be the "catcher only" type that ice and deliver their fish to a shoreside plant or to a mothership for processing, or they may be catcher/processors. "Heading and gutting, **without freezing or additional preparation**, is not considered to be processing for purposes of reporting to NMFS. If your operation only heads, guts, or ices fish, or cools fish in a recirculation seawater system, NMFS does not consider your operation to be processing." If your vessel is not "processing," follow the report week instructions (in the catch message section) for catcher boats, i.e. all hauls are attributed to the week in which the **delivery** of catch is completed.

Longliners catch fish using a line with baited hooks attached to it (refer to the gear diagram). Hooks are each attached to the longline by a length of light line called "gangen." The "long line" is usually maintained aboard in sections coiled onto "skates", into tubs or onto a rack and called "magazines". During retrieval of the line, the end of one skate, magazine, or half magazine and the start of the next may be flagged by a line marker or a weight attached to the line. A longline is put out to fish or "set" from the stern of the vessel. Each end of the longline is anchored and marked with bouys. The set is then left to soak for a couple hours while the fishermen go to set or retrieve another line. Later the vessel returns and starts retrieval of the line over a roller onto the weather deck or into a cutout in the starboard side of the vessel called the "pit". On a longliner, the fish are removed from the hooks one at a time as line is retrieved and are immediately processed or put into the tanks. Longline fishing is labor-intensive but it produces a very high quality product. There are typically three sets made and retrieved each day, and the target groundfish species are sablefish (also called black cod), Pacific cod, or Greenland turbot. Halibut are primarily fished with longline gear also but as they are managed separately from groundfish species, observer coverage is not required during halibut season openings.

### CATCH RATE ESTIMATES

The skipper's catch weight estimates are always based on line counts and production data. There are no deck or bin estimates of catch weight. Longliner catches are logged by set, and all sets are attributed to the day that the retrieval of that set was completed. Just as for trawlers, the only time a noon position is recorded on form 1US is on a non-fishing day. (Refer to Form 1US of a following page.) Observers on longliners should be able to estimate the total catch of each sampled longline set using the following proportion:

$$\text{Estimated catch weight} = \text{weight sampled} \times \frac{\text{Hooks retrieved}}{\text{Hooks sampled}}$$

(for that set)

Alaska Fisheries Science Center  
Resource Ecology and Fisheries  
Management  
7600 Sand Point Way NE  
BIN C15700, Bldg. 4  
Seattle, WA 98115-0070

March 13, 1991

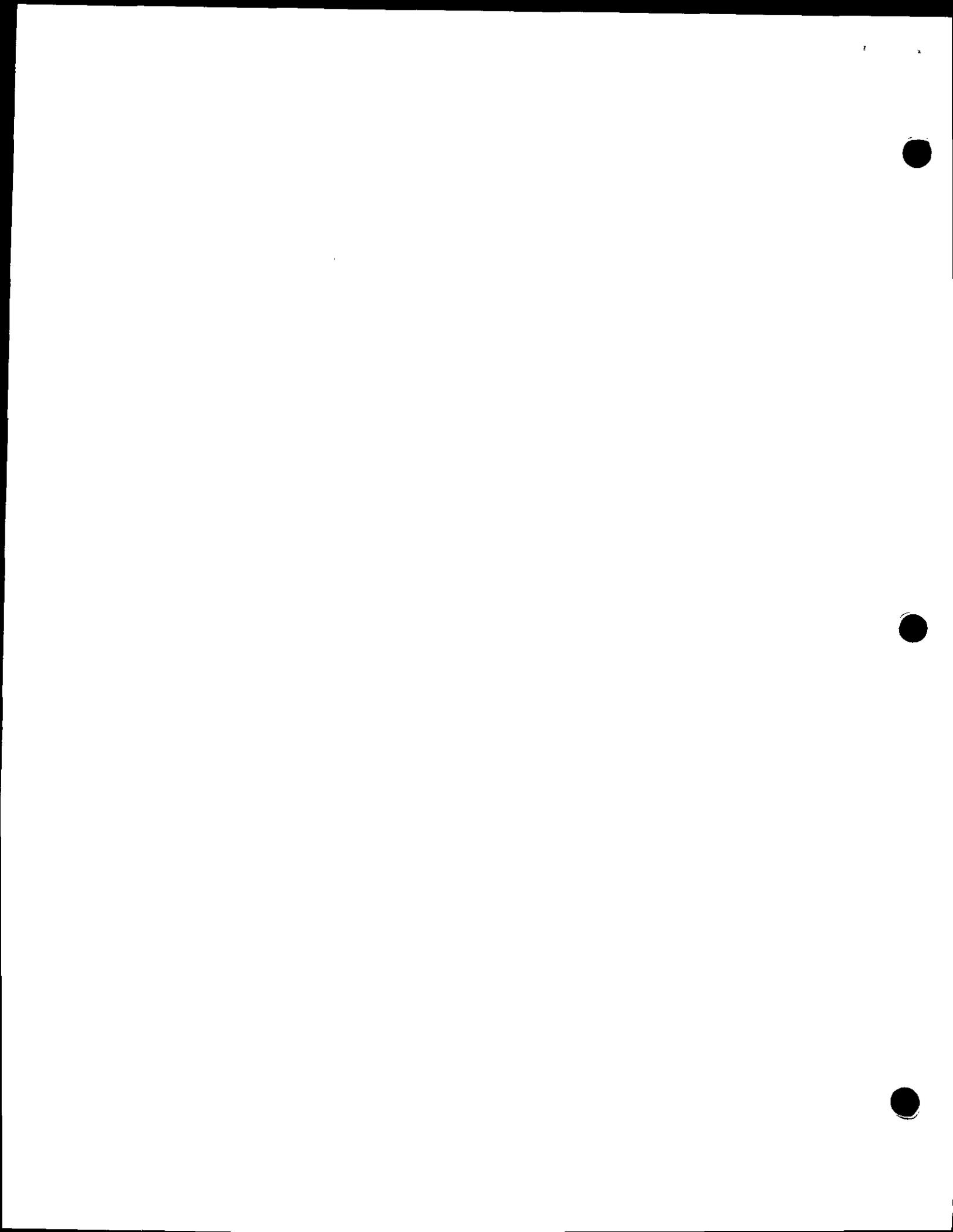
MEMORANDUM FOR: Distribution

FROM: F/AKC2 - Janet Wall

SUBJECT: PROPOSED CHANGE ON FORM 1US (LONGLINE AND POT VESSELS)

In the recent meetings on the NORPAC data format, the issue of whether or not to go ahead with the suggested 1US changes was left up in the air. After conferring with Heather Kenny, Dave Baker, Bob Carlson, Mike Brown, Kerry Dunn, and Mike Bailey, I have decided to go ahead with the changes unless I hear convincing arguments against them in the next few days. The NORPAC description will be changed to reflect the changes immediately, but it will probably be at least a month before Mike Brown or Graphics has time to revise the form. The following is a description of the proposed changes and how they will be implemented.

1. Columns 42-44 will be used for recording "No. of pots" (for pot vessels) as well as "No. of skates" (for longline vessels). The gear type (6 or 8) will distinguish between them.
2. Columns 45-48 will be used for recording "pot set length" (for pot vessels as well as "Skate length", also in fathoms. As pot fishermen presently can not set pots in strings (but might be allowed to do so in the future), it might not be worth the confusion now to actually have this printed on the forms. The NORPAC description would include it so that we would remember where to put it if this is ever allowed again.
3. Columns 53-55 would no longer be used for "No. of pots", and this column would be eliminated from the form. It might be well to have Bailey reserve a field in NORPAC (3 columns, numeric) in case we later need to add another gear descriptor for some new kind of gear.
4. Columns 56-60 would be used to record "total hooks" on longline gear. This would eliminate "length of set" for pot sets (see #2) above, and use column 60 from retained catch, as we would not expect retained catch from a longline/pot vessel to exceed 99.99 mt per set. "Total hooks" would be an either/or option for observers. Observers on vessels with automatic bait counters might find it easier/more accurate to record total hooks--they would then leave "no of hooks/skate" blank. Observers on other vessels might prefer to continue with the present method of recording no. of hooks/skate. Both sets of observers would continue to record "no. of skates" and "skate length", so that length of set and distance between hooks can be calculated.



5. Columns 61-90 would stay the same as on the present form (the same information would be punched in them).
6. On the printed form, columns 56-90 would be shifted to the left, leaving room for a nonkeypunched column at the right for NMFS subarea, utilizing the space gained by deleting the "no. of pots" column.
7. A revision date would be added to the form in order to easily distinguish the new forms from the old forms.

PROPOSED IMPLEMENTATION PROCEDURE:

1. The NORPAC description will be modified by Janet and Heather K to reflect the new changes.
2. Mike Brown is responsible for seeing that a new IUS Form is prepared, either by himself or Heather W using Formtool, or Graphics. He will circulate copies of the form for approval by the critical staff, and to inform everyone in the program that this form will soon be used. After the form is prepared, he should inform Marla, so that she can have the new forms duplicated.
3. Karen Teig will revise the sampling manual to reflect the changes. It is not known how long it will be before the new form will be given to the new classes and it is phased in.
4. Once the new forms are available, Marla should take care to eliminate the old forms so that new observers use the new forms rather than the old ones. Old blank forms should be reserved by debriefers only for those rare instances in which an observer with old forms needs one or two additional pages. We want to avoid having the observers have a mixture of old and new forms for a cruise.
5. A new copy of the form should be put in the NORPAC forms documentation book, together with the implementation date. This can be accomplished by giving the new form to me, along with the date of the implementing training class.
6. The editing staff (Bob Carlson et al), will change the data from existing format to the new format. This should require shifting the data only from the pot cruises--shifting the no. of pots from columns 53-55 to columns 42-44. It was decided to shift the data from the previous cruises from the old format to the new format instead of having the transformation program recognize the two different formats.









Since part of the observer's catch estimate is dependent upon the number of hooks, observers should try to periodically verify their number. Some methods for determining this are as follows:

1. Obtaining hook count from the automatic baiter.
2. Actual count of hooks on several skates (or units of gear) and tallying skates during retrieval.
3. Overall timing of the setting of skate with a calculation of the average number of seconds to set one skate.
4. A conversion of miles of gear set to skate using the video course plotter.

If some sections of line or some pots are set but not retrieved due to bad weather or gear conflicts, note this in your logbook and final report. Do not include catch estimations of this lost gear in the total catch estimation.

### 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. This position determines the designated area of the set. Make sure that all positions are reasonable, i.e. 58-63' does not exist; double check positions that indicate large movements if you have not been aware of any. The first digit of longitude (1) is understood, so record only the following digits. Each longline or set of pots must have a position. On days in which no retrieval of a set is completed, record noon position in these columns.

11. Enter the soak time of the set - the time interval from the time the first part of the line was laid until the time the last of the set is brought in. If bad weather or killer whales prevent the crew from bringing in any of the line for a period of time, subtract the time spent waiting from the total elapsed time. The elapsed time should be entered in hours and minutes; the two digit hour designation (use leading zeros as necessary), should be entered in columns 33 and 34 to the left of the dashed line, and the minutes (use leading zeros again as necessary) should be entered in columns 35 and 36 to the right of the dashed line. For example, a soak time of 38 hours and 5 minutes would be entered as 38|05.

12. A set is assigned to a day according to the time the retrieval of the set is completed, which is not necessarily the same day that the set was begun to be laid or the day that you sample. Sets whose retrieval is completed before 0000 hours are attributed to the

previous day, and sets whose retrieval is completed on or after 0000 hours are assigned to the next day.

13. The average bottom depth (cols 37 - 40) can be recorded in either fathoms (more likely) or meters, depending on the depth recording instruments that the vessel has, and in some cases, what units they are set at. Make sure that you indicate the units (fathoms or meters) with an "F" or an "M" in column 41 for every depth that you record.

14. Longline vessels only:

The number of skates (columns 42-44) should represent the number of units of longline that are retrieved from the set, not necessarily the number that are set. If possible, however, keep track of the number of skates that are lost and include that in your daily log and final report.

The skate length (columns 45-48) should represent the length of groundline that the average skate consists of. The length should be recorded in fathoms, not feet or meters, so convert the length to the proper units, if necessary (see Table of Equivalents). If the set consists of skates of different lengths, record the mean length (proportional average).

The average number of hooks per skate should be recorded in columns 49-52. This number usually remains constant throughout the cruise. Sometimes a line consists of alternating skates with different numbers of hooks - find out what the pattern is and note this in your final report.

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.

If pots are attached to a groundline which connects them together in a string, record the total length of the groundline of the set in columns 56-59 (otherwise, leave this column blank). This length should be recorded in fathoms, not feet or meters, so convert the length to the proper units, if necessary (see Table of Equivalents).

16. Retained catch: this is the 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). To adjust sets for which you do not have sampling data, calculate an adjustment factor

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. 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.

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 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.

## OBTAINING SPECIES COMPOSITION ON LONGLINERS

Unlike the situation on a trawler, all of the fish from a longline set are not dumped at once into a bin. On longliners, the catch comes up one fish at a time and the fish are usually processed as they come aboard. Observers have noted "patchiness" of fish on a longline set. The change in species composition in different portions of the set makes it important to get samples that are representative of the entire set. Try to get as large a sample size as possible, that is, sample large portions of the longline set.

The large size of the target fish makes basket sampling impractical since the sample baskets would fill up quickly and contain few fish. Tally sampling is the most practical method for observers on longliners. Determine which species dominates the catch at a given time--it may be sablefish, Pacific cod, or rattails. As this chosen species is brought aboard during your sampling period, tally the number of these fish using a thumb counter or a stroke-tally on a plastic sheet. (As you gain in proficiency, it may be possible to tally two species at once, such as sablefish and rattails.) Include in your count, tally fish that drop off 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. Note also how many units of gear were retrieved during the sampling period using a thumb counter or tally marks 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. Be aware that the back-up gaffer has a long gaff pole and can jab you in the face with the upper end of it when he pulls in a fish if you're not careful. Wherever you choose to stand, make sure that from your vantage point (whether above the pit or on the fishing deck) you can watch the crew place all of the non-tallied species in your baskets. Obviously, this method requires a good deal of cooperation and understanding on the part of the crew, 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 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.

FORM 3US - SPECIES COMPOSITION FOR LONGLINE or POT VESSELS

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

Worksheet

Species:	Sablefish	Pect. rattails			
No. weighed:	98	71			
Wt. of above:	298.5	224.0			
Avg. weight:	3.046	3.155			

Other calc.: comments: sampled 7 out of 10 skates. Tallied sablefish and pectoral rattails.

Cruise no.		Vessel code			Year	Mo.	Day	Set no.
1	2	3	4	5	6	7	8	9
		1	3	2	A	3	2	1
					8	7	1	0
					2	1		9

ST = Sampling type

Check those seen:

L = Longline

Halibut

T = Trap/pot

Salmon

V = Viability only

King crab

Tanner crab

Species name	x of 50	Species code	ST	Number					Weight (in kg. w/ decimal pt.)	No. of hooks or pots sampled	Viability								
				19	20	21	22	23			30-40	41-51	52	53	54	55	56	57	58
(Keypunch check)		9	9	9				5	8	2	1682.60	Set wt: 3200.0	15			11			9
sablefish		203	L					2	3	5	715.81	980							
shortspine thornyhds		350								8	5.04								
pectoral rattail		82						2	0	8	656.24								
unid. skate		90								6	14.8								
walleye pollock		201							1	2	37.2								
arrowtooth flounder		141							2	7	37.0								
roughscale rattail		81								5	5.0								
shortraker rockfish		326								7	11.7								
Pacific cod		202							3	5	92.0								
red king crab, M	M	13								2	6.48			2					
red king crab, F	F	13								1	1.20			1					
golden king crab, M	M	8								1	1.02					1			
Pacific halibut, U	U	101								3	99.11			12		10			9
Tanner crab, unid. U	U	3								10	0.0								
Salmon, unid. U	U	220	L							0	0.0	980							

## 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: use the same sample size (number of hooks or pots sampled) 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 catch 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.

## LENGTH FREQUENCY AND AGE STRUCTURE SAMPLING

The workload of taking lengths of approximately 150 of your sampling species each day may be too difficult on a longline vessel if, 1) the fish are processed immediately upon landing, 2) slitting the belly to sex the fish would destroy the product, and/or 3) the fish are large and therefore more work to handle. You may find it necessary to reduce the number of length measurements taken each day. Sexed lengths are much more useful to us and so these are preferred but if this is proving too difficult, try to sex some of the fish being measured (random subsample) and take unsexed length measurements of the rest. If **this** is too difficult, unsexed lengths are better than no length data - do what you can. Age structure collecting is a lower priority than length frequency measurements and so here again, do what you can. Remember

that good composition data and biological data on the prohibited species found in your samples takes precedence over length measurements and special projects. For forms 7US and 9US, refer to the instructions included with the trawler forms.

## SAMPLING AND DATA RECORDING INSTRUCTIONS FOR SHORESIDE PROCESSING PLANTS

As a result of the implementation of amendments to the Fishery Management Plans for the Groundfish Fishery of the Gulf of Alaska and Bering Sea and Aleutian Islands Area, managers of shoreside facilities that monthly receive 1,000 mt or more of groundfish are required to have an observer at the facility each day it receives groundfish. Also, managers of shoreside facilities that monthly receive between 1,000 mt and 500 mt of groundfish must have an observer present at the facility for 30 percent of the days it receives groundfish for each 3-month quarter of the fishing year. Some of these plants may also receive deliveries of crab, halibut or salmon. Observers are only to work on deliveries of groundfish. Individual observer assignments will vary; some observers may be stationed at only one 100% coverage plant, others may be expected to cover one 100% coverage plant and one or two 30% coverage plants, while others may cover two 100% coverage plants that are owned by the same company and are in close proximity to each other.

### SAMPLING WORKLOAD

Collecting Delivery Information: The Form A Port Sample Summary Form corresponds to the Haul Form 2US or the Set Form 1US. Information must be gathered and recorded for all groundfish deliveries to a plant whether or not those deliveries were sampled by the observer. The Skipper Interview Form is a worksheet for the port sampler to work from when going to the boat to collect data from the skipper, observer aboard or the vessel logs. The Skipper Interview form is optional and does not need to be turned in.

Prohibited Species Sampling: As often as is possible and practicable. This is a high priority, but you must be able to sample the entire delivery and the delivery must be from a vessel where the catch has been sampled by an onboard observer.

Length Frequencies: For 100% coverage plants--150-200/day; for 30% coverage plants--150-200/day on days that you work at the plant (you'll be working at this plant approximately 30% of the time). You may sample deliveries that come from vessels that do not have observers onboard.

Age Structures: For 100% coverage plants--200-300/plant/mo; for 30% coverage plants--300/plant/3 mo. period. You may sample deliveries that come from vessels that do not have observers onboard.

Product Recovery Rates: Collect product recovery rate information (PRR) for major products on a time available basis. This is not a high priority duty but the information is of value.

Density Determinations: Collect density information for the most common species and species mixes. Accurate density measurements can be acquired at shoreside plants much easier than onboard ship. Large, uniform-sized fish totes can be used and accurate weights can be achieved with little trouble. There is no data form for this information at this time. Record information on an eyeball estimate of species composition, the sample weights and volumes in your logbook. (If density samples are taken from deliveries of observed vessels, the vessel observers

composition could be accessed and a comparison of at-sea versus plant density values could be made). This is not a high priority duty but there is a great need for information of this kind.

Special Projects: Observers are sometimes asked to collect special biological information such as pollock maturity or stomach samples. If you are assigned a special project, follow the directions that will be provided.

#### FORM A - PORT SAMPLE SUMMARY FORM

Keep the data for each plant separate. Instructions for filling out Form A are given below. Follow the instructions in the manual for forms 7US and 9US. Remember that you will not be doing any species composition sampling at shoreside processing plants.

1. Maintain a separate set of Form A's for each plant. At the top of each set of forms, enter your name and the name of the processing plant. You should make an entry for every delivery made to the plant, whether or not it was sampled.
2. Port sampler no. (col. 3-5) and Processing plant code (col. 6-9): These columns will be filled out upon your return to Seattle, so leave them blank. On Forms 3US, 7US and 9US the Port sampler no. will substitute for the "Cruise no." and the Processing plant code will substitute for the "Vessel Code".
3. Year (col. 13-14): Enter the last two digits of the year.
4. Place a check mark in the far left column to indicate which deliveries you sampled. (Remember, you must enter data for all deliveries, not just the ones that you were able to sample.) Also place a check in the column labeled "Observer Onboard", if the delivered catch has been sampled by an onboard observer. This will enable staff at NMFS to easily know if the delivery had been previously sampled at sea.
5. Delivery no. (col. 10-12): Enter the delivery number which applies to the catch being delivered to the plant. Delivery numbers for each plant should be sequential and there cannot be any duplicate numbers within each port sampler/processing plant set of forms. Much of the delivery information can be obtained from the NMFS processing plant logs, NMFS ship logs, or through a skipper interview or interview with processing plant personnel. It is especially important to enter on this form every delivery that you sampled. On Forms 7US and 9US this number will substitute for the "Set/haul no." As with haul numbering on form 2US, you may use the delivery numbering system that is already being used by the processing plant as long as it meets the criteria stated above. This will probably be less confusing for you. However, if you choose, you may set up your own numbering system.



6. Delivery date (col.15-18): Enter the local date (not GMT date) that the catch was delivered to the processing plant. This should coincide with the date that is used in the NMFS processing plant logs and on the ADF&G fish ticket. If the catch is delivered over a period of two or more days, use the date that is on the processing plant logs. This will not necessarily be the date that you sampled the catch. You should use this same date (again, in some cases not the sampling date) on the Forms 3US, 7US and 9US.
7. Gear type (col. 19-20): Enter the appropriate code.

- 1 = bottom trawl
- 2 = midwater trawl
- 3 = unknown or mixed trawl haul
- 4 = pair trawl
- 6 = pot or trap gear
- 7 = jigging vessel
- 8 = longline gear

If you are unsure of the gear type, take notes, leave this column blank for the time being, and discuss it with NMFS staff.

8. NMFS area code: This is the 3-digit code for the area in which the vessel fished (refer to the map in the radio message section of the manual). If the vessel fished in two or more areas for the catch delivered, record the area in which most of the fish was caught, but enter an \*, and note on the back of Form A.
9. ADF&G statistical area: Refer to the maps supplied during training, giving the statistical area, using the more detailed map whenever possible, and record the 6-digit statistical area code for the area in which most of the fish were caught. (If you get this information through an interview with the skipper, it is best to take along copies of these maps when you interview the skipper, and have him point out the area or draw the area on the map so that there is no mistake.) If the vessel fished in two or more areas for the catch delivered, record the area in which most of the fish was caught, but enter an \*, and note on the back of Form A all of the areas in which the catch was caught. If the skipper is reluctant to give you this detailed information, try to at least get the NMFS area.
10. No. of tows: record the number of tows that were made during the trip. If the vessel is a longliner or a pot vessel, record the number of sets. This information can be obtained from the NMFS ship logs.
11. Average duration: record the average duration of the tows in minutes. Get the actual length of each haul from the NMFS logbook, add up the durations and divide by the number of hauls to get the average duration. You can go up to 9999 minutes for the average length of soak for a longline or pot set.
12. Total weight delivered (lbs or mt): Record the total weight of the catch delivered to the

processing plant for that trip. This can be taken from the NMFS processing plant logs. (See note below regarding how to handle cases in which a vessel delivers catch from a single trip to several different processing plants.) In most cases, this should be the same as the sum of the groups reported on the ADF&G fish ticket, but make sure that this includes all of the discards from the plant.

14. Sample species code: This is the three-digit code number for the species of fish referred to on the rest of this row. If you sampled this delivery, you must be sure to record the information on the species that you sampled, and in most cases, you will want to record on additional rows the other major species that were delivered. (Refer to the species code list in the reference section of your manual--use the NMFS species codes and not the ADF&G species codes.)
15. Sorted? (Y or N): this question refers to whether or not any of the individuals of the species in columns 43-45 were sorted out of the catch and discarded at sea. Fishermen might discard undersized individuals, or fish of a given sex. It is important to know this, because this might affect the length frequency data. This does not refer to any sorting and discarding of other species, such as prohibited species or some other unwanted species.
16. Weight of sample species discarded at sea: if the species in question was sorted for size or sex (as indicated with a Y for "Yes" in no. 15, or if some of the catch was dumped because the holds were already full, the fish were too old, or for some other reason, indicate the approximate amount in pounds that was discarded at sea. This information should be in the NMFS processing plant and ship logs.
17. Weight of sampling species delivered: This information should be on the ADF&G fish tickets
18. Main product: the code for the main product that is made by the plant from the species in question. If the plant is making surimi out of pollock and also taking roe from mature female pollock, list the main product as surimi. (Refer to the "List of Alaska Product Types" in the appendix of the manual or in the the ship's logbooks.)
19. Abbreviation of delivering vessel: There are 15 columns available for the vessel name. In most cases you will be able to write down the full name in the spaces provided--if not, choose an appropriate abbreviation. If you must abbreviate, make the abbreviated name as close to the original as possible. Do not use periods and count the space between words as one of the 15 columns. Check the list of joint venture catcher boats to see if NMFS already has an abbreviation.

What to do when vessels deliver to more than one plant: If you discover that a vessel is delivering fish caught in one trip to more than one plant, you should enter Form A information on only one set of Form A's, preferably the Form A's for the plant where most of the catch was delivered. Note on the back of Form A, or on an attached sheet, the amounts of fish delivered to each plant, but enter on the Form A the total amount delivered to all of the plants, the total amount of sample species delivered to all of the plants, and the total number of

tows made during the trip. You may sample the catch from more than one of the deliveries (in fact, it might be a good idea, because you would be apt to sample catch from different parts of the hold), but enter the data on the Form 7's and 9's corresponding to the entry you made on the Form A. Note what you did on a non-keypunched portion of the forms. The two or more length frequency samples from the different plants may be kept as separate length frequencies on the Form 7's--the computer can add them together if necessary, or they may be analyzed separately for variance. Make sure that you do not have any overlapping otolith numbers when you reassign the otoliths to the same plant.

#### NMFS Skipper Interview Form:

The skipper interview form is a form you may chose to use in part or in whole, to help in collecting information needed to fill out the Form A. It might also be useful as a place to record anything unusual about the catch, the skipper's comments, more detailed information on the location of the hauls, and anything else that cannot be recorded on Form A. As the data needed for Form A has already been discussed, you should find the questions on the skipper interview form largely self-explanatory. A reminder: the questions referring to whether or not the catch was sorted, and if so, what percent was discarded, do not refer to a selective discard of prohibited species or some minor unwanted species--they refer to any size selection or sex selection of the main delivered species, although you may enter a more detailed explanation of exactly what was sorted and discarded at sea for clarification purposes.

#### Other Skipper Interview Notes:

Other useful information to collect during an interview might consist of information on schooling behavior of the target species, maturity of the fish, anything unusual about the hauls, or comments on areas in which he spent time searching for fish, whether or not anything was caught. If the vessel has a paper-recording fish finder, you might encourage the skipper to save the paper tape (labelled with haul # and depth) for some of the schools seen. Be sure and thank the skipper for any information that he provides, and explain its usefulness in determining the status of fishery stocks. (Note: Don't pursue this line of questioning if the skipper complains that the shipboard observer has already asked him for this information, or if you know for a fact that the shipboard observer has already collected this kind of information--use tact, diplomacy and common sense during any interview. Also, stress that all information collected will be held in strict confidentiality.)

Gear diagrams--if possible, get the skipper to fill out net diagrams for the nets used on vessels that do not have an onboard observer. There are two diagrams, one for midwater trawls (a Polish rope-wing trawl), and one for bottom trawls. Modify the diagrams as necessary to reflect what the nets are really like. If you can get only some of the information, try to at least get mesh size, especially codend mesh size. If the fisherman used two different nets on a trip, note that on the interview forms. The next time the vessel comes in there is no need to get another gear diagram, so long as the fisherman used the same nets as before--just confirm that fact.

NMFS SKIPPER INTERVIEW FORM

Port sampler no. \_\_\_\_\_ Processing plant code \_\_\_\_\_

Delivery no. \_\_\_\_\_ Delivery date \_\_\_\_\_

Date of interview \_\_\_\_\_ Time \_\_\_\_\_ AM PM

Vessel name \_\_\_\_\_

Person interviewed \_\_\_\_\_

Skipper? Yes, No, if not, position \_\_\_\_\_

Vessel length \_\_\_\_\_ tonnage \_\_\_\_\_ horsepower \_\_\_\_\_

Gear: midwater, bottom, mixed, other

Description of gear (refer to trawl diagrams) \_\_\_\_\_

NMFS area fished \_\_\_\_\_ ADF&G stat. areas fished \_\_\_\_\_

Average steaming time to/from grounds: \_\_\_\_\_ Searching time: \_\_\_\_\_

Number of tows: \_\_\_\_\_ Average haul duration (minutes): \_\_\_\_\_

Was catch sorted (size, sex, etc) prior to delivery? yes no

If sorted, what percent discarded? \_\_\_\_\_ %

<u>Species</u>	<u>Total wt. delivered</u>	<u>Amt. discarded at sea</u>
	lbs	lbs
	lbs	lbs
total all species:	lbs	lbs

Method used to determine total weight of target species:

Method used to determine total weight of fish delivered:

Was observer aboard this trip? No, Yes--NMFS, Yes--ADF&G

General comments (fishing success, fish size, school size, comparisons to previous years, etc):

## SAMPLING INSTRUCTIONS

### Prohibited Species Sampling:

An important emphasis is to be placed on prohibited species sampling. Your efforts at this time in the development of the domestic observer program will enable program managers to analyze whether the prohibited species sampling effort carried on at sea is sufficiently accurate.

Deliveries sampled for prohibited species must be from a catcher boat that has an observer on board. The observer on board the delivering vessel must have whole haul sampled all hauls making up the delivery, for prohibited species. The entire delivery must be delivered to a single plant and the port sampling observer must be able to sample the entire delivery for prohibited species. Thus, the shoreside observer should be mindful of the amount of time it will take to sample the entire delivery for prohibited species. It is essential that the observer monitor the entire delivery, since the purpose of the work is to determine the accuracy of the sampling methods employed at sea. Refer to the prohibited species tally forms for both port samplers and shoreside delivery boat observers following this section.

As an example, consider that the shipboard observer estimates that five salmon fell into the holds and were not sorted out before delivery, and the shoreside observer monitors half of a delivery and counts five salmon, should the shoreside observer conclude that he has accounted for the five salmon that the shipboard observer saw fall into the holds?, or should the shoreside observer extrapolate the salmon figures and assume that there are ten salmon in the entire delivery? It's the classic dilemma of sampling for the incidence of a species that occurs only very rarely in the catch--an observer must sample the entire catch. This example points out another area of concern. It is crucial that the shipboard observer record the number of prohibited species that were estimated in their sample (if there were any). Otherwise, (as in the example above) one could not tell whether the five salmon sorted out of the delivery by the shoreside observer have already been counted by the shipboard observer, or whether these five salmon were entirely missed by the shipboard observer, and the total salmon bycatch for that ship should be at least fifteen salmon. (Note: If the shipboard observer is estimating prohibited species that have been thrown overboard and dumped into the holds, then a distinction between the two should be made on the shipboard observer's form 3US.)

Observers should be cautioned against relying on plant personnel to sort, save and or count prohibited species for them. They should also not use the prohibited species figures that are recorded in the "Alaska Groundfish Daily Cumulative Production Logbook" for shoreside processing plants. These logs can be useful for comparison of figures, but they cannot be used as a substitute for an observers sampling effort.

### Length Frequency Sampling:

Collect lengths from the major or target species that are being delivered to the plant. If more than one target species is being delivered to the plant you may collect length frequencies from more than one species, however, you must collect 150-200 lengths from each species that you collect lengths from on that day. It is important to strive for random, unbiased sampling;

therefore select fish from several samples spaced throughout the delivery. If you are sampling at a plant that requires 100% observer coverage, you should strive to collect 150-200 lengths per day. When you are sampling at a plant that requires 30% observer coverage, you should collect at least 150-200 lengths for each day that you work at that plant. Since, the plant only requires approximately one-third of the sampling effort, it will most likely be sampled only every third day or so.

#### Age Structure Collection:

Observers are asked to collect 200-300 age structures per plant per month, when working at a plant that requires 100% observer coverage. When sampling at plants that require only 30% observer coverage, the observer should collect 300 age structures per plant per three month period. Since most observers are hired for 2-3 months, they will be expected to complete one collection of about 300 age structures, for each plant requiring 30% observer coverage, during their tour of duty.

Age structure collections should be stratified/random collections (5 per cm. per sex) unless otherwise instructed. When you start a second collection at a plant (second month at a 100% coverage plant), continue the numbering of the vials from where you left off, because you can't have duplicate age structure numbers for the same port sampler/processing plant code.

The "roundfish" species of the highest priority for age structure collections are: Pollock, Pacific cod and all rockfish species including thornyheads (Sebastalobus spp.). The flatfish species of most importance are listed below in order of priority:

<u>Bering Sea</u>	<u>Gulf of Alaska</u>
Yellowfin sole	Rock sole
Rock sole	Flathead sole
Flathead sole	Rex sole
Alaska plaice	Dover sole

If you have collected lengths from more than one species in a month, do not split your age structure collection between the two species. Collections are of most value if they consist of about 200 age structures for any one species. If you begin an age structure collection and then find out that the species that you are collecting lengths and age structures from, is no longer going to be delivered, you have a decision to make concerning whether or not to keep the partially completed age structure collection. The rule of thumb to use in making this decision is: if the collection contains more than 50 age structures, go ahead and keep it, and use the remaining empty vials from that collection for another species; conversely, if the collection contains less than 50 age structures, dump it and use the entire collection of vials for a new species.

#### Product Recovery and Density Determinations:

Observers should follow the directions in the manual when determining product recovery rates. Use the form 8 and also use the form 8 worksheets. One difference in the directions for the form 8 worksheet, is that each test should consist of three samples of 50 fish, regardless of

size. Product recovery rate determinations should be gathered for the most common products that are being made and need not be attempted for surimi.

Density measurements can be taken whenever it is practical and should be tailored to measuring the density of common assemblage mix of species as well as single species such as pollock. Since there are large, easy to measure, fish totes and accurate scales, density data gathered by port samplers will eventually replace the need to sample for density values at sea.

### WEEKLY MESSAGES

Messages from shoreside processing plant observers need not follow the same format as those from observers aboard domestic vessels. They can be self-designed, but must include brief explanations of the work accomplished that week. Messages should include the following (at a minimum) for each plant that the observer worked at during the week:

1. Number of deliveries (and total weight of deliveries).
2. Number of deliveries sampled (also number of deliveries sampled for prohibited species).
3. Total delivery weight by species group.
4. Number of prohibited species and weight of halibut (if prohibited species sampling was done).
5. Rough estimate of number of lengths taken, and age structures collected.
6. Report product recovery rate work and density determinations accomplished, as well as progress on other special project assignments.

### DOMESTIC OBSERVER PLANT REPORT

Introduction: Describe the type of plant, its location, targeted species utilized, dates worked at the plant, etc.

Description of the Plant: Discuss the aspects and operation of the plant. Be specific. Provide detailed information on delivery systems. Diagrams are most useful.

Gathering Form A Information: Describe how delivery weights, bycatch information, trawl data from the delivery vessels, etc. were obtained.

Sampling Procedures: How was prohibited species sampling accomplished. Include pertinent diagrams. Discuss how lengths, otoliths or special project data were obtained. Were any product recovery tests performed or was density information gathered? Where was your sampling area and what was it like? What equipment or facilities were available to you that you

found useful for your work?

Living Conditions: Describe in detail where you lived, roommates, bathroom facilities, galley food and anything important the next observer should know.

Interaction With Plant Personnel: List the management structure of the plant, who you had to deal with to do your work or gather information. Discuss any problems with plant workers. Discuss safety considerations, hazardous areas in and outside the plant.

Problems Encountered: Describe any problems associated with you and your work, and any other problem encountered while working there.

Comments/Conclusion: Discuss working relations with delivery vessel observers. Report any innovative plant designs or processing machinery. Discuss your feelings about working there and anything else the next observer should know.







TELEPHONE, RAPIDFAX, TELEX NUMBERS, ETC.

Alaska Fisheries Science Center (for sending or phoning catch messages; for between-trip debriefing or sampling questions) :

Telex: 329422 callback=NWASC-SEA

(backup telex in Bldg.#1 at NWAFC = 9104442786)

Rapidfax: (206) 526-4066 (backup fax in Bldg.#4 - 526-4004 and Bldg.#1 - 526-6426)

Phones: (persons answering will accept collect calls)

For catch messages - Becky Renko or, when she's not in, the message recorder - (206) 526-4205 (You can leave up to a 5-minute message, but the recorder won't accept collect calls).

Ron Erickson, Administrative assistant, (206) 526-4207

Debriefing (206) 526-4192

Bob Maier, Program manager, (206) 526-6695

Instructors (for sampling questions) Karen Teig and Mike Brown, (206) 526-4191

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

Alaska Regional Office

Telex: 6229600 callback = NMFS AKR JNU

Rapidfax: (907) 586-7131

Phone: (907) 586-7229

Address: Dave Cormany  
National Marine Fisheries Service, F/AKR  
P.O. Box 21668  
Juneau, AK 99802 - 1668

National Marine Fisheries Service

Address: Martin Loefflad (field representative)  
Domestic Observer Program - Kodiak Office  
1211 Gibson Cove Road  
Kodiak, Ak 99615  
Phone: 907-486-6920  
Rapidfax: 907-486-6028

Alaska Department of Fish & Game (ADF&G) in Kodiak

Phone: (907) 486-4791 (Leslie Watson)  
Address: 211 Mission Road, Kodiak AK 99615

ADF&G in Dutch Harbor (to obtain extra supplies from Foreign Fishery Observer Program supplies)

Carolyn Griffin (907) 581-1529

## INSTRUCTIONS FOR WEEKLY CATCH MESSAGES

One of the primary tasks of the Observer Program is the estimation of the catch of groundfish and prohibited species throughout the year to insure that these catches remain within the quotas established by the management councils. In order that the observer's data may be utilized before returning from sea, a catch message is sent each week to the Alaska Fisheries Science Center summarizing the week's fishing activity and sampling data. The first part (A) of the message will give the species composition sampling data by haul for each area and gear type, the second part (B) will provide data specifically on the samples for prohibited species, also by area and gear type. The headings of the report forms provide fishing effort information and, for trawlers, a marine mammal catch report.

The report week is always **MONDAY through SUNDAY, Alaska Local Time and date** regardless of the date the message is actually sent. Catch data is attributed to a report week according to the date of completion of the tow or delivery. (Refer to the next section, on "Determination of Report Week of Catch for Catch Messages", for explanation.) **Observers on catcher/processors will send their messages on Monday. Observers on all other vessel types and plant observers will send their messages on Tuesday. Catch messages are critical and must be sent on time.** Observers on catcher boats should accumulate all data for a report week and transmit only once per week. If the catch message is not ready, send us a message informing us of that and the catch message will be expected at the next delivery. When asked to repeat a message, please do so immediately and do not wait until the end of the week. Also, circle "Resubmission" on the top of the forms; this will let us know that your message is clarification of a previous message.

If you are at sea on a catcher/processor, prepare a catch message each week for transmission from the vessel. It can normally be sent to NMFS in Seattle by telex, rapidfax or satellite telephone. (See the letter of introduction for the different possibilities for transmission.) When preparing a message for fax transmission, write your message in larger print than normal, and with block print, **dark**, lettering. Catch message Forms A and B provide the format for your weekly data transmission. For other messages or questions sent via rapidfax, use **unlined** white paper. If your messages are not being sent or are not getting through to our office, try sending your messages to your contractor. Another possibility would be to ask whether the ship's communications are getting through to their company office. If they can send messages to their office, have your weekly message sent there with a note to the addressee such as, "Unable to transmit message to NMFS directly. Please forward this message to: Janet Wall/ AKC/ Seattle WA/ Telex 329422 (Callback NWASC SEA)/ Fax (206)526-4066/ Phone (206)526-4195."

Failing this, it will at least be possible to phone in your weekly message via a ship-to-shore, collect, radio telephone call using the single sideband (SSB) radio and the marine operator (in Alaska this is KMI). Atmospheric conditions will sometimes interfere with these transmissions. Simply try your call again later. Call our logistics office at (206) 526-4205. Whenever catch (or any other) information is being relayed by radio telephone, anyone can listen, and you must remember that the conversation is public. As catch information must be kept confidential, radio telephone catch messages must be coded according to instructions. Do not voice the fishing information, catch weights, species names and sampling data. Using codes

would also be appropriate if it is necessary to relay catch information for one vessel after transferring to another vessel; data from all vessels must be sent to Seattle without delay.

In the unlikely event that you cannot transmit any messages, or you are aboard a vessel for a week or less, (as is commonly the case in shoreside delivery vessels), or you have just gotten off a vessel and have the last few day's data to send in, fax or phone in your catch message as soon as you have returned to port. Call our logistics office at (206) 526-4205 or try our new toll-free number at 1-800-437-9092. As a last resort, mail your message to Seattle. Mail from Dutch Harbor will arrive in three days and that may be faster than waiting until you have returned to port or waiting until you return to Seattle. Keep a copy of all messages sent and received. Your catch message forms will be used for verification purposes in debriefing.

Along with catch reports observers can include any questions or information relating to observer work. For example, observers on 30% coverage vessels need to include a note about which of their assigned vessels they did and did not sample on that week. If there is no catch report for a week, send us a message about that. Questions about observer sampling or responsibilities, information about health problems, or logistical information are common along with catch messages. To help us understand your situation, include parameters such as average catch size, composition, and the sources for your estimates when asking sampling questions. A question or information should be written carefully so it is unmistakably clear, not too wordy, and appropriate and professional. Realize that you may not receive an answer immediately. You are one of many observers at sea at any one time. It takes time for messages to be received and for replies to be formulated and sent.

If you are transferred to a new ship during a report week, you must report the catch and effort data for the period spent on each ship separately. Preferably, you will be able to pass the catch information to us from port before boarding your next vessel. If this is not possible, and your next port call is more than a week away, you must transmit the area, report group code and sampling information by code via the single sideband radio (as fax or telex transmissions are not usually available on these vessels).

#### Determination of Report Week of Catch for Catch Messages

The way in which an observer attributes catch to a particular week varies according to vessel type. Domestic processors group and report their products in the NMFS daily cumulative production log based on the date the catch was made into product. We have attempted to approximate this by grouping the observer's catch data according to the date of completion of the tow or delivery. Below are the options for catcher boats, motherships, or catcher/processors. (This grouping is not used for the observer's 2US or 3US forms. On these forms the haul information is grouped by using the net retrieval time.)

1) Observers on catcher/processors attribute catch according to when the retrieval of the net begins. (example - if a catcher/processor sets a net on Sunday at 2300 ALT, but does not start retrieving the net until 0300 ALT on Monday the catch would be attributed to the next week ending date.)

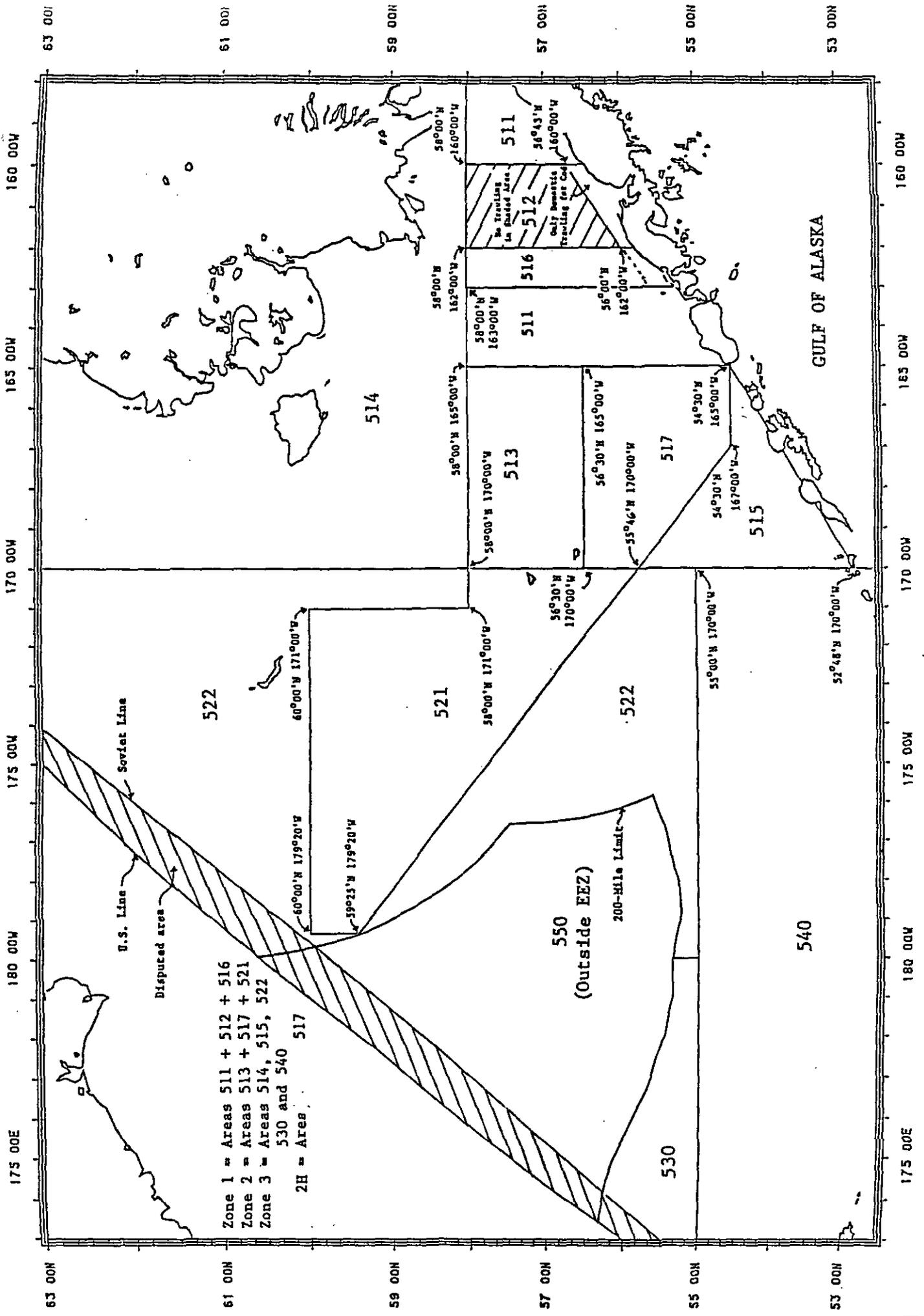
2) Observers on catcher boats attribute catch according to when the final delivery of

catch is completed. All of the hauls made for a delivery are attributed to the week in which the last delivery of catch was completed. (example - a catcher boat makes tows on Thursday, Friday, and Saturday but does not finish making it's delivery to a shoreside plant until Monday. Another catcher boat make tows on Saturday, and Sunday, and Monday and completes it's delivery to a floating processor on the same Monday. The observers on both of these vessels would attribute all of the catch to the next week ending date. Another possibility might be that a catcherboat delivers part of it's catch to Plant A on Sunday, but makes a final delivery to Plant B on Monday. In this case, the catcher boat's observer would attribute all of the catch to the next week ending date.)

3) Observers on motherships that are receiving unsorted catch from catcher boats attribute catch according to the date that the codend was received, i.e. the delivery date. (example - the catcher boat's net arrived at and left the fishing depth on Sunday, but the codend was not delivered until Monday. The mothership's observer would attribute the haul to the next week ending date.) Thus the delivery date and report week of a catch may not necessarily match the haul date (according to retrieval time) on Form 2US.

#### Notes for Observers Aboard "Floaters"

Observers aboard floating processors may choose to coordinate the transmission of catch messages from observers on the catcher boat fleet by collecting all messages and sending them at the same time with their own message from the floater. This sort of arrangement may be the easiest and most efficient for all parties concerned.

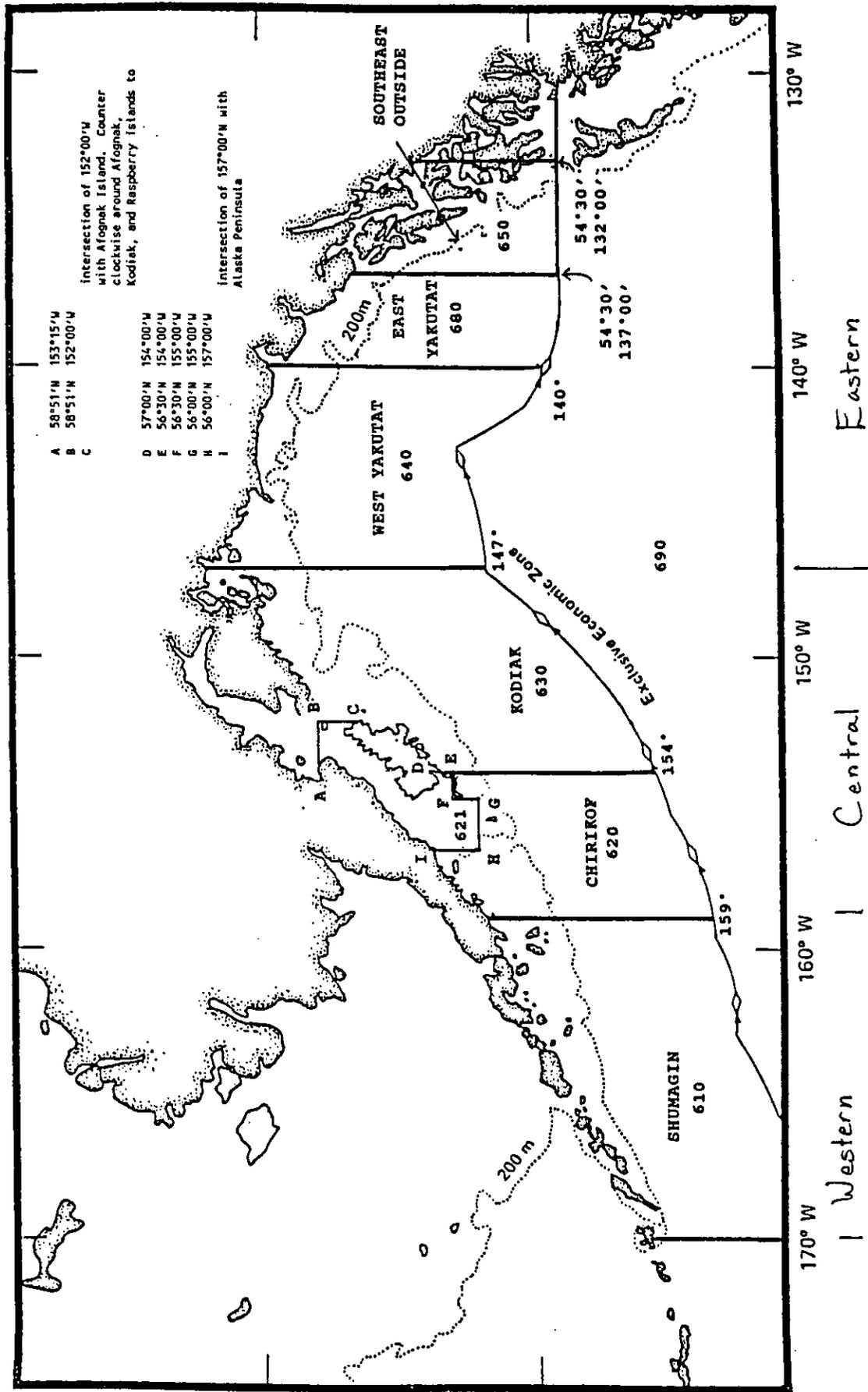


64° N

60° N

55° N

50° N

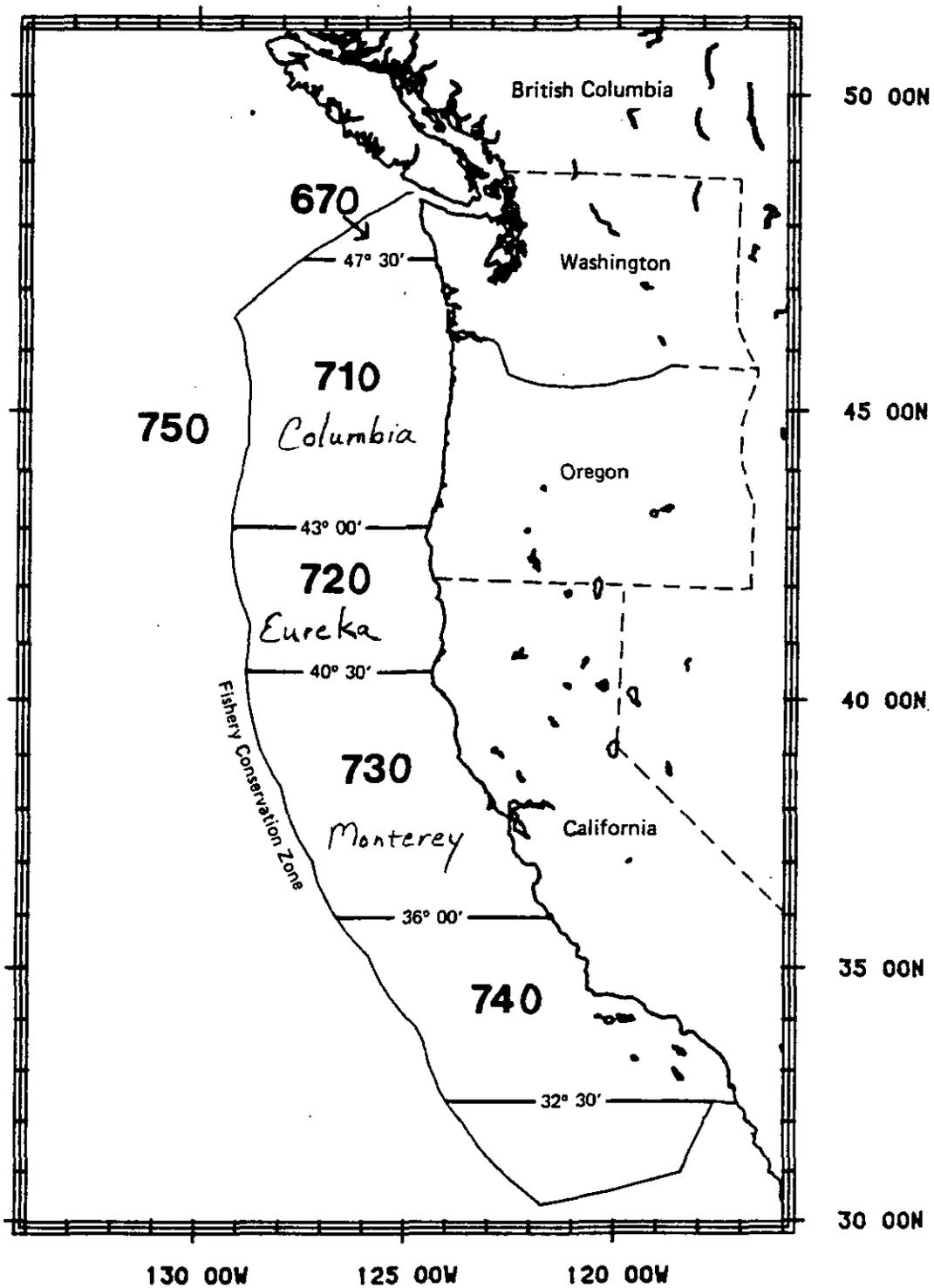


Eastern

Central

Western

Regulatory and reporting areas of the Gulf of Alaska.



Radio Message Report Areas for the  
Washington, Oregon, and California Coast (WOC)



REPORT GROUPS FOR SPECIES COMPOSITION CATCH MESSAGES

Bering Sea/Aleutians (Areas 510 - 550)

<u>Species Group</u>	<u>Report Group</u>	<u>Abbreviation</u>	<u>Code</u>
Squid	Squid	squ	875
Yellowfin sole	Yellowfin sole	yell	127
Rock sole	Rock sole	rsole	123
Greenland turbot	Greenland turbot	turb	134
Arrowtooth flounder Kamchatka flounder	Arrowtooth flounder	arrow	121
Other flatfish (except halibut)	Other flatfish	oflat	120
Pollock	Pollock	poll	270
Pacific cod	Pacific cod	cod	110
Sablefish	Sablefish	sab	710
Atka mackerel	Atka mackerel	atka	193
Pacific ocean perch	POP	pop	141
Shortraker rockfish Rougheye rockfish Northern rockfish Sharpchin rockfish	Red Rockfish	r rock	173
All other rockfish ( <u>Sebastes</u> and <u>Sebastolobus</u> spp.)	Other rockfish	orock	139
Sharks, skates, sculpins, eulachon, smelts, capelin and octopus <b>only</b>	Other fish *	oth	100
All remaining fish spp. Invertebrates (except squid and octopus) Miscellaneous items	Non-allocated *	non	999
Prohibited spp.	Prohibited species	prohib	900

\* The reporting requirement for these two groups (Other and Non-allocated) is different in the ship's and plant's logbooks than for the observer's weekly messages. For the "Other" report group, vessels and plants are required to report each of the species groups (sharks, skates, etc.) separately. Instead of the observer's "Non-allocated" group, vessels and plants report only lingcod and grenadiers. ("All remaining fish species" are not reported by vessels and plants.)

Gulf of Alaska (Areas 610 - 680)

<u>Species Group</u>	<u>Report Group</u>	<u>Abbreviation</u>	<u>Code</u>			
Rex sole Dover sole Greenland Turbot	Deepwater flatfish	dflt	118			
Flathead sole	Flathead sole	flat	122			
Arrowtooth flounder	Arrowtooth flounder	arrow	121			
Mamchatka ↗ Rock sole Yellowfin sole Butter sole Starry flounder All other flatfish (except halibut)	Shallow-water flatfish	sflt	119			
Pollock				Pollock	poll	270
Pacific cod				Pacific cod	cod	110
Sablefish				Sablefish	sab	710
Pacific ocean perch ( <u>S. alutus</u> )				POP	pop	141
Rougheye rockfish ( <u>S. aleutianus</u> ) Shortraker rockfish ( <u>S. borealis</u> )				Red Rockfish	rrock	173
Northern rockfish ( <u>S. polyspinus</u> ) Sharpchin rockfish ( <u>S. zacentrus</u> )						
Aurora rockfish ( <u>Sebastes aurora</u> ) Blackgill rockfish ( <u>S. melanostomus</u> ) Chilipepper rockfish ( <u>S. goodei</u> ) Darkblotched rockfish ( <u>S. crameri</u> ) Greenstriped rockfish ( <u>S. elongatus</u> ) Harlequin rockfish ( <u>S. variegatus</u> ) Pygmy rockfish ( <u>S. wilsoni</u> ) <del>Red-banded rockfish (<u>S. babcocki</u>)</del> Shortbelly rockfish ( <u>S. jordani</u> ) Splitnose rockfish ( <u>S. diploproa</u> ) Stripetail rockfish ( <u>S. saxicola</u> ) Vermilion rockfish ( <u>S. miniatus</u> ) Yellowmouth rockfish ( <u>S. reedi</u> )	Slope Rockfish	slprf	142			
* Bocaccio Rockfish ( <u>S. paucispinus</u> ) * Silvergray Rockfish ( <u>S. brevispinus</u> ) * Redstripe Rockfish ( <u>S. proriger</u> )						

\* now in Slope R.F.

Gulf of Alaska (Areas 610 - 680) cont.

<u>Species Group</u>	<u>Report Group</u>	<u>Abbreviation</u>	<u>Code</u>
Bocaccio ( <u>Sebastes paucispinus</u> )	Demersal Shelf Rockfish	demrf	168
Silvergray rockfish ( <u>S. brevispinus</u> )			
Redstripe rockfish ( <u>S. proriger</u> )			
Canary rockfish ( <u>S. pinniger</u> )			
China rockfish ( <u>S. nebulosus</u> )			
Copper rockfish ( <u>S. caurinus</u> )			
Quillback rockfish ( <u>S. maliger</u> )			
Rosethorn rockfish ( <u>S. helvomaculatus</u> )			
Tiger rockfish ( <u>S. nigrochinctus</u> )			
Yelloweye rockfish ( <u>S. ruberrimus</u> )			
* Redbanded ( <u>S. babcocki</u> )	* Now in Dem. Shelf R.F.		
Black rockfish ( <u>Sebastes melanops</u> )	Pelagic Shelf Rockfish	pelrf	169
Blue rockfish ( <u>S. mystinus</u> )			
Dusky rockfish ( <u>S. ciliatus</u> )			
Widow rockfish ( <u>S. entomelas</u> )			
Yellowtail rockfish ( <u>S. flavidus</u> )			
Longspine thornyhead ( <u>Sebastolobus altivelis</u> )	Thornyhead Rockfish	thrn	143
Shortspine thornyhead ( <u>Sebastolobus alascanus</u> )			
Report group specifically for: sharks, skates sculpins, squid, Atka mackerel, eulachon, smelts, capelin and octopus.	Other fish	oth	100
All remaining fish spp. Invertebrates (except squid and octopus) Miscellaneous items	Non-allocated *	non	999
Prohibited spp.	Prohibited species *	prohib	900

\* The reporting requirement for these two groups (Other and Non-allocated) is different in the ship's and plant's logbooks than for the observer's weekly messages. For the "Other" report group, vessels and plants are required to report each of the species groups (sharks, skates, etc.) separately. Instead of the observer's "Non-allocated" group, vessels and plants report only lingcod and grenadiers. ("All remaining fish species" are not reported by vessels and plants.)

Washington-Oregon-California Hake Fishery (Areas 670 and 710 - 750)

<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
Invertebrates (other than prohibited invertebrate species) Prohibited spp. Miscellaneous items	Non-allocated	NON

\* These two observer report groups (WIDOW and YTAIL) are part of the "Other Rockfish" report group for vessel logbooks. Therefore, be aware that your species composition data for rockfish will differ from that of the ship's when examining their fishing logs.

## INSTRUCTIONS FOR SPECIES COMPOSITION CATCH MESSAGE FORM A

The following instructions pertain only to the data you have collected on the overall species composition of the catch and its inclusion in the weekly catch message. Two lines of data will be entered for each haul sampled on the Species Composition Catch Message Form.

1. Enter your name.
2. Enter the name of your vessel.
3. Enter the fax or telex number of your vessel or plant. If you are on a shoreside delivery vessel enter the fax or telex number of the plant where you can be reached.
4. Enter the ORC (Observer Routing Code) number. The ORC is a security code entry which will be explained to you in training.
5. On the next line is the observed vessel's federal groundfish fishing permit number. The permit number has the format AK-91-0001; where "AK" abbreviates Alaska, "91" indicates the year, and the last four digits are a specific identifier of that vessel. Any letters following the last digits should be ignored.
6. Enter the Processor Code if needed. The processor codes consist of a four digit numerical code preceded by the letter "F". The processor code can be obtained from the list of processor codes that follows these instructions. This list includes both shore-side processing plants and ocean-going processing vessels. The last column on the right-hand side of the list identifies the processor as either a shoreside plant (P) or an ocean-going ship (S). Follow the directions below when deciding which processor code to use in a catch message. (Not all catch messages require a processor code)
  - a. Observers on catcher boats that do not deliver codends (but which store their catch in holds until delivery to a floating processor or shoreside plant for processing) need to include the processor code of the floater or plant in the catch message from the catcher vessel. If the catcher vessel divides its delivery among more than one processor, the observer should only use the code of the last processor, thus attributing the entire delivery to the last processor visited. (Since the catch may be sorted, we must place observers on catcher boats which don't transfer codends.)
  - b. Observers on vessels that catch and process their own fish but do not process another vessel's catch, should include only their vessel's permit number, and not the vessel's processing code. This is the only situation in which a processor code is not entered in a catch message from a vessel.
  - c. Observers on vessels that catch and process their own fish and also process another vessel's unsorted catch (they also serve as a mothership), need to include separate catch message pages for each type of processing. One page of the message containing only their own vessel's catch (permit number, but no processing

code); and a second page (with permit number and processor code) containing only the information from the delivered catches (as in item a. above).

d. Observers on motherships (vessels underway) that process unsorted catch, delivered via codend transfer from catcher boats, should include the mothership's processor code when reporting catch in their weekly catch messages. (Since the catch is not being sorted, we place the observer on the mothership and not on the catcher boat.)

e. Observers at shoreside plants do not have a permit number and don't need to include the plant's processing code in their catch messages. Refer to "Special Directions for Observers at Shore-side Processing Plants" below.

7. Next, the "Week Ending" or Sunday date of the report week should be entered. Each report week is referenced by the week's ending date even if, for example, you were only reporting data for Monday and Tuesday of that week. Dates should have a slash between the month and the day. Leading zeros are not required. January 25th would be written as 1/25.
8. Enter the number of "Observer Coverage Days" for that week as a whole number. (Any part-day of coverage is reported as one day.) For vessels, the observer coverage begins the first day the boat sets their gear for the purpose of fishing and ends when the vessel returns to port. A shoreside vessel that makes their first tow on Wednesday and returns to Dutch Harbor on Saturday evening; the observer should report four (4) Observer Coverage Days. For shoreside plants, the number of Observer Coverage Days is the actual number of days that the observer sampled at the plant during that week. This figure does not have to be divided by area and gear type and should only be entered on one of the Catch Message Form A's for the week.
9. Determine and enter the three digit, federal statistical area of each catch sampled. Data for each area should be recorded on separate sheets of the Species Composition Catch Message Form. Observers on trawlers must also keep data separate by gear type (pelagic, bottom or pair trawls) within each area.
10. As stated before, if a vessel should fish two gear types within an area/week, the observer must report the catch composition data separately by gear type as well as by area/week. The gear codes are as follows:  
Code No.  
1 ..... NPT ..... non-pelagic trawl  
2 ..... PTR ..... pelagic trawl  
4 ..... PAR ..... pair trawl  
6 ..... POT ..... pot vessel  
7 ..... JIG ..... jig vessel  
8 ..... H&L ..... longliner
11. Enter the total number of hauls made for the given area and gear type during the week. (Observers on longline or pot fishing vessels should leave "Total # Tows" blank.)

12. Then, (trawler observers), enter the sum of the minutes of fishing duration of these tows from Form 2US. Leave the duration in minutes; do not convert it to hours and minutes.
13. Observers on trawlers enter the number of randomly chosen tows which were monitored for incidental catch of marine mammals. The "# of Marine Mammal Tows" is the sum of the number of tows on the 10A side (front side) of form 10US Form for each week/area/gear type.
14. The "Weight of the MM Tows" (Marine Mammal Tows) is the weight (Official Total Catch) of the hauls monitored for the incidental catch of marine mammals in metric tons. (This is for observers on trawlers only.)
15. For incidental catch of a marine mammal in monitored hauls, designate the species with the two letter species code given in the instructions for Form 10US. Next report the number of any freshly dead or "lethally removed" mammals that are landed in the monitored hauls listed on Form 10A. **Only freshly dead or "lethally removed" mammals that are landed are to be reported.** If no marine mammals were caught in monitored hauls, write "None" in the space provided. (This is for observers on trawlers only.)
16. Finally, all observers must report the "Initial Date of Sampling" (IDS). You must inform us of your first day of sampling whenever you start work aboard a different ship or plant. The IDS date is important to this program's data organization so please repeat the IDS date in all your catch messages.
17. According to the list by region, (BSA, GOA, or WOC), write the species report group abbreviations and codes across the tops of the columns on the Species Composition Catch Message Form. (Note: There are not enough columns on the form to enable you to enter all of the report groups. You will have to omit one or more report groups that you don't expect to see that week.)
18. In the "PAGE \_\_\_ OF \_\_\_ FOR THE WEEK" section enter the number of pages of the Species Composition Catch Message Form that you have for that week, regardless of the area or gear type. This will allow us to be sure that we have received all the pages for the week.
19. Circle one of the following categories at the top of the form to indicate what kind of message you are sending:  
WEEKLY MESSAGE or DAILY MESSAGE or RESUBMISSION

For each haul or set sampled:

20. Enter numerically the date and haul (or set) number in the first column with slashes between the month, day, and haul number. Haul 104 made on March 10th would be written as 3/10/104.

**If the vessel did not fish, enter a single line with the date, an explanation of the**

situation, and the area involved. (See the example following in the manual.) If you do not sample a gear type/area for a given day, then enter the date, the weight of the hauls involved, and a description of the situation, including what areas or gear types were not sampled. All days must be accounted for from the time the vessel leaves the dock until it returns.

21. Enter the haul weight, in metric tons, from the "Official Total Catch" columns on Form 1US or 2US.
22. Enter the sample weight of your species composition sample, in kilograms, from Form 3US. If some or all of the prohibited species groups have a different, larger sample weight, those data are not entered on a Catch Message Form A, but will be on the Prohibited Species Catch Message Form B instead.
23. Enter the weight for the species or species group, in kilograms, from the sample data on Form 3US. **The sum of these weights must equal your species composition sample weight. Check by adding across the line.** If no members of a particular report group were seen, leave the column blank. (See manual example.)
24. On the next line, enter the date and haul (or set) number in the first column, as explained above.
25. Enter the percentage of each species or species group retained. The percentage should be listed as a whole number. A figure of 100 indicates that all of the fish from that entire species group were retained for that haul. A figure of 0 indicates that the entire species group was discarded. Remember, if any part of the fish is retained then the entire fish is counted as retained. Offal thrown overboard from the processing of fish is not counted as discard.

Note: The percentage of each species or species group that is retained needs to be reported in the species composition section of the catch report. Observers should attempt to *their best ability to independently estimate the amount of whole fish that are retained and the whole fish discarded, and then report those estimates as the percentage retained in their catch message to the nearest whole number. If you consider your independent estimates to be less accurate than the ship's estimates, use the ship's estimate in your catch message. However, continue to work to develop a more accurate technique of sampling, so that you can report your own estimates of the percentage retained in the catch report. (On the other hand, a higher priority must be given to good species composition and prohibited species sampling.)*

A SPECIES COMPOSITION CATCH MESSAGE FORM PAGE 1 OF      FOR THE WEEK      DAILY MESSAGE OR RESUBMISSION PAGE      OF       
 WEEKLY MESSAGE OR  
 OBSERVER NAME Jane Observer VESSEL NAME Sea Gull FAXITELEX # 482-9356 ORC 999  
 PERMIT # AK-87-0001 PROCESSOR CODE NPT WEEK ENDING DATE 10/12 OBS. COVERAGE DAYS 3.0  
 AREA 521 GEAR TYPE NPT TOTAL # TOWS 9 DURATION OF TOWS 1618  
 # MARINE MAMMAL TOWS 5 WT OF MM TOWS 67.97 MM CODE # MM None INITIAL DATE OF SAMP. 10/4

DATE AND HAUL NUMBER	HAUL WEIGHT IN MT	TOTAL SAMPLE WEIGHT IN KG	SPECIES GROUP CODES														
			875	127	123	121	120	270	110	710	141	*	139	100	999	990	*
	KG In SAMPLE	KG In SAMPLE	KG In SAMPLE	KG In SAMPLE	KG In SAMPLE	KG In SAMPLE	KG In SAMPLE	KG In SAMPLE	KG In SAMPLE	KG In SAMPLE	KG In SAMPLE	KG In SAMPLE	KG In SAMPLE	KG In SAMPLE	KG In SAMPLE	KG In SAMPLE	KG In SAMPLE
9/10/101	16.00	16000.0	SQU	YELL	RSOLE	ARROW	OFLAT	POLL	OOD	SAB	POP	BROCK	DROCK	OTH	NON	PRO	SROCK
	PERCENTAGE BY SPECIES	RETAINED	3.6		5.0	5.55	1569.48			72.6	.45	3.2	10.8	90.0	1.4	115.92	
9/10/101		100		100	100	100	100	100	100	100	100	100	100	0	100	0	
9/10/103	20.00	582.37			2.6		181.44	95	396.48	1.85							
	PERCENTAGE BY SPECIES	RETAINED			0					100				16.4		27.8	
9/10/104	12.00	537.1		200.5	26.4	89.1	176.9							0		0	
	PERCENTAGE BY SPECIES	RETAINED		100	15	100	100										
9/10/105	18.62	510.6					478.93		21.4		1.49	2.6	1.04		.86	2.21	.84
	PERCENTAGE BY SPECIES	RETAINED	100				100		100		100	100	100		0	0	0
9/11		No	Fishing-Rough	Seas Area	521	Green Type	NPT										
	PERCENTAGE BY SPECIES	RETAINED															
	PERCENTAGE BY SPECIES	RETAINED															
	PERCENTAGE BY SPECIES	RETAINED															

1  
2  
3  
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14

## INSTRUCTIONS FOR PROHIBITED SPECIES CATCH MESSAGES FORM

The following instructions pertain only to the data you have collected on the incidental catch of prohibited species (king crab, Tanner crab, halibut, salmon, and herring) and their inclusion in the weekly catch message. Entry of data on Prohibited Species Catch Message Form will be made for every haul or set you sample, **even if no prohibited species are found in your samples.**

1. Enter your name.
2. Enter the name of your vessel.
3. Enter the fax or telex number of your vessel or plant. If you are on a shoreside delivery vessel enter the number of the fax or telex number of the plant where you can be reached.
4. All data should be separated by area (i.e. 513, 517, 521, etc., see charts on previous pages) and gear type and each area/gear type should be recorded on separate sheets of the Prohibited Species Catch Message Form.
5. On the next line is the observed vessel's federal groundfish fishing permit number. The permit number has the format AK-91-0001; where "AK" abbreviates Alaska, "91" indicates the year, and the last four digits are a specific identifier of that vessel.
6. Enter the Processor Code if needed. (See the instructions for Species Composition Catch Message Form).
7. Next, the "Week Ending" or Sunday date of the report week should be entered. Each report week is referenced by the week's ending date even if, say, you were only reporting data for Monday and Tuesday of that week. Dates should have a slash between the month and the day. Leading zeros are not required. January 25th would be written as 1/25.
8. Determine and enter the three digit, federal statistical area of each catch sampled. Data for each area should be recorded on separate sheets of the Prohibited Species Catch Message Form. Observers on trawlers must also keep data separate by gear type (pelagic, bottom, or pair trawls) within each area.
9. As stated before, if a vessel should fish two gear types within an area/week, the observer must report the catch composition data separately by gear type as well as by area/week. The gear codes are as follows:

Code No.

- 1 ..... NPT ..... non-pelagic trawl
- 2 ..... PTR ..... pelagic trawl
- 4 ..... PAR ..... pair trawl
- 8 ..... H&L ..... longliner
- 7 ..... JIG ..... jig vessel
- 6 ..... POT ..... pot vessel

10. Observers on longline and pot fishing vessels enter the total number of sets made in the area/week. If your vessel is not fishing their pots in a string, then leave this section blank and only complete the total number of pots fished.
11. Observers on longline and pot fishing vessels enter the total number of hooks or pots retrieved for each area/week. This should be derived or taken from the 1US Form.
12. Observers on longline and pot fishing vessels enter the fishing duration (soak time), in hours and minutes, for all the sets/pots in each area/week. (Be careful in dividing by 60 to obtain total hours and minutes!)
13. All observers enter across the page the date and total of each day's haul or set weights (taken from the Official Total Catch column on the 2US or 1US Form) by area/gear type. **This should be done for all hauls or sets of the day, regardless of whether or not they were sampled.**

For each haul or set sampled:

14. Enter, numerically, the date and haul (or set) number in the first column with slashes between the month, day, and year. Haul 104 made on March 10th would be written as 3/10/104.

**If the vessel did not fish, then enter a single line with the date, an explanation of the situation, and the area involved. (See the example following in the manual.) If you do not sample a gear type/area for a given day, then enter the date, the weight of the hauls involved, and a description of the situation, including what areas or gear types were not sampled. All days must be accounted for from the time the vessel leaves the dock until it returns.**

15. Enter the "Official Total Catch" weight. Enter the weight in metric tons (mt), not kilograms.
16. Enter the weight of groundfish catch sampled (sample weight from 3US) for each of the prohibited species report groups in metric tons to the nearest .01 mt. On the Prohibited Species Catch Message Form we use the following report groups.

<u>Report Groups</u>	<u>Meaning</u>
RED KING CRAB	Red King Crab
OTHER KING CRAB	Blue, Golden & Couesi King Crab
HERRING	Pacific Herring
BAIRDI TANNER	Bairdi Tanner Crab
OTHER TANNER	Opilio, Hybrid, Angulatus, & Tanneri Tanner Crab
PACIFIC HALIBUT	Pacific Halibut
CHINOOK SALMON	Chinook Salmon
OTHER SALMON	the other species of salmon including steelhead

17. Enter the number of prohibited species found in your prohibited species samples for each of the prohibited species report group and their weight. (For Herring just report the weight.) If you subsampled a prohibited species group, you need to extrapolate the data up to the total number in the sample for each report group before entering the results on the worksheet. For example: you entered 1000 Tanner crab on Form 3US but you subsampled 100 for their species composition, sex and viability, obtaining 25 bairdi, 50 opilio, and 25 angulatus. On the Prohibited Species Catch Message Form you would enter 250 Bairdi and 750 other Tanner crab. **If no members of a particular prohibited species report group are seen, then enter a zero (0) in the numbers column.** (For herring enter zero in the weight column.)
  
18. In the "PAGE \_\_\_ OF \_\_\_ FOR THE WEEK" section enter the number of pages of the Prohibited Species Catch Message Form that you have for that week, regardless of the area or gear type. This will allow us to be sure that we have received all the pages for the week.
  
19. Circle one of the following categories at the top of the form to indicate what kind of message you are sending:  
WEEKLY MESSAGE or DAILY MESSAGE or RESUBMISSION



## SPECIAL PROBLEMS

### If Your Ship Fishes Outside of the EEZ

Continue to sample and send catch reports for any catches taken outside the EEZ. In the Bering Sea report the catch as coming from Area 550. Outside the EEZ in the Gulf of Alaska is Area 690. Outside the EEZ along the Washington-Oregon coast is Area 750. (Refer to the charts on previous pages.)

### Lack of Sampling Data from an Area or Gear Type for a Day Fished

If you did **not sample at all** for a given **fishing day** due to illness, severe weather problems, or other reasons, make sure that it is indicated in your weekly catch messages. Similarly, include a line of information in your catch messages if the ship fished two gear types or two or more areas on a day you sampled but you were unable to sample the catch for all the gear types or areas. In your weekly catch message, include the date and the weight of all hauls for that day, gear type or area not sampled in a day, and reason for not sampling on a single line on both the Prohibited Species and the Species Composition Catch Message forms. **All days must be accounted for from the time the vessel leaves the dock until it returns.** The date and the day's weight should still appear in the heading of the Prohibited Species Catch Message form.

### Two Distinct Types of Fishing Strategy within a Day

In those cases where the vessel uses two distinct fishing strategies during the day to target on two different types of fish (i.e. flatfish during the day and rockfish at night), the observer must sample both types of catches proportionately each day. If 30% of the tonnage each day is flatfish caught during the day, then 30% of the observer's sampling should be done on the flatfish hauls.

### Special Directions for Observers at Shore-side Processing Plants

Messages from shoreside processing plant observers need not follow the same format as those from observers aboard domestic vessels. They can be self-designed, but must include brief explanations of the work accomplished that week. Messages should include the following (at a minimum) for each plant that the observer worked at during the week:

- 1) Number of deliveries (and total weight of deliveries).
- 2) Number of deliveries sampled (also number of deliveries sampled for prohibited species).
- 3) Total delivery weight by species group.
- 4) Number of prohibited species and weight of halibut (if prohibited species sampling was done).

- 5) Rough estimate of number of lengths taken, and age structures collected.
- 6) Report product recovery rate work and density determinations accomplished, as well as progress on other special project assignments.

### DAILY CATCH MESSAGES

While you are out at sea, you may receive a message that asks you to begin sending daily catch messages. This is most apt to occur when a report group species is approaching its quota limit. These messages are to be sent in addition to your normal weekly catch message, and are to be sent on a daily basis. This daily message is similar to the weekly catch report, except instead of giving the week-ending-date, give the date of the catch being reported and circle "Daily Message" at the top of the form. Each day, the date of the catch is changed in the Week Ending Date blank and the day's data are entered on the next lin(s) of the form. Do not use a separate sheet for each day. After having made adjustments for late incoming data, if any (see below), a daily message for Sunday and the weekly report are contained in the same message.

**Daily messages must be sent to our office by noon of the following day.** Observers on catcher/processors may find this difficult, if they are using the ship's production figures for calculating the Official Total Catch. (The product information may not appear in the logbooks until twelve hours after the net was brought on board.) In this situation, the observer should use his own estimate of total catch or the ship's hail estimate for the Official Total Catch estimate in the daily messages. Later, when the weekly message is sent, the production figures can be used.

## SUBAREA TABLES FOR THE BERING SEA

When you are given a position that is close to the diagonal boundary lines that separate areas 517 and 515 or areas 521 and 522, it may be difficult to determine exactly which subarea the delivery should be attributed to. These tables will aid you in that determination.

The 1st table: Table 1, is a plot of the line intersecting areas 517 and 515. The line gives the corresponding latitude position for each minute of longitude.

The 2nd table: Table 2, is a plot of the line intersecting areas 521 and 522.

### How To Use The Tables

First find the longitude of your delivery position in Column B of the table. The corresponding latitude in Column A marks the point on the line which intersects the two subareas. If the latitude of your delivery position is greater than the table latitude, your position falls in the subarea to the north of the line. If the latitude of your delivery position is less than the table latitude then your position falls in the subarea to the south of the line.

### Special Cases

For delivery positions that fall exactly on the line, or if the delivery position falls on "Four Corners", the intersecting point of 55-46 N 170-00 W, use the trawl data you have for the delivery to decide which subarea the fish were caught in and assign the delivery to that subarea.

### Example of Use

To demonstrate the use of the tables: suppose your ship had received a codend and records the delivery position as 54-39 N 68-07 W. Determine what subarea this delivery position falls in.

1. First, find longitude 168-07 W in Column B of the tables:  
(longitude 168-07 is found in Table 1)

<u>Col. A</u>	<u>Col. B</u>	
5457. 72	16805. 00	
5458. 15	16806. 00	
5458. 57	16807. 00	<----- delivery longitude
5458. 99	16808. 00	
5459. 42	16809. 00	

2. Read the corresponding latitude from Column A:

	<u>Col. A</u>	<u>Col. B</u>
	5457. 72	16805. 00
	5458. 15	16806. 00
----->	5458. 57	16807. 00
	5458. 99	16808. 00
	5459. 42	16809. 00

3. Determine whether your delivery latitude is greater than or less than the latitude in Column A:

delivery latitude 54-39 (5439. 00) is lower than Intersecting latitude 5458. 57

4. Determine the subarea:

Remember that Table 1, where the delivery longitude was found, represents points on the line between subareas 517 and 515. Table B represents points on the line between subareas 521 and 522. Since the delivery latitude was lower than the line latitude, the delivery position falls into subarea 515, the subarea south of the line.

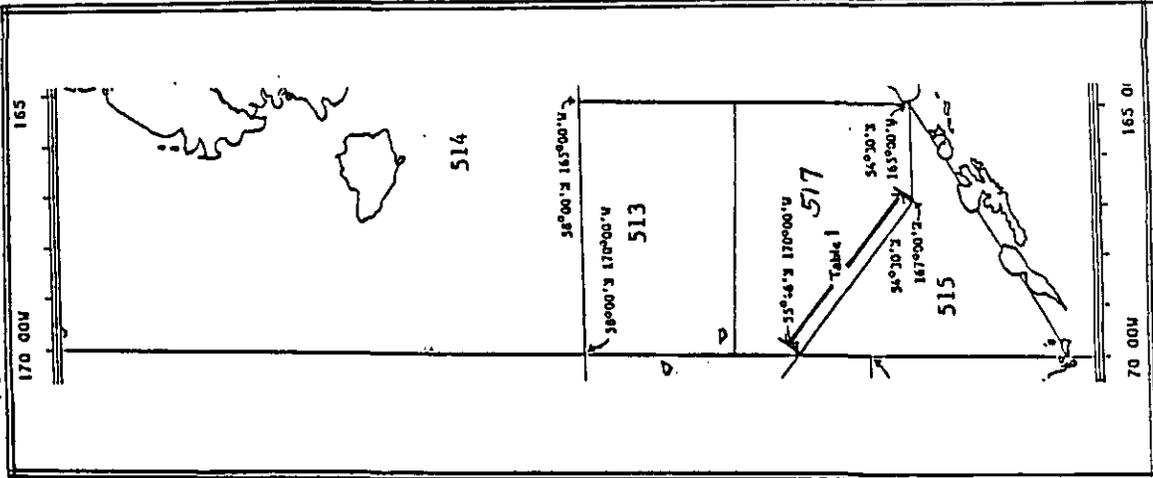
### Summary Table

	Table 1	Table 2	
Delivery latitude less than line latitude	SUBAREA 515	SUBAREA 522	
Delivery latitude greater than line latitude	SUBAREA 517	SUBAREA 521	

TABLE 1

plot of the points on the line intersecting between subarens 513 and 515.

pg. 1



LAT COL. A  
LONG COL. B

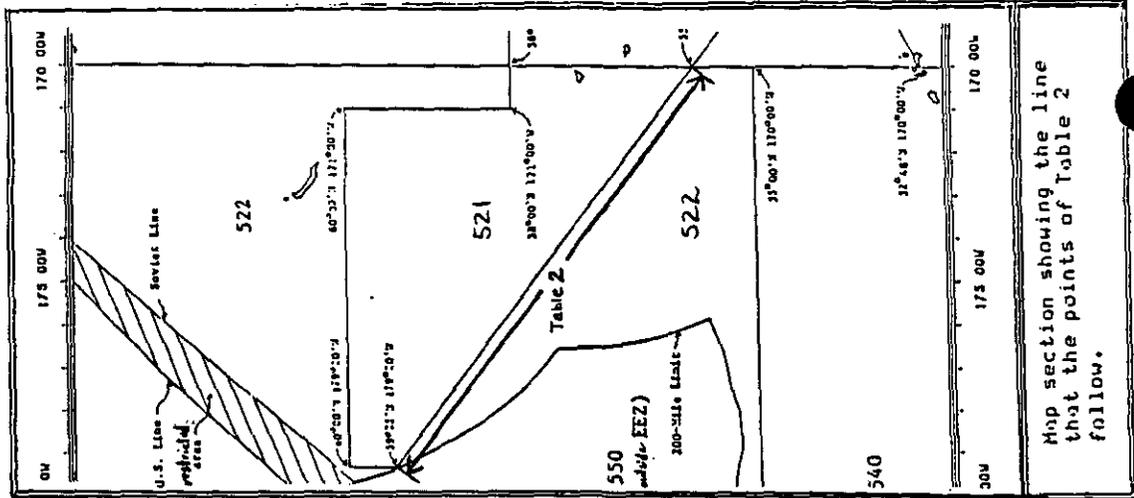
3430.00	16700.00	3434.73	16738.00	3520.07	16838.00
3430.43	16701.00	3435.18	16739.00	3520.51	16839.00
3430.86	16702.00	3435.60	16800.00	3520.93	16900.00
3431.29	16703.00	3436.03	16801.00	3521.35	16901.00
3431.72	16704.00	3436.45	16802.00	3521.77	16902.00
3432.14	16705.00	3436.87	16803.00	3522.19	16903.00
3432.57	16706.00	3437.30	16804.00	3522.61	16904.00
3433.00	16707.00	3437.72	16805.00	3523.03	16905.00
3433.43	16708.00	3438.15	16806.00	3523.45	16906.00
3433.86	16709.00	3438.57	16807.00	3523.87	16907.00
3434.29	16710.00	3438.99	16808.00	3524.29	16908.00
3434.71	16711.00	3439.42	16809.00	3524.71	16909.00
3435.14	16712.00	3439.84	16810.00	3525.13	16910.00
3435.57	16713.00	3500.27	16811.00	3525.55	16911.00
3436.00	16714.00	3500.69	16812.00	3525.97	16912.00
3436.43	16715.00	3501.11	16813.00	3526.39	16913.00
3436.85	16716.00	3501.54	16814.00	3526.81	16914.00
3437.28	16717.00	3501.96	16815.00	3527.23	16915.00
3437.71	16718.00	3502.38	16816.00	3527.64	16916.00
3438.14	16719.00	3502.81	16817.00	3528.06	16917.00
3438.56	16720.00	3503.23	16818.00	3528.48	16918.00
3438.99	16721.00	3503.63	16819.00	3528.90	16919.00
3439.42	16722.00	3504.08	16820.00	3529.32	16920.00
3439.85	16723.00	3504.50	16821.00	3529.74	16921.00
3440.27	16724.00	3504.92	16822.00	3530.16	16922.00
3440.70	16725.00	3505.34	16823.00	3530.57	16923.00
3441.13	16726.00	3505.77	16824.00	3530.99	16924.00
3441.55	16727.00	3506.19	16825.00	3531.41	16925.00
3441.98	16728.00	3506.61	16826.00	3531.83	16926.00
3442.41	16729.00	3507.03	16827.00	3532.25	16927.00
3442.83	16730.00	3507.46	16828.00	3532.66	16928.00
3443.26	16731.00	3507.88	16829.00	3533.08	16929.00
3443.69	16732.00	3508.30	16830.00	3533.50	16930.00
3444.11	16733.00	3508.72	16831.00	3533.92	16931.00
3444.54	16734.00	3509.15	16832.00	3534.34	16932.00
3444.97	16735.00	3509.57	16833.00	3534.75	16933.00
3445.39	16736.00	3509.99	16834.00	3535.17	16934.00
3445.82	16737.00	3510.41	16835.00	3535.59	16935.00
3446.25	16738.00	3510.83	16836.00	3536.01	16936.00
3446.67	16739.00	3511.26	16837.00	3536.42	16937.00
3447.10	16740.00	3511.68	16838.00	3536.84	16938.00
3447.52	16741.00	3512.10	16839.00	3537.26	16939.00
3447.95	16742.00	3512.52	16840.00	3537.67	16940.00
3448.38	16743.00	3512.94	16841.00	3538.09	16941.00
3448.80	16744.00	3513.36	16842.00	3538.51	16942.00
3449.23	16745.00	3513.78	16843.00	3538.93	16943.00
3449.65	16746.00	3514.21	16844.00	3539.34	16944.00
3450.08	16747.00	3514.63	16845.00	3539.76	16945.00
3450.50	16748.00	3515.05	16846.00	3540.18	16946.00
3450.93	16749.00	3515.47	16847.00	3540.59	16947.00
3451.35	16750.00	3515.89	16848.00	3541.01	16948.00
3451.78	16751.00	3516.31	16849.00	3541.42	16949.00
3452.20	16752.00	3516.73	16850.00	3541.84	16950.00
3452.63	16753.00	3517.15	16851.00	3542.26	16951.00
3453.05	16754.00	3517.57	16852.00	3542.67	16952.00
3453.48	16755.00	3517.99	16853.00	3543.09	16953.00
3453.90	16756.00	3518.41	16854.00	3543.51	16954.00
		3518.83	16855.00	3543.92	16955.00
		3519.25	16856.00	3544.34	16956.00
		3519.67	16857.00	3544.75	16957.00
		3520.09	16858.00	3545.17	16958.00
		3520.51	16859.00	3545.59	16959.00
		3520.93	16860.00	3546.01	16960.00
		3521.35	16861.00	3546.42	16961.00
		3521.77	16862.00	3546.84	16962.00
		3522.19	16863.00	3547.26	16963.00
		3522.61	16864.00	3547.67	16964.00
		3523.03	16865.00	3548.09	16965.00
		3523.45	16866.00	3548.51	16966.00
		3523.87	16867.00	3548.92	16967.00
		3524.29	16868.00	3549.34	16968.00
		3524.71	16869.00	3549.75	16969.00
		3525.13	16870.00	3550.17	16970.00
		3525.55	16871.00	3550.59	16971.00
		3525.97	16872.00	3551.01	16972.00
		3526.39	16873.00	3551.42	16973.00
		3526.81	16874.00	3551.84	16974.00
		3527.23	16875.00	3552.26	16975.00
		3527.64	16876.00	3552.67	16976.00
		3528.06	16877.00	3553.09	16977.00
		3528.48	16878.00	3553.51	16978.00
		3528.90	16879.00	3553.92	16979.00
		3529.32	16880.00	3554.34	16980.00
		3529.74	16881.00	3554.75	16981.00
		3530.16	16882.00	3555.17	16982.00
		3530.57	16883.00	3555.59	16983.00
		3530.99	16884.00	3556.01	16984.00
		3531.41	16885.00	3556.42	16985.00
		3531.83	16886.00	3556.84	16986.00
		3532.25	16887.00	3557.26	16987.00
		3532.66	16888.00	3557.67	16988.00
		3533.08	16889.00	3558.09	16989.00
		3533.50	16890.00	3558.51	16990.00
		3533.92	16891.00	3558.92	16991.00
		3534.34	16892.00	3559.34	16992.00
		3534.75	16893.00	3559.75	16993.00
		3535.17	16894.00	3560.17	16994.00
		3535.59	16895.00	3560.59	16995.00
		3536.01	16896.00	3561.01	16996.00
		3536.42	16897.00	3561.42	16997.00
		3536.84	16898.00	3561.84	16998.00
		3537.26	16899.00	3562.26	16999.00
		3537.67	16900.00	3562.67	17000.00

Map Section showing the line that the points of Table 1 follow.

TABLE 2

Plot of the points on the line intersecting between subareas 521 and 522.

pgs. 2-3



Map section showing the line that the points of Table 2 follow.

LAT COL. A	LONG COL. B						
5609.71	17058.00	5633.99	17158.00	5658.00	17258.00	5721.77	17358.00
5610.12	17059.00	5634.39	17159.00	5658.40	17259.00	5722.16	17359.00
5610.52	17100.00	5634.79	17200.00	5658.80	17300.00	5722.55	17400.00
5610.93	17101.00	5635.19	17201.00	5659.20	17301.00	5722.95	17401.00
5611.34	17102.00	5635.60	17202.00	5659.60	17302.00	5723.34	17402.00
5611.74	17103.00	5636.00	17203.00	5659.99	17303.00	5723.74	17403.00
5612.15	17104.00	5636.40	17204.00	5700.39	17304.00	5724.13	17404.00
5612.56	17105.00	5636.80	17205.00	5700.79	17305.00	5724.52	17405.00
5612.96	17106.00	5637.20	17206.00	5701.19	17306.00	5724.92	17406.00
5613.37	17107.00	5637.61	17207.00	5701.59	17307.00	5725.31	17407.00
5613.78	17108.00	5638.01	17208.00	5701.98	17308.00	5725.70	17408.00
5614.18	17109.00	5638.41	17209.00	5702.38	17309.00	5726.10	17409.00
5614.59	17110.00	5638.81	17210.00	5702.78	17310.00	5726.49	17410.00
5614.99	17111.00	5639.21	17211.00	5703.17	17311.00	5726.88	17411.00
5615.40	17112.00	5639.61	17212.00	5703.57	17312.00	5727.28	17412.00
5615.80	17113.00	5640.01	17213.00	5703.97	17313.00	5727.67	17413.00
5616.21	17114.00	5640.42	17214.00	5704.37	17314.00	5728.06	17414.00
5616.62	17115.00	5640.82	17215.00	5704.76	17315.00	5728.45	17415.00
5617.02	17116.00	5641.22	17216.00	5705.16	17316.00	5728.85	17416.00
5617.43	17117.00	5641.62	17217.00	5705.56	17317.00	5729.24	17417.00
5617.83	17118.00	5642.02	17218.00	5705.95	17318.00	5729.63	17418.00
5618.24	17119.00	5642.42	17219.00	5706.35	17319.00	5730.02	17419.00
5618.64	17120.00	5642.82	17220.00	5706.74	17320.00	5730.42	17420.00
5619.05	17121.00	5643.22	17221.00	5707.14	17321.00	5730.81	17421.00
5619.45	17122.00	5643.62	17222.00	5707.54	17322.00	5731.21	17422.00
5619.86	17123.00	5644.02	17223.00	5707.94	17323.00	5731.60	17423.00
5620.26	17124.00	5644.43	17224.00	5708.33	17324.00	5731.99	17424.00
5620.67	17125.00	5644.83	17225.00	5708.73	17325.00	5732.38	17425.00
5621.07	17126.00	5645.23	17226.00	5709.13	17326.00	5732.77	17426.00
5621.48	17127.00	5645.63	17227.00	5709.52	17327.00	5733.16	17427.00
5621.88	17128.00	5646.03	17228.00	5709.92	17328.00	5733.55	17428.00
5622.29	17129.00	5646.43	17229.00	5710.31	17329.00	5733.94	17429.00
5622.69	17130.00	5646.83	17230.00	5710.71	17330.00	5734.33	17430.00
5623.09	17131.00	5647.23	17231.00	5711.11	17331.00	5734.73	17431.00
5623.50	17132.00	5647.63	17232.00	5711.50	17332.00	5735.12	17432.00
5623.90	17133.00	5648.03	17233.00	5711.90	17333.00	5735.51	17433.00
5624.31	17134.00	5648.43	17234.00	5712.29	17334.00	5735.90	17434.00
5624.71	17135.00	5648.83	17235.00	5712.69	17335.00	5736.29	17435.00
5625.12	17136.00	5649.23	17236.00	5713.08	17336.00	5736.68	17436.00
5625.52	17137.00	5649.63	17237.00	5713.48	17337.00	5737.07	17437.00
5625.92	17138.00	5650.03	17238.00	5713.87	17338.00	5737.46	17438.00
5626.33	17139.00	5650.43	17239.00	5714.27	17339.00	5737.85	17439.00
5626.73	17140.00	5650.83	17240.00	5714.67	17340.00	5738.23	17440.00
5627.13	17141.00	5651.23	17241.00	5715.06	17341.00	5738.63	17441.00
5627.54	17142.00	5651.62	17242.00	5715.46	17342.00	5739.02	17442.00
5627.94	17143.00	5652.02	17243.00	5715.85	17343.00	5739.42	17443.00
5628.35	17144.00	5652.42	17244.00	5716.25	17344.00	5739.81	17444.00
5628.75	17145.00	5652.82	17245.00	5716.64	17345.00	5740.20	17445.00
5629.15	17146.00	5653.22	17246.00	5717.03	17346.00	5740.59	17446.00
5629.56	17147.00	5653.62	17247.00	5717.43	17347.00	5740.99	17447.00
5629.96	17148.00	5654.02	17248.00	5717.82	17348.00	5741.38	17448.00
5630.36	17149.00	5654.42	17249.00	5718.22	17349.00	5741.77	17449.00
5630.76	17150.00	5654.82	17250.00	5718.61	17350.00	5742.16	17450.00
5631.17	17151.00	5655.22	17251.00	5719.01	17351.00	5742.55	17451.00
5631.57	17152.00	5655.61	17252.00	5719.40	17352.00	5742.94	17452.00
5631.97	17153.00	5656.01	17253.00	5719.80	17353.00	5743.32	17453.00
5632.38	17154.00	5656.41	17254.00	5720.19	17354.00	5743.71	17454.00
5632.78	17155.00	5656.81	17255.00	5720.59	17355.00	5744.11	17455.00
5633.18	17156.00	5657.21	17256.00	5720.98	17356.00	5744.50	17456.00
5633.58	17157.00	5657.61	17257.00	5721.37	17357.00	5744.89	17457.00

LAT		LONG	
COL. A	COL. B	COL. A	COL. B
5916.81	17858.00	5834.30	17758.00
5917.18	17859.00	5834.67	17759.00
5917.55	17900.00	5835.03	17800.00
5917.93	17901.00	5835.43	17801.00
5918.30	17902.00	5835.81	17802.00
5918.67	17903.00	5836.18	17803.00
5919.05	17904.00	5836.56	17804.00
5919.42	17905.00	5836.94	17805.00
5919.79	17906.00	5837.31	17806.00
5920.16	17907.00	5837.69	17807.00
5920.54	17908.00	5838.07	17808.00
5920.91	17909.00	5838.44	17809.00
5921.28	17910.00	5838.82	17810.00
5921.65	17911.00	5839.20	17811.00
5922.02	17912.00	5839.57	17812.00
5922.40	17913.00	5839.95	17813.00
5922.77	17914.00	5900.32	17814.00
5923.14	17915.00	5900.70	17815.00
5923.51	17916.00	5901.08	17816.00
5923.88	17917.00	5901.45	17817.00
5924.26	17918.00	5901.83	17818.00
5924.63	17919.00	5902.20	17819.00
5925.00	17920.00	5902.58	17820.00

LAT		LONG	
COL. A	COL. B	COL. A	COL. B
5834.30	17758.00	5831.54	17658.00
5834.67	17759.00	5831.92	17659.00
5835.03	17800.00	5832.30	17700.00
5835.43	17801.00	5832.68	17701.00
5835.81	17802.00	5833.06	17702.00
5836.18	17803.00	5833.45	17703.00
5836.56	17804.00	5833.83	17704.00
5836.94	17805.00	5834.21	17705.00
5837.31	17806.00	5834.59	17706.00
5837.69	17807.00	5834.97	17707.00
5838.07	17808.00	5835.35	17708.00
5838.44	17809.00	5835.73	17709.00
5838.82	17810.00	5836.11	17710.00
5839.20	17811.00	5836.49	17711.00
5839.57	17812.00	5836.87	17712.00
5839.95	17813.00	5837.25	17713.00
5900.32	17814.00	5837.63	17714.00
5900.70	17815.00	5838.01	17715.00
5901.08	17816.00	5838.39	17716.00
5901.45	17817.00	5838.77	17717.00
5901.83	17818.00	5839.15	17718.00
5902.20	17819.00	5839.53	17719.00
5902.58	17820.00	5839.91	17720.00
5902.96	17821.00	5840.29	17721.00
5903.33	17822.00	5840.67	17722.00
5903.71	17823.00	5841.05	17723.00
5904.08	17824.00	5841.43	17724.00
5904.46	17825.00	5841.81	17725.00
5904.83	17826.00	5842.19	17726.00
5905.21	17827.00	5842.57	17727.00
5905.58	17828.00	5842.95	17728.00
5905.96	17829.00	5843.33	17729.00
5906.33	17830.00	5843.71	17730.00
5906.71	17831.00	5844.09	17731.00
5907.08	17832.00	5844.47	17732.00
5907.46	17833.00	5844.84	17733.00
5907.83	17834.00	5845.22	17734.00
5908.21	17835.00	5845.60	17735.00
5908.58	17836.00	5845.98	17736.00
5908.96	17837.00	5846.36	17737.00
5909.33	17838.00	5846.74	17738.00
5909.71	17839.00	5847.12	17739.00
5910.08	17840.00	5847.50	17740.00
5910.45	17841.00	5847.87	17741.00
5910.83	17842.00	5848.25	17742.00
5911.20	17843.00	5848.63	17743.00
5911.58	17844.00	5849.01	17744.00
5911.95	17845.00	5849.39	17745.00
5912.33	17846.00	5849.77	17746.00
5912.70	17847.00	5850.14	17747.00
5913.07	17848.00	5850.52	17748.00
5913.45	17849.00	5850.90	17749.00
5913.82	17850.00	5851.28	17750.00
5914.19	17851.00	5851.65	17751.00
5914.57	17852.00	5852.03	17752.00
5914.94	17853.00	5852.41	17753.00
5915.31	17854.00	5852.79	17754.00
5915.69	17855.00	5853.17	17755.00
5916.06	17856.00	5853.54	17756.00
5916.43	17857.00	5853.92	17757.00

LAT		LONG	
COL. A	COL. B	COL. A	COL. B
5808.53	17558.00	5808.53	17558.00
5808.92	17559.00	5808.92	17559.00
5809.30	17600.00	5809.30	17600.00
5809.69	17601.00	5809.69	17601.00
5810.07	17602.00	5810.07	17602.00
5810.46	17603.00	5810.46	17603.00
5810.84	17604.00	5810.84	17604.00
5811.23	17605.00	5811.23	17605.00
5811.61	17606.00	5811.61	17606.00
5812.00	17607.00	5812.00	17607.00
5812.38	17608.00	5812.38	17608.00
5812.77	17609.00	5812.77	17609.00
5813.15	17610.00	5813.15	17610.00
5813.54	17611.00	5813.54	17611.00
5813.92	17612.00	5813.92	17612.00
5814.31	17613.00	5814.31	17613.00
5814.69	17614.00	5814.69	17614.00
5815.08	17615.00	5815.08	17615.00
5815.46	17616.00	5815.46	17616.00
5815.85	17617.00	5815.85	17617.00
5816.23	17618.00	5816.23	17618.00
5816.61	17619.00	5816.61	17619.00
5817.00	17620.00	5817.00	17620.00
5817.38	17621.00	5817.38	17621.00
5817.77	17622.00	5817.77	17622.00
5818.15	17623.00	5818.15	17623.00
5818.53	17624.00	5818.53	17624.00
5818.92	17625.00	5818.92	17625.00
5819.30	17626.00	5819.30	17626.00
5819.68	17627.00	5819.68	17627.00
5820.07	17628.00	5820.07	17628.00
5820.45	17629.00	5820.45	17629.00
5820.83	17630.00	5820.83	17630.00
5821.22	17631.00	5821.22	17631.00
5821.60	17632.00	5821.60	17632.00
5821.98	17633.00	5821.98	17633.00
5822.37	17634.00	5822.37	17634.00
5822.75	17635.00	5822.75	17635.00
5823.13	17636.00	5823.13	17636.00
5823.52	17637.00	5823.52	17637.00
5823.90	17638.00	5823.90	17638.00
5824.28	17639.00	5824.28	17639.00
5824.66	17640.00	5824.66	17640.00
5825.05	17641.00	5825.05	17641.00
5825.43	17642.00	5825.43	17642.00
5825.81	17643.00	5825.81	17643.00
5826.19	17644.00	5826.19	17644.00
5826.58	17645.00	5826.58	17645.00
5826.96	17646.00	5826.96	17646.00
5827.34	17647.00	5827.34	17647.00
5827.72	17648.00	5827.72	17648.00
5828.10	17649.00	5828.10	17649.00
5828.49	17650.00	5828.49	17650.00
5828.87	17651.00	5828.87	17651.00
5829.25	17652.00	5829.25	17652.00
5829.63	17653.00	5829.63	17653.00
5830.01	17654.00	5830.01	17654.00
5830.40	17655.00	5830.40	17655.00
5830.78	17656.00	5830.78	17656.00
5831.16	17657.00	5831.16	17657.00

LAT		LONG	
COL. A	COL. B	COL. A	COL. B
5743.28	17458.00	5743.28	17458.00
5743.67	17459.00	5743.67	17459.00
5744.06	17500.00	5744.06	17500.00
5744.44	17501.00	5744.44	17501.00
5744.83	17502.00	5744.83	17502.00
5745.22	17503.00	5745.22	17503.00
5745.61	17504.00	5745.61	17504.00
5746.00	17505.00	5746.00	17505.00
5746.39	17506.00	5746.39	17506.00
5746.78	17507.00	5746.78	17507.00
5747.17	17508.00	5747.17	17508.00
5747.56	17509.00	5747.56	17509.00
5747.95	17510.00	5747.95	17510.00
5750.34	17511.00	5750.34	17511.00
5750.73	17512.00	5750.73	17512.00
5751.11	17513.00	5751.11	17513.00
5751.50	17514.00	5751.50	17514.00
5751.89	17515.00	5751.89	17515.00
5752.28	17516.00	5752.28	17516.00
5752.67	17517.00	5752.67	17517.00
5753.06	17518.00	5753.06	17518.00
5753.44	17519.00	5753.44	17519.00
5753.83	17520.00	5753.83	17520.00
5754.22	17521.00	5754.22	17521.00
5754.61	17522.00	5754.61	17522.00
5755.00	17523.00	5755.00	17523.00
5755.38	17524.00	5755.38	17524.00
5755.77	17525.00	5755.77	17525.00
5756.16	17526.00	5756.16	17526.00
5756.55	17527.00	5756.55	17527.00
5756.94	17528.00	5756.94	17528.00
5757.32	17529.00	5757.32	17529.00
5757.71	17530.00	5757.71	17530.00
5758.10	17531.00	5758.10	17531.00
5758.49	17532.00	5758.49	17532.00
5758.87	17533.00	5758.87	17533.00
5759.26	17534.00	5759.26	17534.00
5759.65	17535.00	5759.65	17535.00
5800.03	17536.00	5800.03	17536.00
5800.42	17537.00	5800.42	17537.00
5800.81	17538.00	5800.81	17538.00
5801.20	17539.00	5801.20	17539.00
5801.58	17540.00	5801.58	17540.00
5801.97	17541.00	5801.97	17541.00
5802.36	17542.00	5802.36	17542.00
5802.74	17543.00	5802.74	17543.00
5803.13	17544.00	5803.13	17544.00
5803.52	17545.00	5803.52	17545.00
5803.90	17546.00	5803.90	17546.00
5804.29	17547.00	5804.29	17547.00
5804.67	17548.00	5804.67	17548.00
5805.06	17549.00	5805.06	17549.00
5805.45	17550.00	5805.45	17550.00
5805.83	17551.00	5805.83	17551.00
5806.22	17552.00	5806.22	17552.00
5806.60	17553.00	5806.60	17553.00
5806.99	17554.00	5806.99	17554.00
5807.38	17555.00	5807.38	17555.00
5807.76	17556.00	5807.76	17556.00

## LOGBOOK ENTRIES

The observer logbook is not to be used as a personal diary but as a record book for notes and data not included on the forms, and a place to document circumstances and information concerning any possible violations of fishing regulations. From observation and conversations you learn what issues and concerns are driving the decisions on fishing strategy and schedules. Notes from conversations can provide valuable insight. Include in the logbook anything that you may later want to include or summarize in your final report; anything unusual that occurs on the cruise; or anything else that you feel may be of interest. Appropriate entries include: what situations dictated your choice of a sampling method, any changes in sampling procedure, sampling problems, calculation of codend or bin dimensions and densities and any calculations for total catch weight. Descriptions of how catch estimates were obtained should be recorded here. It is also a good place to keep the copies of all messages sent and received. Short comments on hauls sampled can go in the "comments" section of Form 3US, but additional explanations on anything unusual, such as a high percentage of rockfish in a tow, or comments on hauls not sampled, can be entered in the logbook. Some observers have noted details on factory processing, or on the biology of the target species. At the end of the cruise, important entries should be summarized and entered in the final report.

It is important to document carefully any suspected violations in the logbook as soon after the occurrence as possible. You cannot rely on your memory of details of events, it is important that these be written down as soon as possible. Although a complete report may be written upon your return, the original notes may be needed as evidence. If a correction must be made, draw a line through the incorrect word(s) instead of erasing or blackening them out. All logbook entries should be in ink, and any events that are recorded should be in chronological order. Please put your name, vessel name(s) and dates aboard each vessel on the first page inside the logbook.

If the vessel you are on is charged with a violation, all parties concerned, will have a legal right to inspect your logbook or any other evidence known to exist. It is thus important to make your entries factual and to avoid unfounded personal opinions. Do not use your logbook to "blow off steam". Statements such as "the captain acts and dresses like a slob" are irrelevant and detrimental to your statement.

Your logbook entries are not to be viewed by vessel personnel. Keep your logbook secured with your personal belongings.

## DOMESTIC OBSERVER REPORTS

A report must be made for each vessel and/or plant that the observer worked at. The report format for port samplers is given in a previous section of this manual on plant sampling. All vessel reports should contain the Cruise Itinerary or Cruise Summary sheet, Form 12 - Vessel Data Form, the map of the areas fished, answers to the report questions (following), gear diagram and factory and/or weather deck diagrams. If your ship was a mothership, include a "List of Catcher Boats" which delivered catch.

FINAL REPORT

CRUISE # \_\_\_\_\_

VESSEL CODE \_\_\_\_\_

Vessel Name \_\_\_\_\_

Observer \_\_\_\_\_

Contractor \_\_\_\_\_

Itinerary: Local Dates and Times

Boarded Vessel \_\_\_\_\_

Departed Vessel \_\_\_\_\_

Date Sampling Began \_\_\_\_\_

Date Sampling Ended \_\_\_\_\_

Total Number of Days Sampled \_\_\_\_\_

Total Number of Days at Sea \_\_\_\_\_

COVERAGE

Please account for every day spent aboard this vessel or at this plant. Entries should be in chronological order; make a new entry for each trip made by your vessel. For vessels coverage begins the first day the vessel sets gear, and ends when the vessel returns to port. For plants coverage is the total number of days that the observer collected information at a plant. Also list any fishing vessel you used as a transfer vessel if it fished while you were on board and there was not an observer assigned to it at that time.

Date Observer "On Board"	Date Fishing Began	Initial Sample Date	Last Sample Date	No. of Days Sampled	Arrival Date Into Port	No. of Days of Coverage

Give Dates Not Sampled, and Why: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

FORM 12 - VESSEL DATA FORM

Vessel Name \_\_\_\_\_

Vessel Type \_\_\_\_\_ Coast Guard Number \_\_\_\_\_

Federal Permit Number \_\_\_\_\_ ADF&G Permit Number \_\_\_\_\_

Length \_\_\_\_\_ Width \_\_\_\_\_ Draft \_\_\_\_\_

Gross Tonnage \_\_\_\_\_ Net Tonnage \_\_\_\_\_

Engine Type \_\_\_\_\_ Horsepower \_\_\_\_\_

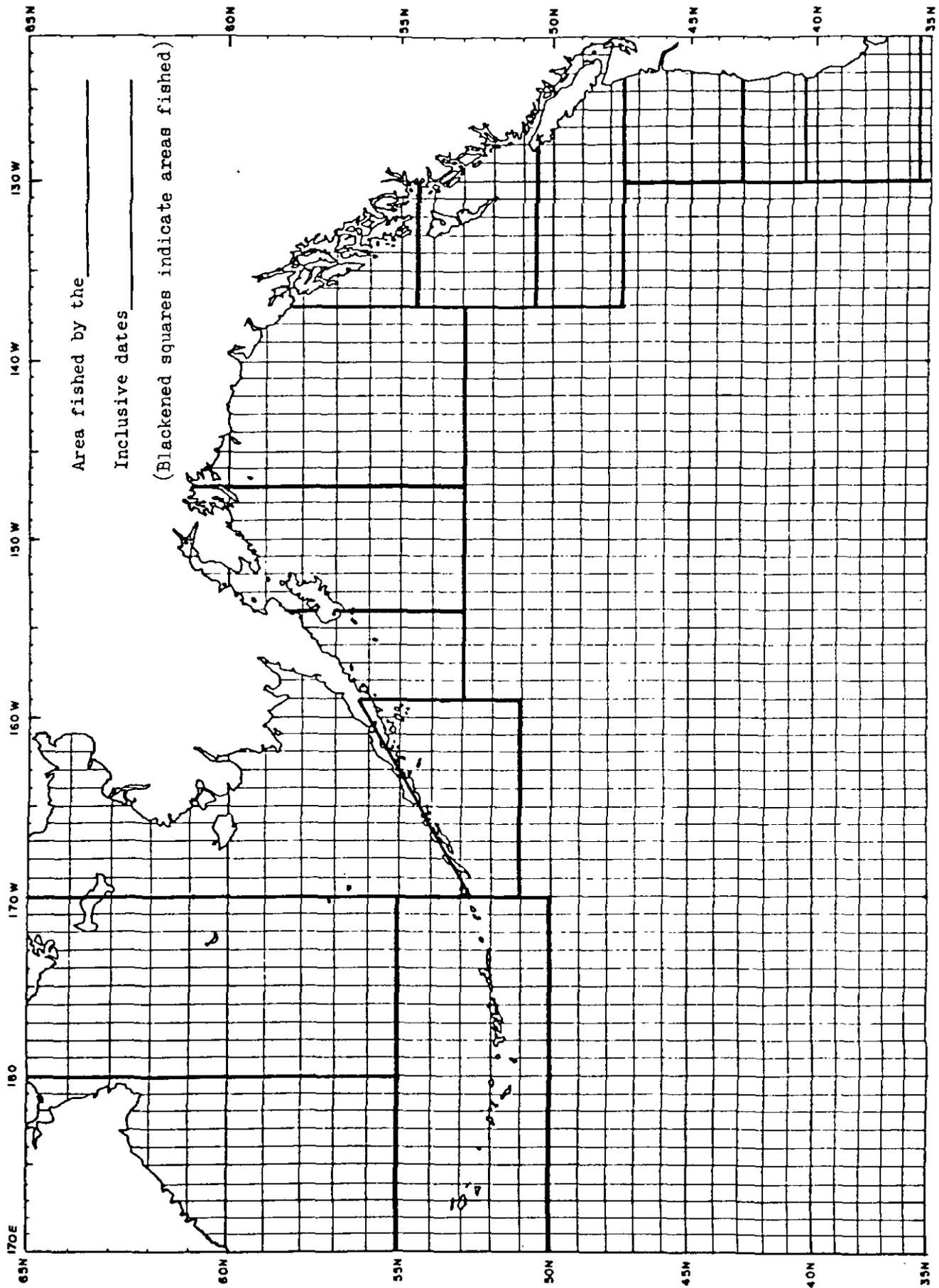
Year Commissioned \_\_\_\_\_ Radio Call Sign \_\_\_\_\_

Company \_\_\_\_\_

Home Port \_\_\_\_\_

Personnel: Skipper \_\_\_\_\_

Total Ship Complement \_\_\_\_\_



Area fished by the \_\_\_\_\_

Inclusive dates \_\_\_\_\_

(Blackened squares indicate areas fished)

## REPORT QUESTIONS

Answer as completely as possible:

1. How was the "official total catch" obtained? If the ship's estimates were adjusted, how were the adjustments made? If the ship's estimate was not used, why did you decide another estimate was more accurate?
2. How was the observer estimate obtained?
3. How was the retained catch obtained?
4. List the species groups, and size groups that were retained and the species/size groups that were discarded. If this varied from haul to haul, indicate the basis for the variation.
5. How was the species composition sampling (including prohibited species sampling) accomplished? Was it difficult to avoid interfering with shipboard procedures? Include, if possible, a diagram of where you sampled and what you had to do to obtain fish, gather data, and discard the fish/invertebrates. If you had to forego gathering certain data, indicate what and why. Discuss how lengths, otoliths, or special project data were obtained (or not obtained).
6. Summarize any marine mammal observations or incidental catch of marine mammals.
7. Report on the fishing strategy employed, any innovative net design, navigational equipment, or processing machinery.
8. Recount any unusual occurrence such as an accident or injury at sea. Was there anything which made you feel this was an unsafe vessel? Is there anything regarding safety that the next observer should be made aware of?
9. Describe anything unusual regarding the catches.
10. What did you do, if anything specific, to help build good working relationships with the captain/crew? How were you treated? What were your quarters like? Indicate the numbers, ship status and sex of those that you shared your quarters with. Where did you do your paperwork? Were there any women in the crew?
11. Report anything you feel the next observer or NMFS should know about this vessel. Were there any noteworthy comments or opinions (regarding the fishery, observers, NMFS, ADF&G, etc.) given by the captain/crew that you feel we should know?

Please fill in the following with information on ship conditions:

Target species \_\_\_\_\_

Approximate average haul size \_\_\_\_\_

Observer's room was: private \_\_\_\_\_; shared with \_\_\_\_\_ others.

Was bedding available? yes \_\_\_\_\_; no, observer should bring \_\_\_\_\_

Ship's bath: private \_\_\_\_\_ or shared with \_\_\_\_\_ others.

Bath availability: daily \_\_\_\_\_ or other (describe) \_\_\_\_\_

Laundry: by hand \_\_\_\_\_; by machine \_\_\_\_\_; by ship's steward \_\_\_\_\_

Drinking water: good \_\_\_\_\_; poor \_\_\_\_\_; requires boiling \_\_\_\_\_

General cleanliness: clean \_\_\_\_\_; adequate \_\_\_\_\_; not clean \_\_\_\_\_

Presence of cockroaches? \_\_\_\_\_ Presence of rats or mice? \_\_\_\_\_

Video player? \_\_\_\_\_ VHS? \_\_\_\_\_ BETAMAX? \_\_\_\_\_ SUPER8? \_\_\_\_\_

Videocamera available? \_\_\_\_\_

Typical meals: Breakfast \_\_\_\_\_

Lunch \_\_\_\_\_

Dinner \_\_\_\_\_

Other \_\_\_\_\_

Was the quantity and quality of the food sufficient ? If not, please explain.

Bottom Trawl Net Dimensions and Characteristics

Vessel Type \_\_\_\_\_ Observation Period \_\_\_\_\_

Trawl Doors: Shape \_\_\_\_\_  
 Material \_\_\_\_\_  
 Dimensions \_\_\_\_\_ m. x \_\_\_\_\_ m.  
 Weight \_\_\_\_\_ kg

Floats: Number \_\_\_\_\_  
 Size \_\_\_\_\_ cm.  
 Material \_\_\_\_\_  
 Shape \_\_\_\_\_

Bobbins: Number \_\_\_\_\_  
 Size \_\_\_\_\_ cm.  
 Material \_\_\_\_\_  
 Shape \_\_\_\_\_

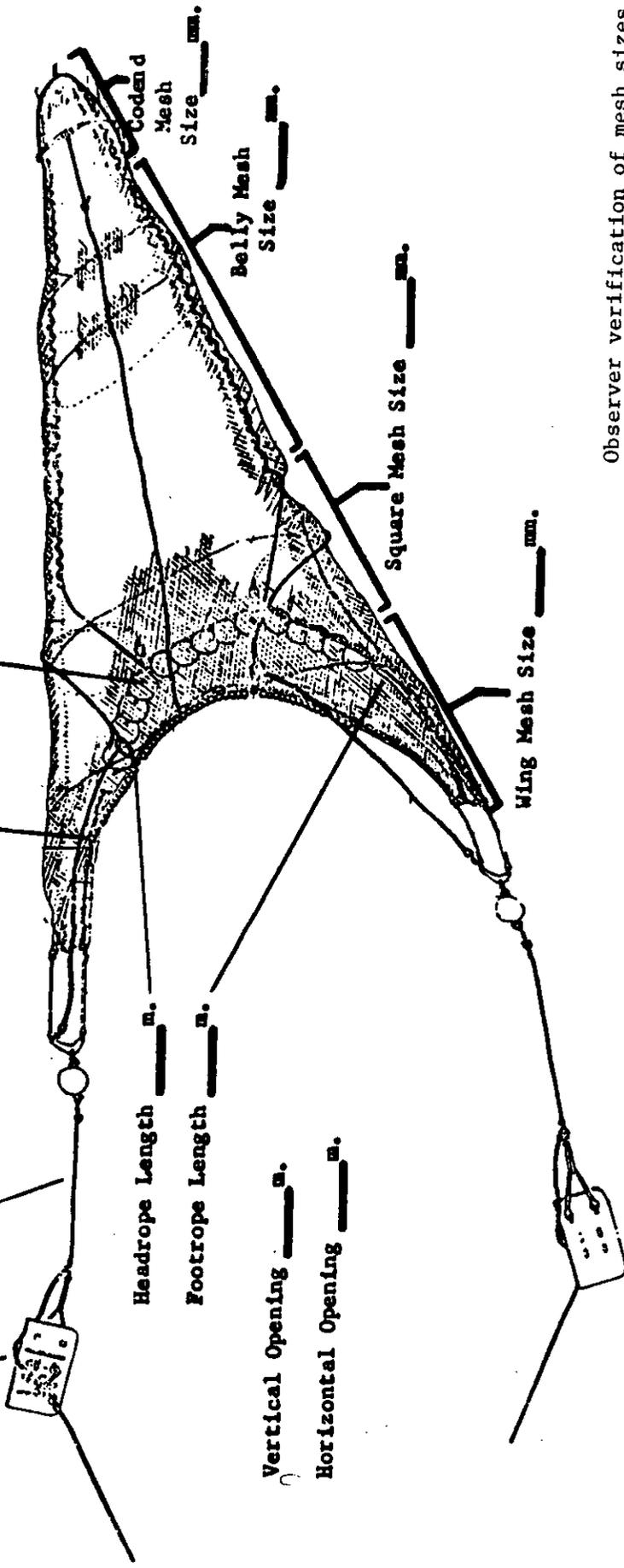
Dandyline Length \_\_\_\_\_ m.

Headrope Length \_\_\_\_\_ m.

Footrope Length \_\_\_\_\_ m.

Vertical Opening \_\_\_\_\_ m.

Horizontal Opening \_\_\_\_\_ m.



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.

Rope lines (as illustrated)  
 Large mesh

Net Recorder: Name \_\_\_\_\_  
 Model Number \_\_\_\_\_  
 Frequency \_\_\_\_\_ kc.

Dandyline Length \_\_\_\_\_ m

Floats: Number \_\_\_\_\_  
 Size \_\_\_\_\_ cm.  
 Material \_\_\_\_\_  
 Shape \_\_\_\_\_

Headrope Length \_\_\_\_\_ m.

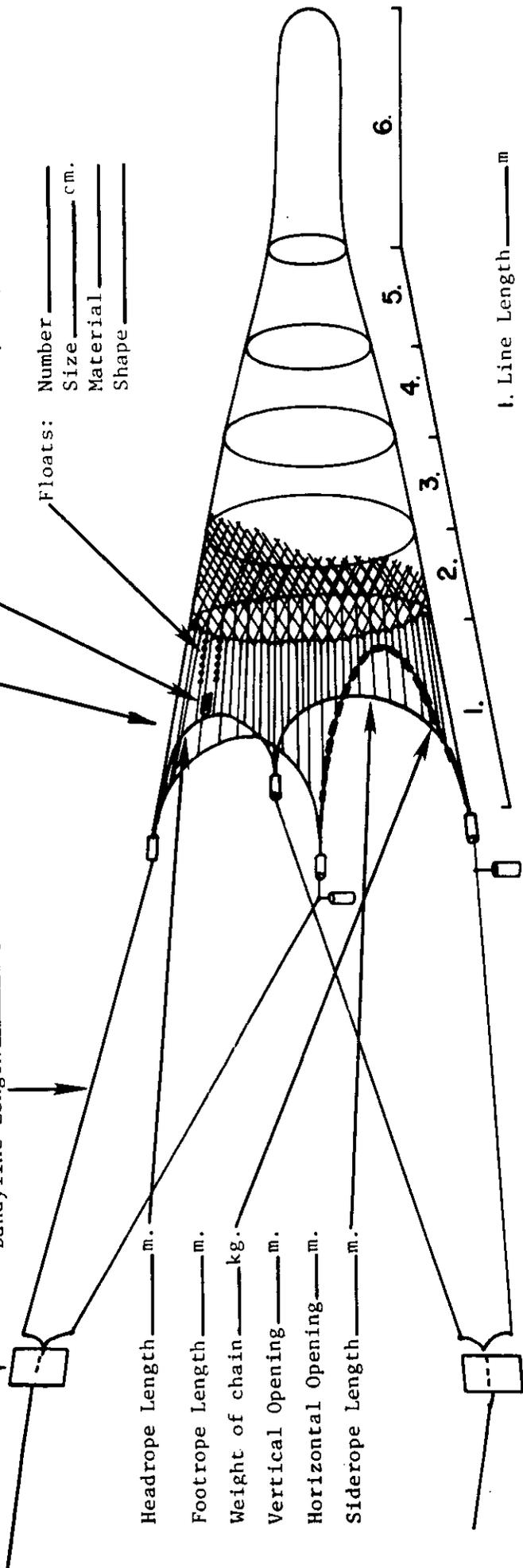
Footrope Length \_\_\_\_\_ m.

Weight of chain \_\_\_\_\_ kg.

Vertical Opening \_\_\_\_\_ m.

Horizontal Opening \_\_\_\_\_ m.

Siderope Length \_\_\_\_\_ m.



Weights: \_\_\_\_\_  
 Number \_\_\_\_\_  
 Weight \_\_\_\_\_ kg

Observer verification  
 of mesh sizes:

Yes \_\_\_\_\_ Date \_\_\_\_\_  
 No \_\_\_\_\_

1. Line Length \_\_\_\_\_ m

2. Mesh size \_\_\_\_\_ mm

3. Mesh size \_\_\_\_\_ mm

4. Mesh size \_\_\_\_\_ mm

5. Mesh size \_\_\_\_\_ mm

6. Codend mesh size \_\_\_\_\_ mm

Net Length \_\_\_\_\_ m.

Fish Finder

Name \_\_\_\_\_

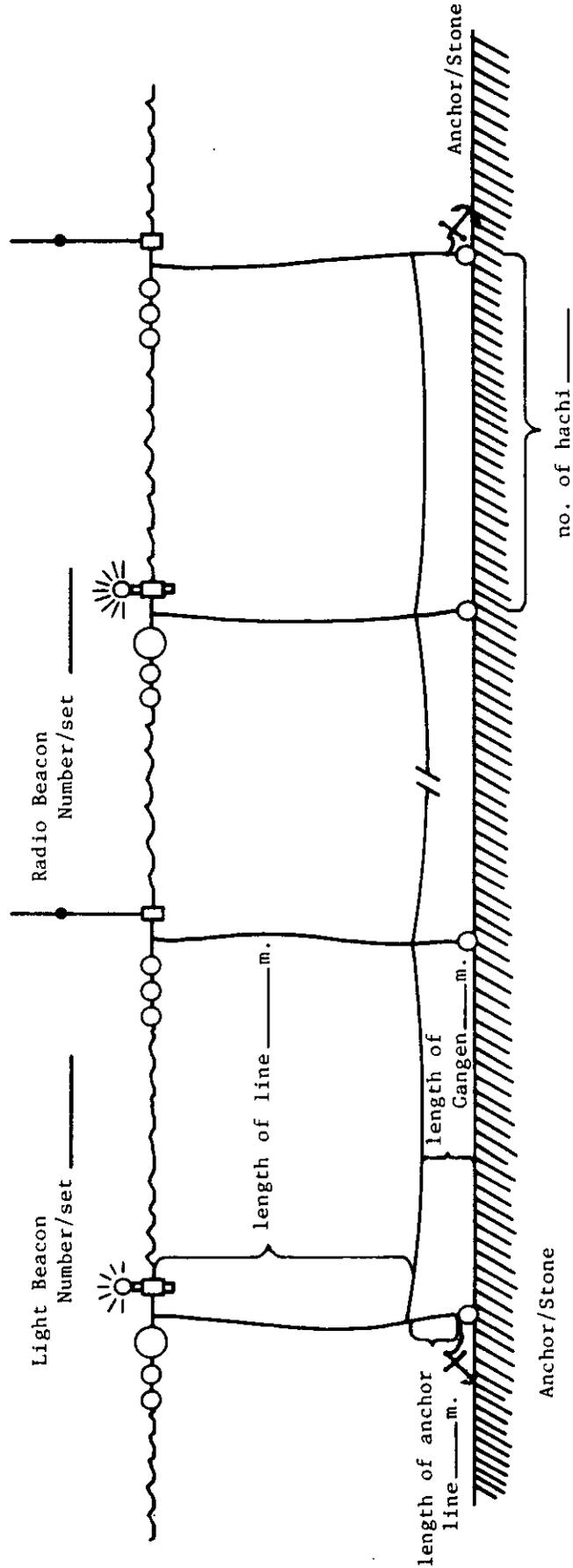
Model No. \_\_\_\_\_

Frequency \_\_\_\_\_ kc.

Paper type: wet or dry

Speed of Paper Advance \_\_\_\_\_

LONGLINE DIMENSIONS



Hachi Length \_\_\_\_\_  
 Average number hachi/set \_\_\_\_\_  
 Average set Length \_\_\_\_\_ km.  
 Average number hooks/hachi \_\_\_\_\_  
 Breaking strength of gangen \_\_\_\_\_  
 Hook size \_\_\_\_\_

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## THE 43 MOST COMMON MISTAKES ON DATA FORMS

### Form 1US, 2US, or 2MUS:

1. Latitude, longitude, or on/off bottom time recorded with greater than 60 minutes.
2. Using 2400 for time instead of 0000.
3. A haul retrieved at 0000 attributed to the previous day.
4. Not putting the noon position under "Trawl Position" on non-fishing days.
5. Overlapping haul times; overlapping on and off bottom times of one haul or between hauls.
6. Recording catch weight to more or less than two decimal places.
7. Positions that are too far from the previous position to be plausible during the time recorded--the ship could not travel that fast.
8. Leaving haul number blank on non-fishing days is incorrect; enter a zero.
9. Missing ADF&G area codes on non-fishing days.
10. Location I.D. omitted.
11. No location listed at all -- you should go back to the fishing log and look up the position, or if it's too late for that, interpolate one from the positions before and after the missing one.
12. Fishing depth and/or bottom depth listed without the accompanying F/M identifier and fishing depths deeper than bottom depths.

### Form 3US:

13. Numbers and/or weights don't add up correctly, do check your math!
14. Species code listed without data accompanying it.
15. Species code doesn't match written name.
16. Species code 900 with a quantity greater than 1.
17. A species listed under more than one sample type.
18. Decimal point not included in every weight figure.
19. A weight listed without a number.
20. Not having each of the four prohibited groups represented for each sampled haul/set.
21. Recording weights to > two decimal places--the computer won't accept them.
22. Viability entries not summed on the 999 line.
23. Haul number doesn't match the date (as listed on Haul Form).
24. Whole-haul sample weight doesn't equal 2US figure for OTC.
25. Not skipping a line between sample types.
26. Recording a fish species that is out of its normal range or normal depth. (Bring back a specimen for verification if this is the case.)

### Form 7US:

27. Data by haul not entered in haul number order.
28. Summations incorrect! (Recheck and double-check your math!)
29. Reversing the size group and the frequency.
30. Haul numbers and dates don't match the haul form.
31. Putting estimated lengths on Form 7.
32. Lengths off by 10 cm. (Write in the 10's values on the plastic strip!)
33. Crab measurements not to nearest 5 mm, size group entries do not end with digit 3 or 8.

Form 9US:

34. Not writing weights out to two decimal places. Do include trailing zeros!
35. Not grouping sexes together.
36. Numbering pages by area instead of by species.
37. Not separating the otolith collections taken on different boats. (See "General Instructions for Data Forms" section in your manual.)
38. Duplicate otolith or scale number within one species collection.
39. An otolith or scale number is skipped without any note as to why.

Form 10US:

40. Not filling them out.
41. Not filling them out for each haul monitored or viewed.
42. Writing in hauls not actually sampled--using crew information to fill out the form. (The entries on the front of Form 10 should only be of hauls the observer actually viewed or sampled.)

For All Forms:

43. Haul and/or set numbers not matching dates.

Cross-Checks For Data Forms

2US - Official Total Catch

*Must equal Haul Weight on 3US and sample weight when whole haul sampling.*  
Is entered on catch message forms A and B for each sampled haul  
Is summed for the day for Catch Message Form B

3US - Prohibited Species

Salmon

The same number of fish (total number) should appear on Form 7US.  
The same number should be entered on Catch Message Form B

Halibut

The same number of fish (total number) should appear on Form 7.  
The same number and weight should be entered on Catch Message Form B.

Tanner and King Crab

All tanner and king crabs in your species composition samples must be entered on Catch Message Form B.

CONVERSION OF POUNDS TO KILOGRAMS (0.5 - 100 lb.)

lb	kg	lb	kg	lb	kg	lb	kg
.5	.2	19.0	8.6	47.0	21.3	75.0	34.1
1.0	.5	20.0	9.1	48.0	21.8	76.0	34.5
1.5	.7	21.0	9.5	49.0	22.2	77.0	35.0
2.0	.9	22.0	10.0	50.0	22.7	78.0	35.4
2.5	1.1	23.0	10.4	51.0	23.2	79.0	35.9
3.0	1.4	24.0	10.9	52.0	23.6	80.0	36.3
3.5	1.6	25.0	11.4	53.0	24.1	81.0	36.8
4.0	1.8	26.0	11.8	54.0	24.5	82.0	37.2
4.5	2.0	27.0	12.3	55.0	25.0	83.0	37.7
5.0	2.3	28.0	12.7	56.0	25.4	84.0	38.1
5.5	2.5	29.0	13.2	57.0	25.9	85.0	38.6
6.0	2.7	30.0	13.6	58.0	26.3	86.0	39.0
6.5	3.0	31.0	14.1	59.0	26.8	87.0	39.5
7.0	3.2	32.0	14.5	60.0	27.2	88.0	40.0
7.5	3.4	33.0	15.0	61.0	27.7	89.0	40.4
8.0	3.6	34.0	15.4	62.0	28.1	90.0	40.9
8.5	3.9	35.0	15.9	63.0	28.6	91.0	41.4
9.0	4.1	36.0	16.3	64.0	29.1	92.0	41.8
9.5	4.3	37.0	16.8	65.0	29.5	93.0	42.3
10.0	4.5	38.0	17.3	66.0	30.0	94.0	42.7
11.0	5.0	39.0	17.7	67.0	30.4	95.0	43.2
12.0	5.4	40.0	18.2	68.0	30.9	96.0	43.6
13.0	5.9	41.0	18.6	69.0	31.3	97.0	44.1
14.0	6.4	42.0	19.1	70.0	31.8	98.0	44.5
15.0	6.8	43.0	19.5	71.0	32.2	99.0	45.0
16.0	7.3	44.0	20.0	72.0	32.7	100.0	45.5
17.0	7.7	45.0	20.4	73.0	33.1		
18.0	8.2	46.0	20.9	74.0	33.6		

Table of Equivalentents

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  
 1 liter = 1.0567 U.S. quarts

HALIBUT LENGTH TO WEIGHT TABLE

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

## HALIBUT LENGTH TO WEIGHT TABLE

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

## OBTAINING INFORMATION ON PRODUCT RECOVERY RATES

A recovery rate represents the proportion of the organism that is used in the factory products. The recovery rate is also referred to as the "product recovery rate (PRR)" or the "recovery ratio". 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:

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

Recovery rates are commonly expressed as a percent or as a ratio. Headed and gutted cod may have a recovery ratio of .62 to 1, or 62% recovery, while fish frozen whole would have a recovery ratio of 1.00 to 1, or 100% recovery. A **conversion factor** is a number which can be multiplied times the product weight to obtain the round weight (whole weight of the fish). A conversion factor is **always greater than 1** (for example, the conversion factor of surimi weight to pollock weight may be 4.5). To convert a conversion factor to a recovery rate, divide the number 1 by the conversion factor.

A wide range of recovery rates are used to describe the utilization of different species in a variety of products. The type of processing, the size of the fish, the area and season of the year, the experience of the processing crew, and the vessel type may all have a bearing on the recovery rate of a particular species. Since there is a need to update the recovery rates are currently being used by data managers, observers may be asked to record the rates used on their vessels, and/or 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.

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

Actually there are two sampling approaches possible. In method A, as explained above, the observer collects a sample of fish, has those same fish processed and weighs the resultant product of those fish. This method is preferred over method B, particularly where the number of samples and their size are limited. In method B, the observer weighs a sample of fish waiting to be processed for a particular product as before. The observer then collects products from the same **number** of fish but not necessarily the **same** fish. For example, if you weighed 60 fish in the round, destined for fillets, 120 fillets would need to be weighed. (The products weighed should be from the same catch of fish.) Method B approaches the accuracy of method A when samples are large and there are many repetitions. Method B has the advantage of

being easier to sample (less interference with the processing line) and as product to be sampled cannot be predicted by the processors, intentional bias can be avoided.

It would be very difficult for an observer to determine the PRR of such products as surimi and fish meal, so it is not expected. However, if the observer were able to run a test on the recovery rate of surimi, it would be very important to fully document the procedure in the logbook. The guidelines for conducting PRR tests are outlined on the worksheet below. Record only the "lowest" PRR test value and the "highest" PRR test value and the lowest and highest unit weight test values on the Form 8 itself. This will provide a range of PRR and unit weight values for each product by area/month/vessel-type designation. (For more complete information, refer to the Form 8 instructions that follow.)

Worksheet For Product Recovery Rate and Unit Weight Tests

Product Recovery Rate Tests:

1. Run PRR tests primarily on target species
2. Run PRR tests on secondary products as possible
3. Each PRR test will consist of three replications of 50 fish each.

Species: \_\_\_\_\_ Product: \_\_\_\_\_

Sorting Criteria: \_\_\_\_\_

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_/ Haul No.: \_\_\_\_\_  
Mo. Day Yr.

Test #      No. of fish      Product wt.      +      Whole wt.      =      PRR

---

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_/ Haul No.: \_\_\_\_\_  
Mo. Day Yr.

Test #      No. of fish      Product wt.      +      Whole wt.      =      PRR

---

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_/ Haul No.: \_\_\_\_\_  
Mo. Day Yr.

Test #      No. of fish      Product wt.      +      Whole wt.      =      PRR

---

UNIT WEIGHT TESTS:

1. Run unit weight tests at least twice per cruise for the major products and once per cruise for minor products.
2. Each test should consist of weighing at least 10 units.

Unit Type      No. of Units Sampled      Total Wt.      -      Container Wt.      =      Unit Wt.

---

---

Average =

## FORM 8 - PRODUCT RECOVERY RATES

This form is to be filled out with the product recovery rates that the ship or processing plant personnel are using, and the recovery rates that the observer has obtained through their own tests. Points to note about Form 8:

1. Enter the year and month (columns 8-11) in which the information was obtained and for which the data applied.
2. Likewise, enter the code for the area in which you collected your own recovery data and the area for which the vessel data applies. There are only two columns, 12 and 13, at this time to record area in. Write the third digit of the federal statistical report area beside column 13.
3. Use a separate sheet for each area, month, vessel or plant sampled.
4. Write the name of the species or species group which is processed and its appropriate code (columns 14-16) from the species code list. Observer-determined recovery data should be listed by each particular species, but figures supplied by vessel personnel are often applied to a group of species. "Unidentified fish" (code 901) may be used for the categories of fish and fish waste turned into fish meal and fish oil. Other possibly useful codes are flatfish unidentified (code 100), turbot unidentified (143), and rockfish unidentified (300).
5. Describe the product and enter the matching product code in columns 17-18 (see "Codes used for Product Recovery Form 8" on the following pages.) If in doubt of the appropriate code, draw a picture and take detailed notes describing the product. Discuss the unidentified product with the debriefer upon your return. Record only those products which were actually produced while you were aboard.
6. Indicate in column 19 whether the product was primarily prepared by machine (M) (includes rotary saw) or through cutting by hand (H).
7. Enter, to 2 decimal places, the recovery ratio used by the vessel or plant in columns 20-22 and observer's recovery rates in columns 28 - 30. If there is a range of values, then enter the data on two lines, first line for the lowest value and second line for the highest value. Use "Example Form 8" on the next page, as a guide.
8. The unit weight asked for in columns 24-27 and 32-35 is the weight of processed fish (**before freezing or addition of water**) in a block of frozen fish, a bag of surimi, or a sack of fish meal. The unit weight is not the weight of a box containing 2 or more blocks of fish, but the weight of the fish making up one of those blocks.
9. Columns 20-27 ask for data obtained from ship personnel and columns 28-35 are for data determined by the observer. The unit weight obtained by the observer should be the average of weighing no less than 10 random samples of each particular unit type. If you discover a range of unit weights for that product, in that area, during a particular month, enter the data on two lines, one for the lowest figure and one for the highest figure.
10. At the bottom of the form there is room for comments.

FORM 8 PRODUCT RECOVERY RATES

Cruise 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

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		Percent Recovery		Unit wt. to .1 kg
									20	21	22	24 - 27	28	29	30
Pollock	2	0	1	surimi	3	6	M			.25	10.0				
↓				"	3	6	M			.34	10.0				
(large fish)				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.

## LIST OF ALASKA PRODUCT TYPES

<u>Product Type Codes</u>	<u>Description</u>
1	Whole fish/food fish (PRR = 1.00)
2	Whole bait (PRR = 1.00)
3	Bled only (throat, or isthmus, slit to allow blood to drain)
4	Gutted only
5	Headed and gutted (H & G)
6	H & G, with roe
7	H & G, Western cut (head removed in front of pectoral girdle)
8	H & G, Eastern cut (head removed behind pectoral girdle)
9	H & G, with pectoral girdle
10	H & G, tail removed
11	Kirimi (head, gut and tail removed by cuts perpendicular to spine)
12	Salted and split
13	"Wings" (On skates, side fins are cut off next to body)
14	Roe only (eggs, either loose or in sacs, or skeins)
15	Pectoral girdle only
16	Heads
17	Cheeks (opercular bone and muscles) or chins (lower jaw, muscles, flesh)
19	Belly flaps (flesh in region of pelvic and pectoral fins)
20	Fillets with skin and ribs
21	Fillets with skin, no ribs
22	Fillets, with ribs, no skin
23	Fillets, no skin or ribs
30	Surimi (paste from any of the fish flesh and additives)
31	Minced fish
32	Fish meal
33	Fish oil
34	Milt (in sacs, or testes)
35	Stomachs (includes all internal organs)
36	Octopus/squid mantles (flesh after removal of viscera and legs)
37	Split, no backbone (head removed, fillets still attached)
39	Bones
97	Other - specify
99	Discard (whole groundfish and PSC species only; PRR = 1.00)

NMFS Product Recovery Rates for Specified Groundfish Products

Species code	Product Codes																								
	3	4	6	7	8	10	11	12	13	14	15	16	17	18	19	20	21	22	23	30	31	32	33	36	37
110	.98	.85	.63	.60	.58	.50	-	.45	-	.05	.05	-	.05	-	.10	.45	.35	.25	.25	-	.50	.17	-	-	.43
118	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
119	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
120	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
121	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
123	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
127	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
134	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
139	.98	.88	-	.60	.50	-	-	-	-	-	-	.15	.05	.05	.10	.40	.30	.35	.25	-	-	.17	-	-	-
141	.98	.88	-	.65	.50	-	-	-	-	-	-	.15	.05	.05	.10	.40	.30	.35	.25	-	-	.17	-	-	-
143	.98	.88	-	.60	.55	-	-	-	-	-	-	.20	.05	.05	.10	.40	.30	.35	.25	-	-	.17	-	-	-
144	.98	.88	-	.60	.50	-	-	-	-	-	-	.15	.05	.05	.10	.40	.30	.35	.25	-	-	.17	-	-	-
161	.98	.88	-	.50	.40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.17	-	-	-
168	.98	.88	-	.65	.50	-	-	-	-	-	-	.15	.05	.05	.10	.40	.30	.35	.25	-	-	.17	-	-	-
169	.98	.88	-	.65	.50	-	-	-	-	-	-	.15	.05	.05	.10	.40	.30	.35	.25	-	-	.17	-	-	-
193	.98	.87	-	.61	.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.17	-	-	-
270	.98	.80	.70	.65	.56	.50	-	-	-	.14	-	.15	-	-	-	.35	.30	.30	.25	.15	.34	.17	-	-	-
510	.98	.82	-	.71	-	-	-	-	-	-	-	-	-	-	-	-	.38	-	-	-	-	.22	-	-	-
511	.98	.82	-	.71	-	-	-	-	-	-	-	-	-	-	-	-	.38	-	-	-	-	.22	-	-	-
516	.98	.89	-	.78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.22	-	-	-
689	.98	.83	-	.72	-	-	-	-	-	-	-	-	-	-	-	-	.30	.30	.25	-	-	.17	-	-	-
700	.98	.90	-	-	.39	-	-	-	.32	-	-	-	-	-	-	-	-	-	-	-	-	.17	-	-	-
710	.98	.89	-	.68	.63	.50	-	-	-	-	-	-	.05	-	.35	.30	.30	.30	.25	-	-	.22	-	-	-
870	.98	.80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.17	-	.85	-
875	.98	.69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.17	-	.75	-

## TAGGED FISH AND CRAB

If you should find a tagged fish or crab while you are sampling, or if a crew member brings you a tagged fish or crab, return the tag, along with all pertinent information, to the debriefers at the end of your cruise. Such information should normally include the date, location, and circumstances of capture, and the length, weight, sex, and stage of maturity of the fish. Tags from yellowfin sole, halibut, cod, pollock, and other fish will be forwarded to the appropriate tagging agency. Otoliths and scales are often also very useful to the tagging agency.

The Pacific Biological Station at Nanaimo, B.C. injected a number of sablefish with a bone-marking chemical and tagged them with a small, plastic tube implanted just below the first dorsal fin. Be sure to record the tag prefix as well as the number. Obtain the otoliths from all tagged sablefish except those from the pink AG series tags which are used for growth studies and should not be exposed to light. Store the otoliths in ethyl alcohol and water, if you have it, or dry in an envelope. AG tags are labeled with "GROWTH STUDY REWARD FOR WHOLE FISH". AG fishes' heads should be cut off and frozen with the tag number enclosed in a plastic bag. (A salmon snout bag may be used for this.) Heads should be cut between the operculum and the pelvic fin to insure that the otoliths are not exposed to light and are contained within the snout. Be sure to get the information listed below for any tagged fish. These samples, along with the accompanying data on date, position of capture, etc. will be forwarded to the Nanaimo laboratory after your return.

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

## 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. In determining sex, it is generally easiest to start with large, mature fish and work down in size to small, immature specimens. Thoroughly dissect a few fish and identify the various internal structures so that you know what you are looking for.

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. 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. 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.

## HOW TO SEX FISH

Part of the job of taking length frequencies and age structures is sexing the fish. If there is any questions about how this is done this handout should help you.

### GADIDAE

Where to look:

The gonads of all cods and pollock are found directly above the vent near the top of the visceral cavity. An easy way to find the gonads of gadids (with a little practice) is to slit the stomach open near the vent, then use your thumb to scoop the viscera out of the visceral cavity. If done properly the gonads will be found on your thumbnail.

What to see:

The ovaries are bags which are typically pink or orange in color and slightly translucent. They may or may not have black and white speckling. When immature the bags can be distinguished by color and position. When the ovaries are mature they tend to be bright orange will often nearly fill the entire posterior end of the visceral cavity and you should be able to see the eggs inside the ovaries.

The testes look completely different than the ovaries. They appear as lacy convolutions that form the lower side of a thin filament that can be found in the same location as the ovaries. In an immature these convolutions may be very small and fine. They can be overlooked easily. When the fish is mature the testes will be thick, opaque and white and look something like pasta noodles filling the inside of the fish.

### SABLEFISH

Where to look:

The gonads of sablefish are lateral lobes that will be found running the entire length of the visceral cavity just beneath the backbone. They appear as fleshy filaments and are tan to slightly pink.

What to see:

There is no difference between the coloration or texture of the ovaries and the testes of sablefish. The only difference is that the testes have four lobes and the ovaries have two lobes. The ovaries may have a partial division through each of their two lobes. If the fish is immature it may be very difficult to determine how many lobes are present. If this is the case you must examine the gonads carefully so that you can see if the

divisions between the lobes are complete or partial.

### FLATFISH

Where to look:

The gonads of flatfish are found posterior to the visceral cavity underneath the flesh of the body. To find the gonads it is usually easiest to cut the flesh starting at the visceral cavity and cutting towards the tail following the curvature of the body. Testes will be found only in the area directly posterior to the viscera, while the ovaries will extend away from the viscera in an elongated triangular shape.

What to see:

Females have ovaries that extend into and through the flesh in an elongated triangle. This triangle is consistently at least three times as long as it is wide and often much longer. The ovaries when they are immature are typically translucent and pinkish. Ovaries that are mature are very elongate, pinkish or orangish, often have blackish spotting and eggs can be seen inside the ovaries.

Males have testes that are either found right next to the visceral cavity or that extend into the flesh as a short wide triangle which is about as wide as it is long. They are consistently white and opaque. Immature testes are slight crescents that are found along the posterior edge of the visceral cavity and parallel the bone that supports the visceral cavity and becomes the anal spine. These small crescents can be very small and difficult to find.

### ROCKFISH

Where to look:

Rockfish gonads are found at the top of the visceral cavity directly above the vent. They are positioned so that they are slanted up to the anterior, parallel to the intestine.

What to see:

Ovaries are bags which will be filled with eggs and then live young (rockfish bear developed young, not eggs). These bags are soft and flaccid, and generally either pinkish or orangish, though they may be yellowish. They are about two or three times as long as they are wide.

Testes are somewhat rod-like, feel firm and are colored yellowish. They are more elongate than ovaries; often about five times as long as they are wide although this is variable and they will get longer in the first stages of maturity.

## SALMON

### Where to look:

The gonads of salmon are thin, clear filaments which are found along the top of the visceral cavity just below the backbone. Salmon gonads, unlike other fish, will be found near the anterior (head) end of the fish.

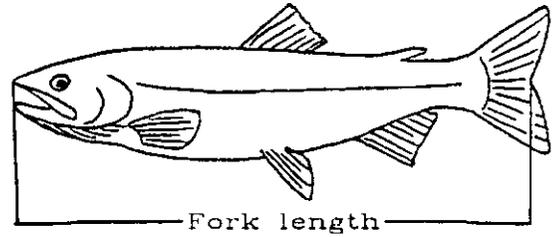
### What to see:

Sexing salmon is relatively easy. Even very young females produce eggs. To sex the fish find the clear tissue of the gonad and look for the presence or absence of the fairly large orange eggs. If eggs are present then the fish is a female. If eggs are absent then the fish is a male.

Fork Length Measurement Used For:

Roundfish  
Rockfish  
Salmon

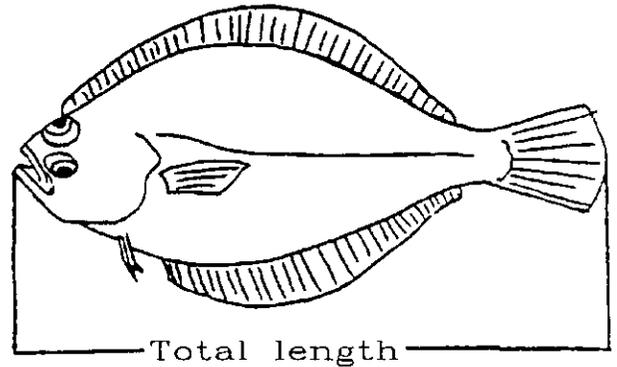
Measured from the tip of snout to the center of the fork in tail.



Total Overall Length Used For:

Flatfish

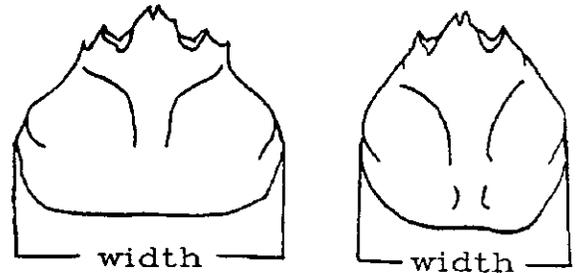
Measured from the tip of the snout to the middle of the tail.



Carapace Width Used For:

Tanner (Snow) Crab

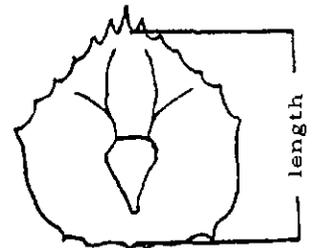
Measured from the widest points, excluding spines, to the nearest 5 mm.



Carapace Length Used For:

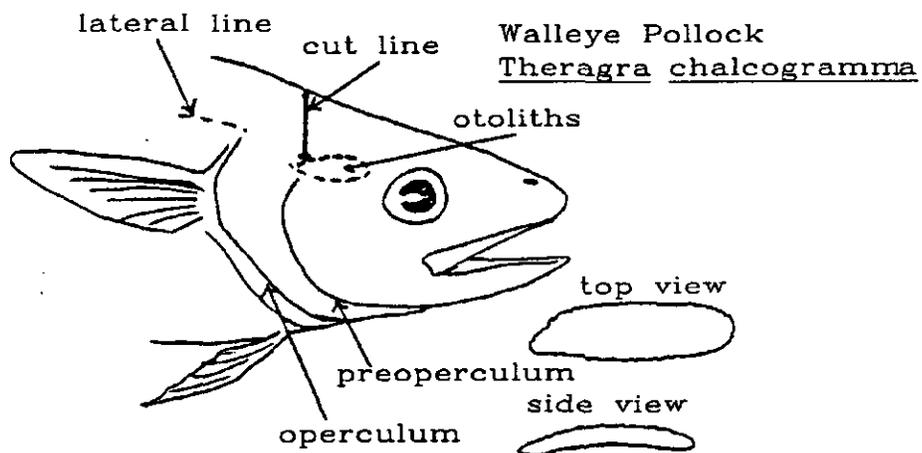
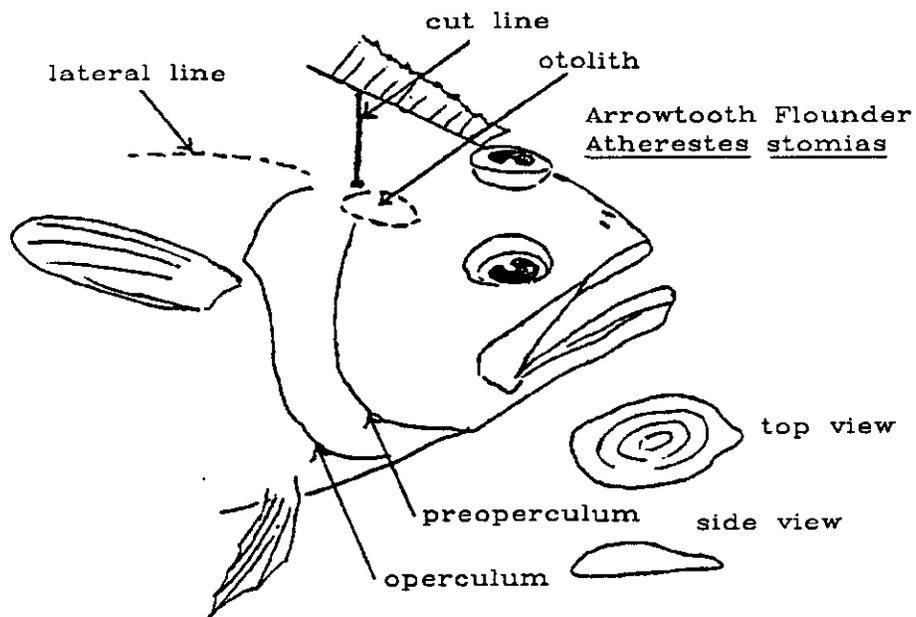
King Crab

Measured from right eye socket to the middle of the posterior margin of the carapace.



## OTOLITH AND SCALE COLLECTION FOR SELECT SPECIES

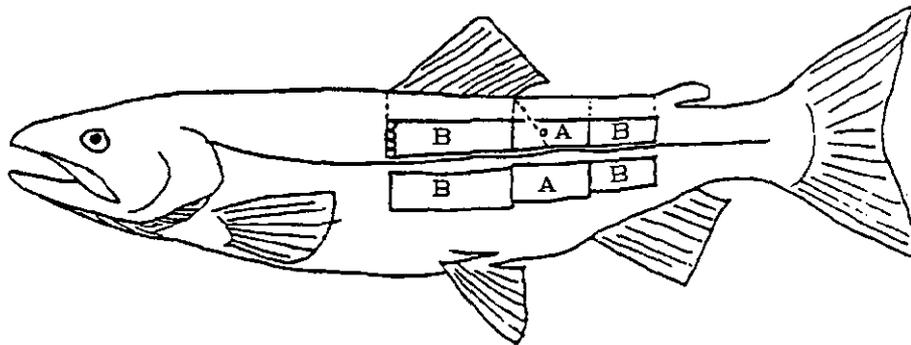
<u>Species</u>	<u>Sample Type</u>	<u>Storage Container</u>	<u>Storage Media</u>
Walleye pollock	Otolith	Plastic vial	50% alcohol 50% water
Yellowfin sole (or other flatfish)	Otolith	Plastic vial	Glycerol/Thymol Solution
Atka mackerel	Otolith	Plastic vial	50% alcohol 50% water
Pacific cod	Otolith & Scale (both in same vial)	Plastic vial	50% alcohol 50% water
Pacific hake	Otolith	Plastic vial	50% alcohol 50% water
Jack mackerel	Otolith	Plastic vial	Dry
Sablefish	Otolith & Scale (both in same vial)	Plastic vial	50% alcohol 50% water
Salmon	Scale	Paper envelope	Dry
Rockfish	Otolith	Plastic vial	50% alcohol 50% water



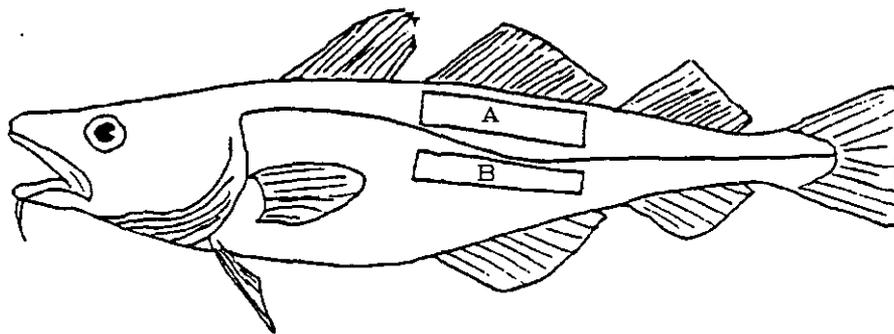
Approximate location of the otoliths (sagittal) and the cut for the removal of otoliths from flatfish and roundfish.

## LOCATION OF PREFERRED SCALE SAMPLING ZONES

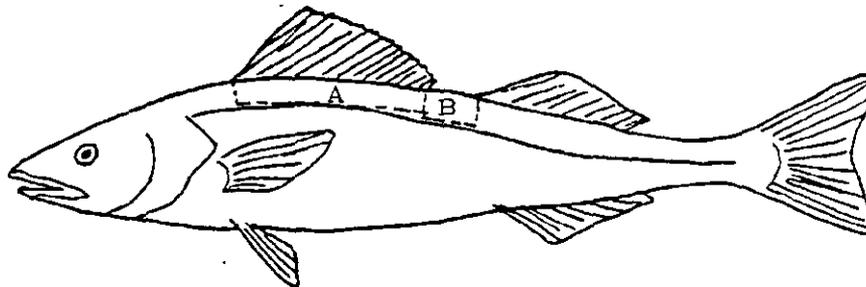
(Do not take lateral line scales)



SALMON - Follow the diagonal scale row from the posterior insertion of the dorsal fin to the lateral line of either side. Two scale rows up from the lateral line (on the diagonal) are the preferred scales



PACIFIC COD - Scrape along either side of the back directly below the second dorsal fin.



SABLEFISH (BLACK COD) - 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 your contact person, if any, know you have a frozen specimen to maintain. Maybe your place of lodging will hold it for you in their kitchen freezers.
- B) Tell the airlines at check-in that you have a package to keep frozen.
- C) In Seattle on a weekend, take it to the Seattle Aquarium if you can't keep it at your lodgings. Their weekend, daytime phone number is: 625-5018 or 625-5019 and their 24-hour phone number is: 625-4359. Tell the aquarium staff you are a NMFS observer, get directions and ask them to hold it for you until Monday. On weekdays bring frozen specimens into our freezer in the wetlab. Tell your debriefer you have a specimen and turn in your form.

Specimens Needed For Teaching Collection

(small (20-35 cm) specimens preferred)

I. Gadidae

Pacific Cod, Gadus macrocephalus

II. Flatfishes

Rough-scale Sole, Clidoderma asperrimum

Alaska Plaice, Pleuronectes quadrituberculatus

Longhead Dab, Limanda proboscidea

Rex Sole, Glyptocephalus zachirus

Curlfin Sole, Pleuronichthys decurrens \*

C-O Sole, Pleuronichthys coenosus

Greenland Turbot, Reinhardtius hippoglossoides

Arrowtooth Flounder, Atheresthes stomias

Kamchatka Flounder, Atheresthes evermanni

Deepsea Sole, Embassichthys bathybius \*

Dover Sole, Microstomus pacificus

Hybrid Sole, Inopsetta ischyra

English Sole, Parophrys vetulus

Butter Sole, Isopsetta isolepis

Slender Sole, Lyopsetta exilis

Petrale Sole, Eopsetta jordani

Flathead Sole, Hippoglossoides elassodon

Bering Flounder, Hippoglossoides robustus \*

Arctic Flounder, Liopsetta gracialis \*

III. Rockfishes

Longspine Thornyhead, Sebastes alascanus \*

Darkblotched Rockfish, Sebastes crameri

Harlequin Rockfish, Sebastes variegatus

Redstripe Rockfish, Sebastes proriger

Shortraker Rockfish, Sebastes borealis \*

Northern Rockfish, Sebastes polyspinus

Redbanded Rockfish, Sebastes babcocki

Silvergray Rockfish, Sebastes brevispinis

Dusky Rockfish, Sebastes ciliatus

Black Rockfish, Sebastes melanops

Blue Rockfish, Sebastes mystinus

IV. Incidentals

1. Any unusual fish

2. Look especially for:

Dragon poacher, Percis japonicus

Bering Wolffish, Anarhichas orientalis

Sablefish, Anoplopoma fimbria

Flathead Pomfret, Taractes asper

Giant Wrymouth, Delolepis gigantea

Atka Mackerel, Pleurogrammus monopterygius

Oxeye Oreo, Allocyttus folletti

Capelin, Mallotus villosus

Eulachon, Thaleichthys pacificus

Pacific Sandfish, Trichodon trichodon

Prowfish, Zaprora silenus

● = collect any size

Specimen Collection Form

Collector: \_\_\_\_\_ Cruise No.: \_\_\_\_\_ Vessel Code: \_\_\_\_\_

Date: \_\_\_\_\_ Vessel Name: \_\_\_\_\_

Haul No.: \_\_\_\_\_ Lat. & Long.: \_\_\_\_\_

Depth: \_\_\_\_\_ (meters) Water Temp.: \_\_\_\_\_ (degrees C.)

Collector's Identification: \_\_\_\_\_

Length: \_\_\_\_\_ (cm) Weight: \_\_\_\_\_ (kg)

Notes on in vivo coloration, unusual scale patterns or spines: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Sketch if necessary:

When completed, return this form to a debriefer.

Identification confirmed by: \_\_\_\_\_ Date: \_\_\_\_\_

Common Name: \_\_\_\_\_

Scientific Name: \_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_



Specimen Collection Form

Collector: \_\_\_\_\_ Cruise No.: \_\_\_\_\_ Vessel Code: \_\_\_\_\_

Date: \_\_\_\_\_ Vessel Name: \_\_\_\_\_

Haul No.: \_\_\_\_\_ Lat. & Long.: \_\_\_\_\_

Depth: \_\_\_\_\_ (meters) Water Temp.: \_\_\_\_\_ (degrees C.)

Collector's Identification: \_\_\_\_\_

Length: \_\_\_\_\_ (cm) Weight: \_\_\_\_\_ (kg)

Notes on in vivo coloration, unusual scale patterns or spines: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Sketch if necessary:

When completed, return this form to a debriefer.

Identification confirmed by: \_\_\_\_\_ Date: \_\_\_\_\_

Common Name: \_\_\_\_\_

Scientific Name: \_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_



Specimen Collection Form

Collector: \_\_\_\_\_ Cruise No.: \_\_\_\_\_ Vessel Code: \_\_\_\_\_

Date: \_\_\_\_\_ Vessel Name: \_\_\_\_\_

Haul No.: \_\_\_\_\_ Lat. & Long.: \_\_\_\_\_

Depth: \_\_\_\_\_ (meters) Water Temp.: \_\_\_\_\_ (degrees C.)

Collector's Identification: \_\_\_\_\_

Length: \_\_\_\_\_ (cm) Weight: \_\_\_\_\_ (kg)

Notes on in vivo coloration, unusual scale patterns or spines: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Sketch if necessary:

When completed, return this form to a debriefer.

Identification confirmed by: \_\_\_\_\_ Date: \_\_\_\_\_

Common Name: \_\_\_\_\_

Scientific Name: \_\_\_\_\_

Comments: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_



U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL MARINE FISHERIES SERVICE

Permit to Import Marine Mammals and Endangered Species  
Permit No. 578

The National Marine Mammal Laboratory, Northwest and Alaska Fisheries Center, National Marine Fisheries Service, 7600 Sand Point Way, N.E. BIN C15700, Seattle, Washington 98115, is hereby authorized to import marine mammal specimens, including material from species listed as threatened or endangered, for scientific research and scientific purposes as cited in the Permit Holder's application and subject to the provisions of the Marine Mammal Protection Act of 1972 (16 U.S.C. 1361-1407), the Regulations Governing the Taking and Importing of Marine Mammals (50 CFR Part 216), the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), the regulations governing endangered species permits (50 CFR Parts 217-222), and the Conditions hereinafter set out.

A. Number and Kind of Marine Mammals:

An unspecified number of specimen materials may be imported from:

1. All Cetacean species
2. All Pinnipedia species, except walrus (Odobenus rosmarus)

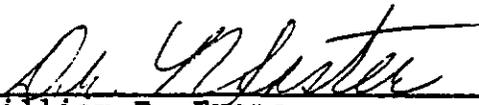
B. Special Conditions:

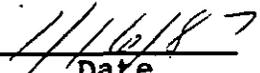
1. The specimen material may be imported from anywhere in the world. The material shall have been collected from animals:
  - a) Taken in fisheries for such animals in situations where such taking is legal;
  - b) killed incidental to fishing or other operations;
  - c) found dead floating at sea or beached; or

d) that have died of natural causes.

2. All specimen materials collected under the authority of this Permit shall be maintained according to accepted curatorial standards in bona-fide scientific collections. In the event that fluid tissue specimens are disposed of upon completion of a project, the disposal shall be reported as required by Section B.
3. The Holder must coordinate activities within the United States with appropriate Federal, state and local resource management agencies.
4. The Holder shall submit written notification to the Protected Species Division and the appropriate Regional Director(s) of names of designated agents and the dates which their designation is valid at least two weeks prior to their activity under the Permit. An annually updated list of agents and NMFS personnel authorized to operate under this Permit shall be provided to the Protected Species Division and appropriate Regional Director(s).
5. The Holder shall notify the appropriate Regional Director(s) sufficiently in advance of importation or transfer of specimen material. This notification shall include the destination of the specimen materials.
6. The Holder shall submit a report within 30 days of the importation authorized herein listing the items imported and the dates of importation.
7. The Holder shall submit an annual report by December 31 of each year the Permit is valid. The report shall include but is not limited to, a description of each animal from which a specimen was taken including its species, age, size, sex, reproductive condition; date and location of collection; circumstances causing death if known; the date and location of each importation; and the name and location of each institution maintaining specimen materials collected under this Permit.
8. The Holder shall submit a final report within 90 days of the expiration date of the Permit which includes a summary describing the materials that have been imported and their disposition. All reports shall be submitted to the Office of Protected Species and Habitat Conservation, National Marine Fisheries Service, U.S. Department of Commerce, Washington, D.C. 20235.

9. The provisions of this permit may be amended upon reasonable notice by the Assistant Administrator for Fisheries depending upon the species and circumstances involved.
  10. This Permit does not relieve the Holder from the requirement of full compliance with all provisions of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). For those species listed on any of the Appendices to CITES valid and appropriate permit(s) authorizing import must be obtained prior to shipment.
  11. The authority to collect and import this material shall extend from the date of issuance through December 31, 1991. The terms and conditions of this permit (Sections B and C) shall remain in effect as long as the material imported hereunder is maintained under the authority and responsibility of the Permit Holder.
- C. All General Conditions attached as Section C shall apply and are made a part hereof.

  
\_\_\_\_\_  
William E. Evans  
Assistant Administrator for Fisheries  
National Marine Fisheries Service

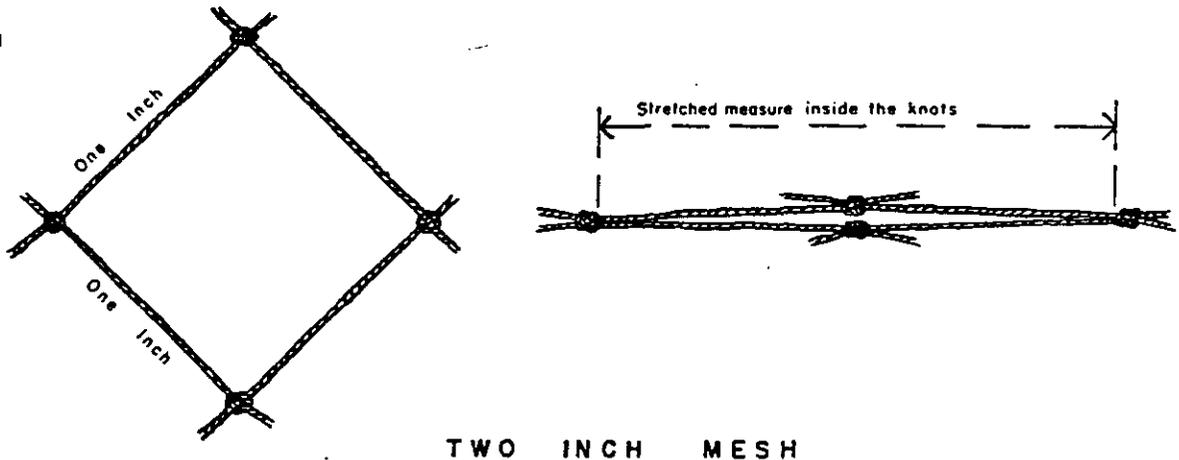
  
\_\_\_\_\_  
Date

## HOW TO MEASURE MESH SIZE

The mesh size measurement requested on the gear diagram is the stretched measure, that is, the distance between two diagonal knots when the mesh is tightly stretched (see second diagram below). In order to obtain this measurement, the net must be empty and the mesh pulled tightly enough so that two opposite knots of the mesh square meet and all four knots are in the same plane; measure the distance inside the two most distant knots in the mesh square.

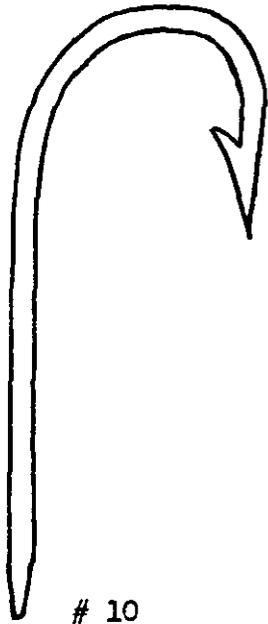
An easier way of obtaining the same measurement (the net does not have to be empty) is to measure the distance between two adjacent knots in a mesh square (the side of a square) and multiply by two. Check several meshes in each part of the net.

W. L. Scofield

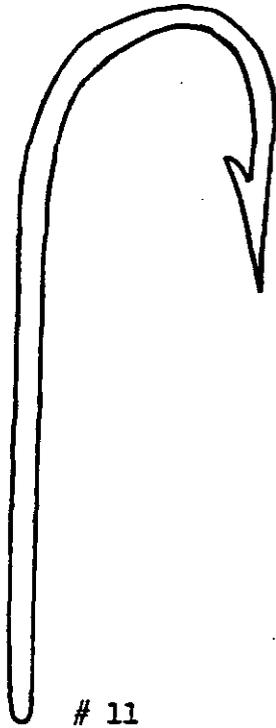


*A two-inch mesh, open (left) and stretched. This points up variables inherent in web measure and consequent difficulties. Common yardstick is "stretch measure."*

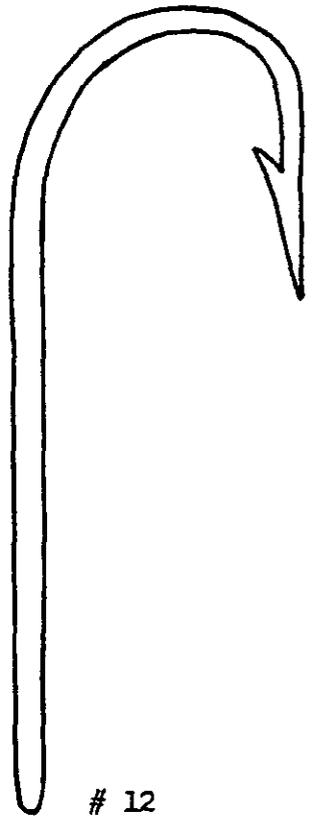
HOOK SIZE CHART FOR LONGLINERS



# 10



# 11



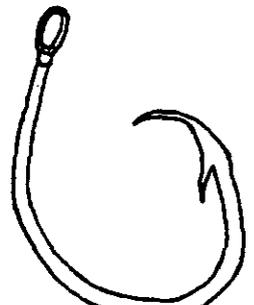
# 12



# 8



# 9



CIRCLE HOOK

## ADVICE TO WOMEN GOING TO SEA

[Note: The original version of "Advice" was prepared by Connie Sancetta and colleagues at Lamont-Doherty Geological Observatory following the rape of a female student on one of Scripp's ships. We believe "Advice" is a balanced statement of potential problems and realistic responses to them that should be helpful to seagoing scientists.]

Sexual harassment occurs at sea, from verbal harassment to assault and rape. Such incidents are frequently not reported, for reasons ranging from a desire to be a good sport in minor cases, to embarrassment in more serious cases. This document is intended to alert you to the different nature of social conditions at sea, and to suggest some actions you should take if you feel uncomfortable or harassed.

Social conditions are different from those on land. Privacy is greatly reduced, and as a result interactions can become more intense, and feelings of intimacy are more quickly established. Small incidents, both pleasant and unpleasant, can quickly take on exaggerated importance, due to the close quarters, the prevalence of gossip, and the sense of isolation from "the real world" back on shore.

Furthermore, staffing on a ship brings together people with very diverse backgrounds and value systems. While some of the men are used to the concept of women as professionals, other are familiar with more traditional views of women. For some men, sexual remarks or actions may be considered an acceptable mode of behavior. Also, the value systems of many men change somewhat during the period of time that they are at sea.

The crew of a ship have usually established a workable interaction among themselves, while scientists, who come on board for a single cruise, are not part of that system. Scientists are therefore particularly apt to draw attention, comment, and speculation.

Sexual awareness and tensions can be heightened at sea, due to the unusual social closeness and deprivation of normal outlets. Behavior and attire that are acceptable on shore can be viewed as provocative at sea and close relationships between people of opposite sexes can strongly affect the atmosphere in which everyone must work and live. The result often is that a woman on board is subject to far more attention than she would be on shore. While some of the attention may be pleasant and even flattering, some of it is not.

In consequence, it is necessary to be aware of the different social situation and to modify your normal behavior if necessary. At the very least, you should consider the possible consequences on some situations so that you can react appropriately. Below are some examples of the sort of actions you might adopt or avoid:

- 1) Strictly obey the ship rules regarding drinking, which can lead to poor judgement, lack of control and alertness, and hasty actions. If the ship allows consumption of alcohol, do so only in moderation. At sea you must be prepared for any emergency. Consider yourself on duty 24 hours a day.
- 2) Refrain from wearing potentially provocative clothing such as halter and tank tops, shorts, and tight clothing such as lycra; avoid going braless.
- 3) Be aware that if you show more attention to one man than others, it may be misinterpreted by him or by others.
- 4) Do not invite a man to your cabin if you are alone, or accept an invitation to be alone with him, ("a friendly chat," "a little drink"). Leave the cabin door open or go to a public area if a man comes to

talk to you without your invitation.

- 5) Activities such as flirting, joking about sex, or touching may be misinterpreted by the persons involved or by others. Unwanted approaches such as these should be responded to politely but very firmly. You yourself should avoid flirtatious behavior or bawdy humor.
- 6) Do not engage in sexual affairs. Such affairs will distract you and your partner from doing your work, can breed resentment and jealousy and will subject other women to increased sexual pressure, both on your cruise and on subsequent cruises. Remember, you are at sea to work, not to amuse yourself.
- 7) Make it clear that your interests in male companionship are elsewhere, (some women wear wedding rings), or that you are "not available."
- 8) Do not stand around on deck or other deserted areas alone at night.
- 9) In general, be very sensitive to the altered social conditions and their possible implications. Be very conservative. Use your common sense.

An assault often occurs with warning signs of milder behavior. If you act firmly and decisively during the early stages, you may reduce the chances of future harassment. Some warning signs to watch for are:

- 1) A man makes frequent attempts to detain you, to be in your company, or to visit you in your cabin.
- 2) Mild or casual sexual remarks become more frequent, pointed and/or objectionable.
- 3) A man attempts any physical contact, even if it appears innocent.
- 4) Other people warn you about a man who begins to harass you.
- 5) A man whom you have repeatedly attempted to discourage continues or escalates his advances.

The definition of harassment is subjective, making it difficult to identify. Federal law defines sexual harassment as "unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature." Thus, it is your decision at what point you will draw the line.

Many women feel uncomfortable with milder forms of harassment, but tolerate it, not wanting to cause trouble, or appear to be oversensitive or bad sports. The unfortunate result of this passivity is that harassment may continue or increase until it becomes serious. At that point, the woman is open to the charge that she allowed (i.e., encouraged) the previous actions. It is best to take action at the time that you first feel uncomfortable. There are a variety of actions you may adopt, which must depend on your judgement. In general, the best sequence to follow is:

- 1) Indicate to the harasser that you do not enjoy or appreciate his actions. Do not make a joke of his behavior. Speak firmly and coldly, or pointedly avoid him. Do not make the mistake of pretending to ignore it; this invites continuation at a higher level. Losing your temper may be effective in some cases but usually is not, and may even encourage the harasser.
- 2) Discuss the problem with someone, preferably an officer, but at least a friendly peer. Ask for his/her opinion as to the severity of the problem and advice as to handling it. If appropriate, you might ask the person to speak to the harasser, warning him off.

- 3) If the problem continues or worsens to the point that you feel upset or threatened, report it to the skipper immediately. Tell him the full story, explain that it is affecting your work, and request that he take steps to end the problem.
- 4) If the harassment advances to the point of assault, it becomes a felony. You should immediately report the offense to your employer and the captain, who are required by law to take certain actions. Make sure the incident is reported and is not swept under the rug. Failure to report a felony can itself be punishable under law.

Sexual assault and rape have occurred on fishing vessels at sea. These serious offenses might be prevented if appropriate action is taken in the early stages. Never believe that the problem is trivial or that you are over-reacting. If you feel harassed, then it has gone too far. It is your right to complain and even your obligation. By reporting harassment, you are protecting others as well as yourself. The skipper does not want trouble on his boat, and if you indicate to him that trouble may be brewing, he will take appropriate action.

## RADIO COMMUNICATIONS

The radios that you will encounter most often are VHF-FM (Very High Frequency Modulation), used for short-range vessel-to-vessel and vessel-to-shore communication, and HF-SSB (High Frequency-Single Side Band), used for communication when the stations are out of VHF range with each other. Both types offer certain special advantages, and each requires a specific operating procedure.

### VHF-FM Radios

In the United States, the VHF Band is broken up into 71 channels, with a frequency range of from 156.000 to 163.000 MHz, including six WX (Weather) channels. By law, all operating VHF stations are required to have at least three of these channels: channel 6, channel 16, and at least one other working channel.

Channel 6 (156.300 MHz) is the Intership Safety Channel, used for intership safety purposes, search-and-rescue (SAR) communications with ships and aircraft of the U.S. Coast Guard, and vessel movement reporting within ports and inland waterways. This channel must not be used for non-safety communications.

Channel 16 (156.800 MHz) is the International Distress, Safety, and Calling Channel (Intership and Ship-to-Coast). This channel must be monitored at all times the station is in operation (except when actually communicating on another channel). This channel is also monitored by the U.S. Coast Guard, Public Coastal Stations, and many Limited Coastal Stations. Calls to vessels are normally initiated on this channel. Then, except in an emergency, you must switch to a working channel. It is against FCC regulations to conduct business on this channel. In addition, vessels calling must use their assigned call sign at the beginning and end of each transmission.

Channel 22A (157.100 MHz) is the U.S. Coast Guard Liaison Channel. This channel is used for communications with U.S. Coast Guard ships, aircraft, and coastal stations after first establishing contact on channel 16. Navigational warnings and, where not available on WX channels, Marine Weather forecasts are also broadcast on this frequency.

Channels 24,25,26,27 and 28 (also 84,85,86 and 87) are the Public Correspondence channels (ship-to-coast). These are available to all vessels to communicate with Public Coastal stations (Marine Operator). Channels 26 and 28 are the primary public correspondence channels.

Channels 1,3,5,12,13,14,15,17,65,66,73,74,77,81,82 and 83 are channels with special designations (port traffic communications, U.S. government communications, locks and bridges, environmental, etc.), and their use close to shore or to ports should be minimized.

Channels 7,8,9,10,11,18,19,67,68,69,70,71,72,78,79,80 and 88 are commercial and non-commercial working channels that are available for conducting business. The abbreviated format (no call signs) is acceptable on these frequencies. It should be noted that some of these channels may be locally restricted (off the Washington Coast, for example, channel 11 is Tofino Coast Guard Traffic Control for the entry into Juan deFuca Strait, used for reporting ship locations), in which case their use for business should be avoided.

### HF-SSB Radios

Single Side Band radio is a special version of AM (Amplitude Modulation) radio specifically intended for long-range communication. As a consequence of the "skip" phenomenon (the tendency of a transmitted signal to reflect off the barrier created by the ionosphere), High Frequency skywaves can reach stations up to several thousand kilometers away (depending on ionospheric conditions and other environmental factors). The very nature of the transmitted skywave, however, means a signal very much poorer in quality than a typical VHF or UHF (Ultra High Frequency) signal, and one that is very susceptible to slight atmospheric shifts. HF propagation can vary with time of day, month of the year, sunspot activity, etc., so it becomes extremely important to use more than one frequency to ensure communications under differing conditions.

A number of specific characteristics must be considered when discussing skywaves in an HF-SSB system. One of the most important is the operating frequency of the system. In general, the lower frequencies are used for medium distances, and the higher frequencies for greater distances. As a general rule of thumb for daytime operations, multiply the frequency in MHz by 100 to obtain the approximate skywave coverage distance in miles: 4 MHz equals 400 miles, and 12 MHz equals 1200 miles. At night, these ranges are from 2 to 3 times greater. The nature of the ionosphere is such that its effective position varies with the time of day, tending to move higher up after sundown. This means that the same frequency will reach farther at night, and it is therefore common practice to use lower frequency at night for coverage of the same distance.

## Radio Procedure

Inasmuch as the airwaves are in the public domain, it is the responsibility of the radio station operator to conduct business according to established guidelines and procedures. While on the air, the operator should follow the following format outline:

1. Listen before beginning transmission in order to ensure that you are not interfering with other stations or with emergency radio traffic.
2. Identify your station when calling. On the SSB, a calling station must limit the duration of the hail to not more than 30 seconds. If there is no reply, the hail may be repeated at 2 minute intervals up to a maximum of three times, at which time the calling station must sign off and wait a minimum of 15 minutes before making another attempt. This requirement does not apply in emergency situations.
3. Keep transmissions short and concise, giving the other station a chance to respond, ask questions, or reconfirm an unclear message. A long, complicated message can best be effected in short segments, with breaks in between to ensure that the receiving station has copied each portion of the message correctly.
4. Follow correct radio procedure while on the air. The phonetic alphabet should be learned and used -- spelling unclear words with an extemporaneous phonetic alphabet can lead to misunderstood messages. You should also know and use the radio "punctuation" words ("over", "clear", "out", "roger", "words twice", "say again", "standing by", and "break"). Since most radio communication is only one way at a time, these words can be invaluable for signaling your intentions to the receiving station. Make sure to speak directly into the microphone; speaking loudly, slowly, and distinctly -- but not shouting -- can significantly improve the legibility of radio broadcasts. The use of profanity on the public airwaves is strictly forbidden.
5. Upon completing a transmission, you must sign off by identifying your station and using the words "clear" or "out" (or, if you expect to soon resume contact with the same station, by using the phrase "standing by").

## Radio Telephone Procedure - Continued

1. Radios are different from telephones in that they cannot transmit and receive simultaneously. Therefore when you have temporarily finished talking and are ready to listen, say "over," and release the button on your microphone. When the other party is ready to listen they will say "over." At the end of your entire message, say "out" rather than "over." Keep in mind that people on other ships can overhear your conversation, so watch what you say.
2. Sounds are easily garbled on marine radios so the phonetic alphabet is used when sailors want to spell something. Here are the words that the Coast Guard will recognize as letters:

A - alpha	N - November
B - bravo	O - Oscar
C - Charlie	P - papa
D - delta	Q - Quebec
E - echo	R - Romeo
F - foxtrot	S - Sierra
G - gulf	T - tango
H - hotel	U - uniform
I - India	V - victor
J - Juliet	W - whiskey
K - kilo (keeloes)	X - x-ray
L - Lima (Leema)	Y - Yankee
M - mike	Z - Zulu

3. Every ship and all Coast Guard stations continually listen to the emergency frequencies. Therefore when you want to talk to someone, call on an emergency frequency. As soon as you contact them, arrange to switch to another channel. It is illegal, impolite, unfair, and dangerous to talk on emergency channels. Sometimes atmospheric conditions are such that the emergency frequencies are the only ones that work. At those times you simply cannot communicate via radio except to report emergencies.

Emergency frequencies are:

FM Channel 16, international distress  
FM Channel 13, for ships to use to avoid collisions. You can contact other ships on 13, but not Coast Guard shore stations.  
AM 2182, international distress

(Almost certainly as an observer you will only be using FM frequencies.)

4. When you initially contact another station make sure you state what channel you are broadcasting on, since all ships and stations constantly listen to several.
5. Speak in normal tones, using normal conversational pauses and emphasis.
6. Ensure that your messages are brief and businesslike. No chatter.
7. When trying to establish communications repeat the other station's name, and your name, at least twice. A typical message may be as follows:

You - "Coast Guard Station Kodiak, Coast Guard Station Kodiak; this is the fishing

vessel Starry Flounder, Whiskey Tango Zulu 4190; this is the fishing vessel Starry Flounder, Whiskey Tango Zulu 4190; on channel 16, over."

C.G.- "Fishing vessel Starry Flounder this is Coast Guard Station Kodiak, shift and answer on channel 11, out."

You - "Coast Guard Station Kodiak, Coast Guard Station Kodiak, this is the Starry Flounder on channel 11, over."

C.G.- "Fishing vessel Starry Flounder, this is Coast Guard Station Kodiak, send your traffic, over."

You - "Kodiak, this is the Starry Flounder, I am an observer talking for the captain. A crewman has a badly crushed arm and needs hospitalization. Can you evacuate the crewman? Over."

C.G. - "Vessel Starry Flounder, this is Kodiak. Affirmative. What is your current position? Over."

You - "Kodiak this is the Starry Flounder. Position 55 degrees 50 minutes north, 157 degrees, 24 minutes west, over." etc.

## MEDICAL DIAGNOSTIC CHART (MDC)

One of the most important functions an observer can perform during a medical emergency is the collection and maintenance of a medical history. This history and its communication to the Coast Guard is essential to the further treatment of an injured person.

There are two histories to be aware of. The first deals with the patient's bodily make-up and past medical concerns. The second history is a record of the accident or illness and how it is affecting the patient over time. These two pieces of information will give doctors and corpsmen, hundreds of miles away, a greater diagnostic tool of what's happening inside the patient's body and what complications may lie ahead.

The patient's past medical history is the "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./ 5 ft. 7 in. / medium build/ no allergies/ no medications///. [Please note that what is underlined would be in your radio message.] This "framework" information is just as important as the details you are about to fill in.

Without previous training and using what is available, you can observe and record the nature of the accident and the patient's vital signs. 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 name 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.

NOJ 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 OWNER/ JOE SMITH/ HOMER/ 907 123-4567///PLEASE ADVISE BEST COURSE OF ACTION///

## MEDICAL DIAGNOSTIC CHART (MDC)

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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:

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Don't forget to have ready, the patient's name, the vessel name and the vessel owner's name and address. All of this extra information is necessary to expedite travel and personnel transfers and to inform family members.

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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.

NOJ 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 OWNER/ JOE SMITH/ HOMER/ 907 123-4567///PLEASE ADVISE BEST COURSE  
OF ACTION///

MDC RADIO WORKSHEET AND FLOW CHART

- (1) VESSEL'S NAME & CALL SIGN \_\_\_\_\_  
 (2) VESSEL'S LAT. & LONG. \_\_\_\_\_ (3) TIME & DATE \_\_\_\_\_ (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

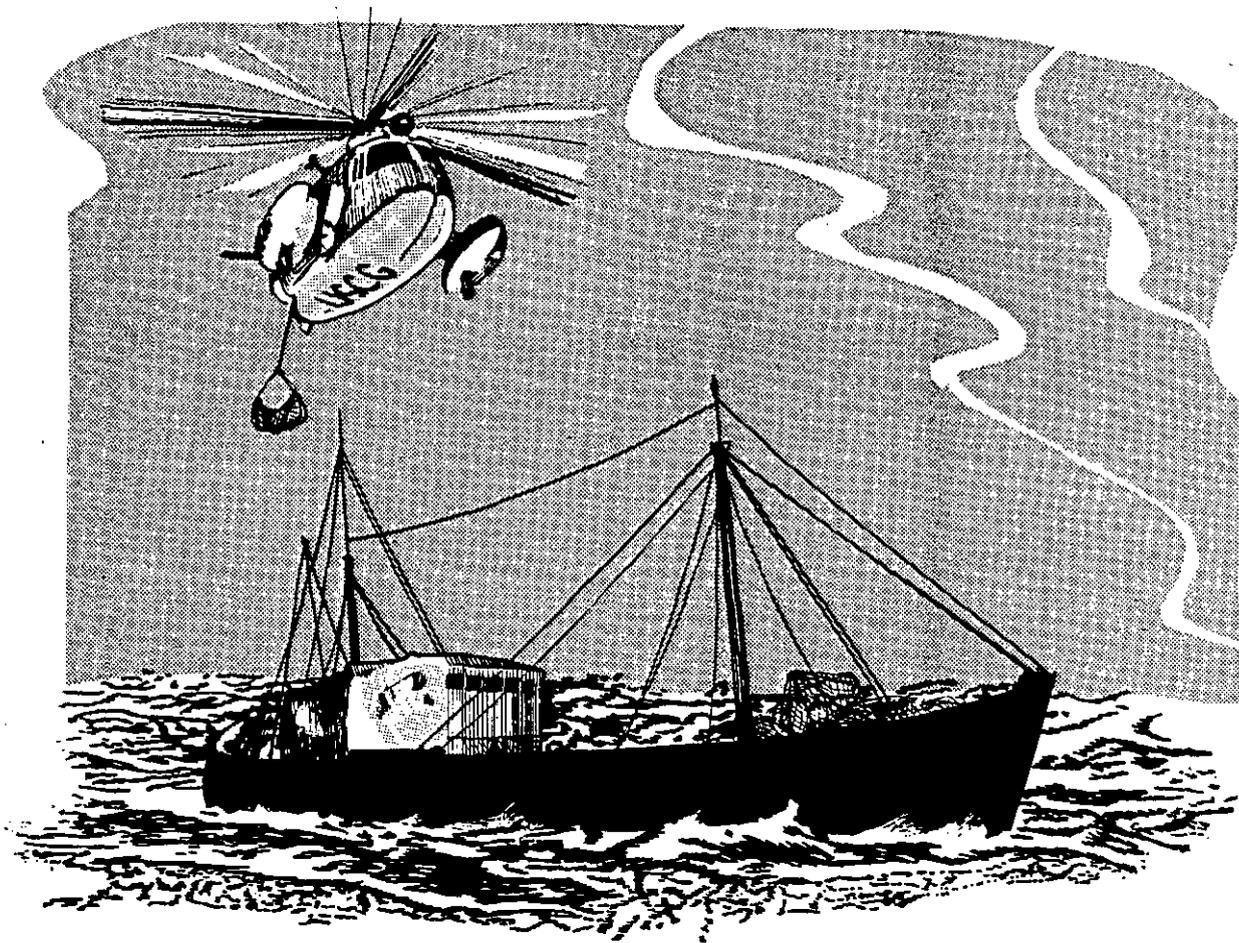
(20) EYES

- 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  
 Thready  
 Irregular





## 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.

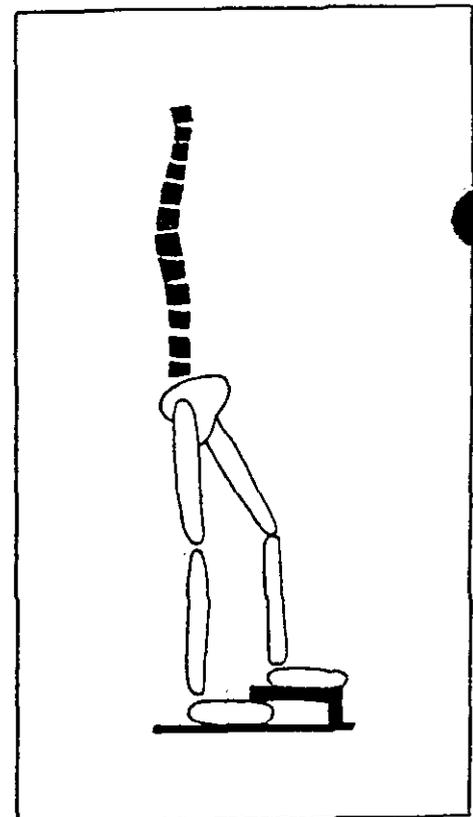
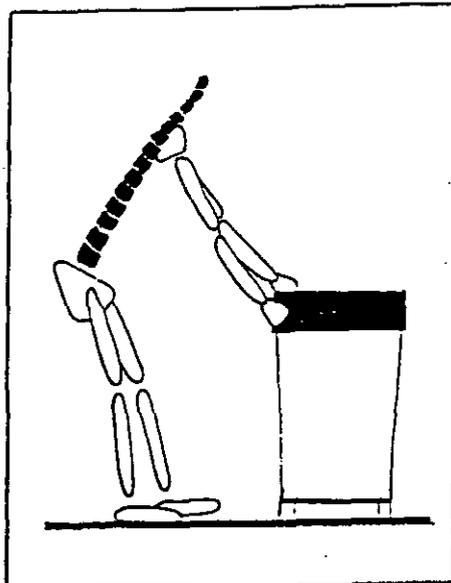
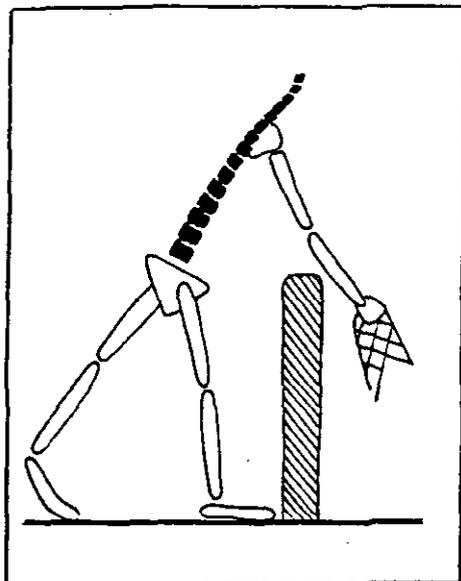
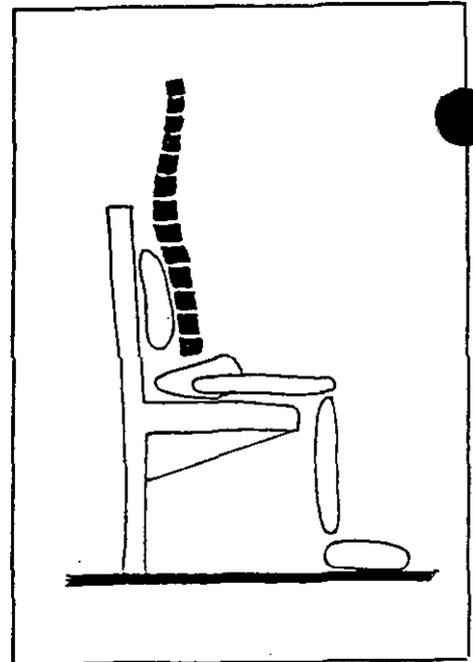
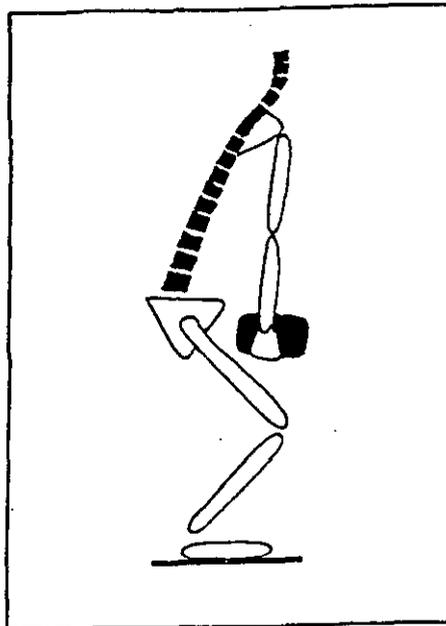
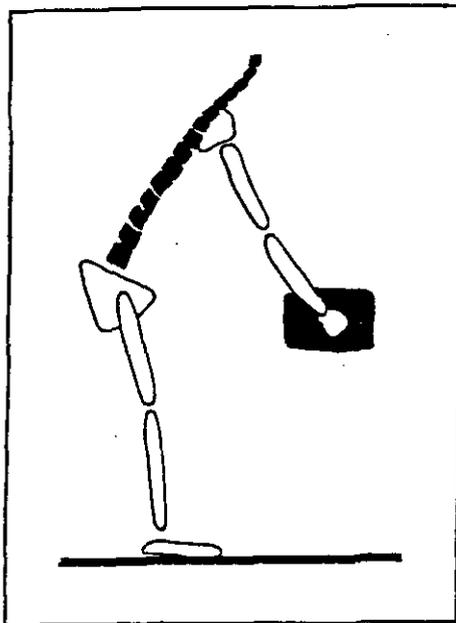
▲ Conditions permitting, have patient in life jacket, strapped in, face up, and hands clear of sides.

▲ 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.

## PREVENTING BACK INJURIES



1. The stress on the back is increased when the work is too far away from the body.

2. Taking the time to get a load directly in front of and close to you will reduce the chance of hurting your back. Always bend your knees and lift with a straight back.

3. If you have to sit for a long period, make sure the seat supports the lower back. If it doesn't, put a rolled-up sweater or towel behind your waist.

4. If you have to reach over something to do a job, put your weight on one leg and stretch the other leg straight out behind.

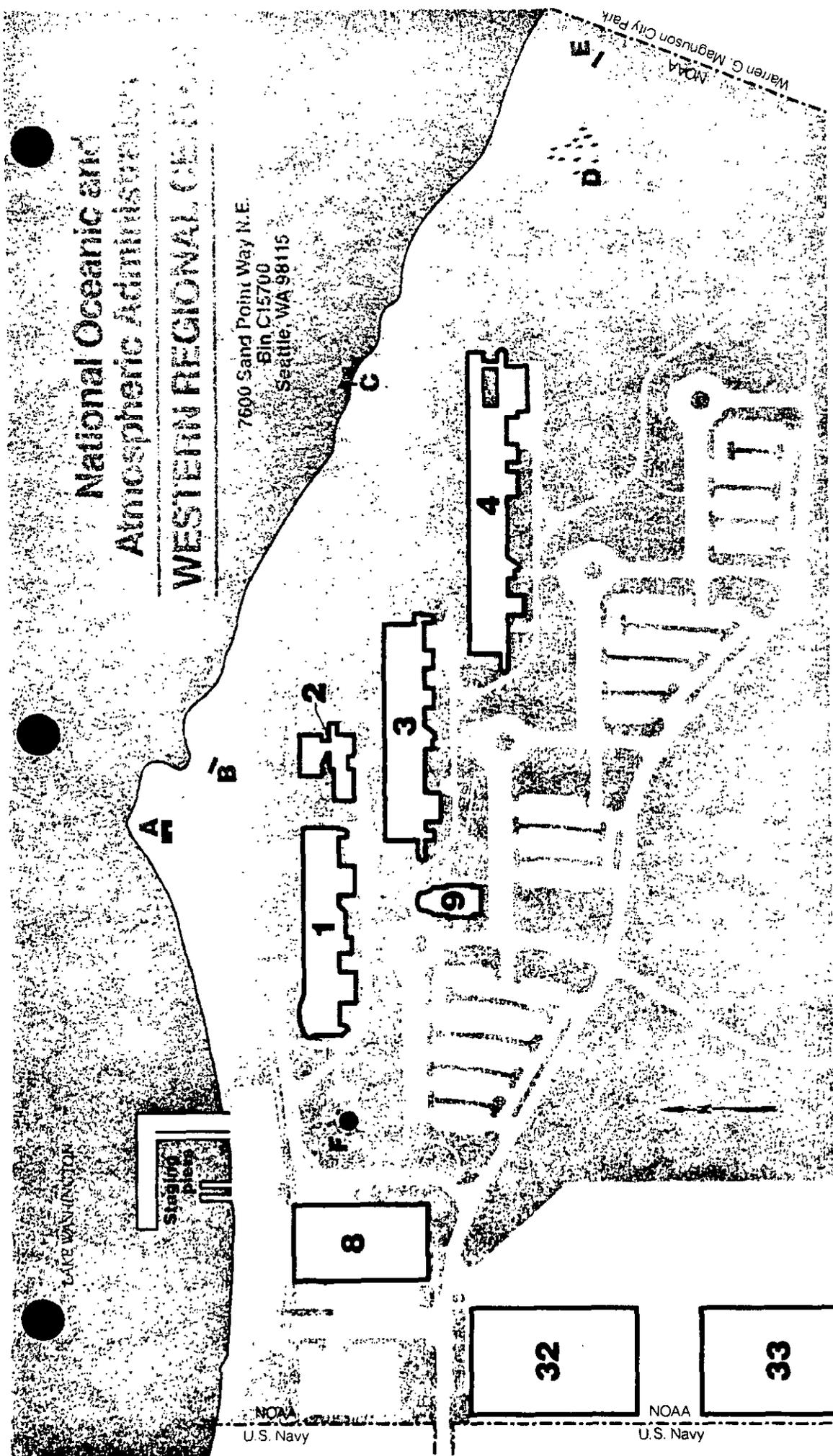
5. If you have to pull or push an object, take the extra step to get it straight in front of you.

6. If you must stand for a long period, put one foot up on a low ledge or rail.

**National Oceanic and Atmospheric Administration**

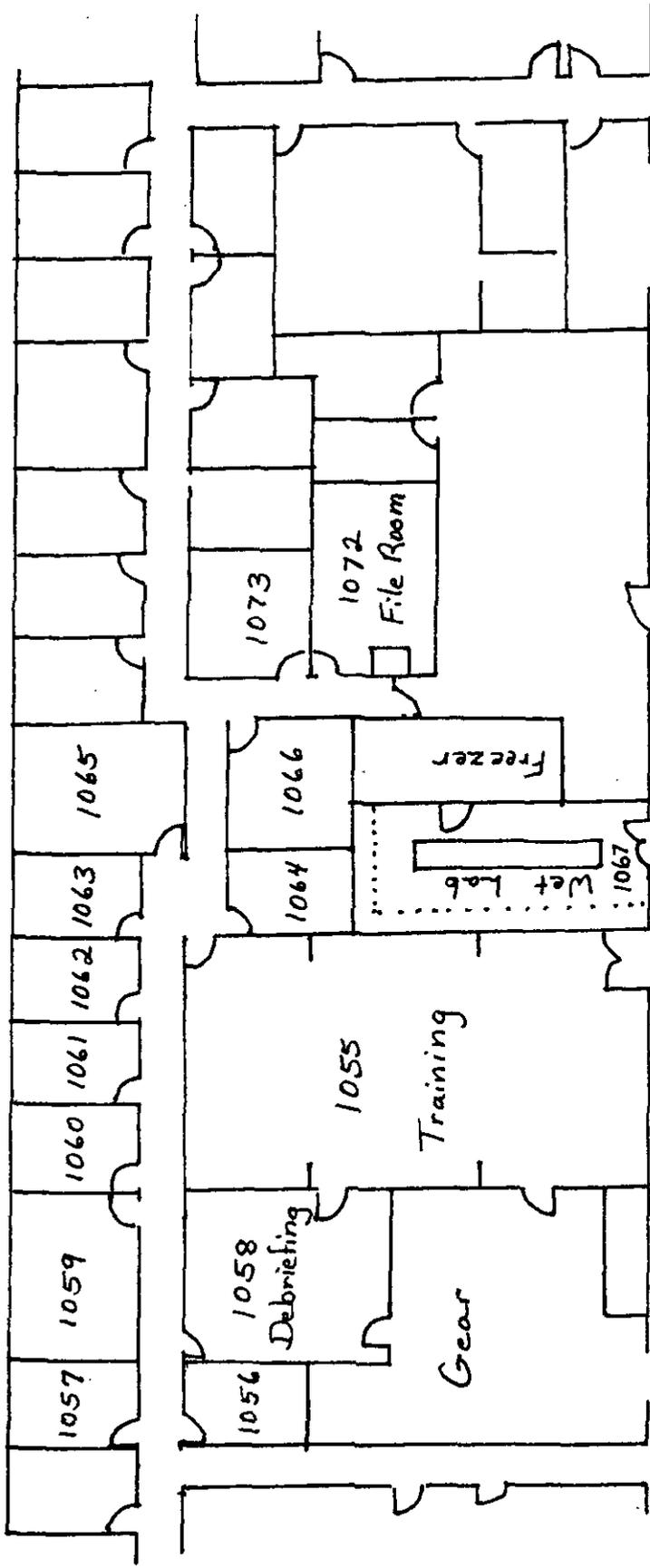
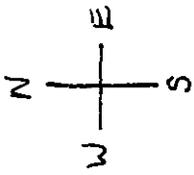
**WESTERN REGIONAL CENTER**

7600 Sand Point Way N.E.  
 Bldg. C15700  
 Seattle, WA 98115



For safety sake — use sidewalks and paths, and observe speed limits

- |   |   |  |
|---|---|--|
| <p><b>Building 1</b><br/>                 NW Regional Office, NMFS.<br/>                 NW Regional Counsel.<br/>                 NW Ocean Service Center.<br/>                 Public Affairs.<br/>                 Office for Civil Rights.<br/>                 National Weather Service Forecast Office.<br/>                 Western Administrative Support Center.</p> | <p><b>Building 3</b><br/>                 Pacific Marine Environmental Laboratory.<br/>                 Nautical Chart Branch, PMC.<br/>                 Library &amp; Information Services Division.<br/>                 Ocean Assessments Division, NOS.</p> | <p><b>Artworks</b></p> <p><b>A</b> Viewpoint<br/> <b>B</b> NOAA Bridge<br/> <b>C</b> Berth Haven<br/> <b>D</b> A Sound Garden<br/> <b>E</b> NOAA Bridge<br/> <b>F</b> Knoll for NOAA</p> |
| <p><b>Building 2</b><br/>                 Cafeteria.<br/>                 Health care facility.</p>   | <p><b>Building 4</b><br/>                 Northwest &amp; Alaska Fisheries Center, NMFS</p>   |  |
| <p><b>Building 32</b><br/>                 NMFS Resource Assessment and Conservation Engineering</p>  | <p><b>Building 9</b><br/>                 Auditorium and seminar rooms</p>  |  |
| <p><b>Building 33</b><br/>                 Warehouse</p>  |   |  |
| <p><b>Building 8</b><br/>                 Pacific Tide Party, PMC.<br/>                 Western Regional Diving Facility.<br/>                 Shops.<br/>                 Warehouse.</p>   |   |  |



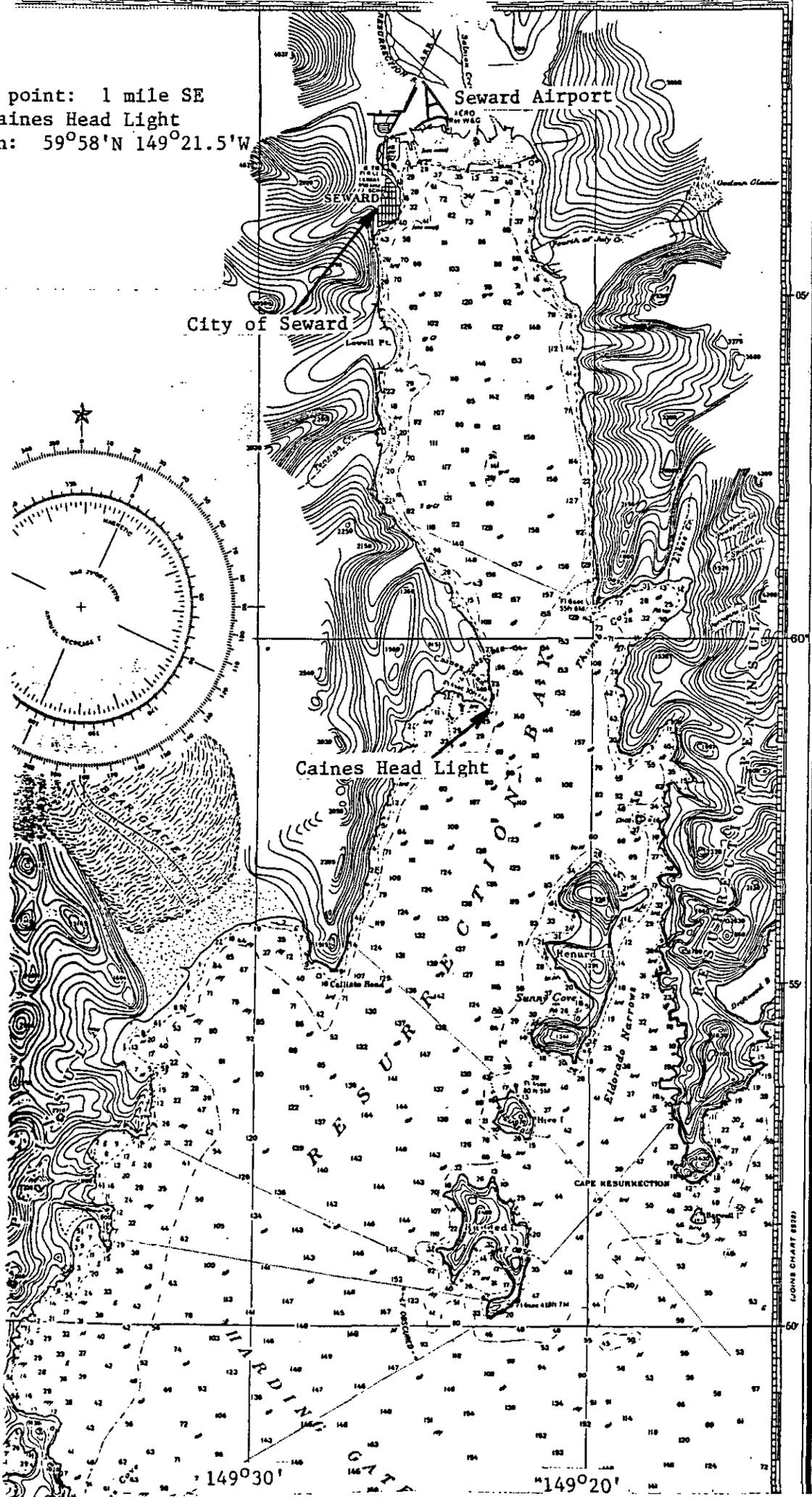
Observer Program Facilities, Building 4 ground floor





SEWARD

Pick-up point: 1 mile SE  
of Caines Head Light  
Position: 59°58'N 149°21.5'W



## 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. Also called live tank, refrigerated seawater tank (RSW tank), lobby.

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.

Directed fishing - targeting or fishing for a species quota.

Disembark - to get off a vessel.

EEZ - Exclusive Economic Zone. This is the term for the 200 mile jurisdiction zone formerly called the FCZ.

Embarkation - to board a vessel.

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.

Fresh weight - the weight of the whole fish (or animal) as it was when alive. Also called round weight, whole weight.

FUS - Fully Utilized Species. FUS is a designation given to bycatch species whose quota has been taken but the fishery was permitted to continue. Fully Utilized Species must be discarded from the catch like prohibited species.

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.

Hatch - an opening in a deck or bulkhead of a ship.

Haul - a catch of fish from one tow of a net

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 - an at-sea, floatin processing vessel whose fish come from catcher boats deliveries.

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/or numbers which are an international identifier of a vessel. The International Radio Call Sign (IRCS) is painted in large letters on the side of each vessel and on the deck of the flying bridge.

Rostrum - a pointed, calcareous, median extension on the anterior end of crab carapaces.

Regenerated scale - a fish scale which has grown in to replace one that was lost. Regenerated scales are useless for aging the fish.

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.

Stern trawler - any of various sized fishing vessels which trawl a conical shaped mesh net through the water, haul it up a ramp through the stern of the ship, empty, and process the catch to make a wholesale fish product. These vessels may fish for a month or more at sea without support.

Surimi - minced fish meat paste usually produced from pollock.

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.