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NATIONAL MARINE FISHERIES SERVICE

ALASKA FISHERIES SCIENCE CENTER

SEATTLE, WASHINGTON

Manual for Biologists

Aboard Domestic Groundfish Vessels

1991

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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.

ROLE OF THE OBSERVER IN THE DOMESTIC FISHERIES OBSERVER PROGRAM

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of 20 - 35% of groundfish trawlers to monitor incidental take of marine mammals but this coverage requirement will be superseded by a domestic observer program created by amendments to the Bering Sea and Gulf Of Alaska Groundfish Fishery Management Plans.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

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

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

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

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

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

Because the management councils are dependent upon the data obtained by observers in order to assess the impact of fisheries upon the stocks, the necessity for accuracy in data collections, accurate determinations of species, and complete fulfillment of the sampling plan cannot be over stressed. Data forms must be carefully completed and <u>checked</u>. 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 favorable upon the program. This means acting in an honest, professional, business-like manner in all situations. Specific guidelines follow:

1. Observers must diligently perform their assigned duties.

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

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

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

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

   b) use or distribution of illegal drugs; and

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

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

CONFLICT OF INTEREST STANDARDS

A NMFS-certified observer:

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

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

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

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

SPECIAL CAUTION ON DEPORTMENT

As a fisheries observer:

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

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

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

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

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

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

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

7. An obvious point (but one of extreme importance) is the prohibition of any sexual activity 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 form the vessel to allow sampling the catch or observing the transfer, unless the observer specifically requests not to be notified;

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

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

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

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

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

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

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

A manager of a shoreside processing facility must:

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

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

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

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

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

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

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

PROHIBITED ACTIONS

No person may:

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

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

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

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

PREPARATION AND DEPARTURE

COMMUNICATIONS

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

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

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

Becky Renko (catch messages) 1-800-437-9092
Russ Nelson (supervisor) (206) 526-4194
Janet Wall (supervisory assistant) (206) 526-4195
Bob Maier (program manager) (206) 526-6195
Debriefing Office (206) 526-4192
Gear Office (206) 526-6376
Karen Teig, Mike Brown or Sheryl Corey (training) (206) 526-4191
Kodiak Office, Martin Loefflad (907) 486-6920, fax (907) 486-6028

Address:

Observer Program, F/AKC2
Alaska Fisheries Science Center
7600 Sand Point Way NE
Bin C15700, Bldg. 4
Seattle, WA 98115-0070

THE TRAINING PERIOD

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

Domestic Observer Training Syllabus

Day 1

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

Day 2

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

Day 3

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

Day 4

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

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

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

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

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

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

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

Day 11
Correction of 2nd exercise homework
Receive special project instruction.
The Marine Mammal Protection Act, Exemption System and the observer's role
Recording information on marine mammals: as incidental take, (form 10); sightings, (form 11).
Guest Lecture: 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 - on-shore and aboard floating processors.
Marine Mammal watches for plant observers.
Gear issue: familiarization and care of equipment, gear check-out and calibration of scales.

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

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

Vessel and observer schedule arrangements are a difficult task. Though you may express a preference for a vessel type, an observer must be willing and able to accept any assignment. The observer-in-training should be prepared for changes in ship assignments and 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)
10 ~~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 counter (1) - (longline observers take 3)
Twine (1)
Knife (1)

Whet stone (l)
Flashlight and batteries

<u>The following items will be checked out either before or during gear issue:</u>

Sleeping bag (1)
Survival suit, signal light, whistle (1 each)
Life vest (with whistle)
Rain pants and jacket (l set)
Boots (l pair)
Rubber gloves (3 pair)
Manila folder containing:
  Carbon paper (l0 sheets)
  Graph paper (2 - 5 sheets)
  Shipping Label for basket (1)
Data forms (important! - check for completeness!)
Calipers (l) - for those who are to measure crab
Otolith vials (200-600) - for those who are to collect age structures
Vial block (l) (if collecting otoliths or cod scales)
Liter bottle of alcohol for roundfish or glycerol for flatfish age structures (l)
Squirt bottle for alcohol (l) (if collecting otoliths or cod scales)
Book - Hart (Optional, issued on request)
Extra calculator batteries (if appropriate)
Safety goggles (for observers on longliners, optional item for others)
Earplugs (2 pair) (optional, issued on request)

<u>The following gear will be handed out during training class:</u>

Observer Sampling Manual (1)
Mechanical Pencil (1) with extra lead
Calculator (l)
Handouts - Key to the Families, Gadidae Key, Flatfish Key, Rockfish Key
Book - Hitz (1)
Book - Eschmeyer (1)
Species identification manual (check for completeness)
Marine mammal guide
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
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

Vessel Reports:

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

Port Sampling Forms	**No. of Pages per Month:**
Form A	10
Form 3US	10
Plant Discards Sampling Form	10
Plant Observer Catch Message Form	5

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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, wheels, and books) List the items weighed and their total weight. This known weight may then be used later to check your scale adjustment or to check the accuracy of shipboard scales.

Prior to using your baskets for weighing, weigh the empty baskets so you will know how much to subtract from each weight figure to reflect the weight of the basket contents only. Be sure to keep track of the basket fitted with wheel sockets as it will be heavier than the others.

Accurate weights are sometimes hard to obtain when the ship is rolling. When possible,

secure the top of the scale directly to a fixed structure, such as a ceiling brace. If the top of the scale has to be attached to the ceiling by a length of rope, use three ropes attached to widely separated points on the ceiling to minimize the swing of the scale. Shortening the length of the ropes to the basket also helps. Scales located close to the center of the ship tend to swing less. If a 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."[1] Indigestible stomach contents, unpleasant fumes or cooking smells, and anticipatory fear will trigger seasickness. The symptoms are nausea, headache, drowsiness, and depression. This is **normal**, it's just difficult to live with. Remember, no one ever dies of seasickness, but what can be a danger is weakness, so you must make yourself drink water or some non-acidic juice and try to eat some mild food (soda crackers are often recommended) to keep up your strength.

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

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[1]Excerpt from: Psychology of Sailing, by Michael Stadler, PhD. International Marine Publishing Co., Camden, Maine. Copyright 1987.

[2]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 extremly hazardous. Observers must watch carefully where they step and

where they grab for handholds.

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

13. Treat all minor cuts, especially those on hands, with antiseptic to avoid infection from fish slime. Poisoning from fish slime is called cellulitus and is a form of staph infection. Should a staph infection be left untreated and allowed to develop, your lymphatic system becomes involved and the threat to your health becomes much more far-reaching than simply a pair of inoperative hands. Wash hands thoroughly after sampling in a solution of very hot water and an antiseptic such as betadine or providone iodine (1-2 oz.per qt. of water). Disinfectants such as Clorox, Lysol or Purex tend to sap your skin's natural chemicals and prolonged use may make you even more vulnerable to fish poisoning.

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

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

Safety in At-Sea Transfers

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

There are no hard and fast rules for allowable safety limits during transfers. Conditions such as 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. On catcher/processor vessels, inquire as to how to send the weekly catch messages.

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

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

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

day or two

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

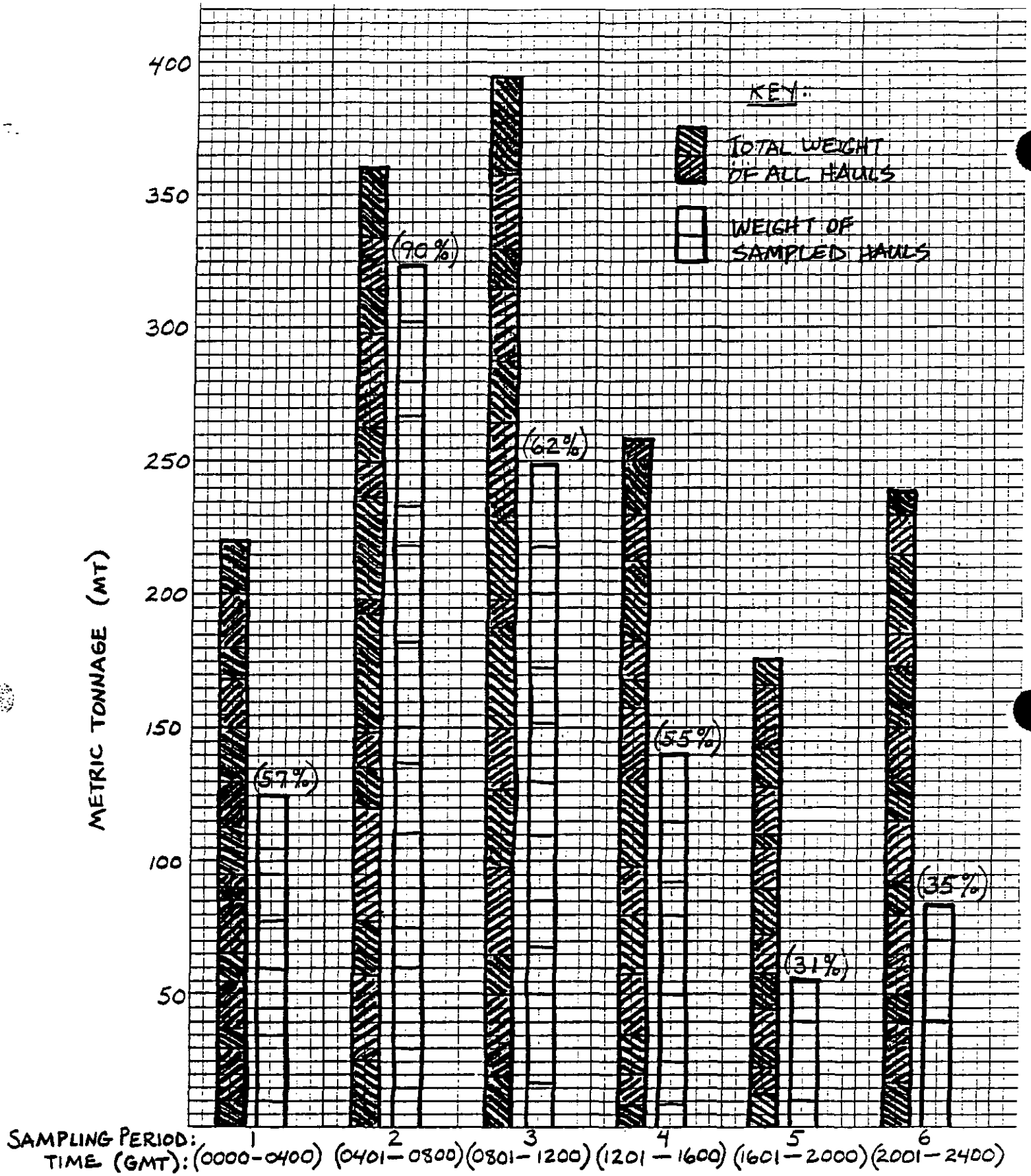
The main work objectives of observers are to record any incidental take of marine mammals, make independent estimates of catch size, determine the catch composition, figure out the incidence of specified prohibited species in the catch, collect biological data on the prohibited, target and other species 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 most important thing to remember is to take random, unbiased samples such that your data will be representative of the catch with a maximum amount of accuracy. We stress the taking of representative samples in all data collections. Accuracy is important in all aspects of the work, including: the physical sampling, recording the data on plastic sheets, transposing the data on the plastic sheets to the final paper copy, and correctly summing and transposing data for the weekly catch reports. The need for 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.

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

Biological data from prohibited species:

4. Sex and identify to species, all the salmon, king and Tanner crab in your sample if possible, or take a random subsample for sexing (Form 3US).

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

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

See 69, (5)

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

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

Every Day:

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

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

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

Per Vessel: (not in order of priority)

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

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

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

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

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

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.

Sampling Over The Change To A New Year

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

When A Vessel Fishes With More Than One Type of Gear

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

PAGE NUMBERING

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

CALCULATION GUIDELINES: THE ROUNDING RULE

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

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

In all your data:

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

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

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

Cruise no.					Vessel code				Year	
1	2	3	4	5	6	7	8	9	10	11
									9	0

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

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

List of catcher boats

full catcher boat name	Vessel code
Sea Scavenger	AR44

Page 2 of ____

Depth (columns 50 and 55)
M = meters
F = fathoms

Hauls sampled	Date Mo. (12-13)	Date Day (14-15)	Haul no. (16-18)	Gear type (21)	Gear performance (22)	Processing mode (23)	Location code (24)	(N) latitude (25-28)	E/W (29)	(1) longitude (30-33)	Fishing time (ALT) Nets on bottom (34-37)	Nets off bottom (38-41)	Fishing duration (min) (42-45)	Avg. fishing depth (46-49)	M/F (50)	Avg. bottom depth (51-54)	M/F (55)	Avg. speed (knot) (56-57)	Retained catch (round wt.) (mt.) (58-62)	Official total catch (mt.) (63-67)	Observers total catch (mt.) (68-72)	ADF&G stat. area (73-78)	Vessel Code (79-82)
M✓	09	10	101	1	1	1	R	5838	W	7624	2345	0525	340	130	F	130	F	3.5	15.80	16.00	18.50	765830	
	↓	↓	102	↓	1	↓	↓	5837	↓	7630	0610	0920	190	135	↓	135	↓	3.5	7.94	8.25		↓	
M✓			103		2			5837		7607	1015	1435	260	140		150		3.2	19.90	20.00	18.00		
M✓		↓	104	↓	1		↓	5838		7647	1530	1850	200	140	↓	145	↓	3.2	10.50	12.00	13.50		
✓		10	105	1	1		R	5838		7654	1935	2330	235	138	F	138	F	3.5	17.92	18.62			
		11	0				N	5832		7620	No Fishing – Rough Seas											765830	
M✓		12	106	1	1		R	5826		7553	2000	0000	240	240	F	260	F	3.4	8.50	11.75	11.00	755800	
		↓	107	1	1			5824		7525	0145	0745	360	240		260		3.6	5.62	7.28			
M✓			108	2	1			5826		7511	0830	1100	150	235		250		3.6	6.30	8.22	8.50		
M	↓	↓	109	2	2	↓	↓	5826	↓	7546	1200	1300	60	220	↓	245	↓	3.0	10.20	13.21	15.00	755800	
M✓	09	12	110	2	4	1	R	5814	W	7710	1800	2350	350	250	F	265	F	3.2	5.34	6.12	7.00	775800	
			A catcher/processor also taking outside deliveries:																				
	11	18	28	2	1	1	R	5859	W	7531	2215	0045	150	70	F	73	F	4.5	60.00	60.00		755830	Self
M✓	↓	↓	29			2		5851		7531	1730	0300	570			72		4.1	63.97	64.00	62.85		AR44
M		↓	30			1		5854		7554	0330	1000	390	66	F	71	↓	4.4	89.92	90.00	85.81		Self
		18	31			1		5846		7551	1720	2200	280	66	F	71	F	4.4	89.96	90.00			Self
M✓		19	32			2		5840		7552	1700	0730	870			70	F	4.1	63.98	64.00	67.10	755830	AR44
	↓	19	33	↓	↓	1	↓	5843	↓	7616	1000	1930	570	70	F	70	F	4.2	60.00	60.00		765830	Self
M✓	11	19	34	2	1	2	R	5844	W	7614	1030	1730	420			71	F	3.9	39.99	40.00	40.83	765830	AR44

Observers aboard floating processors which pump fish from the holds of catcher boats and observers at shoreside plants do not fill out form 2US but instead fill out the Port Sample Summary form A (refer to the Plant Sampling section of this manual).

Specify diff w/floaters

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~~ 2US forms from the ship's logs from vessel personnel, and from direct observation. Logbook information may need to be adjusted if it is not recorded according to instructions below. Check carefully to see that no errors are made in copying the data to the forms and that the data are reasonable. Points to note:

1. Collect Form 2US data for the entire period you are aboard. Make certain that you have all of the hauls recorded. **Do not** make the mistake of recording only the sampled hauls for instance.

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 for species composition and/or enter the letter M for the hauls you monitored for the incidental catch of marine mammals. In the left **margin** enter the NMFS area code.

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

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

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

   2 - pelagic trawl - a trawl which does not have discs, bobbins, rollers, or other chafe protection gear attached to the foot rope, but may have weights on the wing tips. (1) The net must have stretched mesh sizes of at least 64 inches, as measured between knots, starting at all points on the fishing line, head rope, and breast lines and extending aft for a distance of at least ten meshes from the fishing line, head rope, and breast lines and going around the entire circumference of the

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

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

6. Enter the gear performance code:

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

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

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

Done

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

Retained

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

Remove

4 - The vessel is a floating processor which pumps fish from the holds of catcher boats (fish may be sorted), and may also land unsorted codends.

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

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

[Note for Mothership observers: Deliveries of catcher boats will not always (or perhaps, not even usually) be made in the order in which they were retrieved. As you will probably obtain the information in order of delivery, you will need to re-copy the data in order of codend retrieval 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..."]

② X Enter an "N" for noon position under location code

9. If there were no hauls on a given day (due to bad weather, mechanical breakdowns, traveling etc.) enter③ the Alaska Local Time (ALT) noon position in columns 25-33 and ①enter 0 in the haul number column.④ In columns 34-72, comment on the reason there was no fishing.⑤ Enter the ADF&G statistical area corresponding to the noon position in columns 73 - 78. All days at sea must be accounted for in this manner.

10. 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.

11. The location entered should be the haul retrieval position - the location of the ship when a particular haul is begun to be retrieved, i.e. when the winches begin bringing in the cable. (For a mothership the location entered may be a delivery postion if retrieval positions are not available.) Check the latitude and longitude for all positions entered on 2US to make sure that they are reasonable - i.e., 58°63' does not exist; double check positions that indicate large movements if you have not been aware of any. 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.

12. 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.

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

14. The time when net retrieval is begun is recorded under "nets off bottom". ("Bottom" in this context refers to the fishing level rather than the actual ocean floor.) "Nets on bottom" refers to the time that the net first reaches the fishing level and the winches stop paying out cable.

Each Delivery of a catcher boat must be noted on a line of 2US. Write the plant name, date & time of delivery.

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

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

17. 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.]

18. The average fishing depth (cols 46-49) and average bottom depth (cols 51-54) can be recorded in either fathoms (more likely) or meters, depending on the depth recording instruments that the vessel has. Try to obtain both fishing and bottom depths as that will indicate whether the net was fishing on or off the bottom. Make sure you indicate the units (fathoms or meters) for every depth that you record (cols 50 and 55).

19. Record the average trawl speed with a decimal point to tenths of a knot in columns 56-57.

20. 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.

21. Official total catch: this will be the official catch weight (OTC) for the haul, and should be used for all entries of haul weight on 3US forms and on weekly catch message forms. 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. There must be an entry of OTC for every haul on 2US

22. Observer's estimate: this will be an estimate made independently from any ship or plant information. You should make independent estimates of some un-sampled hauls as well as of hauls you intend to sample. 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.

23. Enter the 6-digit ADF&G statistical area that the haul retrieval position places each haul in. Refer to the special supplement on the ADF&G statistical areas to determine the correct area. The ADF&G statistical area must correspond with the latitude and longitude entered in the location columns.

24. 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.

25. Leading zeros should be in the dates (cols 12 & 14) and the times (cols 34-41) only, as needed.

26. Skip a line after each day.

27. 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 their Daily Fishing or 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 which may be also used as the OTC and 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.

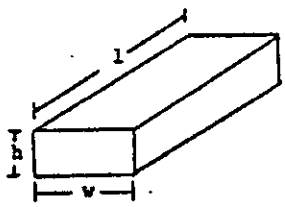
Skipper's Deck Estimates

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.

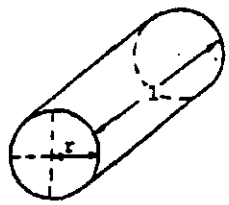
Observer estimates of total catch are an important part of the reason you are there, so you should do your best to get good data. Always make substantiated estimates of catch weight even if you are using the skipper's estimate for OTC. When observer estimates are made, record them in columns 68 - 72 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.

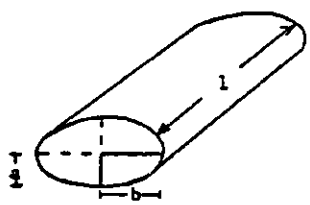


Rectangular solid
Volume = height x width x length
$V = hwl$

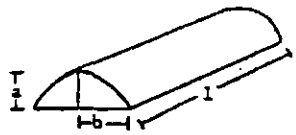


Cylinder
Volume = π x radius^2 x length
$V = \pi r^2 l$

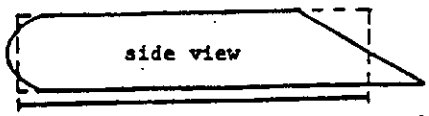
(π=3.1416)

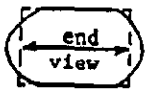


Ellipsoidal solid
Volume = π x short radius x long radius x length
$V = \pi abl$



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





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

The deck crew will often have orders or for their own reasons will want to empty the net as

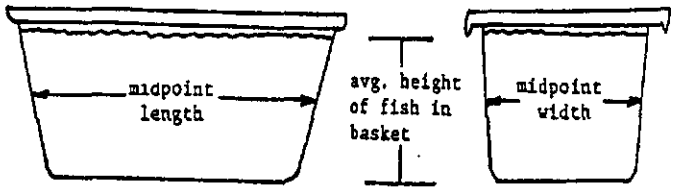
quickly as possible. They may be reluctant to allow an observer time to make the needed measurements. Prepare for this possibility by making sure the skipper is aware of your needs and by being ready to get your measurements as quickly as possible. Be ready to step on deck as soon as the winch cables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

Density Sampling

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

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

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



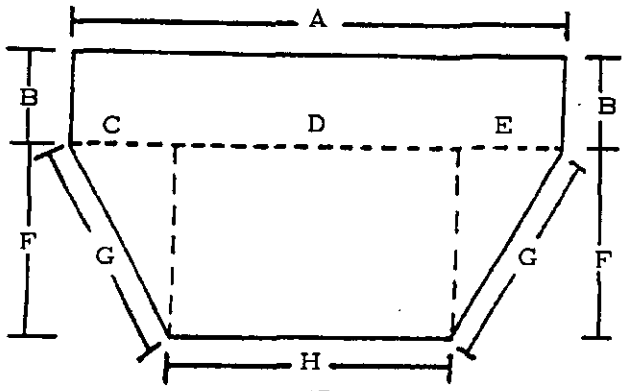
After the volume of an average basket is calculated, you need to obtain the average weight of four or more baskets. Be careful to take a random sample of the catch and to fill all your baskets consistently to the same level. Then simply divide the average weight of a basket by the average volume of a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

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

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

The height of fish in the bin is the third dimension needed to determine volume. If the bin is sided with common width boards of known dimension, use the height of each board to estimate the height of fish in the bin. If the bin is of other composition, ask if you can use some paint to make a height 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 hail (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.

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

A product recovery rate (prr) 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.]

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

Product Weight x Conversion Factor = 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).

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

Haul No.	Deck Est.	% of Day's Catch	Retained Catch/Haul
14	45 t	45/150	40.00 t
15	30	30/150	26.67
16	55	55/150	48.89
17	20	20/150	17.78
	150 t		133.34 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 and divide it up 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.

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

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

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

$$\frac{16.00 + 20.00 + 12.00}{15.80 + 19.90 + 10.50} = \frac{48.00}{46.20} = 1.0390$$

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.

Example 1

FORM 3US—SPECIES COMPOSITION

Page _____ of _____

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

Worksheet

Species:	pollock	Salmon s	hank:	concentus	wt. est.	was
No. weighed:	206	about	200 lb -	rounded	to 90 Kg.	
Wt. of above:	88.6					
Avg. weight:	.43					

Other calc.; comments: Whole haul sampled for prohibs 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:
B= basket
P = partial whole haul
W = whole haul
O = other
V = viability only

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

Species name	Sex	Species code	ST	Number	Weight (in kg. w/ decimal pt.)	Sample weight (in kg. w/ decimal pt.)	Viability: Number excellent	Viability: Number poor	Viability: Number dead
	19	20–22	23	24–29	30–40	41–51	52–54	55–57	58–60
(Keypunch check)	X	9 9 9	X	3 7 2 2 1	16000.0	Haul wt. 16000.0	22	23	44
POP		301	W	1	.45	16000.0			
Redbanded rf		308		1 1	5.0				
Darkblotched rf		311		2	1.3				
Roughey rf		307		1	3.2				
Shortspine th.hd		350		1 2	4.5				
Sablefish		203		3 1	72.6				
Arrowtooth fl		141		2	5.0				
Rex Sole		105		6	1.45				
Alaska Plaice		106		1	4.1				
Salmon shark		66		1	90.0				
Tanner crab unid.	U	3		5 6 2	89.5				
Opilio Tanner	M	5		1 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 16	8.7		15	16	23
Pacific Halibut	U	101		2	6.2		1	1	
King Salmon	M	222		1	1.62				
King Salmon	F	222		1	2.1				
King Salmon	U	222		1	1.76				
King crab	U	2		0	0.0				
Pacific lamprey		79		2	1.4				
Squid		50		5	3.6				
Pollock		201	W	3 6 4 8 4	15691.48	16000.0			

Crab Calc.

2 predator sp.

FORM 3US—SPECIES COMPOSITION Example 2

Page _____ of _____

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. Fcod 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:
B= basket
P = partial whole haul
W = whole haul
O = other
V = viability only

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

	Sex	Species code			ST	Number						Weight (in kg. w/ decimal pt.)	Sample weight (in kg. w/ decimal pt.)	Viability: Number excellent			Number poor			Number dead		
Species name	19	20	21	22	23	24	25	26	27	28	29	30–40	41–51	52	53	54	55	56	57	58	59	60
(Keypunch check)	X	9	9	9	X				4	4	8	611.23	Haul wt. 20000.0								1	
Pacific halibut	U	101			W						1	5.0	20000.0								1	
Tanner crab unid.	U	3			↓						0	0.0	↓									
King crab unid.	U	2			↓						0	0.0	↓									
King salmon	M	222			↓						4	12.6	↓									
King salmon	F	222			↓						3	9.3	↓									
Chum salmon	F	221			W						1	1.96	20000.0									
Done Arrowtooth fl		203			B						2	2.6	582.37									
Sablefish		141			↓						1	1.85	↓									
Pollock		201			↓				3	2	4	181.44	↓									
P. cod		202			B				1	1	2	396.48	582.37									

Example 3

FORM 3US—SPECIES COMPOSITION Page _____ of _____

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

Worksheet

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

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

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

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

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

537.1

Done

Species name	Sex (19)	Species code (20–22)	ST (23)	Number (24–29)	Weight (in kg. w/ decimal pt.) (30–40)	Sample weight (in kg. w/ decimal pt.) (41–51)	Viability: Number excellent (52–54)	Viability: Number poor (55–57)	Viability: Number dead (58–60)
(Keypunch check)	X	9 9 9	X	1 6 5 6	520.7	Haul wt. 12000.0	20	38	67
Pacific Halibut	U	101	B	1	3.6	537.1			
Red King crab	M	13		1 4	6.1		10	3	1
Red King crab	F	13		6	.70		4	2	
Opilio Tanner	M	5		1 2 6	9.2		5	16	39
Opilio Tanner	F	5		6 1	6.1			10	20
Bairdi Tanner	M	4		1 3	1.1			3	3
Bairdi Tanner	F	4		1 5	1.0		1	4	4
Salmon unid	U	220		0	0.0				
Arrowtooth fl		141		3 1	89.1				
flathead sole		103		8 0 2	160.2				
rock sole		104		8 6	26.4				
yellowfin sole		140		4 3 1	200.5				
rex sole		105	↓	7 0	16.7	↓			
skate unid.		90	B	2	16.4	537.1			

FORM 3US—SPECIES COMPOSITION Example 4

Page _____ of _____

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.

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	1	1	0	5

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

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

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

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

3. The weight of catch which was sorted by the observer is the "sample weight". The sample weight will be the OTC if the whole haul was sorted by the observer. If less than the total catch was sampled, the sample weight may **only** be obtained by actually counting and/or weighing all the organisms in the sample.

4. There can be **only one sample weight for target species and bycatch** other than the four prohibited groups (halibut, salmon, king crab and tanner crab), per haul. Each of the prohibited species **groups** may be either whole-haul sampled or basket sampled per haul.

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

6. The sample is sorted according to species or species groups, and the weight, and number of individuals for each group is 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, which is not necessarily the date you sampled it.

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

3. List each species or species group by their common name and the corresponding code from the alphabetically arranged Species Code List in the "Reference Section" of this manual. Look up a species under its group name--rockfish, sculpin, sole, etc. Most fish,

especially the commercially important species, should be identified to species, if possible. See also the section on Species Identification which precedes the Code List.

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

5. All Tanner crab, king crab, or salmon should be listed separately by species and sex whenever possible. Pacific halibut should be listed with "U" for sex unknown. (Do not sex halibut, even the dead ones.) For **these species only**, record an "M", "F", or "U" in column 19. 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 examples 2 and 4).

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.

Explain

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

13. 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 <u>diverting</u> 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 <u>at least</u> 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.

This is a set of example calculations for a whole haul sample of a pollock tow. [Note: there is no example form with these data]

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~~ two species, pollock, ~~is~~ and cod predomina~~nt.~~te. 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 in 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 kg - 308.52 kg = 15691.48 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!*

   $\frac{\text{88.6 kg (wt. of pollock in subsample)}}{\text{206 (number of pollock in subsample)}}$ = .43 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 kg (wt. of pollock) ÷ $\frac{88.6}{206}$ = 36483.57652 or 36484 (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 kg - 94.6 kg = 19905.4 kg
   (sample wt) - (bycatch) = (combined wt of pollock & cod in total catch)

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

   the subsample yielded:

   151 pollock = 117.2 kg
   20 P. cod = 20.4 kg
   Total subsample weight = 137.6 kg

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

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

3. 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 x 19905.4 = 16919.59 kg = wt. of pollock in whole haul
   .15 x 19905.4 = 2985.81 kg = wt. of P. cod in whole haul

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

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

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

   $2985.81 \text{ kg} \div \frac{20.4}{20} \text{ kg} = 2927$ 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 <u>add up exactly</u> 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 defendable sampling data to back up any assumptions that form a basis for the rest of your data collection. Your choice of a sampling method must fall under the natural constraints of your available time, energy, and work space as well as consideration of the size of the catch and its diversity. To guide your judgement in choosing a sampling method, please comply with the following additional constraints to ensure proper and accountable data collection:

1) 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 <u>not</u> 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."

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

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

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

You will need to estimate the data for the unidentified tanner crab based on a subsample. If 4 out of 95 crab are "other tanner" how many "other tanner" would be expected out of 562? (See 3US example 1.) Do this for both number and weight. Don't use average weights.

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

Don't forget the totals numbers and weights on 3US must match the totals of the equivalent groups on the catch messages.

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

BIOLOGICAL DATA COLLECTED FROM PROHIBITED SPECIES

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

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

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

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

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

Collecting Data From Salmon and Steelhead

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

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

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

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

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

whose scales were not sampled.

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

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

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

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

Collecting Data From King and Tanner Crab

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

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

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

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

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

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

(f) **When given as a special project:** Viability--an estimate of the survival chance of each crab. This estimate is based upon an appraisal of the condition of the crab upon release to the sea. Refer to the guidelines on sampling viability of halibut. Apply those same

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

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

Collecting Data From Halibut

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

(a) Numbers--of halibut.

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

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

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

Viability of Halibut

One of our tasks is to assess the condition of halibut returned to the sea as they are normally handled by the crew. 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 Catch 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.

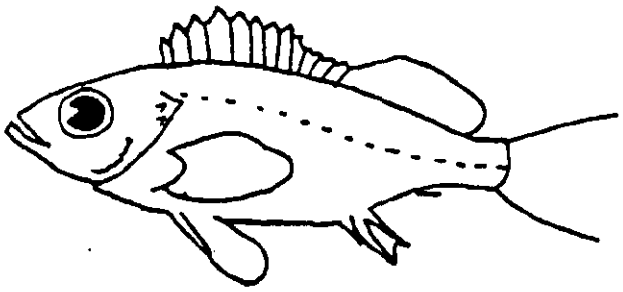
ROCKFISH SPECIES DESCRIPTION FORM

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 extention 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.)

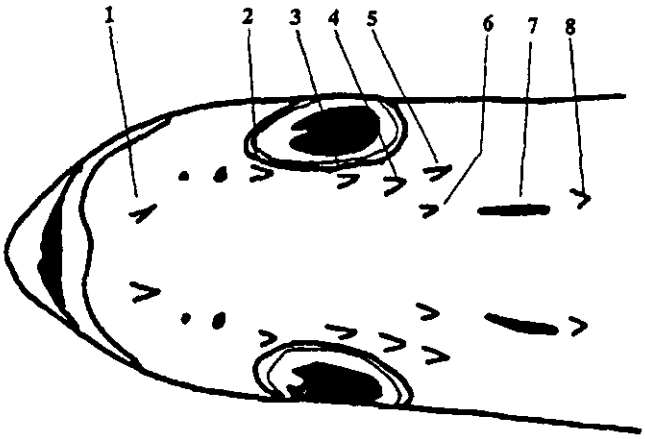
What color category of Hitz's would you place it in?

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



Which fish in Eschmeyer looks the most like your fish?

Plate number: _____ Common name: _____

Scientific name: _____

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

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

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

If not, which is larger? Second spine Third spine

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

Comments and Additional Notes:

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FLATFISH SPECIES DESCRIPTION FORM

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

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

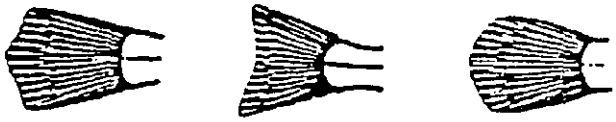
Is the flatfish right eyed or left eyed? _____

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

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

Please answer the following questions:

What is the general tail shape?



Does the fish have an accessory dorsal branch (ADB) of the lateral line?
____ Yes (If so, remember to sketch it in.)
____ No
Does the eye protrude over the profile of the head such that its' edge can be seen from the blind side? ___ Yes ___ No

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

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

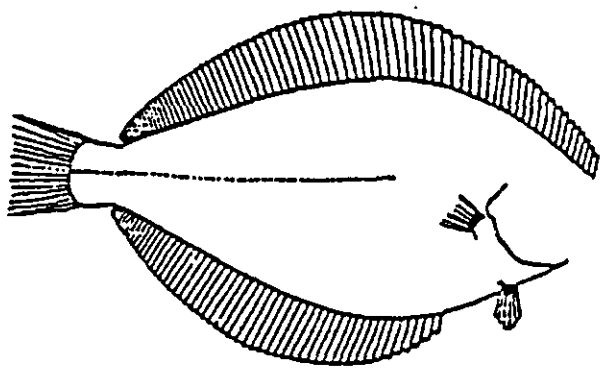
What is the preoperculum shape? Anal spine present?
___ rounded ___ angled ____Yes No____

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

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

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

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



Comments:_____
_____
_____

MISC. SPECIES DESCRIPTION FORM

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

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

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

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

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

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

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

Comments and Additional Notes:

_____
_____
_____
_____
_____
_____
_____

Draw Specimen on Reverse Side

SPECIES CODE LIST

CODE	COMMON NAME	SCIENTIFIC NAME
106	ALASKA PLAICE	PLEURONECTES QUADRITUBERCULATUS
450	ALLIGATORFISH, (POACHER) - UNIDENT.	AGONIDAE
610	ANCHOVY, NORTHERN	ENGRAULIS MORDAX
55	ANEMONE, SEA - UNIDENT.	ACTINIARIA
620	ARGENTINE - UNIDENT.	ARGENTINIDAE
43	ASCIDIANS, SEA SQUIRT, TUNICATE	UROCHORDATA
204	ATKA MACKEREL	PLEUROGRAMMUS MONOPTERYGIUS
48	BARNACLES	CIRRIPEDIA
795	BARRACUDA, PACIFIC (CALIFORNIA)	SPHYRAENA ARGENTEA
770	BARRACUDINA - UNIDENT.	PARALEPIDIDAE
622	BARRELEYE or SPOOKFISH - UNIDENT.	OPISTHOPROCTIDAE
289	BIGSCALE, (MELAMPHID) - UNIDENT.	MELAMPHAEIDAE
998	BIRDS - UNIDENT.	AVES
618	BLACKSMELT - UNIDENT.	BATHYLAGIDAE
260	BLENNY - UNIDENT.	PHOLIDAE, STICHAEIDAE
302	BOCACCIO	SEBASTES PAUCISPINIS
27	BRACHIOPOD, LAMPSHELL	BRACHYOPODA
54	BRISTLEWORM, LEECH, POLYCHAETES	ANNELIDA
32	BRYOZOANS	
604	CAPELIN	MALLOTUS VILLOSUS
44	CHITON - UNIDENT.	AMPHINEURA
199	CHUB MACKEREL	SCOMBER JAPONICUS
29	CLAMS MUSSELS OYSTERS SCALLOPS	PELECYPODA
211	COD, ARCTIC (RACE)	BOREOGADUS SAIDA
203	COD, BLACK (SABLEFISH)	ANOPLOPOMA FIMBRIA
202	COD, PACIFIC	GADUS MACROCEPHALUS
208	COD, SAFFRON	ELEGINUS GRACILIS
214	CODLING - UNIDENT.	MORIDAE
32	CORALS	
1	CRAB - FAMILY, GENUS UNKNOWN	
6	CRAB, BLUE KING	PARALITHODES PLATYPUS
11	CRAB, BOX	LOPHOLITHODES FORAMINATUS
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 WOSNESSENSKII

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

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

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

Note: Many other genera and species of sculpins are present. Group these others under sculpin unidentified.

55	SEA ANEMONE - UNIDENT.	ACTINIARIA
41	SEA CUCUMBER - UNIDENT.	HOLOTHURIOIDEA
689	SEA DEVIL - UNIDENT.	CERATIIDAE
54	SEA MOUSE, BRISTLEWORM, LEECH	ANNELIDA

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

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

DEFINITION OF HALIBUT CONDITION

Trawl Catches

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

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

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

Longline Catches

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

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

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

DEFINITION OF KING CRAB AND TANNER CRAB CONDITION

Trawl and Longline Catches

(1) Excellent: No sign of stress or dismemberment

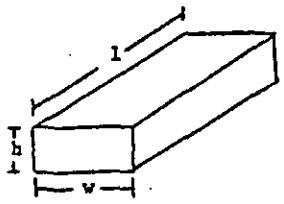
(2) Poor: Alive but showing signs of stress--a few limbs may be missing; minor mouthpart movement may be the only sign of life

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

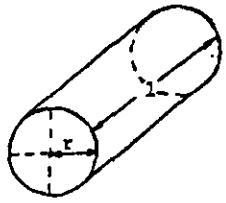
USEFUL FORMULAS YOU MAY NEED

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

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

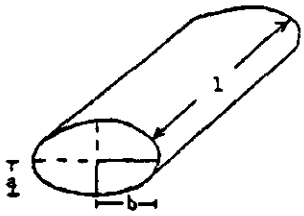


Rectangular solid
Volume = height x width x length
V = hwl

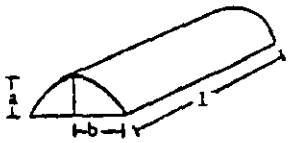


Cylinder
Volume = π x radius^2 x length
$V = \pi r^2 l$

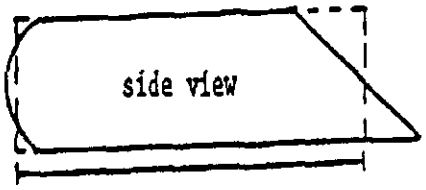
(π=3.1416)

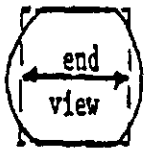


Ellipsoidal solid
Volume = π x short radius x long radius x length
$V = \pi abl$



Semi-ellipsoidal solid
Volume = ½ π abl
V = ½ π abl





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

TABLE OF EQUIVALENTS

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

1 centimeter = .3937 inches
1 meter = 3.2808 feet

1 meter = 100 cm = 0.5468 fathoms

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

1 pound = 0.4536 kg

1 kg = 2.2046 lb.

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

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

CONVERTING POUNDS TO METRIC TONS

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

RELATIONSHIP OF HALIBUT LENGTHS TO WEIGHT (LIVE WEIGHT)

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

RELATIONSHIP OF HALIBUT LENGHTS TO WEIGHT (LIVE WEIGHTS)

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

X Example – Observer is assigned to measure crab & Hauls

FORM 7US–LENGTH FREQUENCY OF MEASURED SPECIES
(Includes halibut, salmon, and crab measurements)

Page _____ of _____

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

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

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

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

LENGTH FREQUENCIES

FORM 7US--LENGTH FREQUENCY OF MEASURED SPECIES

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

1. Fill in the date. Plant observers: 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 fish to be measured may be collected during or after sampling or from an unsampled haul or set, as long as they are randomly gathered. The selection of a sampling species for length frequency measurements of about 150 fish per day depends on your assigned special project and the target species of the vessel.

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

May get fish from unsampled hauls

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).

Pg 95 - Note here too

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).

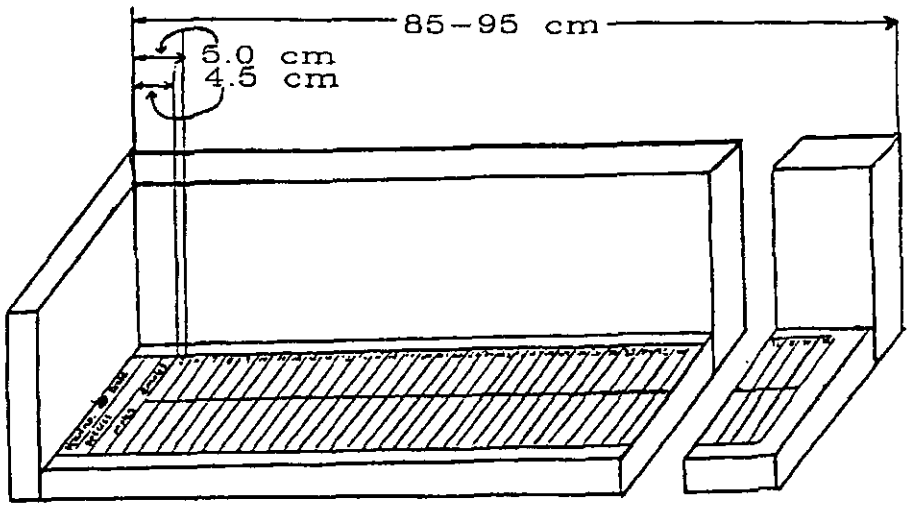
Next, set up a plastic strip on a measuring board, recording on it the haul number, date, and species. Observers on processors and trawlers must keep length frequency data for each tow separate. Record data from different hauls on different plastic strips. The plastic measuring strip is a long, narrow 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.

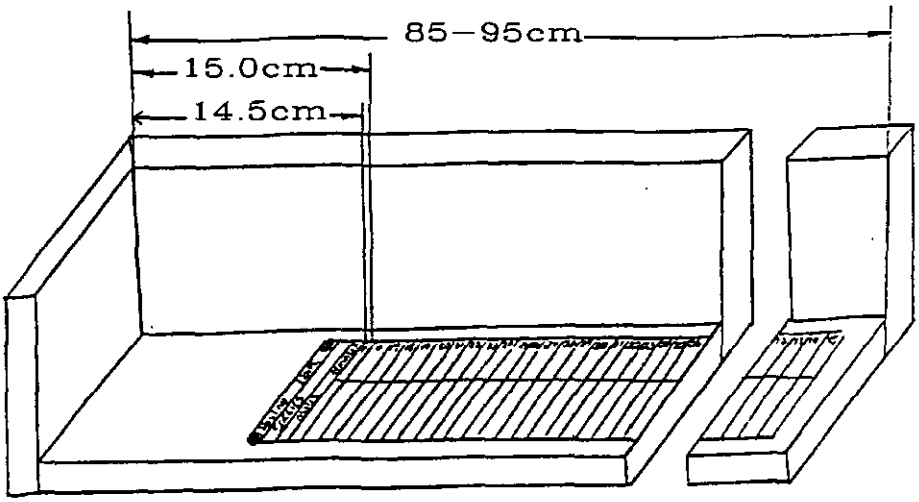
Take one of the baskets of sexed fish. Note that one side or half of the plastic strip is designated for males, and the other half for females. Position each fish on the measuring strip with jaws closed, snout against the end, dorsal surface against the back, and the fish body flat and straight. Spread 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.)

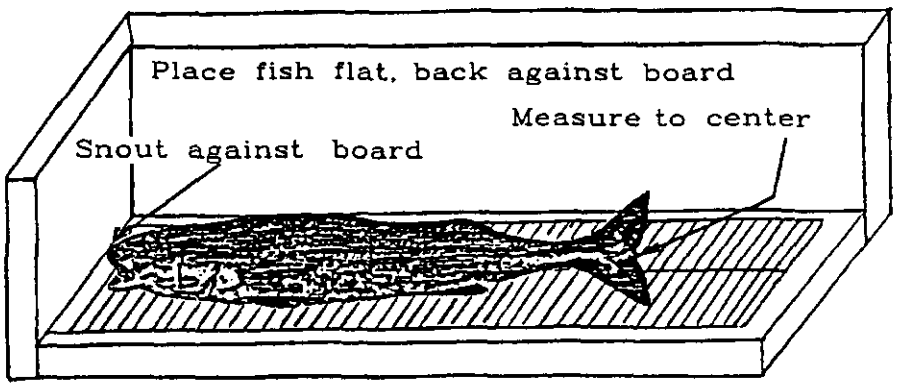
When starting to measure another basket of sexed fish, verify their sex and make sure you are recording their lengths on the appropriate half of the strip. At the end of sampling, the number of pencil strokes per sex, per centimeter length spacing will give the size group's frequency by sex.



Measuring strip set for most fish species.



Srtip offset to measure larger fish.



Measurement of a roundfish on measuring board.

AREA 521

FORM 9US - BIOLOGICAL SAMPLING FORM

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

Total no. of specimens _____

Catalogue date _____

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

SCALE SAMPLES AND RANDOM STRATIFIED OTOLITH SAMPLES

FORM 9US INSTRUCTIONS

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

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

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

3. 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 that ethyl alcohol was used (such as rubbing alcohol), note the preservative at the top of the first page of each set of Form 9US.

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 of the term "random stratified" which is used for a subsample, stratified by length, from the random length frequency sample of fish.

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

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

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

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

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

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

OTOLITH REMOVAL

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

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

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

Plastic Form 9US

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

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

Notice that the sexes are seperated.

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

Otoliths and Scales
Plastic Form 9

Haul/sample No. 101

Species Pollack

* GPO 1985 JACKET #594-409

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

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

SCALE SAMPLES

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

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

Directions for collecting scales:

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

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

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

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

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

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

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

MARINE MAMMALS

FORM 10US - MARINE MAMMAL INCIDENTAL CATCH DATA

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

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

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

Form 10US has two parts--10A for recording marine mammal interactions during hauls randomly selected for monitoring, and 10B (the back of 10A) for recording specimen data and remarks on <u>any</u> 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.

<u>Form 10A US</u>

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

9. Column 42 - Leave this column blank.

Form 10B US

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Fishery no.	Cruise no.	Vessel code	Year
1 2 3	4 5 6 7	8 9 10 11	12 13
			9 0

FORM 10A US - MARINE MAMMAL INCIDENTAL CATCH DATA

Date (MO/DAY)	Haul, delivery, or set number	Marine mammal species (if none observed, write none)	Marine mammal species code	Number of marine mammals: Deterred	Released or escaped alive (uninjured)	Released or escaped alive (injured)	Freshly dead (entangled or entrapped)	Unknown condition	Decomposed	Lethal removal (not entangled or entrapped)	Lethal removal (entangled or entrapped)	Did you observe MM(Y/N)?	Form 10B(Y/N)?
14 15 16 17	18 19 20		21 22	23 24 25	26 27	28 29	30 31	32 33	34 35	36 37	38 39	40	41
0910	101	None											
	103												
0910	104												
0912	106	None											
	108	Northern Sealion	EJ						1			Y	Y
	109	Northern Fur Seal	CU	1	1							Y	Y
0912	110	None											

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

Fishery no.		Cruise no.					Vessel code				Year	
1	2	3	4	5	6	7	8	9	10	11	12	13
											9	0

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

Date (MO/DAY	Haul, delivery, or set number	Marine mammal species code	Haul sampled for fish (Y/N)?	Did you observe the MM (Y/N)?	Sex? (M/F)	Lengths: Curvilinear (cm)	Lengths: Standard (cm)	Tooth collected (Y/N)?	Photo taken (Y/N)?	
14 15 16 17	18 19 20	21 22	23	24	25	26 27 28	29 30 31	32	33	
0912	108	EJ	Y	Y	M	212		Y	N	

Remarks Over two meters long, with ears, light brown color. Dead Sealion found when codend dumped on the deck. Carcass obviously decomposed!

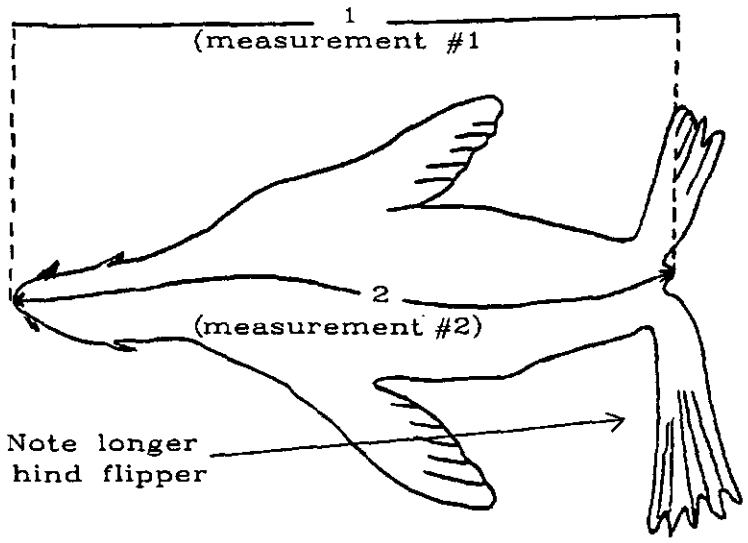
14 15 16 17	18 19 20	21 22	23	24	25	26 27 28	29 30 31	32	33	
0912	109	CU	N	Y	U	140		Y	N	

Remarks Dark brown w/o any mankings, with ears, about foun feet long. Went out on the deck to watch the retrieval after lunch. Seal bombs thrown at seal. Laten apparently same seal came out of codend and ran down stern ramp.

14 15 16 17	18 19 20	21 22	23	24	25	26 27 28	29 30 31	32	33	
0910	103	EJ	Y	Y	U			N	N	

Remarks Was having lunch when crew came in and told be that capt. was shooting at sealions while I was sleeping. Cannot verify information

Length Measurements of Seals and Sea Lions

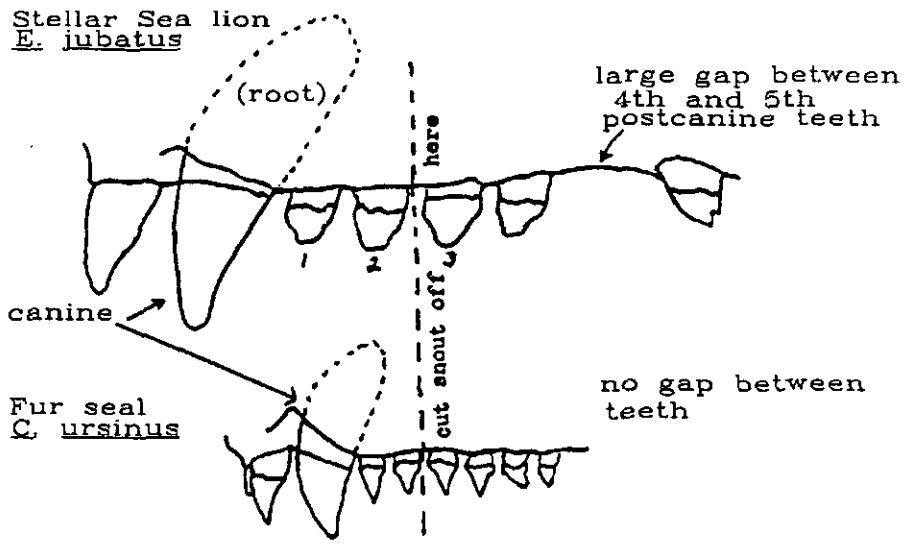


Upper half of the diagram is a Stellar Sea Lion, the lower half a Northern Fur Seal.

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

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

Collection of Sea Lion and Fur Seal Teeth



Outline of sea lion and fur seal teeth.

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

1. Skin and cut off the snout, taking care not to damage the root of the canine tooth.

2. To insure that the entire canine root is collected, the snout should be cut off between the 2nd and 3rd post canine teeth (see figure).

3. Methods of preservation: (use a or b)
   a. Boil the snout until the tooth can be easily pulled and removed. Do not forcibly twist the tooth when removing; twisting will break the tooth.
   b. Boil the snout until no more flesh remains on the jaws. The jaws can then be stored dry.

4. Do not preserve the snout in formaldehyde.

FORM 11(A) - MARINE MAMMAL SIGHTING FORM

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

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

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

1. NAME: In the upper left hand corner of the form, write the observer's and vessel's or plant's names. In the upper right hand corner enter the cruise number and vessel code upon arrival in Seattle. In addition, enter the cruise number and vessel code in columns 65-72 at the bottom of the page.

2. DATE (7-12): Note proper sequence (yr./mo./day)

   TIME (13-16): Time of sighting is logged when the animal is first seen. Times may be logged in ALT and must be noted as such, crossing out the GMT notation printed on the form.

3. LATITUDE (18-23): To tenths of minutes, if possible.

4. LONGITUDE (24-30): To tenths of minutes, if possible. Place E or W in box 30, depending on which side of the 180th meridian the sighting occurs.

5. SPECIES: Write in both the common and scientific name of the animals. Do not enter a species name unless you are absolutely positive. If you are the least bit unsure of the animal's identity, enter as "unident. large whale", "unident. porpoise", etc. Remember that an erroneous identification is worse than none at all. If more than one species are sighted at the same time, note the association (if any) in the comments section and fill out a separate sighting form for each species.

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

A. Shape and size of dorsal fin and its position on the body. If possible, also note size and shape of tail and flippers.

B. Length. Size is difficult to estimate at sea, so if it is convenient, compare unfamiliar animals with a species with which you are familiar. For example--"about size of female Stellar sea lion" or "slightly smaller than adult male killer whale."

C. General shape of body (slender or robust).

D. Shape and size of snout. Is it long or short (estimated length in inches)? Is there a definite break between snout and forehead? Is the forehead markedly bulbous?

E. Color pattern on fins and body (stripes, spots, patches, mottling).

F. Shape, location, and direction of spout. Is it single or double? Where is spout located on head? Does it lean forward or go straight up?

G. Scars and scratch marks

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

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

- No specific behavior other than in the water

- Following vessel
- Bow riding
- Porpoising
- Attracted by fish nets
- Feeding
- Avoidance
- Nonspecific contact/play
- Slow-rolling
- Riding stern wake
- Milling
- Approach vessel-veer away
- Slow roll-roostertail-slow roll
- Roostertailing

8. ANGLE FROM BOW (47-48): Consider the ship a 360 degree circle when recording sighting angle; dead ahead being 000 degrees and dead astern being 180 degrees.

9. INITIAL SIGHTING DISTANCE: Note distance in nautical miles, yards, or meters - whichever you are most comfortable with. Convert to 10's of meters and place in boxes 50-52. Remember that boxes 47-52 are right justified (e.g., 100 meters = 10 in boxes 51-52).

10. VISIBILITY: Note visibility in miles, if good weather, or in meters, if poor (e.g., fog).

11. WAVE HEIGHT: Record wave height in meters.

12. VIS CODE: Do not fill in (note asterisk).

13. WEATHER: Rain, fog, blue skies, overcast, etc. Also note wind strength.

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 * [ ][ ][ ][ ][ ][ ] (1 2 3 4 5 6)

2. DATE (Yr./Mo./Day) & TIME (GMT) OF SIGHTING — YR 8 9 (7 8), MO 1 0 (9 10), DAY 1 1 (11 12); TIME (GMT) 0 3 0 0 (13 14 15 16)

3. LATITUDE (degrees/minutes/10ths)—N/S — DEGREES 5 4, MIN. 5 9, 10ths 4 (18 19 20 21 22) * N (23)

4. LONGITUDE (degrees/minutes/10ths)—E/W — DEGREES 1 5, MIN. 7 3, 10ths 6 8 (24 25 26 27 28 29) E/W W (30)

5. SPECIES Unidentified Balenoptera (Common name) Balenoides sp. (Scientific name) * [ ][ ] (33 34) TENTATIVE * [ ] (35)

6. NUMBER SIGHTED 7 ± 2 C.I. * [ ] (36) [ ][ ][ ] 7 (37 38 39 40)

7. BEHAVIOR Appeared to be feeding; short shallow dives in a concentrated area * [ ][ ] (45 46)

8. ANGLE FROM BOW [ ] 9 0 (47 48 49)

9. INITIAL SIGHTING DISTANCE 2 statute miles

10's of meters 3 2 2 (50 51 52)

10. VISIBILITY 5 statute miles 11. WAVE HEIGHT (meters) 1.5 m 12. VIS CODE * [ ] (53)

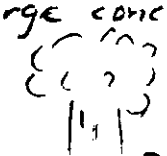
13. WEATHER (& WIND SPEED) Lt. Rain/Fog; Wind 10k @ 200° 14. SURFACE WATER TEMP. (° C) ± + (54) 0 9 (55 56)

15. PLATFORM CODE * 1 9 9 4 (57 58 59 60) 16. TIME ZONE * [ ] (61) * [ ] 0 (62 63)

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

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

Dorsal Fin


Blow

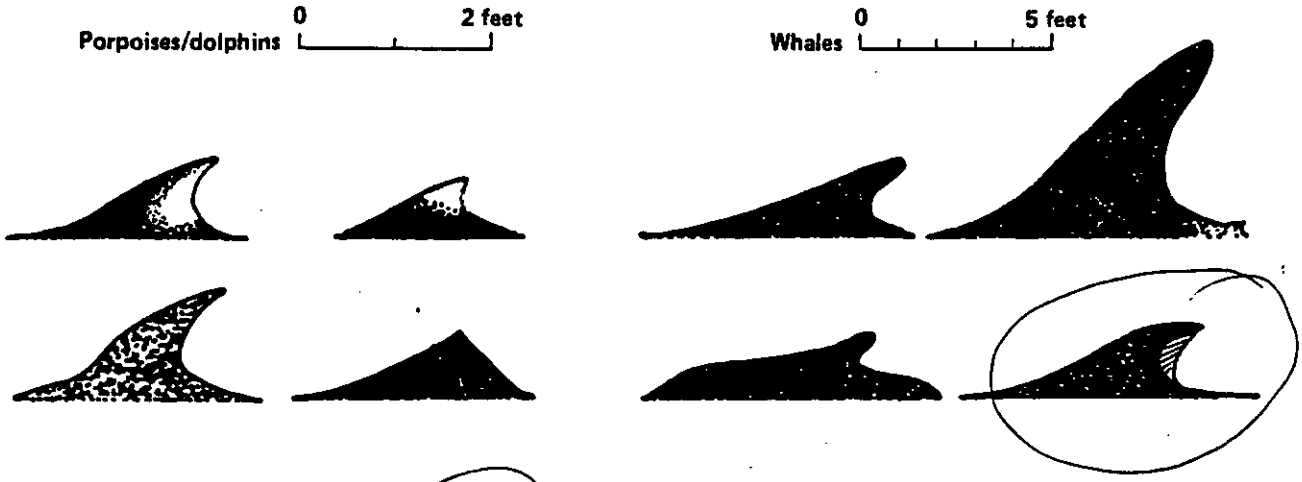
[ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ][ ] (65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80)

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

Body length (estimation): < 10 feet | 10–25 feet | 25–50 feet | 50–80 feet

Dorsal fin? Yes | No

Shape of dorsal fin:



Prominent blow? Yes | No

Number of blows before a long dive: N/A | 1–3 | 4–7 | 8–15

Length of dive: < 2 minutes | 5–7 minutes | 10–20 minutes

Shape of blow:

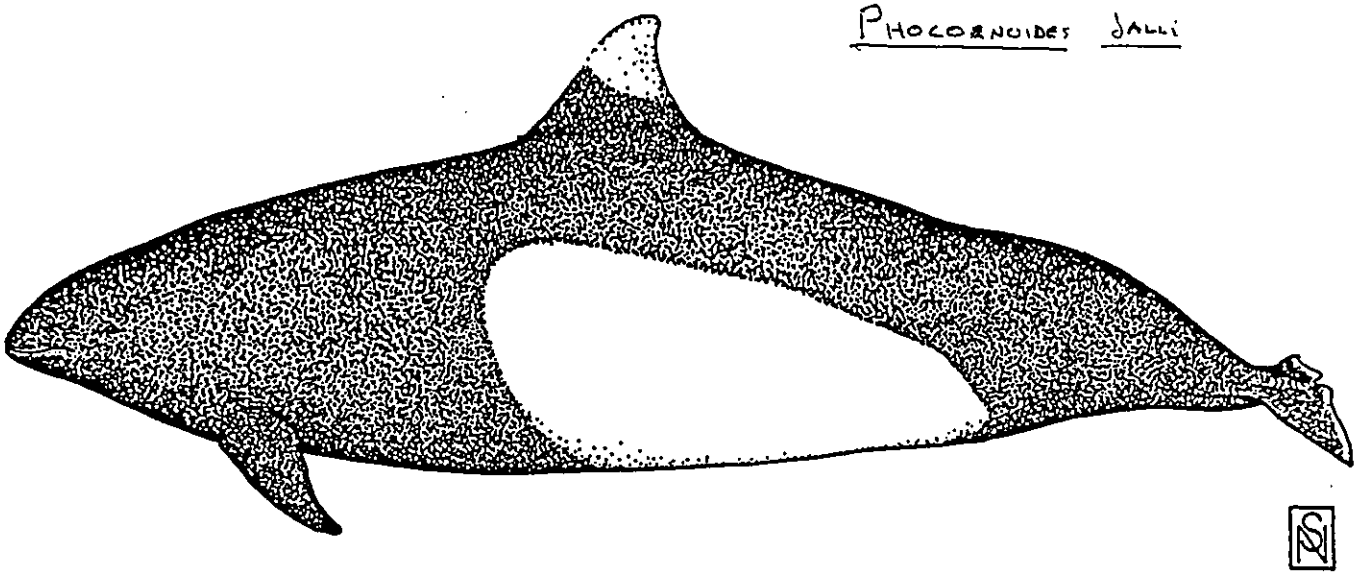
Showed flukes upon dive? Yes | No

Other behavior characteristics: No specific behavior | 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.

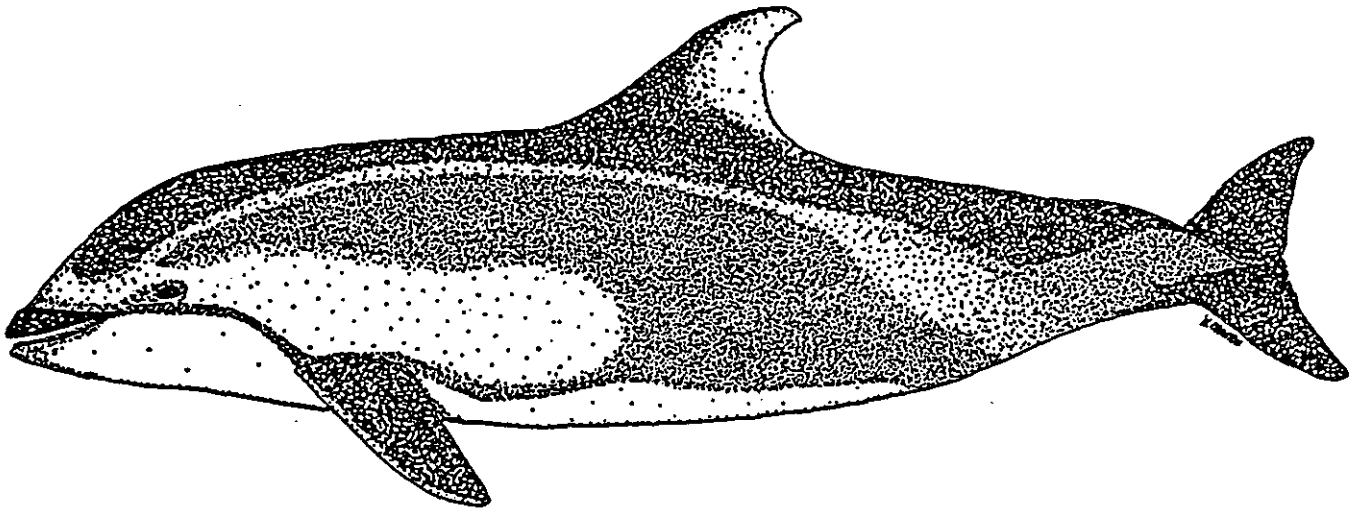
DORSAL FIN Variable in shape, basically low and triangular with a long base. Usually bicolored, dark on lower forward half and white on upper trailing half.

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".

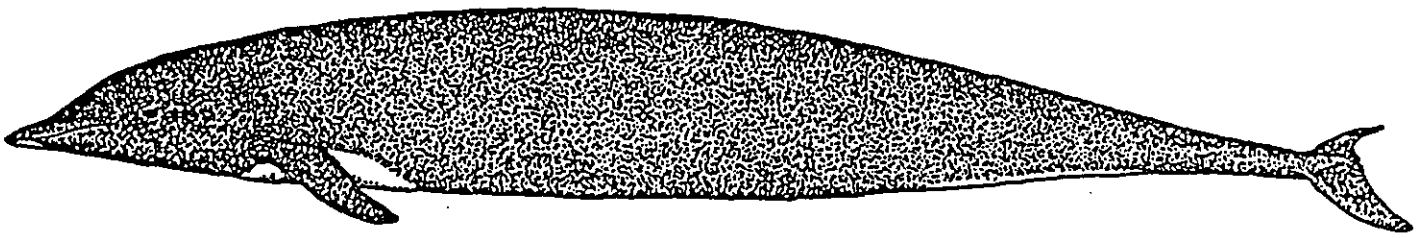
SNOUT/BEAK Head tapers continuously and smoothly, dolphin has only a very abbreviated beak.

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.

OBSERVING ON LONGLINE AND POT FISHING VESSELS

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

Longliners catch fish using a line with baited hooks attached to it (refer to the gear diagram). Hooks are each attached to the longline by a length of light line called "gangen." NMFS refers to longline gear as "hook & line" and defines it as, "A stationary, buoyed, and anchored line with hooks attached, or the taking of fish by means of such a device." The "long line" may be made up of sections of line called "skates" which, when on board, may be coiled into tubs or onto a skate bottom (a white fabric square with lines on the corners to tie it into a bundle), or the line may be wound onto an empty net reel. On vessels equipped with an auto-baiter system, coils of the line are hung on a rod, suspended by the hooks and gangen, much like coat hangers on a closet dowel. The length of line on one rod may be referred to as a "magazine". During retrieval of the line, the end of one skate, magazine, or half magazine and the start of the next may be flagged by a line marker, knot, or a weight attached to the line. The number of hooks per section of line is fairly uniform. Rather than count hooks, observers use line markers to count the number of sections, and thereby the number of hooks, sampled.

A longline is put out to fish or "set" from the stern of the vessel. Each end of the longline is anchored and marked with buoys. The set is then left to soak for a couple hours while the fishermen go to set or retrieve another line. Later the vessel returns and starts retrieval of the line over a roller onto the weather deck or into a cutout in the starboard side of the vessel called the "pit". On a longliner, the fish are removed from the hooks one at a time as line is retrieved and are immediately processed or put into the tanks. Longline fishing is labor-intensive but it produces a very high quality product. There are typically three sets made and retrieved each day, and the target groundfish species are sablefish (also called black cod), Pacific cod, or Greenland turbot. Halibut are primarily fished with longline gear also but as they are managed separately from groundfish species, observer coverage is not required during halibut season openings.

There are a various types of pots used by pot fishing vessels. Most vessels use king crab pots which are adapted for targeting on Pacific cod and excluding halibut. The big king crab pots are made up of a rectangular metal frame to which panels of webbing are tied; the frame sizes vary but typically measure about 8 x 8 x 3 feet. Funnel-shaped webbing in the side panels guide the fish into the pot through openings fitted with "triggers" which function as valves to let cod in and prevent them from swimming back out. Containers of bait are attached inside each pot to attract the fish. Usually a buoy line and marker float is attached to each pot and the pots are each set out and retrieved individually, that is, they are not strung together by a surface or ground line. In any case, NMFS defines a set as: a string of pots (or hook and line

gear) or a group of pots that are deployed in a similar location with a similar soak time.

Regarding the configuration of the gear, NMFS regulations state, "Pots used to fish for groundfish must be equipped with a biodegradable panel at least 18 inches in length that is parallel to and within 6 inches of, the bottom of the pot, and which is sewn up with untreated cotton thread no larger than #30. Each pot used to fish for groundfish must be equipped with rigid tunnel openings that are no wider than 9 inches and no higher than 9 inches, or soft tunnel openings with dimensions that are no wider than 9 inches. Pot and line means a stationary, buoyed line with a single pot attached, or the taking of fish by means of such a device. Pot and longline means a stationary, buoyed, and anchored line with two or more pots attached, or the taking of fish by means of such a device.

In retrieval, the buoy line is snagged, and the line hauler winch brings the pot to the railing. The pot is swung onto the "launcher", a platform attached to the rail. In heavy weather, a pot may swing wide before it can be set onto the launcher. Pots weigh hundreds of pounds and swinging and shifting pots, colliding with crewmen, have resulted in broken bones and backs. Observers must develop an awareness of this kinetic potential. When the pot is landed on the platform, a side panel of the pot is opened and the inboard side of the launching platform is lowered to tip the pot and allow the contents to spill into a waiting tote container. The pot is then re-baited, closed, and then the launching platform is raised to slide the heavy pot overboard. As the pot quickly sinks, loops of buoy line whip overboard. Loops of buoy line have lassoed crewmen and dragged them overboard and down before rescuers could grab them. Obviously observers should also stand well clear of the pots and buoy line during launching.

CATCH RATE ESTIMATES

Longline and pot catches are logged by set, and all sets are attributed to the day that the retrieval of that set was completed. Just as on the 2US form for trawlers, the only time a noon position is recorded on the Catch Summary Form 1US is on a non-fishing day. (Refer to the example Form 1US which follows.) The skipper's catch weight estimates are always based on deck tallies (counts) and/or production data. There are no deck or bin estimates of catch volume or weight. The skipper's catch estimates do not usually include bycatch or, if they do, it is a very rough estimate. On longline vessels, losses of target species which drop off the line would not usually be included in the skipper's catch estimate either. Therefore, on longline and pot fishing vessels, observers should normally use their catch estimates for the "Official" Total Catch. The observer's **independent** catch weight estimate is based on sample data, extrapolated to the whole set using the following proportion. (On some boats, observers frequently sample the whole set and then no extrapolation is necessary.)

$$\frac{\text{Weight sampled}}{\text{Hooks or pots sampled}} = \frac{\text{Estimated total catch wt.}}{\text{Total hooks or pots retrieved}}$$

If the observer's catch weight estimate is used as the official total catch weight, the observer should apply a summed ratio from sampled sets to the number of hooks or pots in each unsampled set. Catch composition, and therefore weight, will vary with depths and areas fished.

Use your judgement to apply ratios from sample data to "like" sets.

$$\frac{\Sigma \text{ sample wt. of sampled sets}}{\Sigma \text{ sampled hooks or pots in sampled sets}} = \frac{\text{Total catch wt. of an unsampled set}}{\text{No. of hooks or pots in an unsampled set}}$$

When the catch rate and/or composition varies along the line or from pot to pot, an observer may decide that the skipper's estimate of retained catch for the set plus an estimate of bycatch and longline drop-offs extrapolated from the observer's samples yields a more accurate estimate of total catch.

$$\frac{\text{Wt. of bycatch + drop-offs in sample}}{\text{No. of hooks or pots sampled}} = \frac{\text{Bycatch + drop-offs in set}}{\text{Total hooks or pots in set}}$$

then, Round wt. of retained catch + Bycatch + drop-offs in set = Official Total Catch

Or, as explained for sample data from trawlers:

$$\frac{\text{Total sample weight}}{\text{Weight of retained fish in sample}} = \frac{\text{Total catch weight}}{\text{Wt. of retained fish in set}}$$

Since an important variable in the equation for the observer's catch estimate is the number of hooks or pots per set, observers should try to verify their number. It is much easier for an observer to count, or verify the count of, pots than for the longline observer to verify the total hook count. Some methods for longline observers to obtain accurate hook counts are as follows:

1. Obtain hook count from the automatic baiter during setting. If gear is subsequently lost, an estimate of the number of hooks lost would have to be subtracted from the number set.

2. Actual count of hooks on several skates (or **units** of gear) and tallying skates during retrieval.

3. When there is only one, very long, set per day, even verifying the total number of skates can be difficult. Total number of skates can be checked by: overall timing of the setting of the line with a calculation of the average number of seconds to set one skate or a conversion of miles of gear set to number of skates using the video course plotter and the average length per skate.

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

Olivia Observer
"Swell"

FORM 1US - CATCH SUMMARY FOR U.S. LONGLINE AND POT VESSELS

1. Leading zeros in columns 12, 14, 33 - 36 only.
2. Skip line after each day
3. On days with no sets, enter date, noon position in 24 - 32 and set no. = 0. Note reason.
4. Trailing zeros are required in columns 60 - 74.

Depth (column 41)
M = meters
F = fathoms

Page 1 of 5

Cruise no. (1-5)	Vessel code (6-9)	Year (10-11)
3 2 1	A 5 5 5	9 1

	Sets sampled (12-15)	Date Mo. (12-13)	Date Day (14-15)	Set no. (16-18)	Gear type (19-20)	Gear performance (21)	Processing mode (22)	Location code (23)	End position of set (N) latitude (24-27)	E/W (28)	(I) longitude (29-32)	Soak time hrs/min (33-36)	Avg. bottom depth (37-40)	M/F (41)	Longline fishery: No. of skates (42-44)	Skate length (fathoms) (45-48)	No. hooks/skate (49-52)	Pot fishery: No. of pots (53-55)	Length of set (fathoms) (56-59)	Retained catch (round wt.) (mt.) (60-64)	Official total catch (mt.) (65-69)	Observers total catch (mt.) (70-74)	ADF&G stat. area (75-80)
517 M	✓	10	20	1	8	1	1	R	5534	W	6842	10:45	325	F	10	300	200			1.62	2.80		685530
M	✓		20	2					5542		6842	12:10	285		10					.78	1.95		685530
M	✓		20	3					5528		6821	12:20	165		12					1.09	2.93		685500
M	✓		21	4					5456		6711	11:50	186		10					1.53	2.80		675430
M	✓		21	5					5524		6802	13:20	127		12					1.76	3.40		685500
M	✓		22	6					5428		6702	10:20	215		10					1.82	3.91		675430
M	✓			7					5445		6711	10:45	290		12					1.51	3.88		
				8					5448		6708	09:15	175		10					1.47	4.00		
517 M	✓		22	9				R	5436		6710	09:30	253	F	10	300	200			1.57	3.64		675430
			23	0				N	5420		6518		NO FISHING - ROUGH SEAS										655401
519 M	✓		24	10				R	5418		6520	16:30	209	F	12	300	200			2.91	3.65		655401
519 M	✓	10	24	11	8	1	1	R	5417	W	6542	17:10	130	F	12	300	200			2.98	3.90		655409

FORM 1US CATCH SUMMARY FOR LONGLINE AND POT VESSELS

This form is used to collect the fishing effort and total catch data for either longline or pot/trap vessels. Most of the form is filled out by observers on both longline or pot vessels, but there is a part of the form that is specific for each type of vessel. Points to note :

1. Collect Form 1US data for the entire period you are aboard. Make certain that you have all of the sets recorded for the days you begin and end sampling.

2. The identifying cruise number and vessel code will be assigned after you return and will be different for each vessel you are on. Keep the data for each cruise separate.

3. Place a check mark in the far left column to indicate which sets of longline or strings (sets) of pots you sampled.

4. A given set number should be used only once - no duplicates. The set numbers must be in numerical sequence (like haul numbers). Make sure that the set numbers do not exceed 3 digits. All sets must be recorded unless there was a gear malfunction resulting in a zero catch. A set number must be assigned to every set. If you reach set number 999, the next set should be "1", not "0." Set number "0" means that the vessel did not finish retrieving any set that day.

5. Enter the gear type:

   6 - pot or trap vessel
   8 - longline vessel

6. Enter the gear performance code:

   1 - no problem
   6 - gear conflict (groundline cut)
   7 - considerable predation of catch by sea lions
   8 - considerable predation of catch by killer whales (orca)

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

   1 - The vessel is a catcher/processor; the processing (if any) is done on board and the product is frozen. A 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 processing plant. The trip lasts 3 to 12 days during which the catch is held in RSW tanks or is iced.

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

Done pg 40

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.

Avg. soak time is desired - We don't want unusual events artificially increasing the average

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. Do not include catch estimations of this lost gear in the total catch estimation.

If pots are attached to a groundline which connects them together in a string, record the total length of the groundline of the set in columns 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 round or live weight of the catch retained on board the ship (in metric tons, not pounds or short tons--see Table of Equivalents). On catcher processors, the retained catch may be the total product weight converted to round weight using product recovery figures (expressed in metric tons). On catcher boats, the skipper may have a total count of the fish going into the hold for each set or the observer might use the delivery weight (converted to fresh weight if necessary) divided proportionately among the sets. Use your judgement as to how to obtain the most accurate data--this figure should always be filled in, even for nonsampled sets, and must be recorded to two decimal places. Give a complete description in your report of how these figures were obtained.

17. Official total catch (mt.): this will be the catch weight for the set reported in your weekly catch messages. This figure must always be filled in (record it to two decimal places). Note at the top of the first page of Form 1US the origin of the official total catch estimate. (The first sheet is sufficient unless it changes.) Give a complete description in your report of how these figures were obtained.

18. Observer's estimate: record your estimate of the sets that you sample. This will be an extrapolation of your sampling data for the skates/pots that you sampled to the total number of skates/pots in the set. (See the preceeding Catch Rate Estimates section for a more detailed description of the extrapolation.) Record it to two decimal places.

19. Enter the 6-digit ADF&G statistical area that the end position of set (cols 24 - 32) places each set in. Refer to the special supplement on the ADF&G statistical areas for your determination of the correct area.

20. 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 non-fishing days) should be placed in a part of the form that is not keypunched.

SPECIES COMPOSITION SAMPLING ON LONGLINERS

Unlike the situation on a trawler, all of the fish from a longline set are not dumped at once into a bin. On longliners, the catch comes up one fish at a time and the fish are usually processed as they come aboard. Observers frequently notice "patchiness" of fish on a longline set. Longline fishermen will often set their line at an angle, up or down a slope. From deeper water, sablefish, idiot fish (shortspine thornyhead), and rattails are commonly caught. Shallow water sets will yield more Pacific cod, arrowtooth flounder and halibut. The change in species composition in different portions of the set makes it important to get samples that are representative of the entire set. also, if the depth of the set is known to you, you can predict and therefore bias your samples. Thus, it is important to have a random sampling scheme in place prior to sampling a set. Try to get as large a sample size as possible, minimally 20% of the set, optimally, 30% - 50% or more. When three sets per day are retrieved, an observer might sample the first third of the skate on the first set, the middle third of the second set, and the last third of the last set. Some observers are able to sample whole sets routinely. Where composition of catch varies from set to set, reduce sample size as necessary in order to sample more sets.

The large size of the target fish makes basket sampling impractical since the sample baskets would fill up quickly and contain few fish. Tally sampling is the most practical method for observers on longliners. Determine which species dominates the catch at a given time--it may be sablefish, Pacific cod, or rattails. As this chosen species is brought aboard during your sampling period, tally the number of these fish using a thumb counter or a stroke-tally on a plastic sheet. (As you gain in proficiency, it may be possible to tally two species at once, such as sablefish and rattails.) Include in your count, tally fish that drop off at the roller and are missed by the gaffer. Place in your sample baskets everything else that comes up on the line--including those organisms that are normally not wanted and are usually knocked off the hooks so that they are not brought aboard (such as crabs, halibut, sea anemones, sea cucumbers, etc.). 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.

Many longline fishermen fish halibut during the short halibut season openings and are very protective of their halibut bycatch when fishing cod. They will be reluctant to bring them aboard for the observer to sample. The observer might get the rollerman to land some of the halibut for average weight, length measurements and viability and simply count the rest of them that occur during sampling. As halibut sizes can vary widely though, average weight may not be as accurate as individual visual length estimates made as the halibut come up against the side of the boat. Length estimates recorded on a plastic sheet can later be converted to weight with the halibut length/weight table (in reference section and appendix). To aid you in this, it would be very helpful to have measured marks on the side of the vessel next to the roller. Remember that estimated length data is never recorded on Form 7US.

Some observers have found it convenient to make their tallies from the deck immediately above the longline pit, since it is less dangerous during rough weather and they were able to obtain a good view of the fish coming up on the line without getting in the way. Be aware that the back-up gaffer has a long gaff pole and can jab you in the face with the upper end of it when he pulls in a fish if you're not careful. Wherever you choose to stand, make sure that from your vantage point (whether above the pit or on the fishing deck) you can watch the crew place all of the non-tallied species in your baskets. Obviously, this method requires a good deal of cooperation and understanding on the part of the crew. The rollerman will have to allow the bycatch he normally knocks off the line to be landed and processing crew may have to sort these into your baskets for you. The observer program expects this amount of cooperation to be given you. If this cannot be worked out, contact one of our offices for advice and assistance as your ability to sample and data recording will be affected.

If you are unable to use the above sampling method, or for the first few days until you become familiar with the fish and fishing operation, you may wish to resort to the following easier sampling method. Simply place all of the catch in your sample baskets until they are filled. Note how many hooks it takes to fill the baskets. Take as many basket samples as possible to increase the sample weight. Weigh and count the species groups.

SPECIES COMPOSITION SAMPLING ABOARD POT FISHING VESSELS

Sampling on pot fishing vessels is very similar to the tally method described for longline vessel sampling. Please read or review the first three paragraphs of the longline sampling section above. When a pot is landed and opened, the contents are spilled into some sort of container. The crew then remove the desired species, usually just Pacific cod, and throw any other bycatch overboard. The observer should count the cod and take the rest of the bycatch aside for counting and weighing, thus relieving the crew of part of their work. After emptying, the pot has to be re-baited, closed, launched and the vessel proceeds to the next pot to begin hauling it. Consequently, there should be ample time for the observer to complete the sampling of one pot before the next is emptied. In order to gather 30 - 50 cod to determine average weight without seriously delaying the crew, take just a few cod from each pot, weigh them quickly and return them to the crew before dealing with the bycatch.

FORM 3US - SPECIES COMPOSITION FOR LONGLINE or POT VESSELS

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

Worksheet

Species:	Sablefish	Grenadier				
No. weighed:	50	60				
Wt. of above:	145.5	211.30				
Avg. weight:	2.910	3.5217				

Other calc.; comments: Sampled 7 out of 10 Skates (980 hooks). Tallied Sablefish and Grenadier.

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

ST = Sampling type
L = Longline
T = Trap/pot
V = Viability only

Check those seen:
- Halibut ☑
- Salmon ☐
- King crab ☑
- Tanner crab ☐

Species name	Sex	Species code	ST	Number					Weight (in kg. w/ decimal pt.)	No. of hooks or pots sampled	Viability: Number excellent	Viability: Number poor	Viability: Number dead
	19	20 21 22	23	24	25	26	27	28 29	30–40	41–51	52 53 54	55 56 57	58 59 60
(Keypunch check)		9 9 9					8	2 1	2551.40	Set wt. 3640.00	16	10	1
Halibut	U	101	L					3 3	99.12	980	16	10	1
Salmon, unident.	U	220						0	0.0				
Golden King Crab	M	8						1	1.70				
Tanner Crab	U	3						0	0.0				
Skate		90						8	20.74				
Sablefish		203					2	6 9	782.79				
Grenadier		80					4	2 6	1500.24				
Shortraker R.F.		326						1	2.70				
Arrowtooth Flounder		141						1 3	28.61				
Shortspine Thornyhead		350						6 0	79.30				
Pollock		201	L					1 0	36.20	980			

FORM 3US - 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. Rather than reiterate column by column what should be recorded on this form, only the items that differ from the 3US trawler forms will be presented.

1. Column 23: note the sampling type code. Use an "L" for longline and a "T" for trap/pot vessel. **Do not use "P"** for pot sampling **or "V"** for viability only sampling. Sample for and record viability data only on sets sampled for composition. The halibut (and crab, if assigned) examined for viability may be those in your composition sample or they may be from a different portion of the sampled set.

2. Columns 41 - 51: Number of hooks or pots sampled: Just as with trawler data, longline and pot observers must have only one sample size (number of hooks or pots sampled) for all of the target and bycatch other than prohibited species. Each prohibited species group may have the same sample weight as the rest of the fish or may be whole-set sampled.

   Done

   IF (take out)

   [**Note: Be careful!** If prohibited species are whole-set sampled while other catch has a smaller sample weight, be sure to add their weight into your OTC calculations]

   Longline observers obtain the number of hooks sampled by multiplying the number of skates sampled times the average number of hooks per skate. On pot vessels, if you run into a large number of small individuals of a given species, weigh them all and obtain an estimate of their number by sub-sampling for average weight. Be sure to record sub-sample data in the worksheet part of the form.

3. A reminder: just as for the trawler form, it is necessary to indicate the sample size for halibut, salmon, king crab, and Tanner crab, even if you do not see individuals of those species in your samples. If no individuals of a given species group were observed, then the observer should enter that group name, species code (use codes 2, 3, 101, 220), sample type, number of hooks or pots monitored for that species group, 0 for the number, and 0.0 for the weight. Use the check-off boxes above the viability column to remind yourself to record those groups not seen.

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 or pot vessel if, 1) the fish are processed immediately upon landing, 2) slitting the belly to sex the fish would destroy the product, and/or 3) the fish are large and therefore more work to handle. You may find it necessary to reduce the number of length measurements taken each day.

If the cod are being headed and gutted, try working with one of the processing

crewmen, taking a length measurement and then examining the viscera pulled out when the fish is gutted to determine the sex. Sexed lengths are much more useful to us and so these are preferred but if this is proving too difficult, try to sex some of the fish being measured (random subsample) and take un-sexed length measurements of the rest. If **this** is too difficult, un-sexed lengths are better than no length data - do what you can. Remember that the length frequency sample does not have to be a sub-set of the composition sample and fish measured for length frequency may be taken from a set not sampled for composition.

Age structure collecting is a lower priority than length frequency measurements and so here again, do what you can. Remember that good composition data and biological data on the prohibited species found in your samples takes precedence over length measurements and special projects. For forms 7US and 9US, refer to the instructions included with the trawler forms.

CATCH MESSAGE FORMS A AND B FOR LONGLINE AND POT VESSELS

~~The total sample weight for Species Composition Catch Message Form A will be the sum of the species weight as long as there is only one sample size. If target and bycatch other than prohibited species have a smaller sample size than prohibited species which are whole-set sampled, add only the target and other bycatch weights together for the sample weight on CM Form A. The OTC will be the sample weight for prohibited species that were whole-set sampled.~~

Long

Longline and pot vessel fishing effort is recorded on Form B rather than on Form A where trawler effort is recorded. There is no marine mammal report in weekly catch reports from longline and pot vessel observers. but Longline observers do fill out & pot vessel forms 10US and 11US for marine mammal entanglement, harassment & sighting

SAMPLING AND DATA RECORDING INSTRUCTIONS FOR OBSERVERS AT 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 processing plants that monthly receive 1,000 mt or more of groundfish are required to have an observer at the facility each day it receives groundfish. Also, managers of processing facilities that monthly receive between 500 mt and 1,000 mt of groundfish must have an observer present at the facility for 30 percent of the days it receives groundfish 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 and completing it is the top priority for a plant observer. Information must be gathered and recorded for all groundfish deliveries to a plant whether or not those deliveries were sampled by the observer. The plant sampler is expected to contact the skipper of each vessel delivering groundfish to arrange for the collection of needed data from the observer aboard or the vessel logs.

Daily Marine Mammal Watches: Aboard floating processors watch particularly for northern sea lions around the ship. Do this in the early evening, each day at about the same time, regardless of the weather. At shoreside plants, the emphasis is on Steller sea lions - their interaction with humans, their movements, and numbers. New observers should use (for the most part), the same observation locations and times as the previous observer and make records of "recognizable" animals, particularly those seen by the previous observer.

Assisting Catcher Boat Observers With Sampling: Plant observers are expected to plan and schedule their time so as to be able to assist each vessel observer that samples at the plant. Plant observers should coordinate the assistance of the plant personnel and arrange for the set-up of totes, scales, etc. as needed. Plant observers might fill out a Form 3US, summarizing their delivery sampling for a vessel observer, but the responsibility for proportioning the data by haul, other data entries and catch messages rests with the vessel observer.

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

Age Structures: For 100% coverage plants--200/plant/mo; for 30% coverage plants--300/plant/3 mo. period. Remember that the fish you collect age structures from must be a sub-set of the fish sampled for length frequencies.

Specify who fills out this form

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. Most of the delivery information should be obtained from the NMFS ship logs or interview with the catcher boat observer and from your own observations of scale weights or scale readouts. ADF&G fish ticket and NMFS processing plant log entries should not be used without researching the source points of their information and at least spot-check verification.

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):** This information will be given to you in debriefing, so leave these columns blank until then. 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 unique. A delivery number may be repeated on a second or third line if there are substantial amounts of more than one utilized species in one delivery. On Forms 7US and 9US the date and "Set/haul no." must correspond with the date and delivery number on Form A.

6. **Delivery date (col.15-18):** Enter the date of completion of each delivery to the processing plant i.e., if the catch is delivered over a period of two or more days, use the date when the transfer of fish to the plant is done. It is the delivery date of the fish measured and sampled that you should use on Forms 7US and 9US. This will not necessarily be the date you sampled.

FORM A - PORT SAMPLE SUMMARY FORM

Port Sampler No.	3	4	5	Processing Plant Code	6	7	8	9	Year	13	14
					D	H	1	5		9	0

Page 3 of ____

Shoreside Sampled	Observer Onboard	Delivery No.	Delivery Date Month	Delivery Date Day	Gear Type	NMFS Area Code	ADF&G Stat. Area	No. of Tows	Ave. Dur. (mins)	Total Wt. Delivered	LB / MT	Sample Sp. Code	Sorted Y/N	Wt. of Sample sp. Discarded at sea	Wt. of Sample sp. Delivered	LB / MT	Main Product	Abbreviation of Delivering Vessel
		10 - 12	15 16	17 18	19 - 20	21 - 23	24 - 29	30 31	32 - 35	36 - 42	43 44	45 - 47	48	49 - 55	56 - 62	63 64	65 - 66	67 - 81
✓		43	04	07	1	517	655430	5	249	187297	lb	202	N		187234	lb	23	Dawn's Delight
		44		09				7	253	198127		202	N		198101		23	Beauty Sea
✓	✓	45		10			665402	6	270	215639		201	N		192045		30	Starlight
		45		10			665402	6	270	215639		202	Y	250.0	23580.0		23	Starlight
	✓	46		10		517	655430	12	258	165663		201	N		165324		30	Alaska Hope
✓		47		12		521	705600	9	132	258165		202	N		258093		23	Beauty Sea
	✓	48		13	1	521	715600	5	143	264643		201	Y	10000.0	260218		30	Starlight
		48		13	1	521	715600	5	143	264643		202	N		4387.0		23	
✓	✓	49	04	14	8	515	665401	12	1440	8349.0	lb	202	N		8349.0	lb	23	Temptation

SHORESIDE PROCESSING FACILITY DAILY CUMULATIVE PRODUCTION LOG

PAGE	YEAR–MON–DATE	PLANT NAME AND ADF&G PROC CODE	REPORTING AREA	GEAR TYPE	MANAGER'S SIGNATURE	OBSERVER PRESENT	EMPLOYEE HOURS
						YES ____ NO ____	Processing: ____ Other: ____ Total:

ALASKA STATE FISH TICKET NO.	RECEIPT TIME	CATCHER VESSEL NAME AND ADF&G NO.	ESTIMATED CATCH RECEIPT WEIGHT (Circle lbs or mt)	COMMENTS

This is the format of the NMFS processing plant log. Notice the reporting requirement for discards by catcher boats as well as from the plant. Observers should never make entries in these logs nor should they implicitly trust the entries in them. Remember, you are an independent "observer" of their operations!

DISCARDED SPECIES

For groundfish and herring, record in lbs or 0.1 mt (circle which): For halibut, salmon, king crab, and Tanner crab, record in numbers

SPECIES CODE										
BALANCE FORWARD										
DAILY TOTAL REPORTED BY CATCHER VESSELS										
DAILY TOTAL IN PROCESSING OPERATIONS										
CUMULATIVE TOTAL FOR WEEKLY REPORTING PERIOD										

RETAINED PRODUCT INFORMATION: Circle lbs or mt (to at least the nearest 0.1 mt)

SPECIES CODE/ PRODUCT TYPE CODE										
BALANCE FORWARD										
DAILY TOTAL										
CUMULATIVE TOTAL FOR WEEKLY REPORTING PERIOD										

NOTE: For ancillary products, begin product type codes with 'A', e.g., A12

The delivery date should coincide with the date that is used in the NMFS processing plant logs and on the ADF&G fish ticket. If a discrepency with their entries is minor, such as the starting-of-delivery date instead of the completion date, ignore it. If the discrepency is more than that, document **who's** responsible, **what** is being entered, **when** and **why**.

When vessels deliver to more than one plant: If you discover that a vessel is delivering fish caught in one trip to more than one plant, you should enter Form A information on only one set of Form A's, preferably the Form A's for the plant where most of the catch was delivered. Note on the back of Form A, or on an attached sheet, the amounts of fish delivered to each plant, but enter on the Form A the total amount delivered to all of the plants, the total amount of sample species delivered to all of the plants, and the total number of tows made during the trip. Additional guidelines for sampling these deliveries follows in the "Sampling Instructions" section.

7. **Gear type (col. 19-20):** Enter the appropriate code.

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

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

8. **NMFS area code:** This is the 3-digit code for the area in which the vessel fished (refer to the map in the catch message section of this manual). If the vessel fished in two or more areas for the catch delivered, record the area in which most of the fish was caught, but enter an asterisk (*) and note the areas fished on the back of Form A.

9. **ADF&G statistical area:** Refer to the ADF&G maps supplied during training. Plot the end position of haul or set from the NMFS Catcher Vessel log, using the more detailed map whenever possible, and record the 6-digit statistical area code for the area in which most of the fish were caught. If the vessel fished in two or more areas for the catch delivered, record the area in which most of the fish was caught, but enter an asterisk (*) and note on the back of Form A all of the areas where hauls were made.

10. **No. of tows:** record the number of tows that were made during the trip. If the vessel is a longliner or a pot vessel, record the number of sets. This information can be obtained from the NMFS ship logs.

11. **Average duration:** record the average duration of the tows in minutes. Get the actual length of each haul from the NMFS logbook, add up the durations and divide by the number of hauls to get the average duration. You can go up to 9999 minutes for the average length of soak for a longline or pot set.

12. **Total weight delivered (lbs or mt):** Record the total weight of the catch delivered to the processing plant for that trip. This can be taken from the NMFS processing plant logs. (See the note above regarding how to handle cases in which a vessel delivers catch from a single trip to several different processing plants.) In most cases, this should be the same as the sum of the groups reported on the ADF&G fish ticket, but make sure that this includes all of the discards from the plant. Whenever possible, sum the scale readouts yourself.

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. Check the NMFS ship logs for this information but it would be best to ask the vessel's observer if any, or ask one of the crew.

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 might be in the NMFS ship log and thereby in the processing plant logs but is notoriously under-reported.

17. **Weight of sampling species delivered (lbs or mt):** This information should be on the ADF&G fish tickets and may be accurate unless the processor has cut a deal with the catcher boat to reduce the state tax on this amount. As possible, sum the scale weights yourself.

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 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.

SAMPLING INSTRUCTIONS

When sampling for composition at a plant, observers should be cautioned against relying on plant personnel to sort, save and or count fish for them. **Do not use weights of non-target species that are recorded in the ADF&G Fish Tickets or the "Alaska Groundfish Daily Cumulative Production Logbook" for species composition.** These logs can be useful for comparison of figures, but they cannot be used as a substitute for an observers sampling effort.

There is a handout for marine mammal watches. Refer to it for more detailed instructions.

Length Frequency Sampling:

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. Follow the instructions given for Form A regarding dates and delivery number entries on Form 7US.

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

Age Structure Collection:

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

Age structure collections should be stratified/random collections (5 per cm. per sex) 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:

Bering Sea	Gulf of Alaska
Yellowfin sole	Rock sole
Rock sole	Flathead sole
Flathead sole	Rex sole
Alaska plaice	Dover sole

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

PLANT OBSERVER WEEKLY CATCH MESSAGES

Messages from processing plant observers do not follow the same format as those from vessel observers. Messages should include the following for each plant that the observer worked at during the week:

Observer Name: _____

Plant Name: _____

Processor Code: _____ Fax/telex#: _____

Week Ending Date: _____

Dates of Observer Coverage: _____
(list each date)

Vessels delivering to plant: _____

_____

Deliveries by Species Group: (This does not need to be reported until you have received instructions for retained and discards sampling)

Species Code	Amount Retained By Plant (lbs)	Amount Discarded By Plant (lbs)

DOMESTIC OBSERVER PLANT REPORT

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

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

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

Sampling Procedures: 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, (206) 526-4205 or, when she's not in, the message recorder - 1-800-437-9092 (You can leave up to a 5-minute message. Be sure to back up catch messages by phone by immediately mailing A's and B's.)
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
Martin Loefflad (field representative)
Address: 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

Dutch Harbor (to obtain extra 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, or as they can. Catch messages are critical and must be sent on time.** Observers on catcher boat trawlers will commonly be one trip behind in sending their data but should never lag more than one week in their transmissions. 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

make daily reports to a lead observer or to

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 if you are aboard a vessel for a week or less, (as is commonly the case with shoreside delivery vessels), or you have just gotten off a vessel and have the last few day's data to send in, fax or phone in your catch message as soon as you have returned to port. Call our logistics office at (206) 526-4205 or try our new toll-free number at 1-800-437-9092. ~~As a last resort,~~ Whenever you phone in a catch message, you must back-up your call by mailing ~~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 ususally 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.)

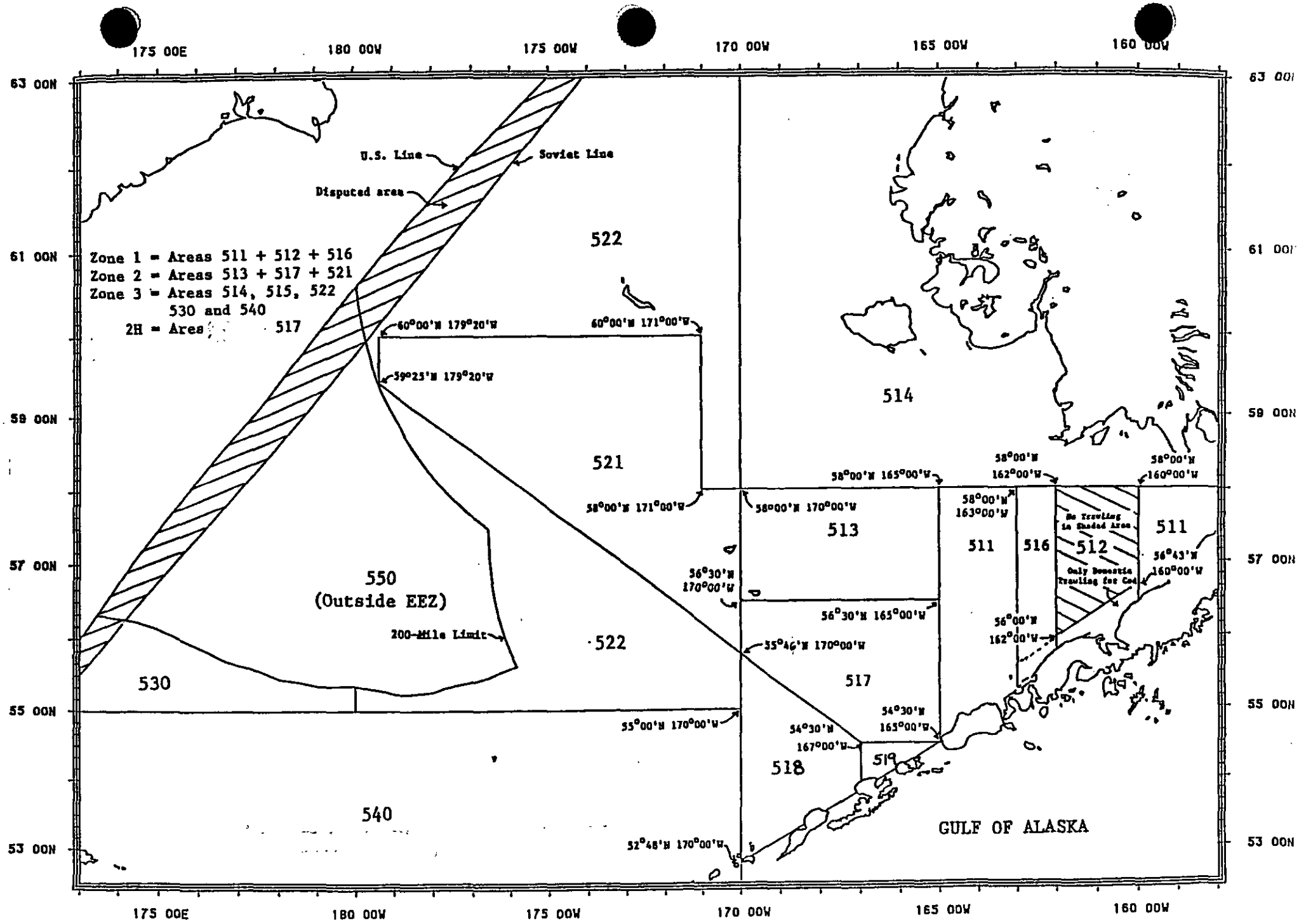
Same wk 2 trips 2 plants 2 messages

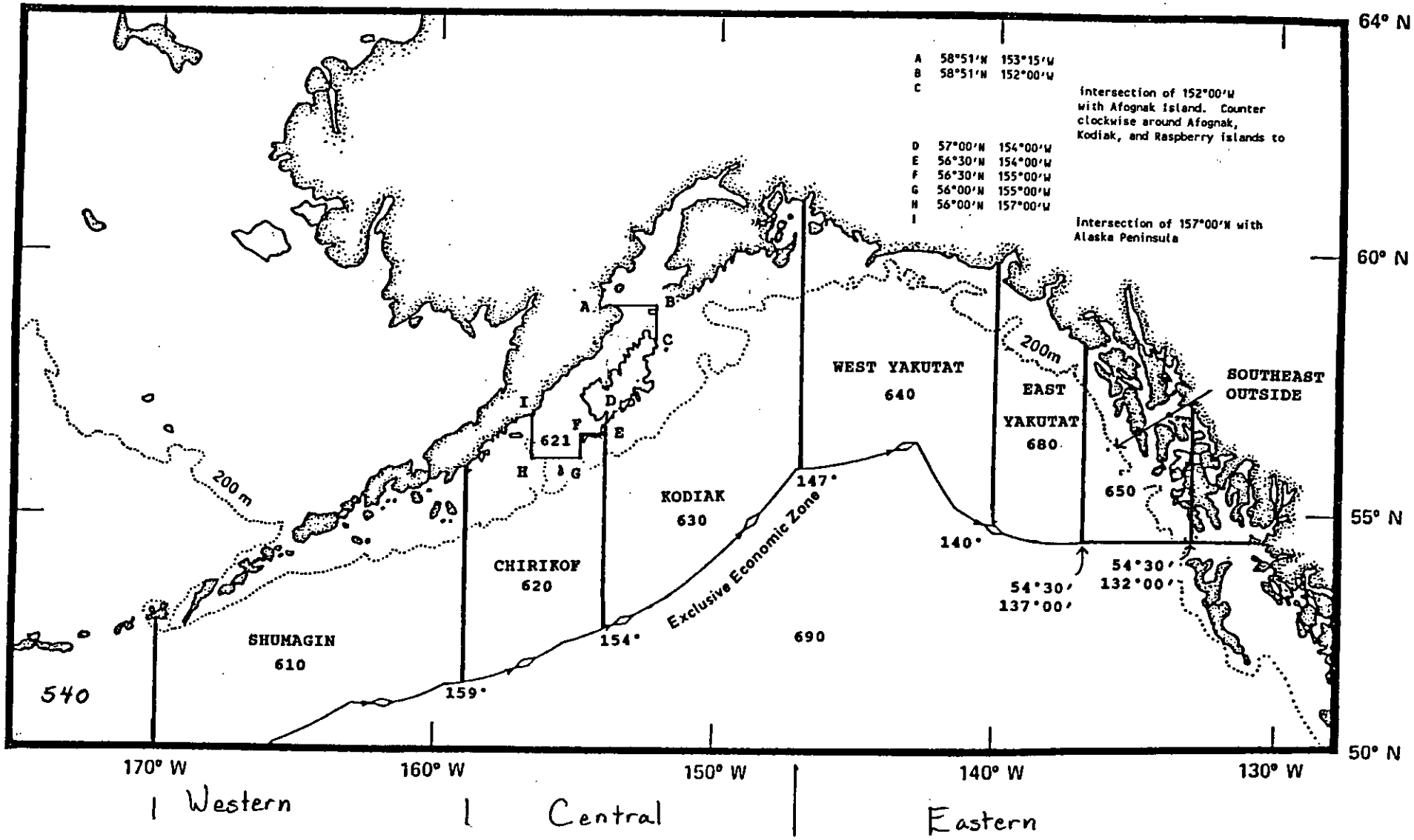
2) Observers on catcher boats attribute catch according to when the final delivery of catch is completed. All of the hauls made for a delivery are attributed to the week in which the last delivery of catch was completed. (example - a catcher boat makes tows on Thursday, Friday, and Saturday but does 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~~ delivers the remainder of the catch to Plant B on Monday. In this case, the catcher boat's observer would attribute all of the catch to the next week ending date.) & Plant B

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.

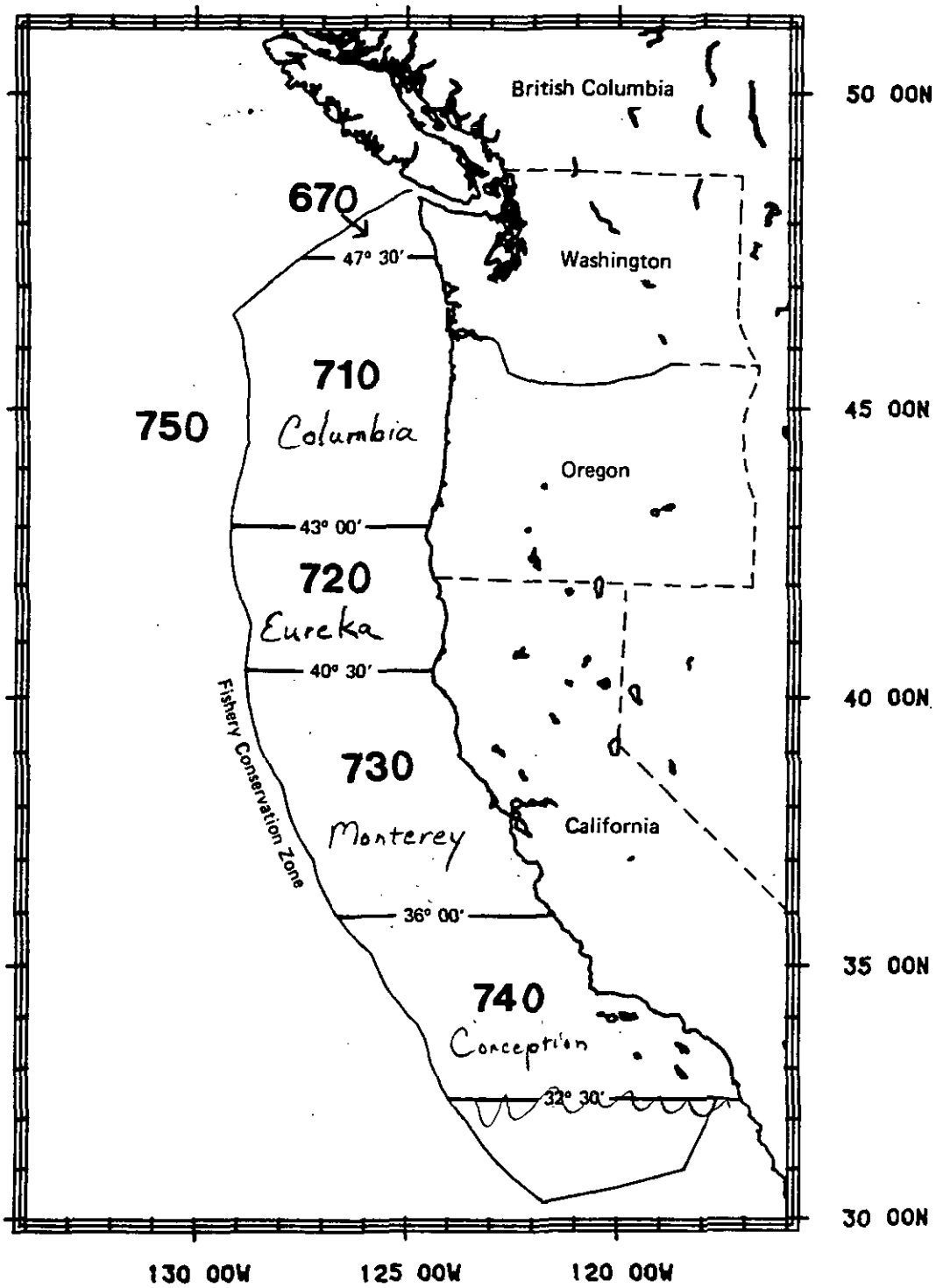
Notes for Observers Aboard "Floaters"

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.


175 00E
180 00W
175 00W
170 00W
165 00W
160 00W
63 00N
61 00N
59 00N
57 00N
55 00N
53 00N
U.S. Line
Soviet Line
Disputed area
Zone 1 = Areas 511 + 512 + 516
Zone 2 = Areas 513 + 517 + 521
Zone 3 = Areas 514, 515, 522
530 and 540
2H = Area 517
522
60°00'N 179°20'W
60°00'N 171°00'W
59°25'N 179°20'W
514
521
58°00'N 171°00'W
58°00'N 170°00'W
58°00'N 165°00'W
58°00'N
162°00'W
58°00'N
160°00'W
58°00'N
163°00'W
513
511
516
512
511
56°43'N
160°00'W
56°30'N
170°00'W
56°30'N 165°00'W
56°00'N
162°00'W
550
(Outside EEZ)
200-Mile Limit
522
55°46'N 170°00'W
530
517
55°00'N 170°00'W
54°30'N
165°00'W
54°30'N
167°00'W
518
519
540
52°48'N 170°00'W
GULF OF ALASKA



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)

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

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

Gulf of Alaska (Areas 610 - 680)

Species Group	Report Group	Abbreviation	Code
Rex sole Dover sole Greenland Turbot	Deep-water flatfish	dflt	118
Flathead sole	Flathead sole	flat	122
Arrowtooth flounder	Arrowtooth flounder	arrow	121
Rock sole Yellowfin sole Butter sole Starry flounder All other flatfish (except halibut)	Shallow-water flatfish	sflt	119
Pollock	Pollock	poll	270
Pacific cod	Pacific cod	cod	110
Sablefish	Sablefish	sab	710
Pacific ocean perch (S. alutus)	POP	pop	141
Rougheye rockfish (S. aleutianus) Shortraker rockfish (S. borealis)	Deep-water rockfish	deep rf	171
Northern rockfish (S. polyspinus) Sharpchin rockfish (S. zacentrus) Aurora rockfish (Sebastes aurora) Blackgill rockfish (S. melanostomus) Chilipepper rockfish (S. goodei) Darkblotched rockfish (S. crameri) Greenstriped rockfish (S. elongatus) Harlequin rockfish (S. variegatus) Pygmy rockfish (S. wilsoni) Bocaccio (S. paucispinus) Shortbelly rockfish (S. jordani) Splitnose rockfish (S. diploproa) Stripetail rockfish (S. saxicola) Vermilion rockfish (S. miniatus) Yellowmouth rockfish (S. reedi) Redstripe rockfish (S. proriger) Silvergray rockfish (S. brevispinus)	Slope Rockfish	slprf	144

Gulf of Alaska (Areas 610 - 680) cont.

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

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

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

Species Group	Report Group	Abbreviation	
Pacific hake	Pacific hake	HAKE	280
Pacific cod	Pacific cod	PCOD	110
Lingcod	Lingcod	LING	130
Jack mackerel	Jack mackerel	JMACK	290
Sablefish	Sablefish	SABLE	710
Arrowtooth flounder	Arrowtooth flounder	ARROW	121
Dover sole	Dover sole	DOVER	124
English sole	English sole	ENGLS	128
Petrale sole	Petrale sole	PETRL	131
All other flatfish (except halibut)	Other flatfish	OFLAT	120
Bocaccio	Bocaccio	BOCCI	137
Canary rockfish	Canary Rockfish	CANRY	146
Chilipepper rockfish	Chilipepper rockfish	CHILI	176
Pacific ocean perch	Pacific ocean perch	POP	141
Shortbelly rockfish	Shortbelly rockfish	SBLY	177
Longspine thornyhead Shortspine thornyhead	Thornyhead Rockfish	THRN	143
Widow rockfish	Widow rockfish	WIDOW	156
Yellowtail rockfish	Yellowtail rockfish	YTAIL	155
Other rockfish	Other rockfish	OROCK	139
All remaining fish spp. (except halibut and salmon)	Other fish	OTHGF	100
Invertebrates (other than prohibited invertebrate species) Miscellaneous items	Non-allocated	NON	999
Prohibited spp. (halibut, salmon and dungeness crab)	Prohibited species	PROHIB	900

CMA

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 it's 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 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 be entered on each of the Catch Message Form A's for the transmission.

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.)
    trawl Catches 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. For each species recorded on 3US, refer to the list of species report groups and codes by region (BSA, GOA, or WOC), and find the corresponding report group and it's code. Write the species report group abbreviations and codes across the tops of the columns on the Species Composition Catch Message Form. For subsequent samples, additional report groups may need to be added. For each transmission, all pages of Form A for an area/gear type must have the same report groups, in the same order. Be sure to "zero fill" as necessary, refer to items 23 and 25 below.

18. In the "PAGE ____ OF ___ FOR THE TRANSMISSION" section, enter the total number of pages of both Catch Message Forms A and B that you have for that transmission, regardless of the area or gear type. This will allow us to be sure that we have received all the pages you intended to send.

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:

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.

A SPECIES COMPOSIITION CATCH MESSAGE FORM PAGE 1 OF ____ FOR THE WEEK (WEEKLY MESSAGE) OR DAILY MESSAGE OR RESUBMISSION PAGE ____ OF ____

OBSERVER NAME Jane Observer
PERMIT # AK-87-0001
AREA 521
MARINE MAMMAL TOWS 3

VESSEL NAME Sea Gull
PROCESSOR CODE ____
GEAR TYPE NPT
WT OF MM TOWS 48.00

FAX\TELEX # 482-9356
WEEK ENDING DATE 9/11
TOTAL # TOWS 5
MM CODE ____ # MM None

ORC 999
OBS. COVERAGE DAYS 2.0
DURATION OF TOWS 683
INITIAL DATE OF SAMP. 9/10

	SPECIES GROUP CODES			875	127	123	121	120	270	110	710	141	173	139	100	999	900		
				SQU	YELL	RSOLE	ARROW	OFLAT	POLL	COD	SAB	POP	Scom	ORock	OTH	NON	PRO		
	DATE AND HAUL NUMBER	HAUL WEIGHT IN MT	TOTAL SAMPLE WEIGHT IN KG	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE	KG in SAMPLE
1	9/10/101	16.00	16000.0	3.6	0	0	5.0	5.55	1569.48	0	726	.45	3.2	10.8	90.0	1.4	115.92		
2	9/10/101	PERCENTAGE BY SPECIES	RETAINED	100	0	0	100	100	100	0	100	100	100	100	0	100	0		
3	9/10/103	20.00	582.37	0	0	0	2.6	0	181.44	396.48	1.85	0	0	0	0	0	0		
4	9/10/103	PERCENTAGE BY SPECIES	RETAINED	0	0	0	0	0	95	100	100	0	0	0	0	0	0		
5	9/10/104	12.00	537.1	0	200.5	26.4	89.1	176.9	0	0	0	0	0	0	16.4	0	27.8		
6	9/10/104	PERCENTAGE BY SPECIES	RETAINED	0	100	15	100	100	0	0	0	0	0	0	0	0	0		
7	9/10/105	18.62	510.6	1.23	0	0	0	0	478.93	21.4	0	1.49	3.44	1.04	0	.86	2.21		
8	9/10/105	PERCENTAGE BY SPECIES	RETAINED	100	0	0	0	0	100	100	0	100	100	100	0	0	0		
9	9/11		No	Fishing-Rough			Seas	Area	521										
10		PERCENTAGE BY SPECIES	RETAINED																
11																			
12		PERCENTAGE BY SPECIES	RETAINED																
13																			
14		PERCENTAGE BY SPECIES	RETAINED																

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, you must enter a zero in that column, that is, fill in all empty data cells with zeros ("zero fill"). (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. If there is no entry for a report group for a sample, enter a zero in the percentage retained line as well (zero fill).

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.)

INSTRUCTIONS FOR PROHIBITED SPECIES CATCH MESSAGE FORM B

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, for all days of coverage, 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 the sum of 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 haul or set number. 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.

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

B PROHIBITED SPECIES CATCH MESSAGE FORM PAGE 1 OF ____ FOR THE WEEK WEEKLY MESSAGE OR DAILY MESSAGE OR RESUBMISSION PAGE ____ OF ____

OBSERVER NAME Jane Observer VESSEL NAME Sea Gull FAX\TELEX # 482-9356

PERMIT# AK-87-0001 PROCESSOR CODE ____ WEEK ENDING DATE 9/11 AREA 521

GEAR TYPE NPT TOTAL # SETS ____ TOTAL # HOOKS/POTS ____ DURATION (hrs) ____ (min) ____

DATE 9/10 WT 74.87 DATE 9/11 WT 0 DATE ____ WT ____ DATE ____ WT ____ DATE ____ WT ____ DATE ____ WT ____ DATE ____ WT ____

	DATE AND HAUL NUMBER	HAUL WEIGHT IN MT	SAMPLE WEIGHT IN MT	RED KING CRAB		OTHER KING CRAB		SAMPLE WEIGHT IN MT	HERRING	SAMPLE WEIGHT IN MT	BAIRDI TANNER		OTHER TANNER		SAMPLE WEIGHT IN MT	PACIFIC HALIBUT		SAMPLE WEIGHT IN MT	CHINOOK SALMON		OTHER SALMON	
				NUMBER	WEIGHT KG	NUMBER	WEIGHT KG		WEIGHT KG		NUMBER	WEIGHT KG	NUMBER	WEIGHT KG		NUMBER	WEIGHT KG		NUMBER	WEIGHT KG	NUMBER	WEIGHT KG
1	9/10/101	16.00	16.00	0	0	0	0	16.00	0	16.00	629	100.0	28	4.24	16.00	2	6.2	16.00	3	5.48	0	0
2	9/10/103	20.00	20.00	0	0	0	0	.582	0	20.00	0	0	0	0	20.00	1	5.0	20.00	7	21.9	0	0
3	9/10/104	12.00	.54	20	6.8	0	0	.54	0	.54	28	2.1	187	15.3	.54	1	3.6	.54	0	0	0	0
4	9/10/105	18.62	18.62	0	0	0	0	.51	0	.51	7	2.21	0	0	18.62	24	247.0	18.62	0	0	0	0
5	9/11		No	Fishing -		Rough		Seas	-	Area	521											
6																						
7																						
8																						
9																						
10																						
11																						
12																						
13																						
14																						

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. Similarly, proportion the weight based on the percentages in the subsample.

18. **If no members of a particular prohibited species report group are seen, then enter a zero (0) in the number and weight columns.**

19. In the "PAGE ____ OF ___ FOR THE TRANSMISSION" section enter the number of pages of the Catch Message Forms A and B that you have for that transmission, 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.

Catch Message Directions for Observers at Processing Plants

Messages from processing plant observers do not follow the same format as those from observers aboard domestic vessels. Refer to the instructions in the plant sampling section of this manual. Messages should include the following (at a minimum) for each plant that the observer worked at during the week:

Observer Name
Plant Name
Processor Code
Fax/telex#
Week Ending Date
Dates of Observer Coverage (list each date)
Names of all vessels delivering to plant

DAILY CATCH MESSAGES

While you are out at sea, you may receive a message that asks you to begin sending daily catch messages. This is most apt to occur when a 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, if transmitting the message by fax, circle "Daily Message" at the top of the form. Daily messages should **not** be sent to the Seattle Observer Program office. Instead send them to Dave Cormany, Juneau Regional Office, (address and phone number is on the first page of this Catch Message section). **Remember:** dailies to Juneau, **weeky messages to Seattle.**

Daily messages must be sent to the Juneau 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.

For transmission via fax, 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 line(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 and the report should be sent to **both** Seattle and Juneau.

For transmission via telex or radiotelephone, the abbreviated format below will be much easier. The information for this format should come directly off of your Catch Message Forms A and/or B. Radiotelephone transmissions must be coded by substituting your letter codes for numbers.

Vessel Name (**Vessel**)
Federal groundfish permit no. (**Permit no.**)
Observer name (**Observer**)
Date of catch and sample data being reported (**Data for:**)
Area fished, NMFS (**Area**)
Total daily catch, sample plus un-sampled hauls, (**Total catch**)

then you will need to report for each species report group requested, (usually halibut):

Weight of haul sampled, in metric tons, (**haul wt.**)
Sample weight for the report group requested, in kilograms, (**sample wt.**)
Report group species weight, in kilograms, (**species wt.**)

DIAGONAL BOUNDARY LINE TABLES FOR THE BERING SEA

When you are given a position that is close to the diagonal boundary lines that separate areas 517 and 515 or areas 521 and 522, it may be difficult to determine exactly which subarea the deliver 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)

Col. A	Col.B	
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:

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

3. Determine whether your 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	AREA 515	AREA 522
Delivery latitude greater than line latitude	AREA 517	AREA 521

LAT COL. A	LONG COL. B
5430.00	16700.00
5430.43	16701.00
5430.86	16702.00
5431.29	16703.00
5431.72	16704.00
5432.14	16705.00
5432.57	16706.00
5433.00	16707.00
5433.43	16708.00
5433.86	16709.00
5434.29	16710.00
5434.71	16711.00
5435.14	16712.00
5435.57	16713.00
5436.00	16714.00
5436.43	16715.00
5436.85	16716.00
5437.28	16717.00
5437.71	16718.00
5438.14	16719.00
5438.56	16720.00
5438.99	16721.00
5439.42	16722.00
5439.85	16723.00
5440.27	16724.00
5440.70	16725.00
5441.13	16726.00
5441.55	16727.00
5441.98	16728.00
5442.41	16729.00
5442.83	16730.00
5443.26	16731.00
5443.69	16732.00
5444.11	16733.00
5444.54	16734.00
5444.97	16735.00
5445.39	16736.00
5445.82	16737.00
5446.25	16738.00
5446.67	16739.00
5447.10	16740.00
5447.52	16741.00
5447.95	16742.00
5448.38	16743.00
5448.80	16744.00
5449.23	16745.00
5449.65	16746.00
5450.08	16747.00
5450.50	16748.00
5450.93	16749.00
5451.35	16750.00
5451.78	16751.00
5452.20	16752.00
5452.63	16753.00
5453.05	16754.00
5453.48	16755.00
5453.90	16756.00
5454.33	16757.00

LAT COL. A	LONG COL. B
5454.75	16758.00
5455.18	16759.00
5455.60	16800.00
5456.03	16801.00
5456.45	16802.00
5456.87	16803.00
5457.30	16804.00
5457.72	16805.00
5458.15	16806.00
5458.57	16807.00
5458.99	16808.00
5459.42	16809.00
5459.84	16810.00
5500.27	16811.00
5500.69	16812.00
5501.11	16813.00
5501.54	16814.00
5501.96	16815.00
5502.38	16816.00
5502.81	16817.00
5503.23	16818.00
5503.65	16819.00
5504.08	16820.00
5504.50	16821.00
5504.92	16822.00
5505.34	16823.00
5505.77	16824.00
5506.19	16825.00
5506.61	16826.00
5507.03	16827.00
5507.46	16828.00
5507.88	16829.00
5508.30	16830.00
5508.72	16831.00
5509.15	16832.00
5509.57	16833.00
5509.99	16834.00
5510.41	16835.00
5510.83	16836.00
5511.26	16837.00
5511.68	16838.00
5512.10	16839.00
5512.52	16840.00
5512.94	16841.00
5513.36	16842.00
5513.78	16843.00
5514.21	16844.00
5514.63	16845.00
5515.05	16846.00
5515.47	16847.00
5515.89	16848.00
5516.31	16849.00
5516.73	16850.00
5517.15	16851.00
5517.57	16852.00
5517.99	16853.00
5518.41	16854.00
5518.83	16855.00
5519.25	16856.00
5519.67	16857.00

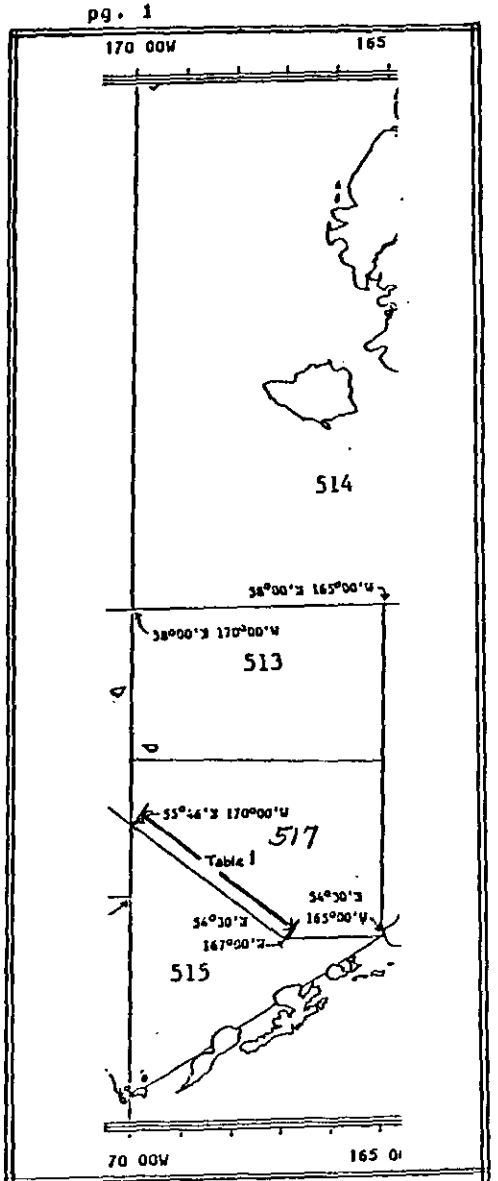
LAT COL. A	LONG COL. B
5520.09	16858.00
5520.51	16859.00
5520.93	16900.00
5521.35	16901.00
5521.77	16902.00
5522.19	16903.00
5522.61	16904.00
5523.03	16905.00
5523.45	16906.00
5523.87	16907.00
5524.29	16908.00
5524.71	16909.00
5525.13	16910.00
5525.55	16911.00
5525.97	16912.00
5526.39	16913.00
5526.81	16914.00
5527.23	16915.00
5527.64	16916.00
5528.06	16917.00
5528.48	16918.00
5528.90	16919.00
5529.32	16920.00
5529.74	16921.00
5530.16	16922.00
5530.57	16923.00
5530.99	16924.00
5531.41	16925.00
5531.83	16926.00
5532.25	16927.00
5532.66	16928.00
5533.08	16929.00
5533.50	16930.00
5533.92	16931.00
5534.34	16932.00
5534.75	16933.00
5535.17	16934.00
5535.59	16935.00
5536.01	16936.00
5536.42	16937.00
5536.84	16938.00
5537.26	16939.00
5537.67	16940.00
5538.09	16941.00
5538.51	16942.00
5538.93	16943.00
5539.34	16944.00
5539.76	16945.00
5540.18	16946.00
5540.59	16947.00
5541.01	16948.00
5541.42	16949.00
5541.84	16950.00
5542.26	16951.00
5542.67	16952.00
5543.09	16953.00
5543.51	16954.00
5543.92	16955.00
5544.34	16956.00
5544.75	16957.00

LAT COL. A	LONG COL. B
5545.17	16958.00
5545.58	16959.00
5546.00	17000.00

TABLE 1

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

pg. 1



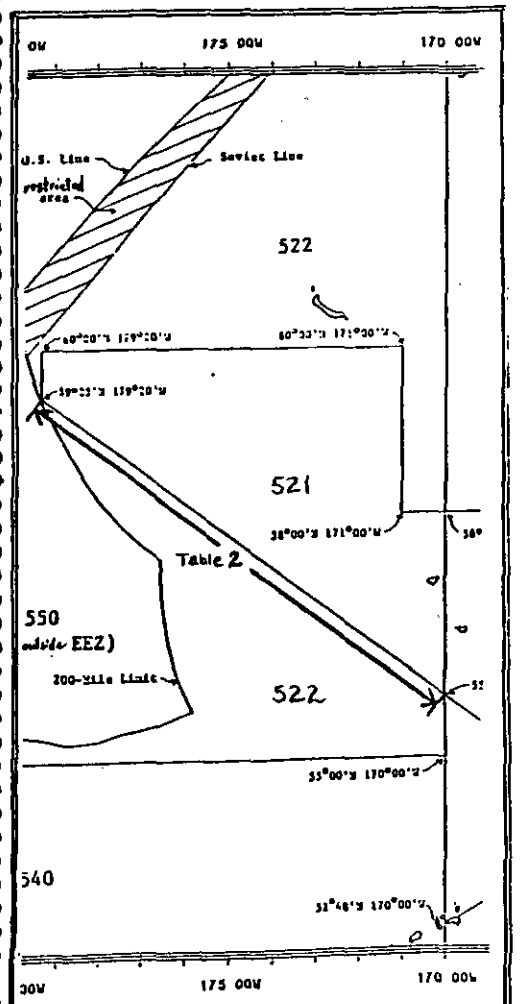
Map Section showing the line that the points of Table 1 follow.

TABLE 2

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

pgs. 2-3

LAT COL. A	LONG COL. B
5545.41	17001.00
5546.82	17002.00
5547.23	17003.00
5547.64	17004.00
5548.05	17005.00
5548.46	17006.00
5548.87	17007.00
5549.28	17008.00
5549.70	17009.00
5550.11	17010.00
5550.52	17011.00
5550.93	17012.00
5551.34	17013.00
5551.75	17014.00
5552.16	17015.00
5552.57	17016.00
5552.97	17017.00
5553.38	17018.00
5553.79	17019.00
5554.20	17020.00
5554.61	17021.00
5555.02	17022.00
5555.43	17023.00
5555.84	17024.00
5556.25	17025.00
5556.66	17026.00
5557.07	17027.00
5557.48	17028.00
5557.89	17029.00
5558.29	17030.00
5558.70	17031.00
5559.11	17032.00
5559.52	17033.00
5559.93	17034.00
5600.34	17035.00
5600.75	17036.00
5601.15	17037.00
5601.56	17038.00
5601.97	17039.00
5602.38	17040.00
5602.79	17041.00
5603.19	17042.00
5603.60	17043.00
5604.01	17044.00
5604.42	17045.00
5604.83	17046.00
5605.23	17047.00
5605.64	17048.00
5606.05	17049.00
5606.46	17050.00
5606.86	17051.00
5607.27	17052.00
5607.68	17053.00
5608.08	17054.00
5608.49	17055.[illegible]
5608.90	17056[illegible]
5609.30	17057[illegible]
5609.71	17058.00
5610.12	17059.00
5610.52	17100.00
5610.93	17101.00
5611.34	17102.00
5611.74	17103.00
5612.15	17104.00
5612.56	17105.00
5612.96	17106.00
5613.37	17107.00
5613.78	17108.00
5614.18	17109.00
5614.59	17110.00
5614.99	17111.00
5615.40	17112.00
5615.80	17113.00
5616.21	17114.00
5616.62	17115.00
5617.02	17116.00
5617.43	17117.00
5617.83	17118.00
5618.24	17119.00
5618.64	17120.00
5619.05	17121.00
5619.45	17122.00
5619.86	17123.00
5620.26	17124.00
5620.67	17125.00
5621.07	17126.00
5621.48	17127.00
5621.88	17128.00
5622.29	17129.00
5622.69	17130.00
5623.09	17131.00
5623.50	17132.00
5623.90	17133.00
5624.31	17134.00
5624.71	17135.00
5625.12	17136.00
5625.52	17137.00
5625.92	17138.00
5626.33	17139.00
5626.73	17140.00
5627.13	17141.00
5627.54	17142.00
5627.94	17143.00
5628.35	17144.00
5628.75	17145.00
5629.15	17146.00
5629.56	17147.00
5629.96	17148.00
5630.36	17149.00
5630.76	17150.00
5631.17	17151.00
5631.57	17152.00
5631.97	17153.00
5632.38	17154.00
5632.78	17155.00
5633.18	17156.00
5633.58	17157.00
5633.99	17158.00
5634.39	17159.00
5634.79	17200.00
5635.19	17201.00
5635.60	17202.00
5636.00	17203.00
5636.40	17204.00
5636.80	17205.00
5637.20	17206.00
5637.61	17207.00
5638.01	17208.00
5638.41	17209.00
5638.81	17210.00
5639.21	17211.00
5639.61	17212.00
5640.01	17213.00
5640.42	17214.00
5640.82	17215.00
5641.22	17216.00
5641.62	17217.00
5642.02	17218.00
5642.42	17219.00
5642.82	17220.00
5643.22	17221.00
5643.62	17222.00
5644.02	17223.00
5644.43	17224.00
5644.83	17225.00
5645.23	17226.00
5645.63	17227.00
5646.03	17228.00
5646.43	17229.00
5646.83	17230.00
5647.23	17231.00
5647.63	17232.00
5648.03	17233.00
5648.43	17234.00
5648.83	17235.00
5649.23	17236.00
5649.63	17237.00
5650.03	17238.00
5650.43	17239.00
5650.83	17240.00
5651.23	17241.00
5651.62	17242.00
5652.02	17243.00
5652.42	17244.00
5652.82	17245.00
5653.22	17246.00
5653.62	17247.00
5654.02	17248.00
5654.42	17249.00
5654.82	17250.00
5655.22	17251.00
5655.61	17252.00
5656.01	17253.00
5656.41	17254.00
5656.81	17255.00
5657.21	17256.00
5657.61	17257.00
5658.00	17258.00
5658.40	17259.00
5658.80	17300.00
5659.20	17301.00
5659.60	17302.00
5659.99	17303.00
5700.39	17304.00
5700.79	17305.00
5701.19	17306.00
5701.59	17307.00
5701.98	17308.00
5702.38	17309.00
5702.78	17310.00
5703.17	17311.00
5703.57	17312.00
5703.97	17313.00
5704.37	17314.00
5704.76	17315.00
5705.16	17316.00
5705.56	17317.00
5705.95	17318.00
5706.35	17319.00
5706.75	17320.00
5707.14	17321.00
5707.54	17322.00
5707.94	17323.00
5708.33	17324.00
5708.73	17325.00
5709.13	17326.00
5709.52	17327.00
5709.92	17328.00
5710.31	17329.00
5710.71	17330.00
5711.11	17331.00
5711.50	17332.00
5711.90	17333.00
5712.29	17334.00
5712.69	17335.00
5713.08	17336.00
5713.48	17337.00
5713.87	17338.00
5714.27	17339.00
5714.67	17340.00
5715.06	17341.00
5715.46	17342.00
5715.85	17343.00
5716.25	17344.00
5716.64	17345.00
5717.03	17346.00
5717.43	17347.00
5717.82	17348.00
5718.22	17349.00
5718.61	17350.00
5719.01	17351.00
5719.40	17352.00
5719.80	17353.00
5720.19	17354.00
5720.59	17355.00
5720.9[illegible]	[illegible]356.00
5721.3[illegible]	[illegible]357.00
5721.77	17358.00
5722.16	17359.00
5722.55	17400.00
5722.95	17401.00
5723.34	17402.00
5723.74	17403.00
5724.13	17404.00
5724.52	17405.00
5724.92	17406.00
5725.31	17407.00
5725.70	17408.00
5726.10	17409.00
5726.49	17410.00
5726.88	17411.00
5727.28	17412.00
5727.67	17413.00
5728.06	17414.00
5728.45	17415.00
5728.85	17416.00
5729.24	17417.00
5729.63	17418.00
5730.02	17419.00
5730.42	17420.00
5730.81	17421.00
5731.20	17422.00
5731.59	17423.00
5731.99	17424.00
5732.38	17425.00
5732.77	17426.00
5733.16	17427.00
5733.55	17428.00
5733.95	17429.00
5734.34	17430.00
5734.73	17431.00
5735.12	17432.00
5735.51	17433.00
5735.90	17434.00
5736.29	17435.00
5736.69	17436.00
5737.08	17437.00
5737.47	17438.00
5737.86	17439.00
5738.25	17440.00
5738.64	17441.00
5739.03	17442.00
5739.42	17443.00
5739.81	17444.00
5740.20	17445.00
5740.59	17446.00
5740.99	17447.00
5741.38	17448.00
5741.77	17449.00
5742.16	17450.00
5742.55	17451.00
5742.94	17452.00
5743.33	17453.00
5743.72	17454.00
5744.11	17455.00
5744.50	17456.00
5744.89	17457.00



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

LAT COL. A	LONG COL. B
5745.28	17458.00
5745.67	17459.00
5746.06	17500.00
5746.44	17501.00
5746.83	17502.00
5747.22	17503.00
5747.61	17504.00
5748.00	17505.00
5748.39	17506.00
5748.78	17507.00
5749.17	17508.00
5749.56	17509.00
5749.95	17510.00
5750.34	17511.00
5750.73	17512.00
5751.11	17513.00
5751.50	17514.00
5751.89	17515.00
5752.28	17516.00
5752.67	17517.00
5753.06	17518.00
5753.44	17519.00
5753.83	17520.00
5754.22	17521.00
5754.61	17522.00
5755.00	17523.00
5755.38	17524.00
5755.77	17525.00
5756.16	17526.00
5756.55	17527.00
5756.94	17528.00
5757.32	17529.00
5757.71	17530.00
5758.10	17531.00
5758.49	17532.00
5758.87	17533.00
5759.26	17534.00
5759.65	17535.00
5800.03	17536.00
5800.42	17537.00
5800.81	17538.00
5801.20	17539.00
5801.58	17540.00
5801.97	17541.00
5802.36	17542.00
5802.74	17543.00
5803.13	17544.00
5803.52	17545.00
5803.90	17546.00
5804.29	17547.00
5804.67	17548.00
5805.06	17549.00
5805.45	17550.00
5805.83	17551.00
5806.22	17552.00
5806.60	17553.00
5806.99	17554.00
5807.38	17555.00
5807.76	17556.00

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

LAT COL. A	LONG COL. B
5831.54	17658.00
5831.92	17659.00
5832.30	17700.00
5832.68	17701.00
5833.06	17702.00
5833.45	17703.00
5833.83	17704.00
5834.21	17705.00
5834.59	17706.00
5834.97	17707.00
5835.35	17708.00
5835.73	17709.00
5836.11	17710.00
5836.49	17711.00
5836.87	17712.00
5837.25	17713.00
5837.63	17714.00
5838.01	17715.00
5838.39	17716.00
5838.77	17717.00
5839.15	17718.00
5839.53	17719.00
5839.91	17720.00
5840.29	17721.00
5840.67	17722.00
5841.05	17723.00
5841.43	17724.00
5841.81	17725.00
5842.19	17726.00
5842.57	17727.00
5842.95	17728.00
5843.33	17729.00
5843.71	17730.00
5844.09	17731.00
5844.47	17732.00
5844.84	17733.00
5845.22	17734.00
5845.60	17735.00
5845.98	17736.00
5846.36	17737.00
5846.74	17738.00
5847.12	17739.00
5847.50	17740.00
5847.87	17741.00
5848.25	17742.00
5848.63	17743.00
5849.01	17744.00
5849.39	17745.00
5849.77	17746.00
5850.14	17747.00
5850.52	17748.00
5850.90	17749.00
5851.28	17750.00
5851.65	17751.00
5852.03	17752.00
5852.41	17753.00
5852.79	17754.00
5853.17	17755.00
5853.54	17756.00
5853.92	17757.00

LAT COL. A	LONG COL. B
5854.30	17758.00
5854.67	17759.00
5855.05	17800.00
5855.43	17801.00
5855.81	17802.00
5856.18	17803.00
5856.56	17804.00
5856.94	17805.00
5857.31	17806.00
5857.69	17807.00
5858.07	17808.00
5858.44	17809.00
5858.82	17810.00
5859.20	17811.00
5859.57	17812.00
5859.95	17813.00
5900.32	17814.00
5900.70	17815.00
5901.08	17816.00
5901.45	17817.00
5901.83	17818.00
5902.20	17819.00
5902.58	17820.00
5902.96	17821.00
5903.33	17822.00
5903.71	17823.00
5904.08	17824.00
5904.46	17825.00
5904.83	17826.00
5905.21	17827.00
5905.58	17828.00
5905.96	17829.00
5906.33	17830.00
5906.71	17831.00
5907.08	17832.00
5907.46	17833.00
5907.83	17834.00
5908.21	17835.00
5908.58	17836.00
5908.96	17837.00
5909.33	17838.00
5909.71	17839.00
5910.08	17840.00
5910.45	17841.00
5910.83	17842.00
5911.20	17843.00
5911.58	17844.00
5911.95	17845.00
5912.33	17846.00
5912.70	17847.00
5913.07	17848.00
5913.45	17849.00
5913.82	17850.00
5914.19	17851.00
5914.57	17852.00
5914.94	17853.00
5915.31	17854.00
5915.69	17855.00
5916.06	17856.00
5916.43	17857.00

LAT COL. A	LONG COL. B
5916.81	17858.00
5917.18	17859.00
5917.55	17900.00
5917.93	17901.00
5918.30	17902.00
5918.67	17903.00
5919.05	17904.00
5919.42	17905.00
5919.79	17906.00
5920.16	17907.00
5920.54	17908.00
5920.91	17909.00
5921.28	17910.00
5921.65	17911.00
5922.02	17912.00
5922.40	17913.00
5922.77	17914.00
5923.14	17915.00
5923.51	17916.00
5923.88	17917.00
5924.26	17918.00
5924.63	17919.00
5925.00	17920.00

LOGBOOK ENTRIES

The observer logbook is not to be used as a personal diary but as a record book for notes and data not included on the forms, and a place to document circumstances and information concerning any possible violations of fishing regulations. 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 _____

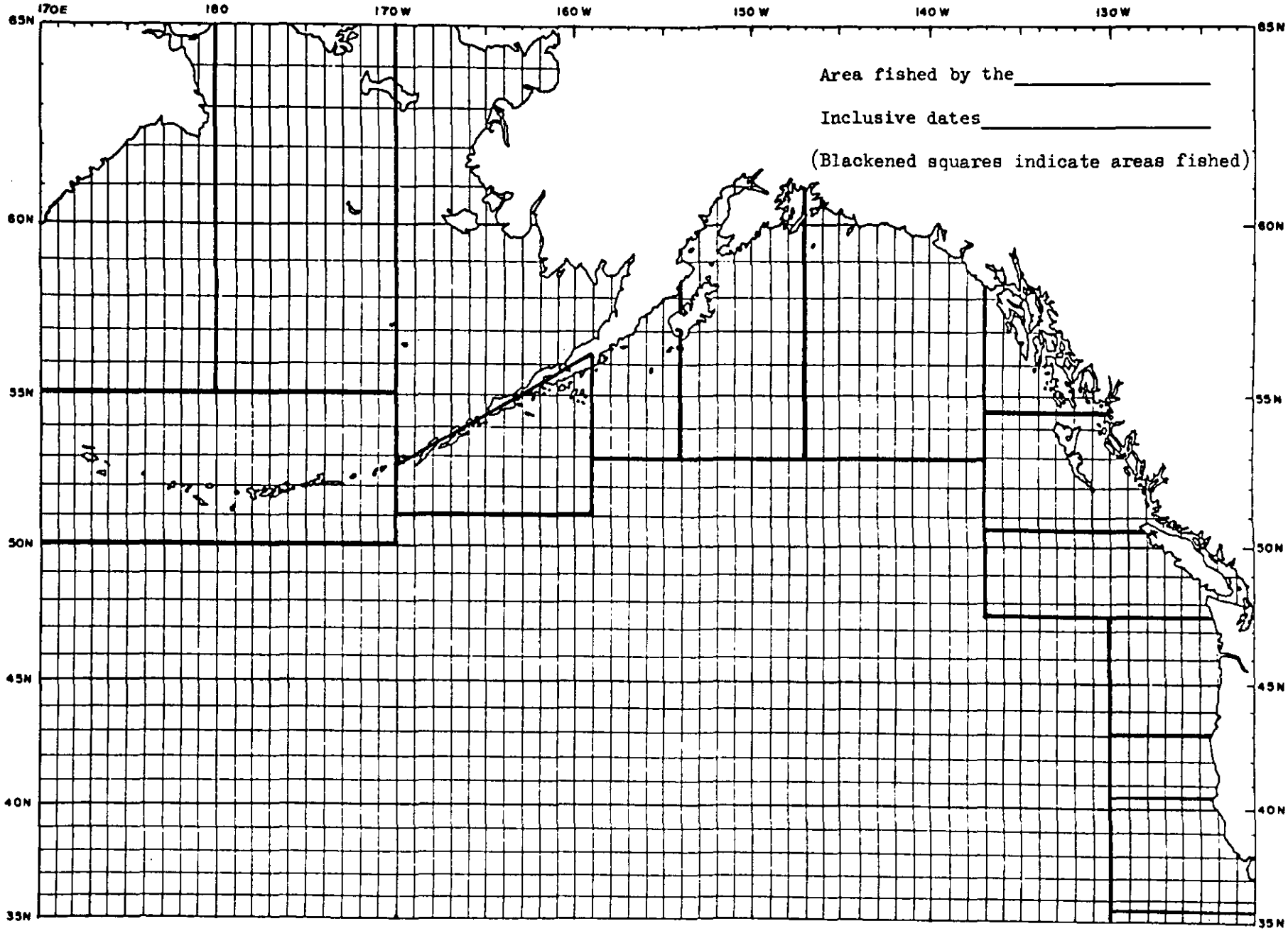
Year Commissoned _____ Radio Call Sign _____

Company _____

Home Port _____

Personnel: Skipper _____

Total Ship Complement _____


170E
180
170W
160W
150W
140W
130W
65N
60N
55N
50N
45N
40N
35N
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.

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? _____

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**

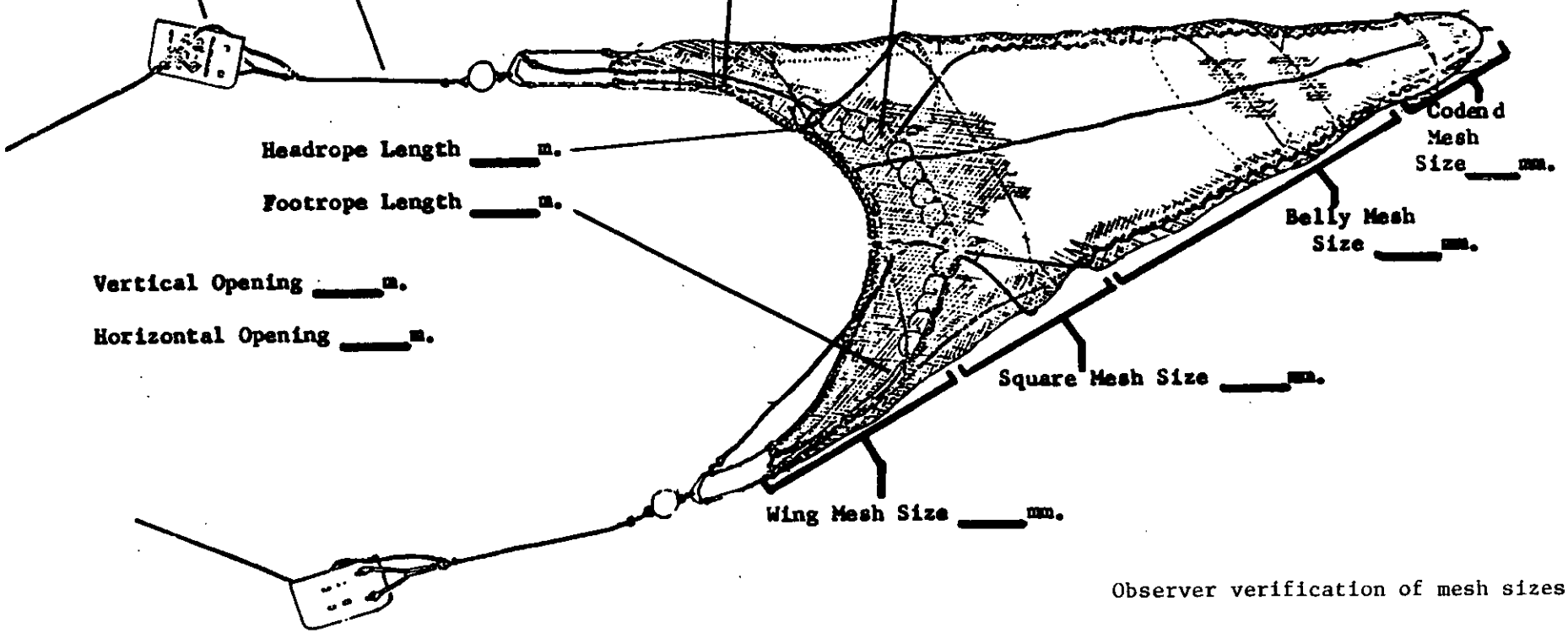
Vessel Type _____ **Observation Period** _____

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

Floats: Number ____
Size ____ **cm.**
Material _____
Shape _____

Dandyline Length ____ **m.**

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



Headrope Length ____ **m.**

Footrope Length ____ **m.**

Vertical Opening ____ **m.**

Horizontal Opening ____ **m.**

Codend Mesh Size ____ **mm.**

Belly Mesh Size ____ **mm.**

Square Mesh Size ____ **mm.**

Wing Mesh Size ____ **mm.**

Observer verification of mesh sizes

Yes_____ No_____

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

Net Recorder
Name _____
Model Number _____
Frequency _____ **kc.**

PELAGIC TRAWL NET DIMENSIONS AND CHARACTERISTICS

Vessel Type _____

Observation Period _____

Wing section was composed of: (circle one)

Rope lines (as illustrated)
Large mesh

Trawl Doors: Shape _____
Material _____
Dimensions ____m. x ____m.
Weight _____kg.

Dandyline Length _____m

Net Recorder: Name _____
Model Number _____
Frequency _____kc.

Floats: Number _____
Size _____cm.
Material _____
Shape _____

Headrope Length _____m.

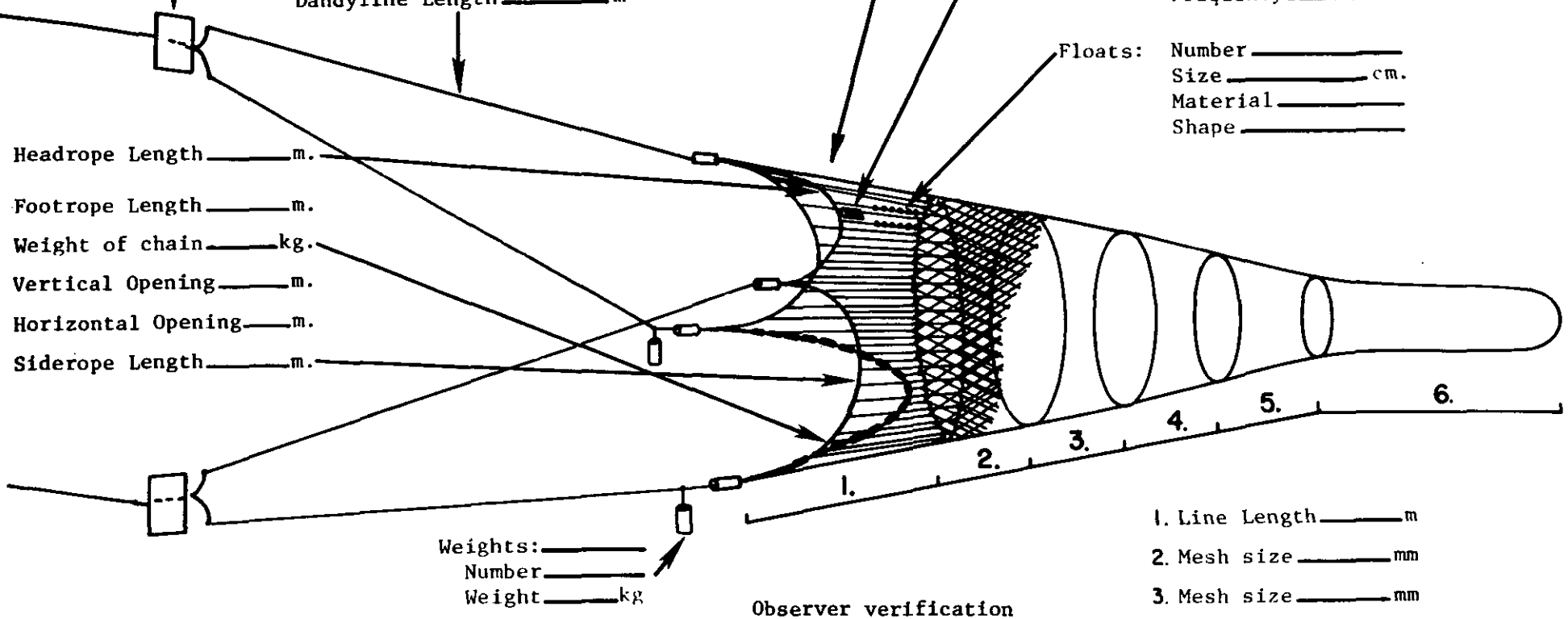
Footrope Length _____m.

Weight of chain _____kg.

Vertical Opening _____m.

Horizontal Opening _____m.

Siderope Length _____m.



Weights: _____
Number _____
Weight _____kg

1. Line Length _____m
2. Mesh size _____mm
3. Mesh size _____mm
4. Mesh size _____mm
5. Mesh size _____mm
6. Codend mesh size _____mm

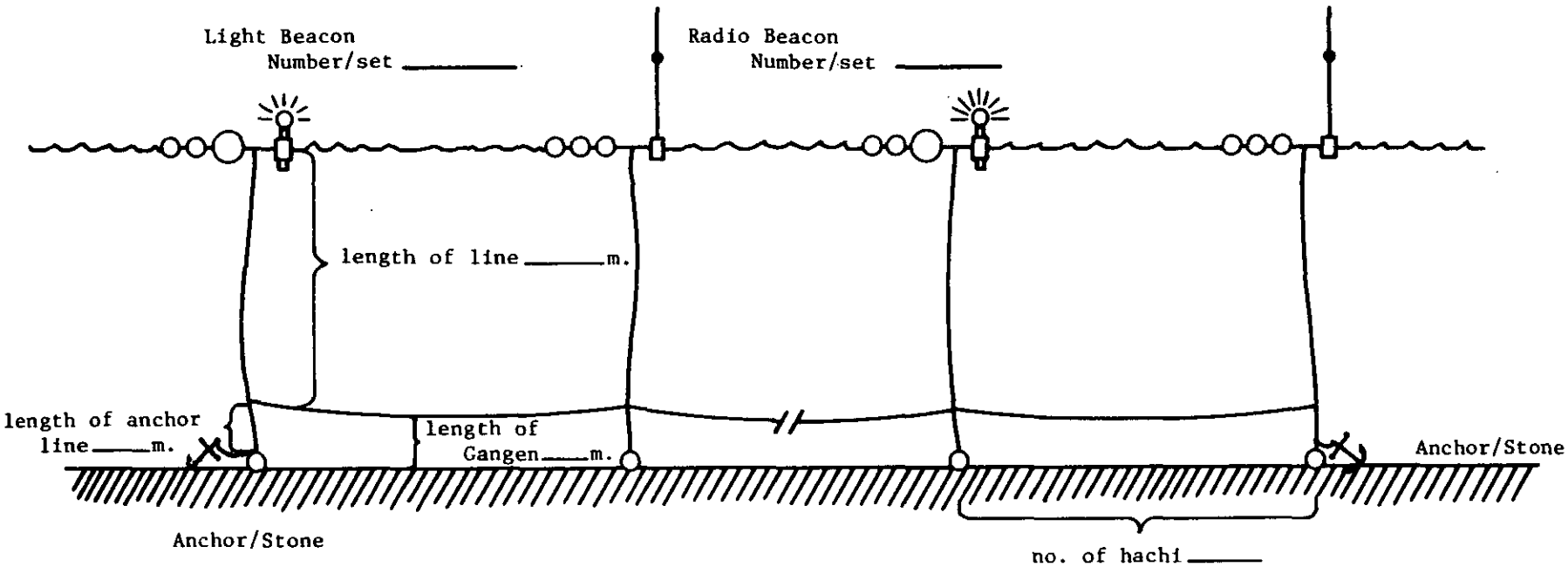
Net Length _____m.

Observer verification of mesh sizes:

Yes _____ Date _____
No _____

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

LONGLINE DIMENSIONS



Hachi Length _____

Average set Length _____km.

Breaking strength of gangen _____

Average number hachi/set _____

Average number hooks/hachi _____

Hook size _____

HOW TO SURVIVE DEBRIEFING

Debriefing is a process, not a single event. It is as important to your job as the work you do at sea. It is the process during which your work is converted to data which is usable by the computer. It begins with an interview with a debriefer, which can last anywhere from 1 to 4 hours. During your interview, the debriefer will glance through your forms for obvious errors. If any are detected they must be fixed before you turn in your data. Once you have turned in your data it will be checked on a first come, first served, basis. The debriefers look at each entry, each number, on each form. The forms will be sent to keypunchers whose job it is to enter numbers. Their job is NOT interpreting data. Because the data will be used in a computer the forms have a specific format and must be filled in correctly. If you try to be creative with your forms the computer will not be able to read the data properly and you may render your hard work worthless. After a debriefer has pre-keypunch checked your data it will be returned to you along with a list of needed corrections. When you have made the corrections, resubmit your data and it will be double checked. If the debriefer is satisfied with your corrections and you have checked in your gear, you have finished your job.

Why does debriefing take so long? Several factors contribute to the length of the debriefing process. These include, but are not limited to:

1. Observer preparedness
2. Number of vessels/plants sampled
3. Length of deployment
4. Number of other observers in debriefing
5. Amount of corrections to be made
6. How diligently and systematically you go through your data and make the corrections

In general the less experienced an observer, the more corrections are needed, especially over a long deployment. No promises will be made as to the length of your debriefing period. Be prepared to stay as long as it takes to get your data as close to perfect as possible.

PREPARATION

The most common complaints debriefers hear are, "No one told me I had to do this", and, "I thought I'd be done in five days". This information has been prepared to address those complaints.

1. While you are at sea, check your work on a regular basis. The cleaner your work is when you return the faster you will be finished with the debriefing process. Your manual should be your constant companion while you are doing paperwork. It is as much a tool as your knives and scales - USE IT! Do not assume that just because you did well in class that you remember everything that was taught. Consult your manual and be sure that you are right.

2. Use your logbook. In it you will want to keep notes, records, calculations, diagrams, etc.

You can get a head start on your reports this way, and should questions arise during debriefing you will have a reference. When you first get on your ship look over the list of questions that you will need to answer in the reports. This way the questions will be fresh in your mind when you are doing the things that you will be describing later in your reports.

3. You will need these forms and reports completed when you come in for debriefing:

For trawlers:
Form 2US, 3US, 7US, and 10US.
Other forms you may have include:
Any special project forms, 8 (PRR), 9US, and 11A.

For longliners and pot vessels:
Form 1US, 3US, 7US, and 10US.
Other forms you may have include:
Any special project forms, 8 (PRR), 9US, and 11A.

For plant samplers:
Form A, 7US, 9US and 11A.
Other forms you may have include:
8 (PRR), Density calculations (plant observer special project)

All observers need to have:
Logbook: Inside the front cover (in ink) you need to put your name, your ship's and/or plant names (for all the ships and/or plants that you worked on), cruise number and vessel or plant code for each ship or plant, the dates you were aboard each ship or sampling at each plant, and your contractor's name. Do not write on the outside of the logbook.

Reports, which need to include:
A Vessel Itinerary Sheet
Vessel Data Form 12
Map of areas fished
Answers to all the Report Questions written neatly in proper English, with no undefined abbreviations or misspellings. All questions must be answered completely and in detail. All pages need to be either printed in ink, or photocopied.
Gear diagrams
Factory/deck diagrams, sampling area diagrams.

Catch message information including:
All Catch Message Forms A and B
Any catch message forms you didn't send

Species Identification forms
And, if applicable:

Salmon scale samples
Otolith collections
Specimen collection forms
Tagged fish forms

With the exception of the itinerary sheet, tagged fish form, and the final draft of your reports, all of these forms can be filled out while you are at sea. If you have maintained a detailed logbook, the itinerary sheet won't take more than a minute or two. Keeping up with your work at sea becomes especially important if you are deployed on more than one vessel or plant. The speed with which you complete debriefing depends largely on your preparedness.

Data Preparation
(or how to make debriefing go faster and easier)

Going through your data is one of the most time consuming and tedious tasks that you will need to do but the following preparation will make processing your data much easier and will get you out more quickly. This is a list of things to do and to look for.

Check everything over carefully. If you make one correction be sure to think about what other data might be affected by the change and carry the correction through to the end. Some corrections have a ripple effect from form to form. One thing that often helps is to check your forms over in a new direction from the way in which you filled them out. In other words, check a set of data forms from back to front and check pages from the bottom to the top, rather than always starting at the beginning and from the top of the page. Doing this helps you see things in a different pattern and will help you see what you skipped over previously.

Be actively concentrating when you check over your data. If you get into a somewhat hypnotic state, which is very easy to do, you will miss mistakes. Take short, frequent breaks and do something else to relieve the boredom. Get familiar with the manual list of the most common mistakes. If you watch for these errors it will save you a lot of trouble. Be sure to consult your manual to find the answers to your questions. The debriefers are also available to answer questions.

Remember that if you were on more than one ship and/or plant that the data from each will need to be kept separate. Do not mix the data together; number the pages in sequence for each vessel/plant--NOT for your entire trip. In addition, changing over to a new year requires a new cruise number, new page numbering, etc., even if you remain on the same vessel.

All Forms:

Put your name and ship's name on the first page of each type of form for each ship or plant.

Make sure the pages are numbered properly with no skipped numbers and no duplicate numbers. If you have a page with data on one side and blank on the other the blank page may have a page number or not at your discretion.

Every page needs to have a cruise number and a vessel code. Cruise numbers should be

adjusted to the right and have no leading zeros.

Leading zeros should be present only for dates, times, and haul weights of zero weight (recorded as 0.00 on 2US) and prohibited species weights when that group was not found in the sample (record number as 0 and weight as 0.0 on 3US). No other numbers or weights should have a leading zero.

Every time there is a decimal point printed on the page there should be two decimal places written in behind it (the exception to this is the fishing speed on form 2US). If there is no decimal point printed on the page then you can put one or two decimal places at your discretion. Remember that every weight must have a decimal place and no numbers of fish can have a decimal place.

All arrows should be present and have the same number at the top and the bottom of the arrow.

Be sure that your handwriting is clear and readable. The data is punched by people who do not have any idea how the data is used and what should be on each form. They will, and often do, punch whatever they think they see.

One thing that will speed your trip through debriefing is for you to make notes on your forms. Notes should be made any time you have something that is a little bit odd or that might need some explaining. There is space on the top, bottom, and edges of the forms to make notes, so use it. The one thing to remember is to not put notes in data areas where they will get punched. These notes will enable the person checking your data, and people dealing with your data after you are gone, to read your note and understand what your data means without having to talk to you and have you explain it. Notes may include, but are certainly not limited to sub-samples, long fishing times, missing data that you could not obtain, and other items.

Form 1US & 2US:

The haul forms are often the ones with the most problems. Look them over carefully. Question anything that seems incorrect with the ships officers while at sea. Check Form 1US or 2US for:

An entry for every day, whether fishing or not. A note after the noon position giving the reason why the ship is not fishing. This is the only case where you may write notes within a keypunch area of a form.

No duplicate haul numbers.

Haul numbers in consecutive order. Haul number zero for all non-fishing days.

No missing data in a line, except possibly speed or observer total catch.

No decimals except those printed on the page. Depths must be rounded to whole numbers.

Positions for all hauls or non-fishing days.

Impossibly large changes in positions within small amounts of travel time.

No recorded minutes larger than 59.

No overlapping nets down and nets retrieved times.

Fishing durations greater than 100 hours must be recorded in the keypunch columns as 99 hours and 59 minutes with a note recording the real duration in the margin.

Retrieval times of 0000 are attributed to the next day.

Retained weights and official total catches recorded for every haul. Retained weight cannot be greater than official total catch.

An F or M for every depth recorded.
ADF&G areas for all hauls and any noon positions not in port.
Column 79-82 "vessel code" and "catcher boat name" at the top is only to be filled in if your vessel was a mothership.

Form A Plant Sampling Summary:

Make sure that you have all mandatory information on the form. Check for durations, number of tows, all weights, positions or areas. Be sure to list the catcher boat names or approved abbreviations. One problem you might have is figuring out the products and what to put down in that column. If you have any questions ask a debriefer. All dates should be dates of delivery.

Form 3US:

Be sure that there are:

Species names which match your species codes. Codes are not the catch message species report group codes.
No duplicate species codes unless used in designating female and male prohibited species.
Sex designations for all of the prohibited species, and for no other species.
Entries for each of the prohibited species groups, Tanner crab, king crab, Pacific halibut, and salmon, for every sample whether they were seen or not.
Weights for every number of fish and a number of fish for every weight listed. The only time zeros should be recorded for either is when a prohibited species group was not found in your sampled haul.
A "1" in the number column for miscellaneous items, species code 900, no matter what the weight.
Sample types in descending order of size listed for every species.
At least one decimal place behind a distinct decimal point for every weight.
Haul weights in kg, sample and species weights in kg.
Necessary calculations and sub-sample data recorded at the top of the page.
Keypunch check sums at the column tops.
Viability data for halibut when seen, never salmon, crab viability only when assigned. No zeros in viabilities or viability totals.
No decimals in the number of hooks sampled for longliner data.

Form 4 (molting crab special project form):

Form 4 is for crab molt only. Do not use this form for any other reason. Be sure to include a note explaining what criteria you used to determine hard and soft shelled crabs on the first page. If you checked crab molt for any species other than Red King crabs and Bairdi Tanner crabs, cross it out but don't erase the data--it might be usable sometime in the future.

Form 7:

On this form there must be:

Matching species codes to species names.
Species name, species code and haul number for every line of data.
No species with a greater total number listed than is on the 3US form in whole haul sampled data.
No decimal places in lengths.
Keypunch checks summing each number on the line.
Lengths recorded in ascending order. No lengths with a frequency of zero.
All crab units of measurement ending in a "3" or an "8".
Sex codes recorded for every species, every line. Halibut always have a sex code of "U".
Dates matching haul retrieval dates for all vessel observer data. Dates match delivery dates for all plant observer data.

Form 9:

Check for:

Specimen type, sampling system entries in the heading line.
Only one area per page.
No comments or numbers in "total no. of specimens" or "catalogue date" or "remarks" section. These are for otolith or scale readers only.
Weights and lengths that make sense in relation to each other.
All specimens have a haul number, a specimen number, a sex, a length, and a weight.
Each species must be grouped separately with separate page sequences (1 through whatever, for each species). No pages with one species on the front and another on the page back.
No duplicate specimen numbers for the same species.
Lengths must also be recorded on the 7US, weights will match the 3US form.

Form 10US:

Form 10US is mandatory for all cruises except plants. Be sure to have one filled out for each vessel before you hand in your data. Be sure that the dates match up to the hauls on your 1US or 2US and that the data you have entered is correct. If a marine mammal was caught, lethally removed or deterred, be sure to write a species description that is complete and can be used to identify the animal. You need to add as much information as you can gather. Form 10US should only be used for marine mammals that are harrassed or caught in the fishing operation. All sightings of marine mammals should be on form 11A, not on the 10US.

Form 11A:

Again make sure that you have filled in all of the pertinent information. On this form type, note that:

Boxes without an asterisk in front of them must be filled in. Usually missed are the estimated numbers and the tens of meters boxes.
Time system on form may be ALT or GMT. Make a notation defining the time system you used.
Write very detailed descriptions of the characteristics you used to identify the animal on every page of 11A. These pages may be separated so one good description is

not sufficient. Descriptions of behavior, color patterns, size and age, and drawings (however rough) are all essential to verify your mammal identifications.

Catch Message Forms A and B:

Almost everyone forgets to go back and recheck their catch messages, and they are consistently one of the main areas of problems for people in debriefing. Read the instructions carefully and follow them. Check for these potential errors:

Permit number has only 4 digits after the "AK-91-". Any more means you have the wrong permit number.

Processor code: Who processed your ship's catch?

Page numbers per week and per form type totals are correct. Pages are numbered per form type (not separated by area or gear type in page numbering).

Haul weights match the OTC's on 1US or 2US.

Form A Check:

Species are grouped correctly, correct groups for the region are used,.

Species weights are transcribed correctly from the 3US and correctly summed for groups with more than one species in them.

Prohibited species groups are listed on Form A ONLY if they appeared in the species composition sample. These cases only:

All prohib. weights if haul was whole haul sampled.

All prohib. weights if haul was basket sampled only, no species whole haul sampled.

Only the prohib. groups that were basket sampled along with the species composition basket sample.

Coverage days are whole numbers only. Arrival into port is one whole day of coverage even if arrival time was early in the day.

Percentage retained on every species group found, for each haul.

Days not fished are listed on a line with a reason.

"MM CODE" and "# MM" cannot be left blank. Must have an "NU" and a zero or the word "NONE" if none found.

Form B Check:

All prohibited species groups are listed on Form B, for every haul sampled, whether they occured in the sample or not. Zeros listed if fish not seen.

Sample weights are listed for each separate group.

Species groups weights should not have more than three places behind the decimal.

All dates are represented in the heading, with accompanying weights for the day. The weight equals zero for non-fished days.

Days not fished have a line of explaination. Days fished but not sampled have a line of explaination as well.

After you return from sea, add in the processor code even if you were on a catcher/processor and did not need a processor code for the CM transmissions. Write in the page number totals per form type in the upper right corner. Put all changes and corrections to the CM forms in RED with an asterisk.

Cross Checking:

A very important part of doing your data is cross checking one form to other forms that have the same data. Often we find problems with hauls listed on different days on some forms than they are on the haul forms. The haul date must match up to the day when it was brought on board the ship (for normal vessel data) or when it was delivered to the plant (for plant observer data), not necessarily on the day when you did the work. Observers on motherships have all of their forms EXCEPT the catch message forms by retrieval date. Catch message forms A and B are grouped by delivery dates. If you kept two sets of 2US forms while at sea, grouping hauls the two ways, turn in both sets to your debriefer.

If you have salmon you will need to match the weight data on the 9US to the weights on the 3US. There should be no salmon taken from outside your sample. The lengths on your form 9US should match lengths on your form 7US for the same species in the same haul. You might have more salmon or otolith species on your form 7US, but all of the lengths on form 9US should be present on the 7US.

If you took otoliths be sure that the haul numbers for the otolith collection correspond to the hauls from which you took lengths on your 7US. If you took your otoliths from outside your length frequency sample you will need to talk to a debriefer about how it should be handled. Do not mix species or areas on a page.

Reports:

Reports are a written synopsis of your activities at sea. They should be complete with good detail and be easy to follow. Remember that one of the main reasons for the reports is for first time observers, or observers who have never been on your boat, to read. Your reports should contain enough detail such that any person, even somebody who has never seen a fishing ship in action, can follow what you are saying and understand how you did your work on your ship or in your plant.

The questions that you should answer are in the preceeding manual section: Domestic Observer Reports. If one of the questions does not apply to your situation, state that in a complete sentence. All pages of the reports including the cover sheet, diagrams, maps, and other pages need to be in ink or photocopied. Pencil is not acceptable as it tends to disappear over time.

THE DEBRIEFING PROCESS

When you have all your data and reports completed let your contractor know so that your debriefing interview can be scheduled. DO NOT schedule debriefing before these are completed; it will NOT save time. On the contrary, it sometimes means a longer debriefing period. Upon arriving in the city in which you will debrief (Seattle, Kodiak, or Dutch Harbor), the following items must be taken care of:

1. Your gear must be prepared for gear check-in. This includes cleaning and repairing any gear which is still usable. If you have any questions about what is still usable ask the person responsible for gear check-in. Also, be sure to sign up in the debriefing office for a check-in appointment.

2. If you have had an injury at sea, inform your contractor and a debriefer who will direct you to fill out an Injury Report. Even if you think that the injury is fairly minor this is something that you must do in order that we have a record verifying that your injury occurred while you were on the job. Without this record your contractor will not pay the doctor and you will end up paying for the bills out of your own pocket.

3. Any catch messages not sent should be submitted as soon as possible. Turn them in at NMFS in Seattle.

4. Fill out a cover slip for salmon scale samples. You will need one slip for each species. Up to 6 of each of the non-Chinook samples (zone A) and 3-4 of the Chinook samples need to be mounted in re-sealable plastic bags with the scale envelope attached to the outside of each bag. Scales must be separated, not clumped in the plastic, for identification. In Seattle you will find instructions on the white posters and all mounting materials in the observer workroom, and your debriefer will instruct you further.

5. Make sure otoliths or other special projects are in order. Otolith vials need to have enough solution in them to cover the otoliths. Vials need to be grouped in groups of ten vials (1-10, 11-20, etc.) and the end of the box marked properly. Instructions on how to do this are also on the white poster in the observer workroom in Seattle or can be obtained from the debriefer staff.

6. Complete all tagged fish and specimen collection forms.

IF YOU HAVE QUESTIONS REGARDING ANYTHING, ASK A DEBRIEFER!

Gear Check-In

In Seattle, the gear check-in procedure occurs two or three times each week. Check the sign up in the debriefing office to find a day that will work for you. You should arrive at least three hours or the day prior to the check-in time to begin cleaning your gear. Wear work clothes. Gear check-in can be an all day process.

It is expected that all gear be clean and laid out on the black counter in the Wet Lab (Rm. 1067) for inspection at the scheduled time. Failure to meet this expectation will result in delay of your gear check-in to the next scheduled time. Even if the gear was cleaned in the field, it will still need to be re-cleaned before check-in. Gear becomes dirty from airplane rides, storage on vessels, and in other ways.

Because of the large amount of equipment stored in the gear room, it doesn't take many fish scales etc. to make the gear room and surrounding areas very smelly. One of the most difficult items to clean are the baskets. These will be scrutinized very closely and therefore will require a good deal of scrubbing. Corners and crevices should be given special attention. Rain gear will go to the laundry after it has been checked so it will only require minor cleaning. Be sure to read the instruction posters on the wall in the Wet Lab for other specifics about cleaning gear. Improperly cleaned gear will result in frustration and additional cleaning so it is best to do a thorough job the first time.

Once checked, you are responsible for putting away gear in the gear room #1052. When all gear is put away, the whole group is responsible for cleaning the Wet Lab thoroughly including all counters, cabinet doors and the floor. This will also include cleaning the metal scrub table and includes drying it with a squeegee. Any questions that may come up about this procedure can be asked of the Gear Manager.

The Interview

During your interview the debriefer will ask questions about everything you did during your deployment. The most important aspects of the interview are honesty and a willingness to discuss problems and difficulties. We want your data to be perfect, but if you withhold information that is not possible. We also need to know the feasibility of sampling on the various vessels and plants. Observers are our only sources for this kind of information. If you don't feel that you were able to sample adequately don't cover up the fact; tell us so that we can help the next observer.

Affidavits

Observers who witness fisheries violations will be instructed during debriefing in how to write affidavits. These are formal legal statements, so if you encounter violations they must be well documented in your logbook and supported by your data. If you are required to write an affidavit remember to write it in formal language and add precise details. The most typical error in writing affidavits is not adding the necessary details that are required. You may or may not be contacted at a later date regarding your affidavits.

Decertification

Decertification is something most observers need not worry about. It is reserved for extreme cases, and each case is considered individually. Decertification may be based on a single incident or on a combination of many factors. Conduct, attitude, professionalism, and even common sense all come into the picture when decertification is a possibility. If you conduct yourself in a professional manner, make an honest effort, and remember that you are hired to do biological sampling, decertification is not something that should be a concern to you.

Final Note:

Remember that the amount of time spent in debriefing depends largely on you. If you don't take the time to check your data carefully it will cost you more time later in the process than you saved initially. If you take the time before turning in your data to make sure it is neat, complete and correct, you will save everyone time later on. The people who are done the quickest and with the least pain are the ones who go through their data carefully and methodically the first time so that they have fewer errors to correct later. The debriefers have a given set of criteria that they try to meet with each set of data, and your debriefing will not be finished until your data meets those criteria. Debriefing involves a lot of work, but it is necessary in order that your hard work at sea is translated into useful data.

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THE 43 MOST COMMON MISTAKES ON DATA FORMS

Form 1US, or 2US:

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

Form 3US:

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

Form 7US:

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

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 Equivalents

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 14	15	16	Description of Product	Product Code 17 18	H/M 19	Vessel Data: Percent Recovery 20 21 22	Vessel Data: Unit wt. to .1 kg 24 – 27	Observer Data: Percent Recovery 28 29 30	Observer Data: Unit wt. to .1 kg 32 – 35
Pollock	2	0	1	Surimi	36	M	.25	10.0	.	.
				"	36	M	.34	10.0	.	.
(large fish)				dorsal fillets	30	H	.65	15.0	.	.
Pollock (large fish)	2	0	1	skinless fillets	32	H	.40	.	.	.
Pacific Cod	2	0	2	headed + gutted	13	M	.50	.	.54	15.4
				" "	13	M	.60	.	.60	.
Pacific Cod	2	0	2	fillet-skin on one side	31	H	.43	.	.	.
Pacific Ocean Perch	3	0	1	headed + gutted	13		.60	.	.	.
Harlequin Rockfish	3	2	3	" "			.62	.	.65	.
Sharpchin Rockfish	3	0	4	" "			.62	.	.	.
Other Rockfish	3	0	0	" "	13		.60	.	.	.
Sablefish	2	0	3	headed + gutted with pect. girdle	15	H	.70	.	.70	14.8
Atka Mackerel	2	0	4	frozen whole	10	H	1.00	.	.	.
Greenland Turbot	1	0	2	headed + gutted	13	H	.55	.	.59	15.1
Flathead Sole	1	0	3	frozen whole	10	H	1.00	.	.	.
Other flatfish	1	0	0	headed + gutted	13	H	.70	.	.	.
Octopus		6	0	gutted	51		.80	.	.	.
Squid		5	0	mantles	52		.50	.	.	.
"		5	0	tentacles	53		.30	.	.	.
All skates		9	0	skate wings	26	H	.30	15.0	.42	.
All other fish + waste	9	0	1	fish meal	40	M	.20	20.0	.	.
All other fish + waste	9	0	1	fish oil	41	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

Product Type Codes	Description
1	Whole fish/food fish (PRR = 1.00)
2	Whole bait (PRR = 1.00)
3	Bled only (throat, or isthmus, slit to allow blood to drain)
4	Gutted only
5	Headed and gutted (H & G)
6	H & G, with roe
7	H & G, Western cut (head removed in front of pectoral girdle)
8	H & G, Eastern cut (head removed behind pectoral girdle)
9	H & G, with pectoral girdle
10	H & G, tail removed
11	Kirimi (head, gut and tail removed by cuts perpendicular to spine)
12	Salted and split
13	"Wings" (On skates, side fins are cut off next to body)
14	Roe only (eggs, either loose or in sacs, or skeins)
15	Pectoral girdle only
16	Heads
17	Cheeks (opercular bone and muscles) or chins (lower jaw, muscles, flesh)
18	Chins (lower jaw, muscles and flesh)
19	Belly flaps (flesh in region of pelvic and pectoral fins)
20	Fillets with skin and ribs
21	Fillets with skin, no ribs
22	Fillets, with ribs, no skin
23	Fillets, no skin or ribs
30	Surimi (paste from any of the fish flesh and additives)
31	Minced fish
32	Fish meal
33	Fish oil
34	Milt (in sacs, or testes)
35	Stomachs (includes all internal organs)
36	Octopus/squid mantles (flesh after removal of viscera and legs)
37	Split, no backbone (head removed, fillets still attached)
39	Bones
97	Other - specify
99	Discard (whole groundfish and PSC species only; PRR = 1.00)

NMFS Product Recovery Rates for Specified Groundfish Products

Fillet w/Skin & rib

Species code	Product Codes 3	4	6	7	8	10	11	12	13	14	15	16	17	18	19	20	21	22	23	30	31	32	33	36	37
110	.98	.85	.63	.60	.58	.50	-	.45	-	.05	.05	-	.05	-	.10	.45	.35	.25	.25	-	.50	.17	-	-	.43
118	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
119	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
120	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
121	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
123	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
127	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
134	.98	.90	.80	.72	.65	.62	.48	-	-	.08	-	-	-	-	-	.32	.27	.27	.22	-	-	.17	-	-	-
139	.98	.88	-	.60	.50	-	-	-	-	-	-	.15	.05	.05	.10	.40	.30	.35	.25	-	-	.17	-	-	-
141	.98	.88	-	.65	.50	-	-	-	-	-	-	.15	.05	.05	.10	.40	.30	.35	.25	-	-	.17	-	-	-
143	.98	.88	-	.60	.55	-	-	-	-	-	-	.20	.05	.05	.10	.40	.30	.35	.25	-	-	.17	-	-	-
144	.98	.88	-	.60	.50	-	-	-	-	-	-	.15	.05	.05	.10	.40	.30	.35	.25	-	-	.17	-	-	-
161	.98	.88	-	.50	.40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.17	-	-	-
168	.98	.88	-	.65	.50	-	-	-	-	-	-	.15	.05	.05	.10	.40	.30	.35	.25	-	-	.17	-	-	-
169	.98	.88	-	.65	.50	-	-	-	-	-	-	.15	.05	.05	.10	.40	.30	.35	.25	-	-	.17	-	-	-
193	.98	.87	-	.61	.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.17	-	-	-
270	.98	.80	.70	.65	.56	.50	-	-	-	.14	-	.15	-	-	-	.35	.30	.30	.25	.15	.34	.17	-	-	-
510	.98	.82	-	.71	-	-	-	-	-	-	-	-	-	-	-	-	.38	-	-	-	-	.22	-	-	-
511	.98	.82	-	.71	-	-	-	-	-	-	-	-	-	-	-	-	.38	-	-	-	-	.22	-	-	-
516	.98	.89	-	.78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.22	-	-	-
689	.98	.83	-	.72	-	-	-	-	-	-	-	-	-	-	-	-	.30	.30	.25	-	-	.17	-	-	-
700	.98	.90	-	-	.39	-	-	-	.32	-	-	-	-	-	-	-	-	-	-	-	-	.17	-	-	-
710	.98	.89	-	.68	.63	.50	-	-	-	-	-	-	.05	-	-	.35	.30	.30	.25	-	-	.22	-	-	-
870	.98	.80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.17	-	.85	-
875	.98	.69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.17	-	.75	-

NMFS SPECIES GROUP REPORTING CODES FOR LOGBOOKS AND CATCH MESSAGES

Sp. group codes	Mgmt Areas	Species Common Names
110	all	Pacific cod
118	GOA	Deep water flatfish (rex sole, Dover sole, Greenland turbot)
119	GOA	Shallow water flatfish (flatfish other than deepwater flatfish, flathead sole or arrowtooth flounder
120	BSAI	Other flatfish (flathead sole, Alaska plaice, rex sole, Dover sole, starry flounder, longhead dab, butter sole, and all Pleuronectiformes not specifically defined) for the BSAI
121	all	Arrowtooth flounder (Arrowtooth flounder and Kamchatka flounder)
122	GOA	Flathead sole
123	BSAI	Rock sole
127	all	Yellowfin sole
130	all	Ling cod (non-allocated)
134	BSAI	Greenland turbot
139	BSAI	Other rockfish (all Sebastes and Sebastolobus except POP, Sebastes alutus)
141	all	Pacific Ocean Perch (Sebasted alutus)
143	GOA	Thornyhead rockfish (Sebastolobus)
144	GOA	Slope rockfish (Northern, Sharpchin, Aurora, Blackgill, Chilipepper, Darkblotch, Greenstriped, Harlequin, Pygmy, Shortbelly, Splitnose, Stripetail, Vermillion, Yellowmouth, Bocaccio, Silvergrey, and Redstripe.
161	all	Sculpins
168	GOA	Demersal shelf rockfish (China, Copper, Quillback, Rosethorn, Tiger, Yelloweye, Canary and Redbanded
169	GOA	Pelagic shelf rockfish (black, blue, dusky, widow and yellowtail)
171	GOA	Deepwater rockfish (shortraker and rougheye)
173	BSAI	Shortraker complex (shortraker, rougheye, sharpchin, and northern)
193	all	Atka mackerel
213	all	Grenadier (non-allocated)
270	all	Pollock
510	all	Smelt
511	all	Eulachon
516	all	Capelin
689	all	Sharks
700	all	Skates
710	all	Sablefish
870	all	Octopus
875	all	Squid

Species Prohibited in Groundfish Fisheries

000	all	Salmon, unspecified	920	all	Crab, unspecified king
001	all	Crab, unspecified	921	all	Crab, red king
200	all	Pacific halibut	922	all	Crab, blue king
235	all	Pacific herring	923	all	Crab, golden/brown king
410	all	Salmon, chinook	930	all	Crab, unspecified tanner
420	all	Salmon, sockeye	931	all	Crab, bairdi tanner
430	all	Salmon, coho	932	all	Crab, opilio
440	all	Salmon, pink			
450	all	Salmon, chum			
540	all	Trout, steelhead			

TAGGED FISH AND CRAB

If you should find a tagged fish or crab while you are sampling, or if a crew member brings you a tagged fish or crab, return the tag, along with all pertinent information, to the debriefers at the end of your cruise. Such information should normally include the date, location, and circumstances of capture, and the length, weight, sex, and stage of maturity of the fish. Tags from yellowfin sole, halibut, cod, pollock, and other fish will be forwarded to the appropriate tagging agency. Otoliths and scales are often also very useful to the tagging agency.

The Pacific Biological Station at Nanaimo, B.C. injected a number of sablefish with a bone-marking chemical and tagged them with a small, plastic tube implanted just below the first dorsal fin. Be sure to record the tag prefix as well as the number. Obtain the otoliths from all tagged sablefish except those from the pink AG series tags which are used for growth studies and should not be exposed to light. Store the otoliths in ethyl alcohol and water, if you have it, or dry in an envelope. AG tags are labeled with "GROWTH STUDY REWARD FOR WHOLE FISH". AG fishes' heads should be cut off and frozen with the tag number enclosed in a plastic bag. (A salmon snout bag may be used for this.) Heads should be cut between the operculum and the pelvic fin to insure that the otoliths sre 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.

The International Pacific Halibut Commission has tagged halibut with orange, yellow and pink spaghetti tags. These tags are attached to the cheek on the eyed side of the halibut and have a five or six digit number printed on the side. All tags from halibut should be brought in. If possible, the otolith should be collected as well, as this information is very helpful for age and growth studies. Do not collect a scale sample and the fish weight is not required. The IPHC rewards fishermen for the return of tags with $5.00 or a baseball cap so the skipper's complete address is needed. IPHC has no way of handling data from halibut that are re-released with the tag attached. If it is best to release the fish alive, please remove the tag and record the other information including length.

Some agencies tag salmon by inserting a coded wire into the snout of fingerling salmon. These wire-tagged salmon are marked by clipping their adipose fins. If you find a salmon missing an adipose fin, check to see whether it is missing any other fins, collect a scale sample, record the usual data, and in addition, weigh the gonads. Remove the snout by cutting well behind the eye, salt the snout, attach the completed data tag to the snout, and seal it in one of the provided plastic bags. After a few days, drain off any accumulated liquid and resalt the snout. Repeat the draining and resalting as needed. The tag should be filled out in pencil and the scale sample number written on the top.

The Alaska Department of Fish and Game along with other agencies have tagged crab with bright yellow or orange plastic, "spaghetti" tags. If one of these tagged crabs are found, record the needed information and measure the crab as best you can to the nearest millimeter, even if you were not assigned calipers or dividers to measure crab. (Refer to "Length Measurements For Various Species" in Appendix). Sometimes tagged crabs that have been caught are alive and in good condition. If this is the case, record the pertinent information along with the tag number and release the crab as quickly as possible.

Collecting and returning tags is an important way to help fishery research. Please remember to bring back tags with as much of the following information as possible:

1. Tag or tag serial number.
2. Scale and/or otoliths for aging.
3. Fish length (in mm if possible).
4. Fish weight (in gm if possible).
5. Sex and maturity of gonads (immature, mature, spawning).
6. General appearance (poor body condition, good body condition).
7. Condition of tagging wound (healthy healed tissue, open wound, etc.).
8. Time and date of capture.
9. Capture location (latitude and longitude).
10. Capture depth.

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. In determining sex, it is generally easiest to start with large, mature fish and work down in size to small, immature specimens. Thoroughly dissect a few fish and identify the various internal structures so that you know what you are looking for.

The Japanese have a way of telling the sex of pollock without cutting them open. This method uses the relative size and shape of the pelvic fins to distinguish male from female. Since this method requires a fair amount of judgment and works consistently only for the larger specimens, we ask observers not to use this method. Pollock can be more accurately sexed by splitting the belly and inspecting the gonads, and with practice this can be accomplished very rapidly.

Halibut should not be sexed, but all other pertinent data should be obtained before releasing the fish. Most salmon have a very poor chance of surviving after being caught in a trawl net, especially if many scales have been lost, so identify the species 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 consistantly 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, parrallel 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.

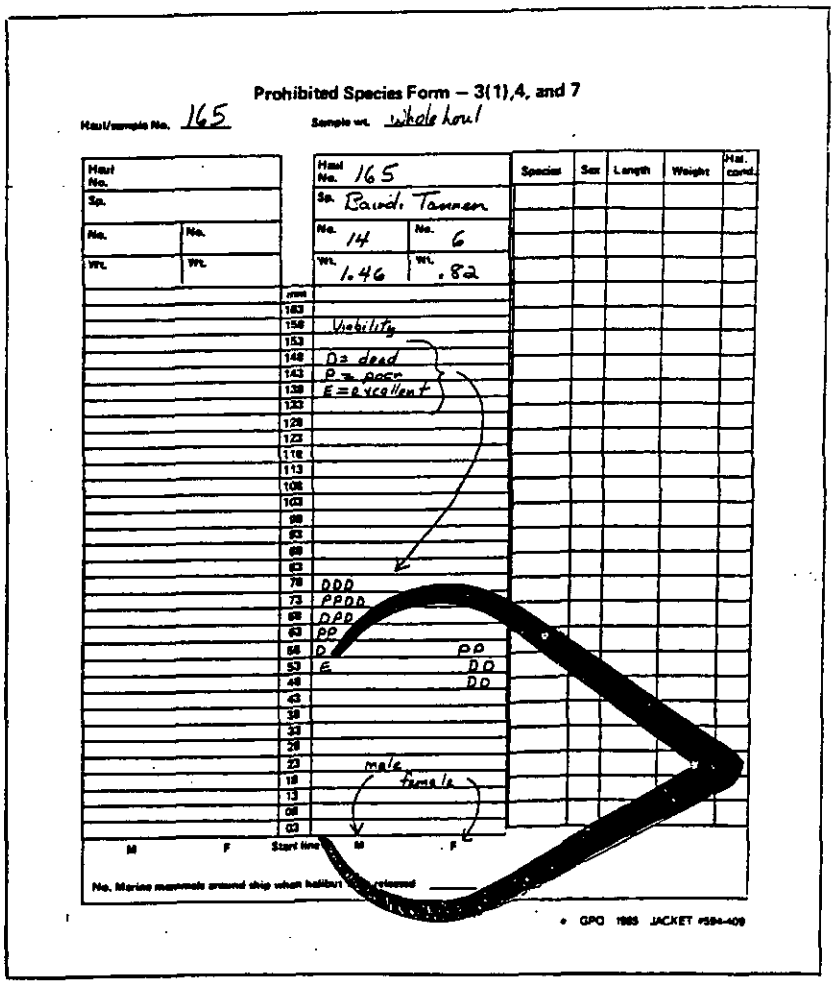
What to see:

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.

LENGTH MEASUREMENTS FOR VARIOUS SPECIES

Observers given the special project of measuring king and tanner crab will be provided with dividers to use in conjunction with a measurement scale on a plastic form. Spread the dividers across the width of Tanner crab carapaces at their widest points, excluding spines. Without moving the arms of the instrument, lay one arm of the divider on the "start line" at the bottom of the plastic form and, when placed perpendicular to the start line, where the tip of the other arm lands, record the measurement with a tally mark on the 5 mm space. Measurements are grouped in 5 mm increments starting at 3 mm. For example, crabs 41 to 45 mm in size are recorded as 43 mm; crabs 46 to 50 mm are recorded as 48 mm. Thus, check your entries on Form 7US to see that all records of crab measurements end in the digits three or eight.

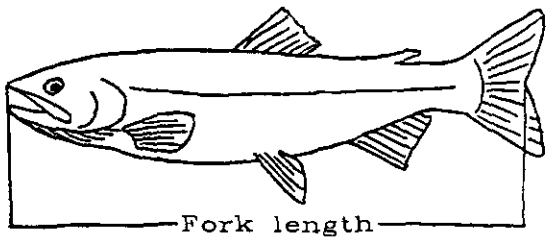
The carapace length of king crab should be measured. Measure from the right eye socket to the midpoint of the posterior margin of the carapace. Be careful not to let the tip of the divider arm slip **into** the eye socket below the carapace surface; keep the instrument on the **rim** of the carapace socket at it's deepest point. Record the length to the nearest 5 mm size group as explained for Tanner crab above. (Refer to the illustration below.) in the Appendix.)



Fork Length Measurement Used For:

Roundfish
Rockfish
Salmon

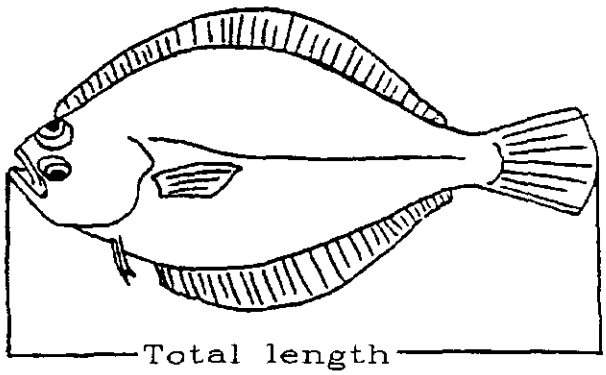
Measured from the tip of snout to the center of the fork in tail.



Total Overall Length Used For:

Flatfish

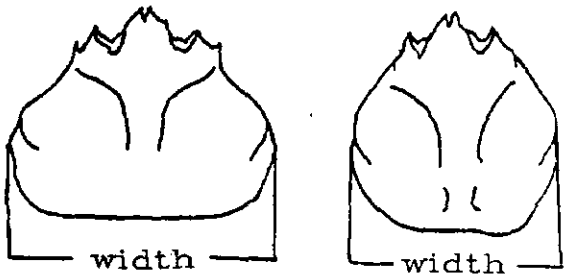
Measured from the tip of the snout to the middle of the tail.



Carapace Width Used For:

Tanner (Snow) Crab

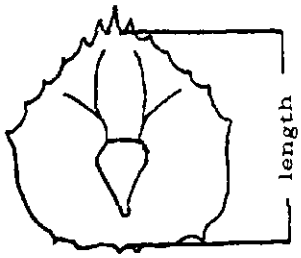
Measured from the widest points, excluding spines, to the nearest 5 mm.



Carapace Length Used For:

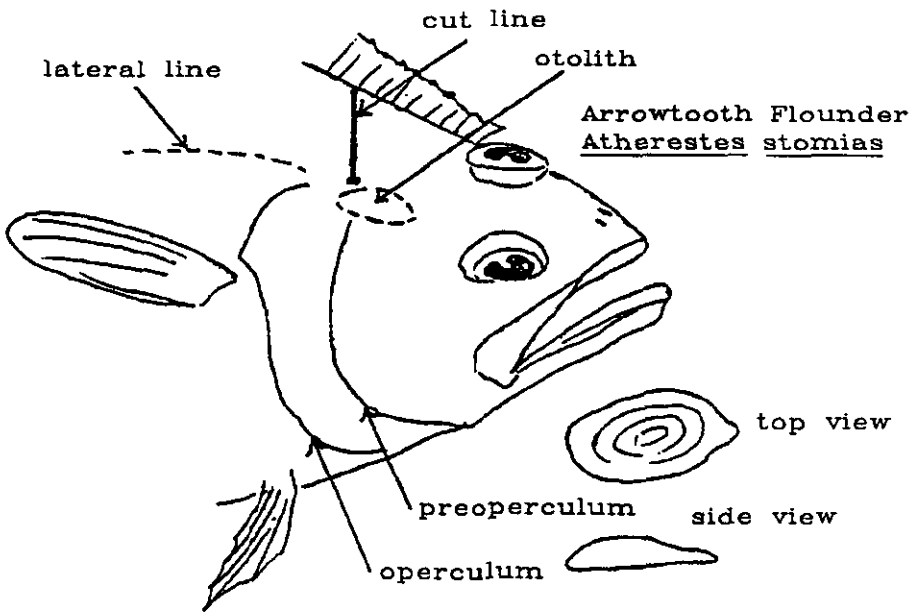
King Crab

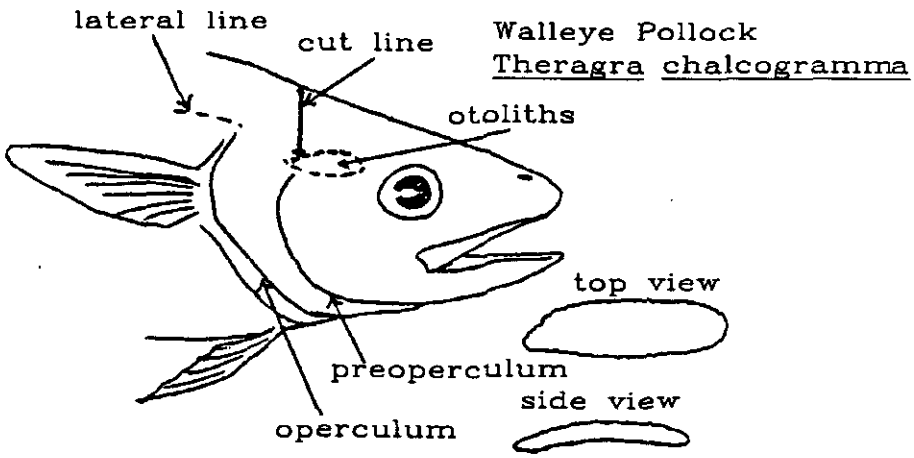
Measured from right eye socket to the middle of the posterior margin of the carapace.



OTOLITH AND SCALE COLLECTION FOR SELECT SPECIES

Species	Sample Type	Storage Container	Storage Media
Walleye pollock	Otolith	Plastic vial	50% alcohol 50% water
Yellowfin sole (or other flatfish)	Otolith	Plastic vial	Glycerol/Thymol Solution
Atka mackerel	Otolith	Plastic vial	50% alcohol 50% water
Pacific cod	Otolith & Scale (both in same vial)	Plastic vial	50% alcohol 50% water
Pacific hake	Otolith	Plastic vial	50% alcohol 50% water
Jack mackerel	Otolith	Plastic vial	Dry
Sablefish	Otolith & Scale (both in same vial)	Plastic vial	50% alcohol 50% water
Salmon	Scale	Paper envelope	Dry
Rockfish	Otolith	Plastic vial	50% alcohol 50% water

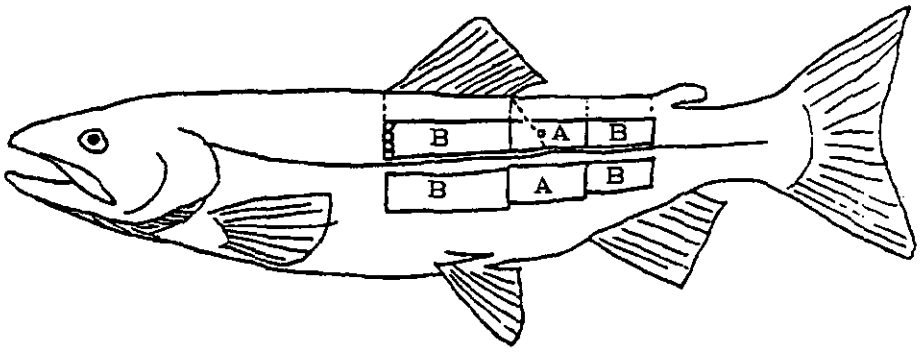




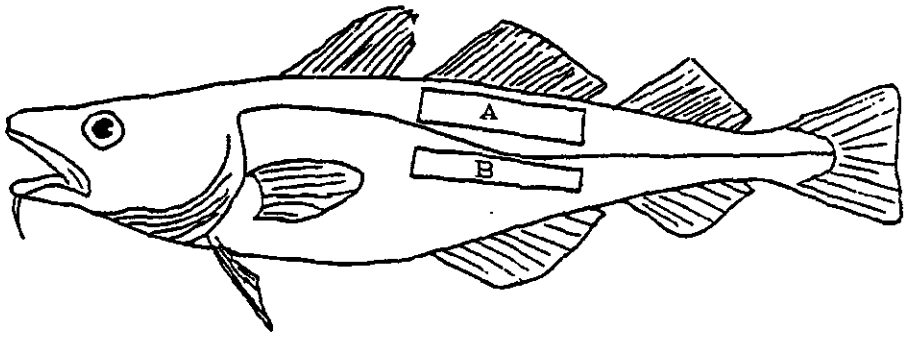
Approximate location of the otoliths (sagittal) and the cut for the removal of otoliths from flatfish and roundfish.

LOCATION OF PREFERRED SCALE SAMPLING ZONES

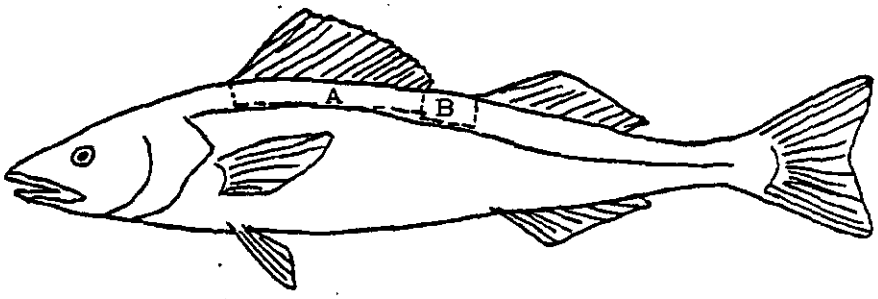
(Do not take lateral line scales)



SALMON - Follow the diagonal scale row from the posterior insertion of the dorsal fin to the lateral line of either side. Two scale rows up from the lateral line (on the diagonal) are the preferred scales



PACIFIC COD - Scrape along either side of the back directly below the second dorsal fin.



SABLEFISH (BLACK COD) - <u>If assigned to collect scales</u>, scrape the scales from the dorsal surface directly below the first dorsal fin.

HOW TO COLLECT FISH

Keep in mind that a large frozen specimen or a specimen collection becomes a piece of luggage so limit the size to what you can handle. Freeze the fish quickly after deciding to collect it. Lay the fish flat and straight to freeze it. Make an identifying label and put it with (in) the fish before freezing. Fill out a Specimen Collection Form and keep that with your paperwork. When the fish is frozen, glaze and reglaze it a couple times. When debarkation is near, pad and package it well. While in transit do your best to keep it frozen.

You can:

A) In Dutch Harbor let your contact person, if any, know you have a frozen specimen to maintain. Maybe your place of lodging will hold it for you in their kitchen freezers.

B) Tell the airlines at check-in that you have a package to keep frozen.

C) In Seattle on a weekend, take it to the Seattle Aquarium if you can't keep it at your lodgings. Their weekend, daytime phone number is: 625-5018 or 625-5019 and their 24-hour phone number is: 625-4359. Tell the aquarium staff you are a NMFS observer, get directions and ask them to hold it for you until Monday. On weekdays bring frozen specimens into our freezer in the wetlab. Tell your debriefer you have a specimen and turn in your form.

Specimens Needed For Teaching Collection
(small (20-35 cm) specimens preferred)

I. Gadidae

Pacific Cod, Gadus macrocephalus

II. Flatfishes

Rough-scale Sole, Clidoderma asperrimum
Alaska Plaice, Pleuronectes quadrituberculatus
Longhead Dab, Limanda proboscidea
Rex Sole, Glyptocephalus zachirus
Curlfin Sole, Pleuronichthys decurrens *
C-O Sole, Pleuronichthys coenosus
Greenland Turbot, Reinhardtius hippoglossoides
Arrowtooth Flounder, Atheresthes stomias
Kamchatka Flounder, Atheresthes evermanni
Deepsea Sole, Embassichthys bathybius *
Dover Sole, Microstomus pacificus
Hybrid Sole, Inopsetta ischyra
English Sole, Parophrys vetulus
Butter Sole, Isopsetta isolepis
Slender Sole, Lyopsetta exilis
Petrale Sole, Eopsetta jordani
Flathead Sole, Hippoglossoides elassodon
Bering Flounder, Hippoglossoides robustus *
Arctic Flounder, Liopsetta gracialis *

III. Rockfishes

Longspine Thornyhead, Sebastolobus alascanus *
Darkblotched Rockfish, Sebastes crameri
Harlequin Rockfish, Sebastes variegatus
Redstripe Rockfish, Sebastes proriger
Shortraker Rockfish, Sebastes borealis *
Northern Rockfish, Sebastes polyspinus
Redbanded Rockfish, Sebastes babcocki
Silvergray Rockfish, Sebastes brevispinis
Dusky Rockfish, Sebastes ciliatus
Black Rockfish, Sebastes melanops
Blue Rockfish, Sebastes mystinus

IV. Incidentals

1. Any unusual fish
2. Look especially for:

Dragon poacher, Percis japonicus
Bering Wolffish, Anarhichas orientalis
Sablefish, Anoplopoma fimbria
Flathead Pomfret, Taractes asper
Giant Wrymouth, Delolepis gigantea
Atka Mackerel, Pleurogrammus monopterygius
Oxeye Oreo, Allocyttus folletti
Capelin, Mallotus villosus
Eulachon, Thaleichthys pacificus
Pacific Sandfish, Trichodon trichodon
Prowfish, Zaprora silenus

* = collect any size

Specimen Collection Form

Collector:_____ Cruise No.:_____ Vessel Code:_____

Date:_____ Vessel Name:_____

Haul No.:_____ Lat. & Long.: _____

Depth:_____(meters) Water Temp.: _____(degrees C.)

Collector's Identification: _____

Length: _____(cm) Weight:_____(kg)

Notes on in vivo coloration, unusual scale patterns or spines:_____

_____

_____

_____

Sketch if necessary:

When completed, return this form to a debriefer.

Identification confirmed by:_____ Date:_____

Common Name:_____

Scientific Name:_____

Comments:_____

_____

_____

Specimen Collection Form

Collector:_____ Cruise No.:_____ Vessel Code:_____

Date:_____ Vessel Name:_____

Haul No.:_____ Lat. & Long.: _____

Depth:_____(meters) Water Temp.: _____(degrees C.)

Collector's Identification: _____

Length: _____(cm) Weight:_____(kg)

Notes on in vivo coloration, unusual scale patterns or spines:_____

_____

_____

_____

Sketch if necessary:

When completed, return this form to a debriefer.

Identification confirmed by:_____ Date:_____

Common Name:_____

Scientific Name:_____

Comments:_____

_____

_____

Specimen Collection Form

Collector:_____ Cruise No.:_____ Vessel Code:_____

Date:_____ Vessel Name:_____

Haul No.:_____ Lat. & Long.: _____

Depth:_____(meters) Water Temp.: _____(degrees C.)

Collector's Identification: _____

Length: _____(cm) Weight:_____(kg)

Notes on in vivo coloration, unusual scale patterns or spines:_____

_____

_____

_____

Sketch if necessary:

When completed, return this form to a debriefer.

Identification confirmed by:_____ Date:_____

Common Name:_____

Scientific Name:_____

Comments:_____

_____

_____

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE

Permit to Import Marine Mammals and Endangered Species
Permit No. 578

The National Marine Mammal Laboratory, Northwest and Alaska Fisheries Center, National Marine Fisheries Service, 7600 Sand Point Way, N.E. BIN C15700, Seattle, Washington 98115, is hereby authorized to import marine mammal specimens, including material from species listed as threatened or endangered, for scientific research and scientific purposes as cited in the Permit Holder's application and subject to the provisions of the Marine Mammal Protection Act of 1972 (16 U.S.C. 1361-1407), the Regulations Governing the Taking and Importing of Marine Mammals (50 CFR Part 216), the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), the regulations governing endangered species permits (50 CFR Parts 217-222), and the Conditions hereinafter set out.

A. Number and Kind of Marine Mammals:

An unspecified number of specimen materials may be imported from:

1. All Cetacean species
2. All Pinnipedia species, except walrus (*Odobenus rosmarus*)

B. Special Conditions:

1. The specimen material may be imported from anywhere in the world. The material shall have been collected from animals:

   a) Taken in fisheries for such animals in situations where such taking is legal;

   b) killed incidental to fishing or other operations;

   c) found dead floating at sea or beached; or

d) that have died of natural causes.

2. All specimen materials collected under the authority of this Permit shall be maintained according to accepted curatorial standards in bona-fide scientific collections. In the event that fluid tissue specimens are disposed of upon completion of a project, the disposal shall be reported as required by Section B.

3. The Holder must coordinate activities within the United States with appropriate Federal, state and local resource management agencies.

4. The Holder shall submit written notification to the Protected Species Division and the appropriate Regional Director(s) of names of designated agents and the dates which their designation is valid at least two weeks prior to their activity under the Permit. An annually updated list of agents and NMFS personnel authorized to operate under this Permit shall be provided to the Protected Species Division and appropriate Regional Directors.

5. The Holder shall notify the appropriate Regional Director(s) sufficiently in advance of importation or transfer of specimen material. This notification shall include the destination of the specimen materials.

6. The Holder shall submit a report within 30 days of the importation authorized herein listing the items imported and the dates of importation.

7. The Holder shall submit an annual report by December 31 of each year the Permit is valid. The report shall include but is not limitted to, a description of each animal from which a specimen was taken including its species, age, size, sex, reproductive condition; date and location of collection; circumstances causing death if known; the date and location of each importation; and the name and location of each institution maintaining specimen materials collected under this Permit.

8. The Holder shall submit a final report within 90 days of the expiration date of the Permit which includes a summary describing the materials that have been imported and their dispostion. All reports shall be submitted to the Office of Protected Species and Habitat Conservation, National Marine Fisheries Service, U.S. Department of Commerce, Washington, D.C. 20235.

9. The provisions of this permit may be amended upon reasonable notice by the Assistant Administrator for Fisheries depending upon the species and circumstances involved.

10. This Permit does not relieve the Holder from the requirement of full compliance with all provisions of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). For those species listed on any of the Appendices to CITES valid and appropriate permit(s) authorizing import must be obtained prior to shipment.

11. The authority to collect and import this material shall extend from the date of issuance through December 31, 1991. The terms and conditions of this permit (Sections B and C) shall remain in effect as long as the material imported hereunder is maintained under the authority and responsibility of the Permit Holder.

C. All General Conditions attached as Section C shall apply and are made a part hereof.

William E. Evans
Assistant Administrator for Fisheries
National Marine Fisheries Service

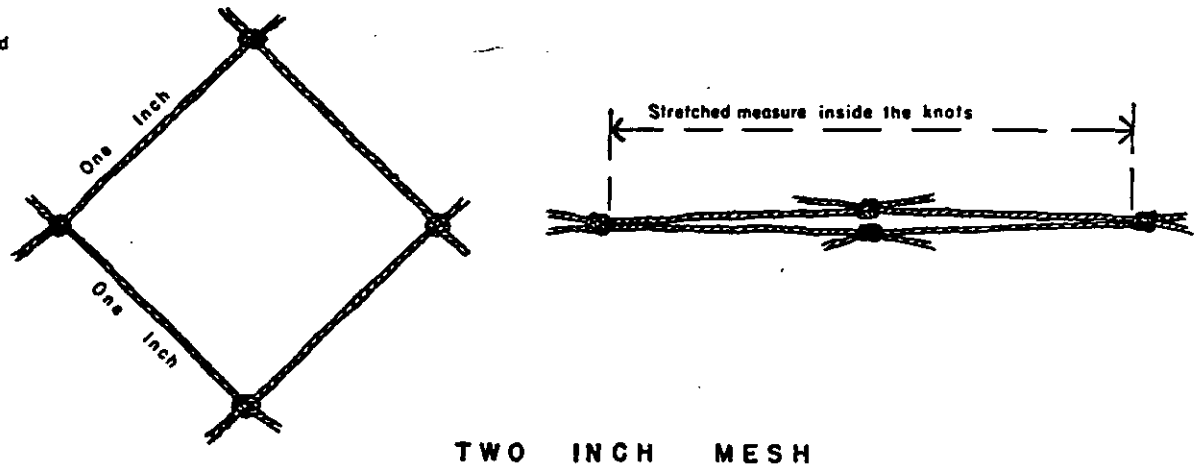
11/6/87
Date

HOW TO MEASURE MESH SIZE

The mesh size measurement requested on the gear diagram is the stretched measure, that is, the distance between two diagonal knots when the mesh is tightly stretched (see second diagram below). In order to obtain this measurement, the net must be empty and the mesh pulled tightly enough so that two opposite knots of the mesh square meet and all four knots are in the same plane; measure the distance inside the two most distant knots in the mesh square.

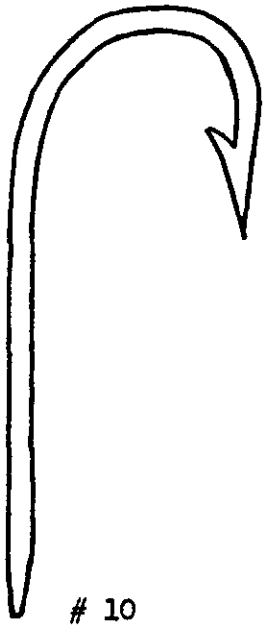
An easier way of obtaining the same measurement (the net does not have to be empty) is to measure the distance between two adjacent knots in a mesh square (the side of a square) and multiply by two. Check several meshes in each part of the net.

W. L. Scofield



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



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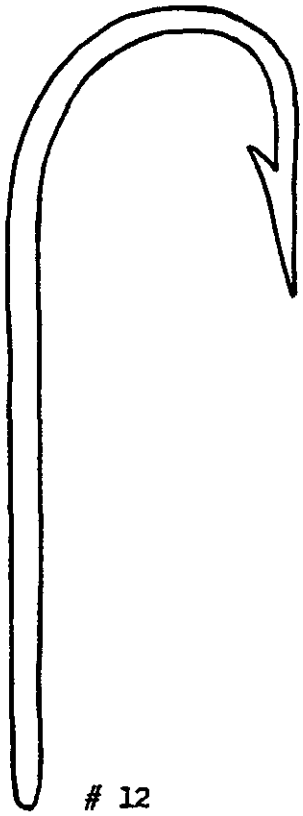

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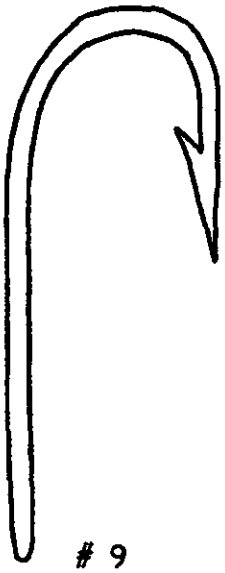

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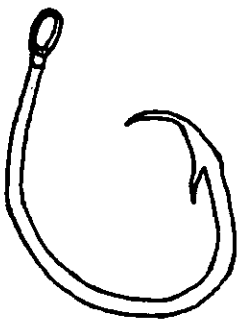


CIRCLE HOOK

ADVICE TO WOMEN GOING TO SEA

[Note: This has been adapted from the original version of "Advice" which was prepared by Connie Sancetta and colleagues at Lamont-Doherty Geological Observatory following the rape of a female student on one of Scripp's ships. We believe "Advise" is a balanced statement of potential problems and realistic responses to them that should be helpful to seagoing scientists.]

Sexual harassment occurs at sea, from verbal harassment to assault and rape. Such incidents are frequently not reported, for reasons ranging from a desire to be a good sport in minor cases, to embarrassment in more serious cases. This document is intended to alert you to the different nature of social conditions at sea, and to suggest some actions you should take if you feel uncomfortable or harassed.

Social conditions are different from those on land. Privacy is greatly reduced, and as a result interactions can become more intense, and feelings of intimacy are more quickly established. Small incidents, both pleasant and unpleasant, can quickly take on exaggerated importance, due to the close quarters, the prevalence of gossip, and the sense of isolation from "the real world" back on shore.

Furthermore, staffing on a ship brings together people with very diverse backgrounds and value systems. While some of the men are used to the concept of women as professionals, other are familiar with more traditional views of women, For some men, sexual remarks or actions may be considered an acceptable mode of behavior. Also, the value systems of many men change somewhat during the period of time that they are at sea.

The crew of a ship have usually established a workable interaction among themselves, while scientists, who come on board for a single cruise, are not part of that system. Scientists are therefore particularly apt to draw attention, comment, and speculation.

Sexual awareness and tensions can be heightened at sea, due to the unusual social closeness and deprivation of normal outlets. Behavior and attire that are acceptable on shore can be viewed as provocative at sea and close relationships between people of opposite sexes can strongly affect the atmosphere in which everyone must work and live. The result often is that a woman on board is subject to far more attention than she would be on shore. While some of the attention may be pleasant and even flattering, some of it is not.

In consequence, it is necessary to be aware of the different social situation and to modify your normal behavior if necessary. At the very least, you should consider the possible consequences on some situations so that you can react appropriately. Below are some examples of the sort of actions you might adopt or avoid:

1) Strictly obey the rules regarding drinking, which can lead to poor judgement, lack of control and alertness, and hasty actions. At sea you must be prepared for any emergency. Consider yourself on duty 24 hours a day.

2) Refrain from wearing potentially provocative clothing such as halter and tank tops, shorts, and tight clothing such as lycra.

3) Be aware that if you show more attention to one man than others, it may be misinterpreted by him or by others.

4) Do not invite a man to your cabin if you are alone, or accept an invitation to be alone with him, ("a friendly chat," "a little drink"). Leave the cabin door open or go to a public area if a man comes to talk to you without your invitation.

5) Activities such as flirting, joking about sex, or touching may be misinterpreted by the persons involved or by others. Unwanted approaches such as these should be responded to politely but very firmly. You yourself should avoid flirtatious behavior.

6) Do not engage in sexual affairs. Such affairs will distract you and your partner from doing your work, can breed resentment and jealousy and will subject other women to increased sexual pressure, both on your cruise and on subsequent cruises. Remember, you are at sea to work, not to amuse yourself. Remember, physical or emotional involvement with vessel or shoreside processing plant personnel is grounds for de-certification.

7) Make it clear that your interests in male companionship are elsewhere, (some women wear wedding rings), or that you are "not available."

8) If you are experiencing unwelcome advances or are in any tense situations, do not stand around on deck or other deserted areas alone at night.

9) In general, be very sensitive to the altered social conditions and their possible implications. Be very conservative. Use your common sense.

An assault often occurs with warning signs of milder behavior. If you act firmly and decisively during the early stages, you may reduce the chances of future harassment. Some warning signs to watch for are:

1) A man makes frequent attempts to detain you, to be in your company, or to visit you in your cabin.

2) Mild or casual sexual remarks become more frequent, pointed and/or objectionable.

3) A man attempts any physical contact, even if it appears innocent.

4) Other people warn you about a man who begins to harass you.

5) A man whom you have repeatedly attempted to discourage continues or escalates his advances.

further quote from Supreme Court ruling "Situ. in w/reasonable person is made uncomfort."

The definition of harassment is subjective, making it difficult to identify. Federal law defines sexual harassment as "unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature." Thus, it is your decision at what point you will draw the line.

Many women feel uncomfortable with milder forms of harassment, but tolerate it, not wanting to cause trouble, or appear to be oversensitive or bad sports. The unfortunate result of *this passivity is that harassment may continue or increase until it becomes serious.* At that point, the woman is open to the charge that she allowed (i.e., encouraged) the previous actions. It is best to take action at the time that you first feel uncomfortable. There are a variety of actions you may adopt, which must depend on your judgement. In general, the best sequence to follow is:

1) Indicate to the harasser that you do not enjoy or appreciate his actions. Do not make a joke of his behavior. Speak firmly and coldly, or pointedly avoid him. Do not make the mistake of pretending to ignore it; this invites continuation at a higher level. Losing your temper may be effective in some cases but usually is not, and may even encourage the harasser.

2) Discuss the problem with someone, preferably an officer, but at least a friendly crewperson. Ask for his/her opinion and advice as to handling it. If appropriate, you might ask the person to speak to the harasser, warning him off.

3) If the problem continues or worsens to the point that you feel upset or threatened, report it to the skipper immediately. Tell him the full story, explain that it is affecting your work, and request that he take steps to end the problem.

4) If the harassment advances to the point of assault, it becomes a felony. You should immediately report the offense to your employer and the captain, who are required by law to take certain actions. Have your contractor make arrangements for you to leave the vessel immediately or get yourself off of the vessel and inform your contractor of your actions. Make sure the incident is reported and is not swept under the rug. Failure to report a felony can itself be punishable under law.

Sexual assault and rape have occurred on fishing vessels at sea. These serious offenses might be prevented if appropriate action is taken in the early stages. Never believe that the problem is trivial or that you are over-reacting. If you feel harassed, then it has gone too far. It is your right to complain and even your obligation. By reporting harassment, you are protecting others as well as yourself. The skipper does not want trouble on his boat, and if you indicate to him that trouble may be brewing, he should take appropriate action.

Include CG reqs
Say: Don't need witness or anyone to agree w/you - you do need to document

RADIO COMMUNICATIONS

The radios that you will encounter most often are VHF-FM (Very High Frequency Modulation), used for short-range vessel-to-vessel and vessel-to-shore communication, and HF-SSB (High Frequency-Single Side Band), used for communication when the stations are out of VHF range with each other. Both types offer certain special advantages, and each requires a specific operating procedure.

VHF-FM Radios

In the United States, the VHF Band is broken up into 71 channels, with a frequency range of from 156.000 to 163.000 MHz, including six WX (Weather) channels. By law, all operating VHF stations are required to have at least three of these channels: channel 6, channel 16, and at least one other working channel.

Channel 6 (156.300 MHz) is the Intership Safety Channel, used for intership safety purposes, search-and-rescue (SAR) communications with ships and aircraft of the U.S. Coast Guard, and vessel movement reporting within ports and inland waterways. This channel must not be used for non-safety communications.

Channel 16 (156.800 MHz) is the International Distress, Safety, and Calling Channel (Intership and Ship-to-Coast). This channel must be monitored at all times the station is in operation (except when actually communicating on another channel). This channel is also monitored by the U.S. Coast Guard, Public Coastal Stations, and many Limited Coastal Stations. Calls to vessels are normally initiated on this channel. Then, except in an emergency, you must switch to a working channel. It is against FCC regulations to conduct business on this channel. In addition, vessels calling must use their assigned call sign at the beginning and end of each transmission.

Channel 22A (157.100 MHz) is the U.S. Coast Guard Liaison Channel. This channel is used for communications with U.S. Coast Guard ships, aircraft, and coastal stations after first establishing contact on channel 16. Navigational warnings and, where not available on WX channels, Marine Weather forecasts are also broadcast on this frequency.

Channels 24, 25, 26, 27 and 28 (also 84, 85, 86 and 87) are the Public Correspondence channels (ship-to-coast). These are available to all vessels to communicate with Public Coastal stations (Marine Operator). Channels 26 and 28 are the primary public correspondence channels.

Channels 1, 3, 5, 12, 13, 14, 15, 17, 65, 66, 73, 74, 77, 81, 82 and 83 are channels with special designations (port traffic communications, U.S. government communications, locks and bridges, environmental, etc.), and their use close to shore or to ports should be minimized.

Channels 7, 8, 9, 10, 11, 18, 19, 67, 68, 69, 70, 71, 72, 78, 79, 80 and 88 are commercial and non-commercial working channels that are available for conducting business. The abbreviated format (no call signs) is acceptable on these frequencies. It should be noted that some of these channels may be locally restricted (off the Washington Coast, for example, channel 11 is Tofino Coast Guard Traffic Control for the entry into Juan deFuca Strait, used for reporting ship locations), in which case their use for business should be avoided.

HF-SSB Radios

Single Side Band radio is a special version of AM (Amplitude Modulation) radio specifically intended for long-range communication. As a consequence of the "skip" phenomenon (the tendency of a transmitted signal to reflect off the barrier created by the ionosphere), High Frequency skywaves can reach stations up to several thousand kilometers away (depending on ionospheric conditions and other environmental factors). The very nature of the transmitted skywave, however, means a signal very much poorer in quality than a typical VHF or UHF (Ultra High Frequency) signal, and one that is very susceptible to slight atmospheric shifts. HF propagation can vary with time of day, month of the year, sunspot activity, etc., so it becomes extremely important to use more than one frequency to ensure communications under differing conditions.

A number of specific characteristics must be considered when discussing skywaves in an HF-SSB system. One of the most important is the operating frequency of the system. In general, the lower frequencies are used for medium distances, and the higher frequencies for greater distances. As a general rule of thumb for daytime operations, multiply the frequency in MHz by 100 to obtain the approximate skywave coverage distance in miles: 4 MHz equals 400 miles, and 12 MHz equals 1200 miles. At night, these ranges are from 2 to 3 times greater. The nature of the ionosphere is such that its effective position varies with the time of day, tending to move higher up after sundown. This means that the same frequency will reach farther at night, and it is therefore common practice to use lower frequency at night for coverage of the same distance.

Radio Procedure

Inasmuch as the airwaves are in the public domain, it is the responsibility of the radio station operator to conduct business according to established guidelines and procedures. While on the air, the operator should follow the following format outline:

1. Listen before beginning transmission in order to ensure that you are not interfering with other stations or with emergency radio traffic.

2. Identify your station when calling. On the SSB, a calling station must limit the duration of the hail to not more than 30 seconds. If there is no reply, the hail may be repeated at 2 minute intervals up to a maximum of three times, at which time the calling station must sign off and wait a minimum of 15 minutes before making another attempt. This requirement does not apply in emergency situations.

3. Keep transmissions short and concise, giving the other station a chance to respond, ask questions, or reconfirm an unclear message. A long, complicated message can best be effected in short segments, with breaks in between to ensure that the receiving station has copied each portion of the message correctly.

4. Follow correct radio procedure while on the air. The phonetic alphabet should be learned and used -- spelling unclear words with an extemporaneous phonetic alphabet can lead to misunderstood messages. You should also know and use the radio "punctuation" words ("over","clear","out","roger","words twice","say again","standing by", and "break"). Since most radio communication is only one way at a time, these words can be invaluable for signaling your intentions to the receiving station. Make sure to speak directly into the microphone; speaking loudly, slowly, and distinctly -- but not shouting -- can significantly improve the legibility of radio broadcasts. The use of profanity on the public airwaves is strictly forbidden.

5. Upon completing a transmission, you must sign off by identifying your station and using the words "clear" or "out" (or, if you expect to soon resume contact with the same station, by using the phrase "standing by").

Radio Telephone Procedure - Continued

1. Radios are different from telephones in that they cannot transmit and receive simultaneously. Therefore when you have temporarily finished talking and are ready to listen, say "over," and release the button on your microphone. When the other party is ready to listen they will say "over." At the end of your entire message, say "out" rather than "over." Keep in mind that people on other ships can overhear your conversation, so watch what you say.

2. Sounds are easily garbled on marine radios so the phonetic alphabet is used when sailors want to spell something. Here are the words that the Coast Guard will recognize as letters:

A - alpha	N - November
B - bravo	O - Oscar
C - Charlie	P - papa
D - delta	Q - Quebec
E - echo	R - Romeo
F - foxtrot	S - Sierra
G - gulf	T - tango
H - hotel	U - uniform
I - India	V - victor
J - Juliet	W - whiskey
K - kilo (keeloes)	X - x-ray
L - Lima (Leema)	Y - Yankee
M - mike	Z - Zulu

3. Every ship and all Coast Guard stations continually listen to the emergency frequencies. Therefore when you want to talk to someone, call on an emergency frequency. As soon as you contact them, arrange to switch to another channel. It is illegal, impolite, unfair, and dangerous to talk on emergency channels. Sometimes atmospheric conditions are such that the emergency frequencies are the only ones that work. At those times you simply cannot communicate via radio except to report emergencies.

   Emergency frequencies are:

   FM Channel 16, international distress
   FM Channel 13, for ships to use to avoid collisions. You can contact other ships on 13, but not Coast Guard shore stations.
   AM 2182, international distress

   (Almost certainly as an observer you will only be using FM frequencies.)

4. When you initially contact another station make sure you state what channel you are broadcasting on, since all ships and stations constantly listen to several.

5. Speak in normal tones, using normal conversational pauses and emphasis.

6. Ensure that your messages are brief and businesslike. No chatter.

7. When trying to establish communications repeat the other station's name, and your name, at least twice. A typical message may be as follows:

You - "Coast Guard Station Kodiak, Coast Guard Station Kodiak; this is the fishing vessel Starry Flounder, Whiskey Tango Zulu 4190; this is the fishing vessel Starry Flounder, Whiskey Tango Zulu 4190; on channel 16, over."

C.G.- "Fishing vessel Starry Flounder this is Coast Guard Station Kodiak, shift and answer on channel 11, out."

You - "Coast Guard Station Kodiak, Coast Guard Station Kodiak, this is the Starry Flounder on channel 11, over."

C.G.- "Fishing vessel Starry Flounder, this is Coast Guard Station Kodiak, send your traffic, over."

You - "Kodiak, this is the Starry Flounder, I am an observer talking for the captain. A crewman has a badly crushed arm and needs hospitalization. Can you evacuate the crewman? Over."

C.G. - "Vessel Starry Flounder, this is Kodiak. Affirmative. What is your current position? Over."

You - "Kodiak this is the Starry Flounder. Position 55 degrees 50 minutes north, 157 degrees, 24 minutes west, over." etc.

MEDICAL DIAGNOSTIC CHART (MDC)

One of the most important functions an observer can perform during a medical emergency is the collection and maintenance of a medical history. This history and its communication to the Coast Guard is essential to the further treatment of an injured person.

There are two histories to be aware of. The first deals with the patient's bodily make-up and past medical concerns. The second history is a record of the accident or illness and how it is affecting the patient over time. These two pieces of information will give doctors and corpsmen, hundreds of miles away, a greater diagnostic tool of what's happening inside the patient's body and what complications may lie ahead.

The patient's past medical history is the "framework" for which you will later fill in the "details". This medical history (refer to "MDC RADIO WORKSHEET AND FLOW CHART", items 7 - 13), is simple, basic, and vital. For example: 30 yr. old /male/145 lbs./ 5 ft. 7 in. / medium build/ no allergies/ no medications///. [Please note that what is underlined would be in your radio message.] This "framework" information is just as important as the details you are about to fill in.

Without previous training and using what is available, you can observe and record the nature of the accident and the patient's vital signs. On the worksheet, items 14 - 18 are observation questions of "what's happened" (#'s 7-13 are to whom), and 19 - 25 are the observation questions of "what's happening now". An example of what's happened might be:

Injured by a broken cable on jan. 24 at 2300/ Patient has sustained a head injury/ Complains of severe pain in the upper left quadrant of abdomen/ Compound fracture to right hand/ Possible fracture to left arm below elbow/ Possible internal bleeding in the abdomen, area hard and tight, some blood in urine/ Right hand and left arm splinted, external bleeding controlled///

"What's happening now" is information on the vital signs: level of consciousness, eye reactions, pulse, blood pressure, respiration, skin condition and body temperature. Here is an example of what's happening now:

VITAL SIGNS:/ LOC, alert/ EYES, E-R/ PULSE, 64 steady but weak/ B-P unavailable, distal pulse present, cap refill good/ LUNGS, clear and equal/ RESP, 30 and shallow/ SKIN PERSPIRATION, normal; COLOR, normal; TEMPERATURE, normal/ BODY TEMPERATURE, 102.2///

Don't forget to have ready the patient's name, the vessel name and the vessel owner's name and address. All of this extra information is necessary to expedite patient care and transport if necessary, and to inform family members. The procedure and interpretation of the worksheet is as follows:

(1 - 3) The "address" of the message.

(4) (Is not necessary for domestic vessels.)

(5) Self-explanatory.

(6) The patient's name is very important, don't forget to include it.

(7 - 11) Age, sex, height and weight can be estimated when there is a lack of specific information.

(12 - 13) Build and allergies information is critical and must be exact!

(14) (Self-explanatory.)

(15) Type of injuries should be self-explanatory, however there are three things to be aware of: 1) the definition of a soft tissue injury; 2) trying to localize abdominal pain; and 3) the various types of bleeding. Soft tissue injuries are injuries related to the organs (i.e. eyes, kidneys, testes, etc.). Whenever possible, locate the abdominal pain using the navel as the center point. This will give the doctors and corpsmen a better idea of which organs are traumatized.

(16) Fill type of bleeding out carefully. Bleeding is not only an injury, but also an indicator of further problems and therefore must be observed in greater detail. Identify the type of bleeding as: profuse, shallow, pulsating, steady, and/or internal. Internal bleeding is difficult to identify but can be suspected, if an area such as the abdomen which is normally soft, is now hard and rigid; if that area or another is tender, swollen and/or has a bruised appearance to it. Look for the presence of blood in the eyes, ears, mouth, vomit and urine. Blood in the vomit needs specific identification as to its consistency and color (i.e. is the blood fluid-like in appearance or does it appear clumped together like coffee grounds, is it dark red or bright red?). All of these observations are necessary to determine the nature and origin of the bleeding.

(17 - 18) Self-explanatory, rely on basic observations.

(19 - 25) The vital signs are indicators of the patient's present physiology. To record the vital signs, all you need other than your good judgment is a watch with a second hand and a flashlight. Item (19), a patient's Level Of Consciousness (LOC) is generally described in terms of Alert, Vocal, Pain or Unconscious. Use the following standard criteria to determine a patient's LOC. The method used to determine Alertness is "Time, Date, Place Orientation." A person is considered Alert if they can answer simple questions, "What is your name, where are we, what is today's date?" **Do not ask** questions like, "How many fingers do I have up?"; number skills involve an entirely different set of motor functions in the brain. A person who is incoherent, semi-conscious, or mumbling without direction is considered Vocal. When a patient is unconscious but responsive to Pain (a thin pinch on the bottom of the foot or under the armpit should suffice) then this should be noted differently than the state of Unconscious, since it denotes a higher state of consciousness.

(20) Eyes: you will need a flashlight for this one. Open both of the victim's eyes, shine the light into one eye **from the side of the face** (not directly in from the front of the face), and look into the other eye. Both pupils should constrict equally, quickly, and simultaneously. If you have any doubts, have someone else repeat this procedure and compare your results.

(21) Pulse is counted at beats per 30 seconds times 2, and rated per minute. The pulse is best taken at the wrist (follow the thumb down to the beating area...) or at the throat (off to either side of the windpipe, under the jaw). Again, if in doubt, compare. A description of the pulse should follow: strong, weak, bounding, etc.

(22) Without a blood pressure cuff, accurate B-P information is unavailable. However, the other data you are collecting, the qualitative information on the pulse and skin conditions, will assist in a general qualitative assessment of the B-P. With that, there are two other direct indicators of B-P quality, they are: Distal Pulse and Capillary Refill. Distal pulse is a pulse taken at a location distant from the heart. The two most common places to take distal pulse are: 1) below and behind the ankle and, 2) top center of the foot. The presence and quality of this pulse is your data. (NOTE: these pulses are difficult to find on a healthy person and if you are unable to find them on your patient, try to find them first on yourself or on someone around you). Capillary refill is your other index of quality. Pinch a little bit of skin on the fore finger and toe. Note how quickly color is lost and then returns. That speed in which skin color returns is your indicator. Capillary refill is diminished by cold.

(23) The information requested on lungs and respirations should be self-explanatory. In the event that you don't have a stethoscope, place your ear on the patient's chest, both sides, high and low. With a stethoscope, check the lungs high, middle and low on the chest, and high and low on the back. Respirations should be timed and qualified the same way as the pulse is. One word of caution, don't let the patient know that you are monitoring their breath, they will breath differently.

(24) Skin perspiration, color and temperature is monitored by sight and touch. This should not present any problems, but do not confuse skin temperature with body temperature.

(25) Place a thermometer in the patient's mouth or armpit and record your findings. To convert Celsius to fahrenheit use the equation given on the worksheet.

The flow chart on the back of the MDC is simply an update of items 19 - 25, every 15 or 30 minutes as necessary. For the first half hour it is good to monitor your patient every 10 minutes, every 15 minutes for the next hour and a half, and every half hour after that. An example of your first radio message should read something like the following, with subsequent radio messages updating the patients condition as necessary.

TO: Coast Guard, Kodiak
FROM: your name, vessel name, vessel permit number, present lat. and long.,time & date

Request medical assistance/ Crewman Joe Misfortunate/ 30 yr./ male/ 145 lbs./ 5 FT. 7 IN./ medium build/ no allergies/ no medications///

Injured by a broken cable on Jan. 24 at 2300/ Patient has sustained a head injury/ Complains of severe pain in the upper left quadrant of abdomen/ Compound fracture to the right hand/ Possible fracture to the left arm below elbow/ Possible internal bleeding in the abdomen, area hare and tight, some blood in urine/ right hand and left arm splinted, external bleeding controlled///

VITAL SIGNS/ LOC, alert/ EYES, E-R/ PULSE 64 steady but weak/ B-P unavailable, DISTAL PULSE present, CAPILLARY REFILL good/ LUNGS clear and equal /RESPIRATIONS 30 and shallow/ SKIN: PERSPIRATION, normal; COLOR, normal; TEMPERATURE, normal/ BODY TEMPERATURE 102.2///

VESSEL OWNER/ Joe Smith/ Homer/ 907 123-4567///Please advise best course of action///

MDC RADIO WORKSHEET AND FLOW CHART

(1) VESSEL'S NAME & CALL SIGN _____

(2) VESSEL'S LAT. & LONG. _____ (3) TIME & DATE _____

(4) VESSEL AGENT'S U.S. NAME & ADDRESS _____

(5) VESSEL OWNER'S NAME & ADDRESS _____

(6) PATIENT'S NAME _____ (7) AGE _____ (8) SEX _____

(9) HT. ___ ' ___ " (10) WT. _____ # (11) BUILD _____ (12) ALLERGIES _____

(13) PRESENTLY ON MEDICATIONS Y/N _____ WHAT _____

(14) DATE, TIME & NATURE OF INJURY _____

(15) TYPE OF INJURIES OR ILLNESS

___ Airway	___ Abdominal Pain (general)	___ Fracture	___ Swelling
___ Cardiac Arrest	___ Upper Left Quadrant	___ Burn	___ Bleeding
___ Head	___ Upper Right Quadrant	___ Poisoning	___ Alcohol On Breath
___ Soft Tissue	___ Lower Left Quadrant	___ Seizure	___ Other _____
___ Chest Pain	___ Lower Right Quadrant	___ Psychiatric	_____

(16) TYPE OF BLEEDING

___ Profuse ___ Internal

___ Shallow

___ Pulsating

___ Steady

Blood in the:

___ Eyes ___ Ears ___ Vomit

___ Nose ___ Mouth ___ Urine

(17) LOCATION OF INJURIES

___ Head/Face ___ Upper Extremities

___ Neck/Spine ___ Abdomen

___ Chest ___ Pelvis

___ Back ___ Lower Extremities

(18) TREATMENT

___ Cleared Airway ___ Wound Care

___ Oxygen ___ Splint

___ CPR ___ Neck/Spine Immobilized

___ Controlled Bleeding ___ Other _____

VITAL SIGNS

(19) LEVEL OF CONSCIOUSNESS

___ Alert

___ Vocal (but not alert)

___ Pain (responsive to)

___ Unconscious

(20) EYES

___ Pupils EQUAL & REACTIVE

___ UNEQUAL but reactive

___ Sluggish

___ Dialated (Enlarged)

___ Constricted (Small)

___ NON-REACTIVE

(21) PULSE (#'s & quality)

___ XX Beats per minute

___ Strong

___ Steady

___ Bounding

___ Weak

___ Thready

___ Irregular

(22) BLOOD PRESSURE (B-P)

#'s ___this/that___ Distal Pulse Present Y/N____

B-P Cuff Only Capillary Refill Quality ____ Good ____ Poor

____ Fair ____ Unavailable

(23) LUNGS & RESPIRATIONS

Lung sounds are:

___ Clear ___ Equal

___ Congested ___ Unequal

___ Raspy

Respirations are:

___ XX per minute ___ Short

___ Deep ___ Irregular

___ Shallow ___ Strained

___ Weak

(24) SKIN (perspiration, color & temperature)

PERSPIRATION	COLOR	TEMPERATURE
___ Very Dry	___ Flushed	___ Hot
___ Normal	___ Normal	___ Normal
___ Sweating	___ Pale/Ashened	___ Cool/Cold
	___ Cyanotic (blue)	

(25) BODY TEMPERATURE

_____

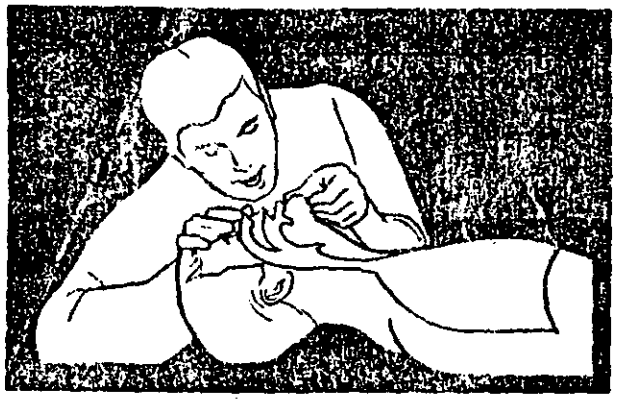
°F = °C x 1.8 + 32

FLOW CHART					FLOW CHART		FLOW CHART	
TIME (GMT)	19 LOC	20 EYES	21 PULSE & qual	22 B/P	23 RESP (# & qual)	24 SKIN (p-c-t)	25 BODY TEMP	OTHER

Cardiopulmonary Resuscitation (CPR)

SHAKE OR SHOUT TO DETERMINE UNCONSCIOUSNESS

Airway



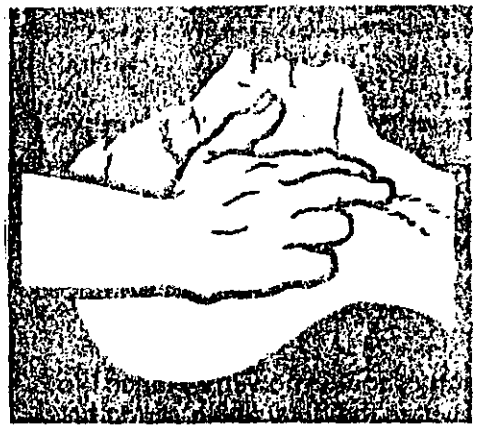
If no response:

TILT head and **LIFT** chin to clear airway of tongue.
LOOK, LISTEN, and **FEEL.**
Look to see if chest is rising and falling.
Listen and Feel at mouth with your ear to determine breathing.

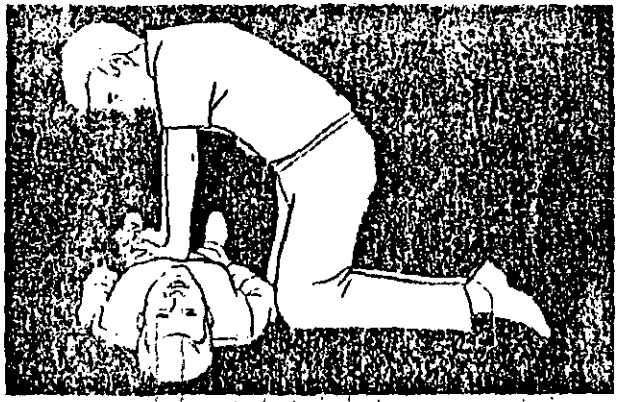
Breathing

If no breathing:

PINCH nostrils.
OPEN your mouth.
TAKE a deep breath.
SEAL patient's mouth with yours.
BLOW four quick, full breaths.
CHECK neck pulse on the side nearest you.
If pulse is present, continue breathing 12 times per minute (1 each 5 seconds).
Child/Infant rate - 20 times per minute (1 each 3 seconds)

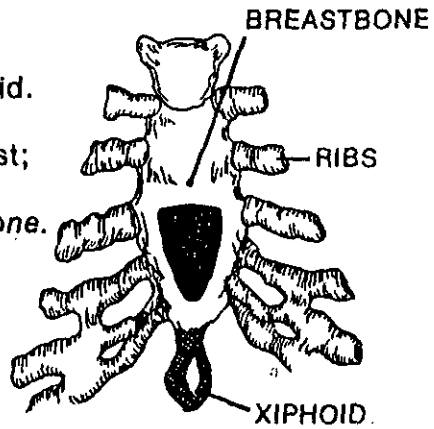


Circulation



If no pulse:

REMOVE obstructive clothing from chest.
FEEL for lower end of breastbone with 2 or 3 fingers on xiphoid.
PLACE heel of one hand just above fingers so that you are on lower one-half of breastbone, **PLACE** other hand on top of first; **KEEP** arms straight.
Small child — use heel of one hand at midpoint of breastbone.
Infant — use 2 fingers at midpoint of breast bone.
COMPRESS breastbone straight down 1½ to 2 inches . . .
Child — ¾ to 1½ inches
Infant — ½ to ¾ inch
. . . at a **RATE** of 60-80 times per minute.
Child/Infant 80-100 times per minute.



ONE PERSON — give **2 BREATHS** after **15 CHEST COMPRESSIONS.** Chest compressions are done at a rate of 80 times per minute.

TWO PERSONS — Give **1 BREATH** during the upstroke of each **5th CHEST COMPRESSION.** Chest compressions are done at a rate of 60 times per minute.

Call for Help.

HELICOPTER EVACUATION

Helicopter evacuation is a hazardous operation and should only be attempted in a life or death situation. The *following information provides the capabilities and requirements of the Coast Guard for evacuation at sea.*

RANGE:
Helicopters can operate only 100 to 150 miles offshore weather conditions permitting.

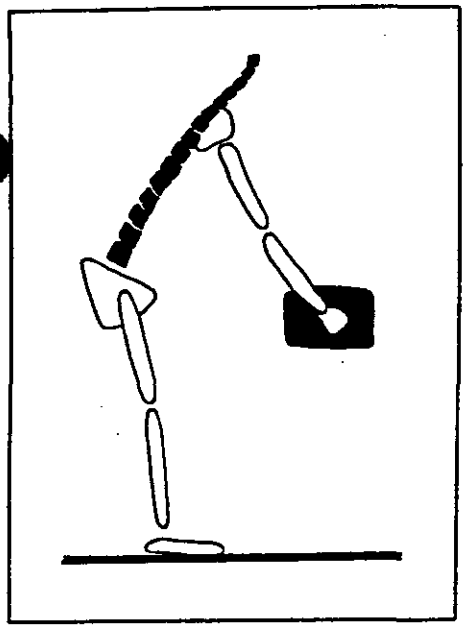
REQUEST FOR ASSISTANCE:
▲ Determine patients condition and call the nearest Coast Guard station listed on NMFS Medical Assistance Placard.
▲ Give position, course, speed, weather conditions, type and characteristics of vessel.
▲ Conserve time by heading towards rendezvous point.

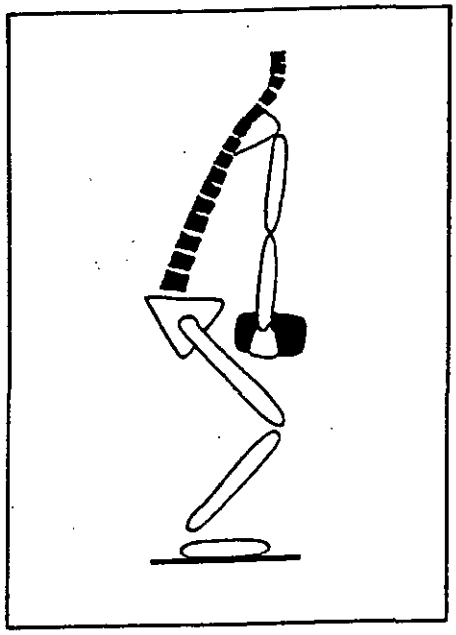
PREPARE FOR ARRIVAL:
▲ Stand by on 2182 kHz or specified alternate if not available.
▲ Display distress signal.
▲ Clear hoist area, preferably aft, with maximum horizontal clearance. If area is mid-ships lower antenna and secure running gear.
▲ At night, light area, DO NOT shine lights on helicopter.

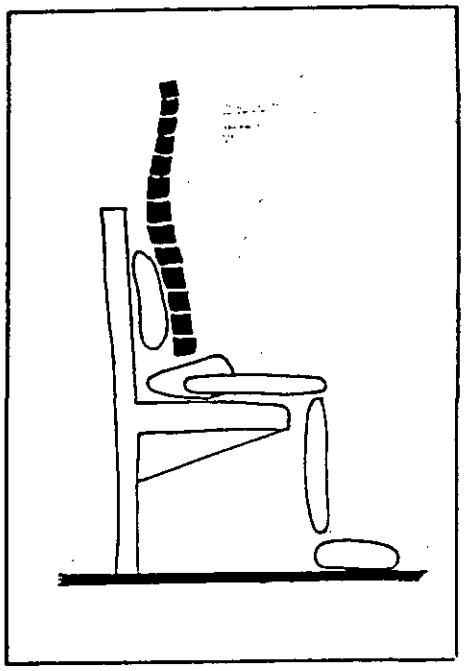
HOISTING:
▲ Tag patient, indicate medication given and conditions doctor should be aware.
Keep vessel into wind or with wind about 20° on port bow at 10 to 15 knots.
▲ Hoist instructions will be given by pilot. Allow stretcher or basket to touch deck to discharge static electricity. Wear dry cotton or rubber gloves.
▲ If stretcher is needed it will be equipped with a hoisting bridle.
▲ Conditions permitting, have patient in life jacket, strapped in, face up, and hands clear of sides.
▲ DO NOT secure hoist cable to vessel or attempt to move stretcher without first unhooking cable.
▲ With patient strapped in signal pilot to lower hoist. Steady stretcher.
▲ Use trail line to steady stretcher. Make sure line is clear of rigging and crew.

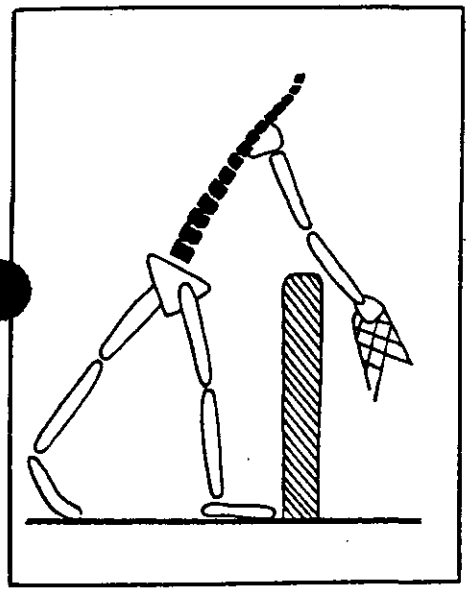
U.S. Department of Commerce, National Oceanic and Atmospheric Administration
National Marine Fisheries Service, Fisheries Extention Service, Northeast Region,
Gloucester, Massachusetts

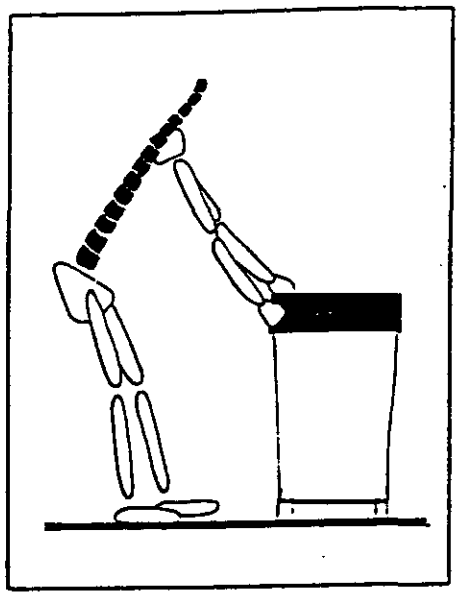
PREVENTING BACK INJURIES

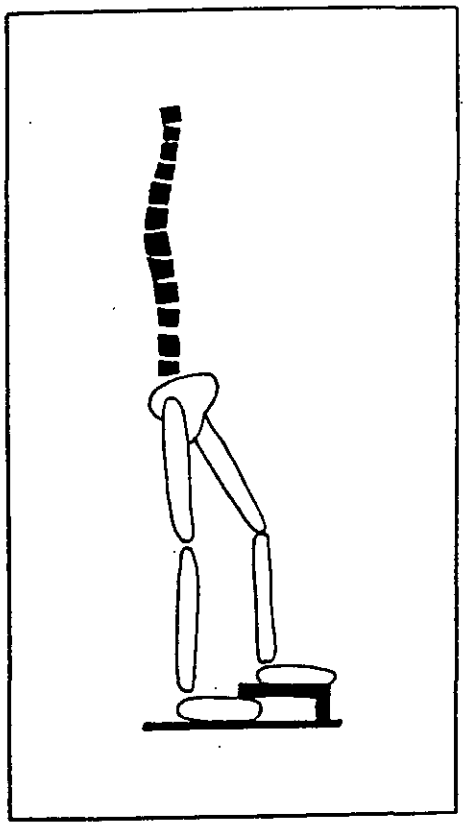












1. The stress on the back is increased when the work is too far away from the body.

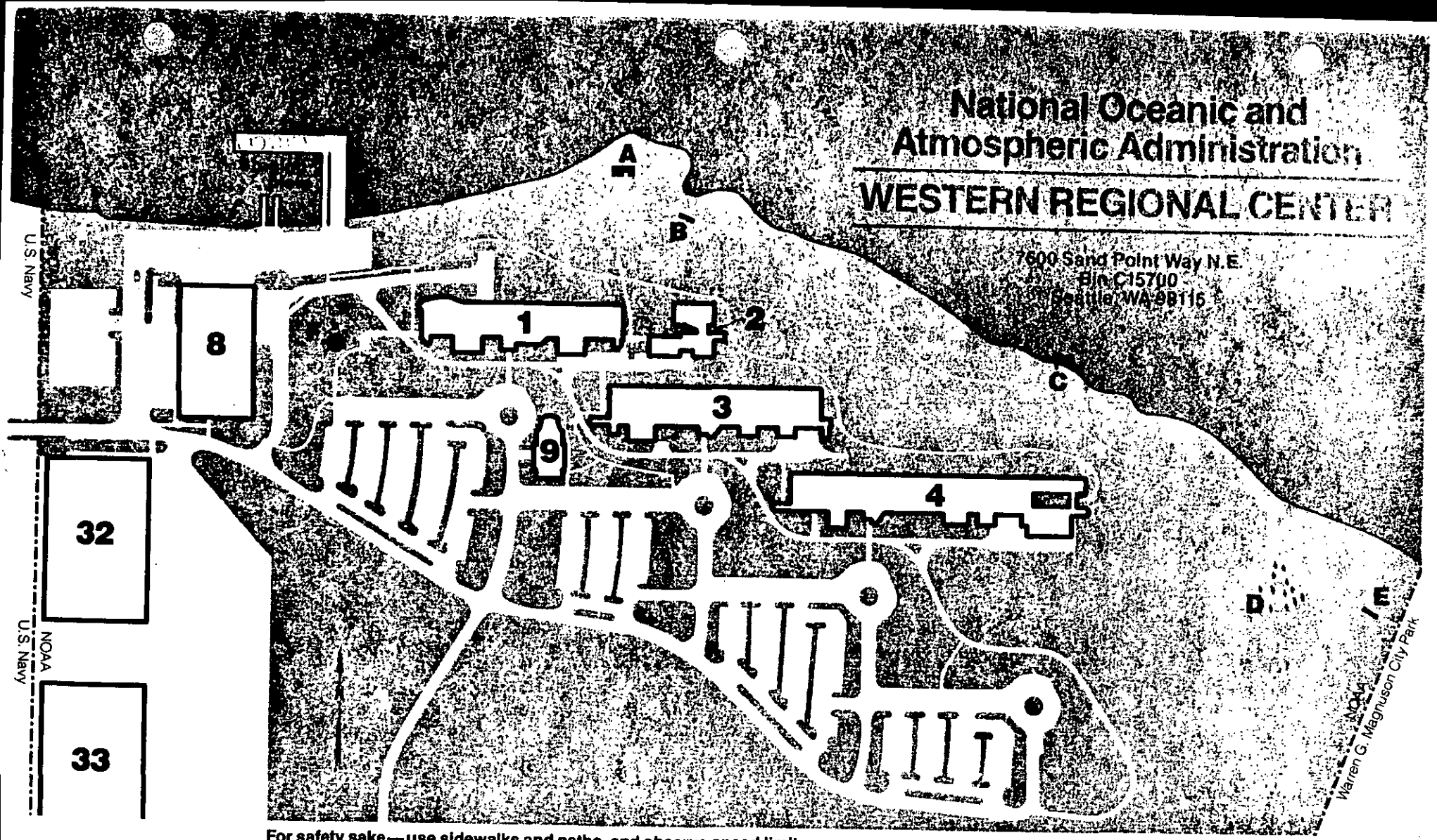
2. Taking the time to get a load directly in front of and close to you will reduce the chance of hurting your back. Always bend your knees and lift with a straight back.

3. If you have to sit for a long period, make sure the seat supports the lower back. If it doesn't, put a rolled-up sweater or towel behind your waist.

4. If you have to reach over something to do a job, put your weight on one leg and stretch the other leg straight out behind.

5. If you have to pull or push an object, take the extra step to get it straight in front of you.

6. If you must stand for a long period, put one foot up on a low ledge or rail.



For safety sake—use sidewalks and paths, and observe speed limits

Building 32
NMFS Resource Assessment and Conservation Engineering

Building 33
Warehouse

Building 8
Pacific Tide Party, PMC.
Western Regional Diving Facility.
Shops.
Warehouse.

Building 1
NW Regional Office, NMFS.
NW Regional Counsel.
NW Ocean Service Center.
Public Affairs.
Office for Civil Rights.
National Weather Service Forecast Office.
Western Administrative Support Center.

Building 2
Cafeteria.
Health care facility.

Building 3
Pacific Marine Environmental Laboratory.
Nautical Chart Branch, PMC.
Library & Information Services Division.
Ocean Assessments Division, NOS.

Building 4
Northwest & Alaska Fisheries Center, NMFS

Building 9
Auditorium and seminar rooms

Artworks

A Viewpoint
B NOAA Bridge
C Berth Haven
D A Sound Garden
E NOAA Bridge
F Knoll for NOAA

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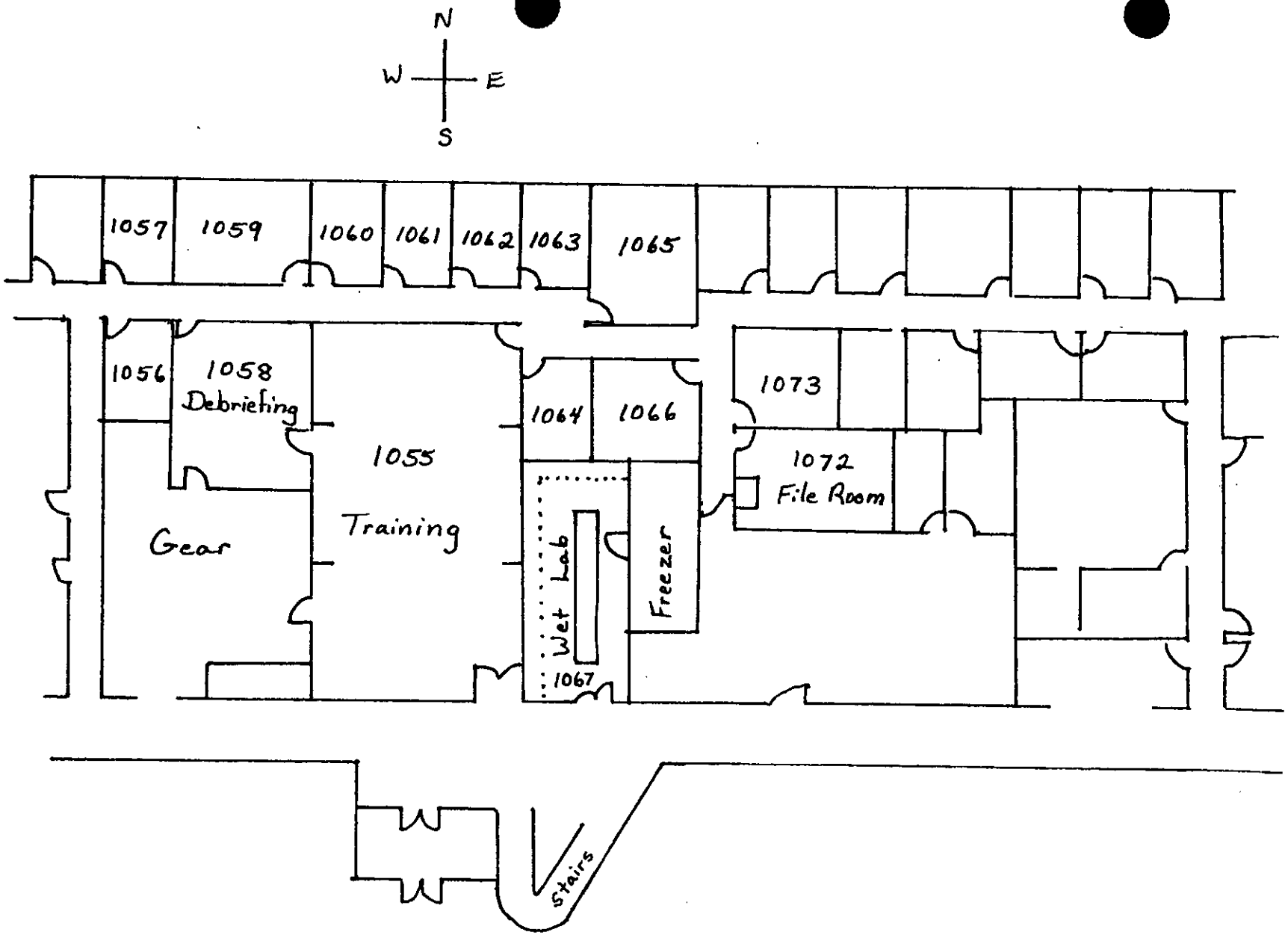
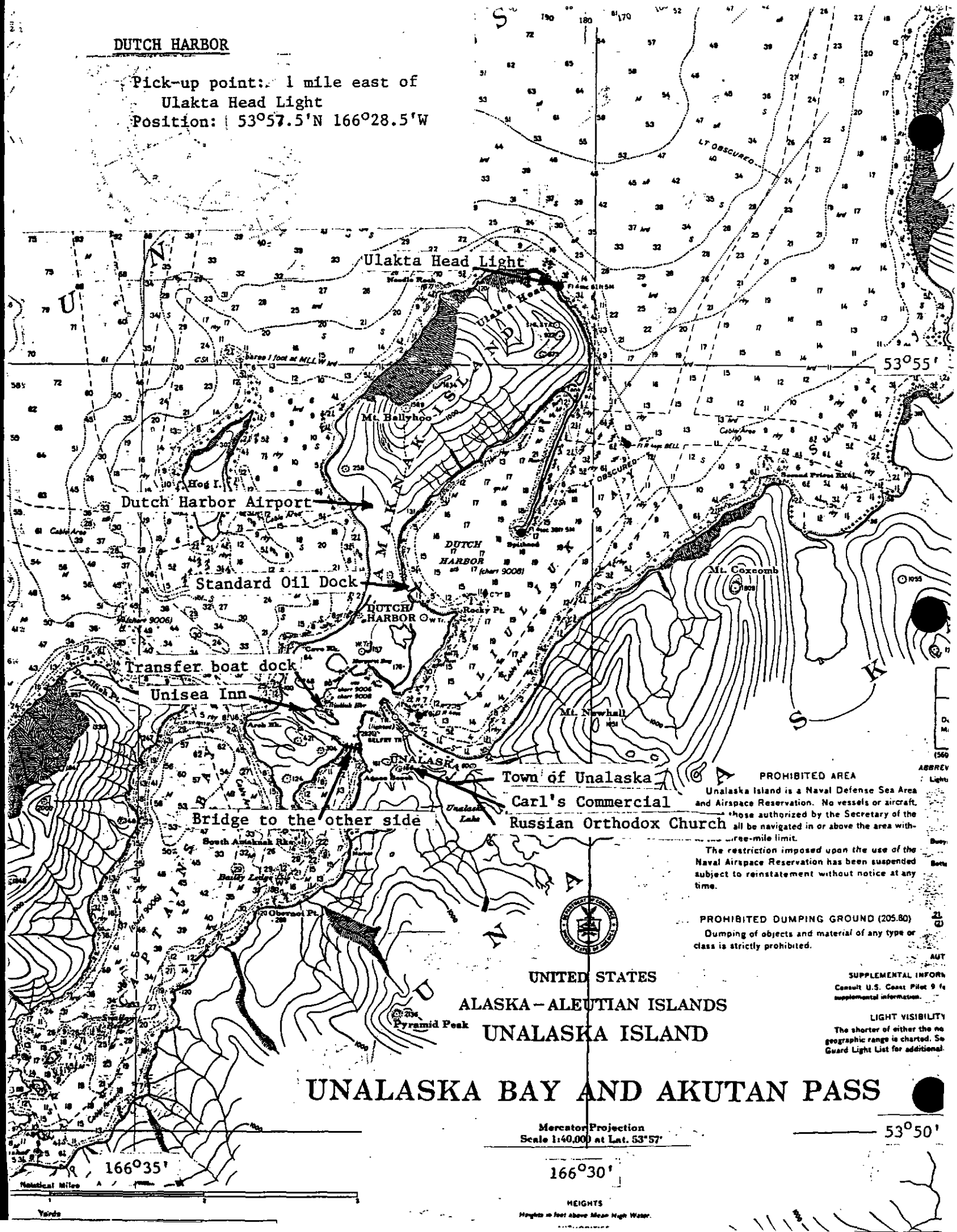
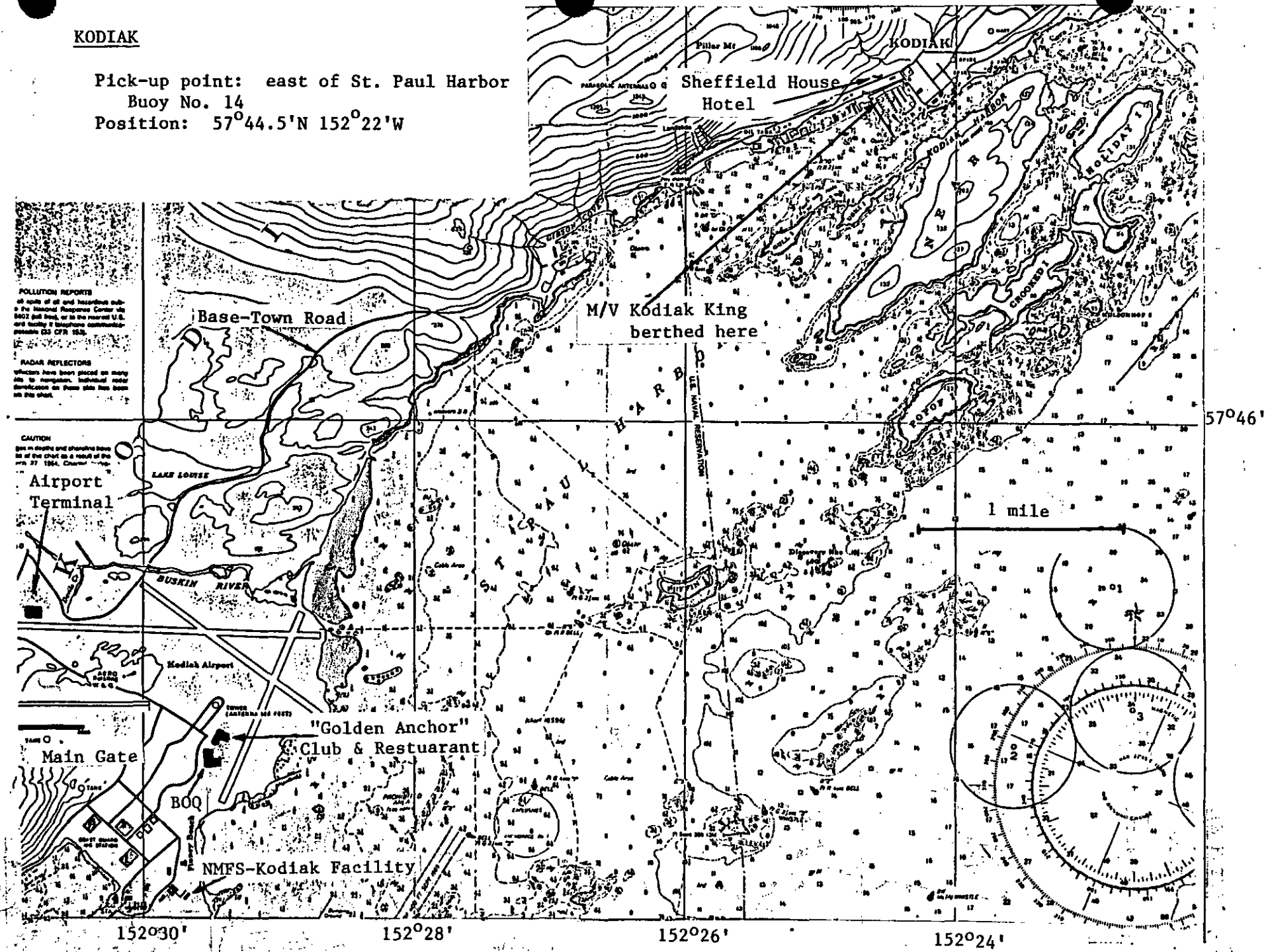


Observer Program Facilities, Building 4 ground floor


DUTCH HARBOR
Pick-up point: 1 mile east of
Ulakta Head Light
Position: 53°57.5'N 166°28.5'W
Ulakta Head Light
Ulakta Head
Mt. Ballyhoo
Hog I.
Dutch Harbor Airport
Standard Oil Dock
DUTCH HARBOR
Rocky Pt.
Transfer boat dock
Unisea Inn
Mt. Coxcomb
Mt. Newhall
UNALASKA
Town of Unalaska
Carl's Commercial
Russian Orthodox Church
Bridge to the other side
Unalaska Lake
South Amaknak Rk.
Pyramid Peak
53°55'
53°50'
166°35'
166°30'
PROHIBITED AREA
Unalaska Island is a Naval Defense Sea Area and Airspace Reservation. No vessels or aircraft, those authorized by the Secretary of the all be navigated in or above the area with-ree-mile limit.
The restriction imposed upon the use of the Naval Airspace Reservation has been suspended subject to reinstatement without notice at any time.
PROHIBITED DUMPING GROUND (205.80)
Dumping of objects and material of any type or class is strictly prohibited.
SUPPLEMENTAL INFORM
Consult U.S. Coast Pilot 9 fo supplemental information.
LIGHT VISIBILITY
The shorter of either the no geographic range is charted. Se Guard Light List for additional.
UNITED STATES
ALASKA – ALEUTIAN ISLANDS
UNALASKA ISLAND
UNALASKA BAY AND AKUTAN PASS
Mercator Projection
Scale 1:40,000 at Lat. 53°57'
HEIGHTS
Heights in feet above Mean High Water.
Nautical Miles
Yards

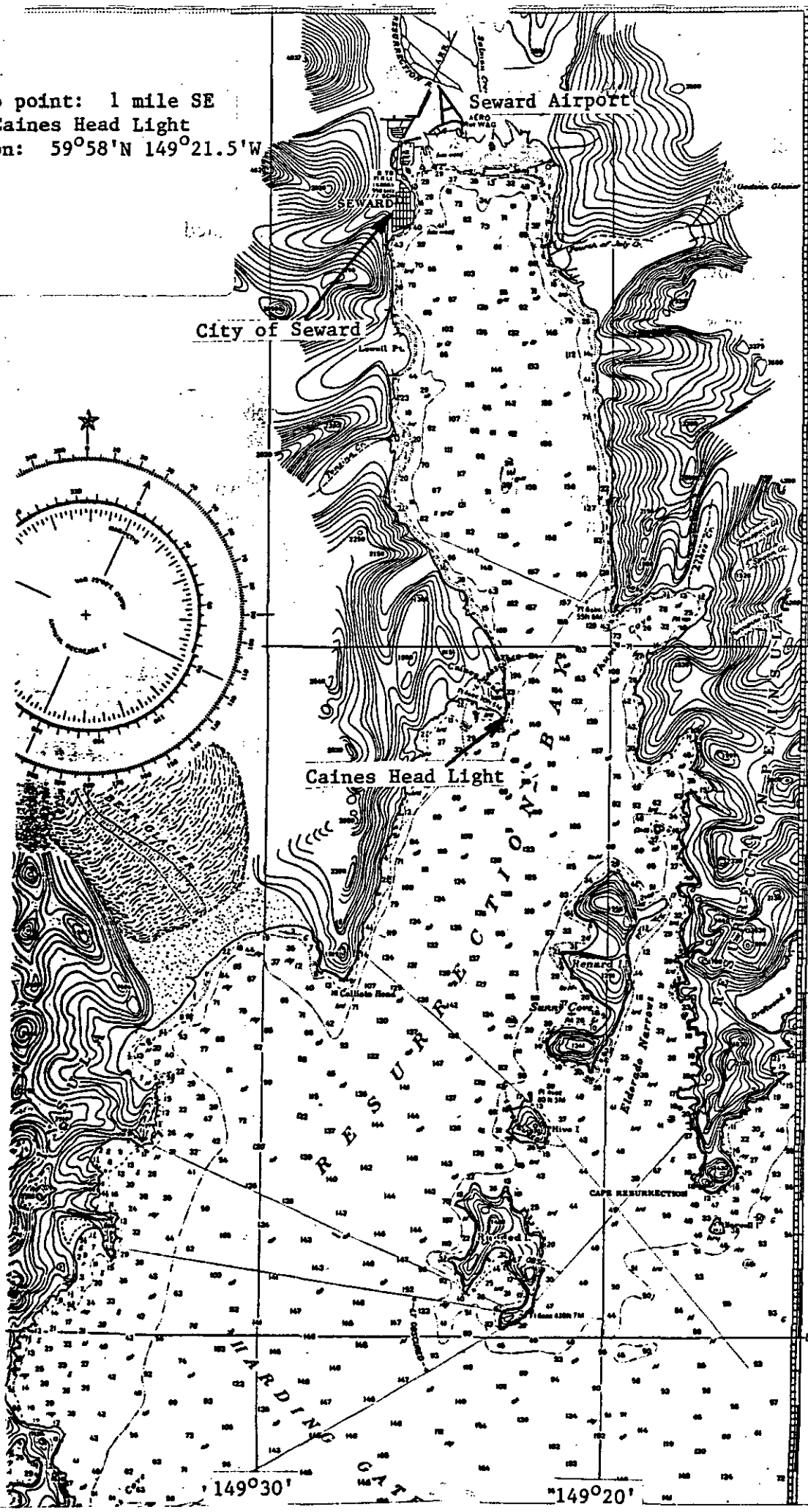
KODIAK

Pick-up point: east of St. Paul Harbor
Buoy No. 14
Position: 57°44.5'N 152°22'W



SEWARD

Pick-up point: 1 mile SE of Caines Head Light
Position: 59°58'N 149°21.5'W



GLOSSARY

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, refridgerated seawater tank (RSW tank), lobby.

Boat Share - The percentage of the gross which goes to the vessel owner.

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.

Chief - The engineer, the man responsible for care of engines and deck machinery.

Codend - the end "bag" of a trawl net where the majority of the fish are collected and held.

Combing - a low partition that separates the trawl deck from the side pockets.

Companionway - Entrance/stairway from deck to fo'c'sle and engine room.

Compliance - in accordance with the fishing regulations.

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.

Expenses - All costs of making the trip: fuel, groceries, ice, bait, lost gear. Some expenses may be gross-stock expenses, that is, costs levied against the gross stock before any shares are deducted. Crew expenses are those trip costs levied against the crew's share, shich is that amount left after deduction of boat share and gross-stock expense.

Flatfish - fish which are laterally compressed and who orient themselves in the water with their lateral surfaces or sides towards the surface and bottom.

Fo'c'sle (from: forecastle) - the forward part of a ship where sailor's quarters are located.

Footrope - the bottom, leading edge of a trawl net.

Forward - towards the bow of a vessel.

Freezer trawler - a large, catcher/processor vessel whose products are whole fish or parts of fish frozen into blocks.

Fresh weight - the weight of the whole fish (or animal) as it was when alive. Also called round weight, whole weight.

FUS - Fully Utilized Species. FUS is a designation given to bycatch species whose quota has been taken but the fishery was permitted to continue. Fully Utilized Species must be discarded from the catch like prohibited species.

Galley - Ship's kitchen and/or mess hall.

Gallows - 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.

Gurdy - Special winch for hauling of longlines or trolling lines.

Gypsyhead - A metal drum with a smooth concave surface, usually mounted on a winch. Several wraps of line around the gypsy provide enough friction while it is turning to raise heavy loads smoothly because the line slips and is easily controlled, like the friction on a clutch plate.

Hatch - an opening in a deck or bulkhead of a ship.

Haul - a catch of fish from one tow of a net

Joint Venture - a cooperative fishing/processing effort between vessels of different nationalities.

Knot - A measure of time multiplied by distance, equalling speed. One knot equals one nautical mile (6080 feet) in one hour.

Lee, Leeward - the side protected from the wind,opposite the "windward" side

Master - fishing master and/or captain.

Mothership - a processing vessel at-sea (under way) whose fish come from catcher boat's 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.

R.D.F. - Radio direction finder.

Regenerated scale - a fish scale which has grown in to replace one that was lost. Regenerated scales are useless for aging the fish.

Rostrum - a pointed, calcareous, median extension on the anterior end of crab carapaces.

Roundfish - fish that orient themselves in the water with the dorsal side towards the surface and ventral side towards the bottom.

Round weight - the weight of the whole fish (or animal) as it was when alive, synonymous with fresh weight.

RSW - Refridgerated sea water, usually referring to a tank for holding fish.

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.

Taper - to cut webbing according to a given formula for fitting into a trawl.

Trawl - A cone shaped net, towed through the water to catch fish.

Under way - Vessel in forward motion, running. According to Coast Guard regulation, a vessel is under way if it is not at anchor or at dock, so a vessel adrift is technically under way.

Vessel Code - A code used only by the observer program to identify a ship.

Wing - the sides off a trawl net near the opening, usually with larger mesh than the rest off the net.

Wrister - A coated cloth tube worn on the arm, extending from the elbow and covering the wrists. Keeps arms warm. Fish blood and slime are more easilly washed out from these than from shirt sleeves. Most fishermen cut off workshirt sleeves, generally about halfway between elbow and wrist.

Zulu - another name for GMT.