preliminary

North Pacific Groundfish Observer Manual 1999

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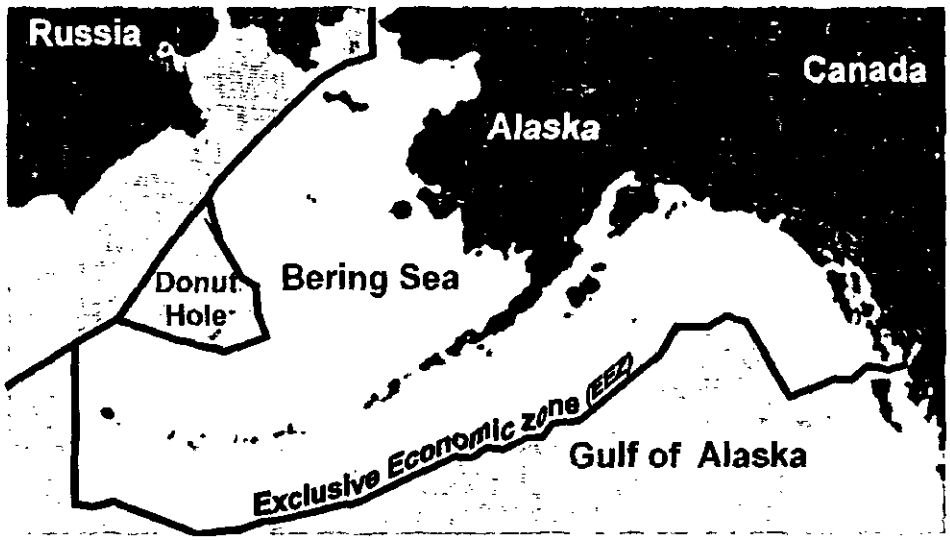
INTRODUCTION

Welcome to the National Marine Fisheries Service (NMFS) training course for North Pacific Groundfish Observers. Observer training takes place at the University of Alaska North Pacific Fisheries Observer Training Center and at the NMFS Alaska Fisheries Science Center in Seattle; the training offered at both locations is identical, and successful students become NMFS- certified groundfish Observers.

Large-scale exploitation of eastern Bering sea groundfish stocks began in the 1930s with the initiation of the Japanese yellowfin sole fishery. Following the Second World War, fisheries in this region expanded as more countries became involved and additional species were targeted. By the early 1960s operations had extended into the Gulf of Alaska and off the coasts of Washington, Oregon, and California. Observers began collecting data aboard some foreign vessels in 1973 upon invitation of the host countries. During the first few years of the program, coverage levels were low and Observers' primary responsibilities were to collect information on bycatch rates of halibut, crab, and salmon, and biological data for a range of species. In 1977, the Magnuson Fishery Conservation and Management Act (MFCMA) was implemented to regulate fishing within the Exclusive Economic Zone (EEZ) of the United States. It was reauthorized in 1990 and again in 1996 as the Magnuson-Stevens Fishery Conservation and Management Act (or Sustainable Fisheries Act). MFCMA established eight fishery management councils to develop management plans for the nation's fishery resources. Among the fishery management plans developed by the North Pacific Fishery Management Council were those which regulate groundfish fisheries in the Gulf of Alaska and the Bering Sea/Aleutian Islands Region. Since implementation of MFCMA, placement of Observers in groundfish fisheries off Alaska has been achieved through provisions of these management plans.

When MFCMA was initiated, all groundfish fisheries in the EEZ off Alaska were conducted by foreign vessels. Direct U.S. participation began in 1978 through joint ventures where fish was harvested by U.S. fishing vessels and transferred to foreign factory ships for processing. All non-joint venture foreign fishing ceased in 1986 and all foreign fishing in these waters ended in 1991 when the U.S. industry had become large enough to harvest and process the total allowable catches for all groundfish species.



As the fisheries have changed, so has the Observer Program. Coverage levels have increased and Observer data has become increasingly important to the management of catch, bycatch, and prohibited species. The availability of data and samples collected by Observers has allowed scientists at the Alaska Fisheries Science Center and elsewhere to develop and utilize sophisticated procedures for estimating age composition, stock abundance, and allowable biological catch. Observer data is now critical to inseason management, scientific research, documentation of fishery interactions with marine mammals and birds (including endangered species), and monitoring for compliance with certain fishery regulations.

Since 1990, when the Domestic Observer Program was fully implemented, 100 percent Observer coverage has been required aboard all vessels greater than 124' length overall (LOA) harvesting groundfish in the EEZ off Alaska. Vessels of 60' - 124' LOA participating in these fisheries have a 30 percent Observer coverage requirement. Shoreside plants processing groundfish harvested in the EEZ have Observer coverage requirements linked to the quantities of fish they receive. This is the largest fishery Observer program in the world. Each year we deploy 300 - 400 individuals to collect more than 30,000 Observer days of data aboard approximately 400 vessels and at about 30 shoreside fish processing plants.

While NMFS recognizes that sampling and collection of data aboard commercial vessels and at fish processing plants is sometimes quite difficult, the quality and integrity of Observer data is of paramount importance. The training should prepare you well for your work as an Observer, and program staff will always be available to work with you to resolve problems as they arise. However, you will have to rely on your own resources to ensure that you collect the best possible data under difficult conditions. Most Observers find the experience challenging and rewarding. We have great confidence in our Observers and we are rarely disappointed in the work that they perform.

Preparation and Departure

The North Pacific Fisheries Management Council (NPFMC) developed a comprehensive data- gathering program for the North Pacific groundfish fishery. In addition to vessel permitting and reporting requirements, it included a mandatory Observer program. The Council and the National Marine Fisheries Service (NMFS) prepared an Observer Plan to implement the program in 1990. The Observer Plan has subsequently been incorporated into the Code of Federal Regulations at 50 CFR §679.50. Under these regulations, the NMFS Observer Program at the Alaska Fisheries Science Center in Seattle provides the operational oversight, certification training, definition of Observer sampling duties and methods, debriefing of Observers, and management of the data. Although the vessel and plant owners pay for the cost of the Observers, the costs associated with managing the program are borne by the Federal government.

When fishing or processing companies require Observer coverage, they sign up with an Observer contractor which has been certified by NMFS. Contractors advertise and hire, insure, and make the logistical arrangements for Observers. Certification training is provided by either the Observer Program in Seattle or the North Pacific Fisheries Observer Training Center (NPFOTC). The NPFOTC is operated through the Community and Technical College, University of Alaska Anchorage, funded by the Alaska Sea Grant College Program, University of Alaska Fairbanks.

Groundfish Observer's Job

Briefing or Training

Every Observer must attend a training (new Observers) or briefing (prior Observers) by NMFS or NPFOTC staff before deployment. A three week training class is required for new Observers. Each prior Observer must attend four days for the first briefing of the year; subsequent contracts require only one-day briefings.

First Days on Board

When beginning a new vessel assignment, spend time adjusting to your new surroundings. Safety is your foremost concern, so locate and inspect safety equipment before you leave port (see "Before You Board" on page 18-2). Once the vessel is underway, consider your data collection needs. It is helpful to watch the first few hauls and consider how you should estimate catch and collect samples to maximize efficiency and reduce bias in the data.

Inseason Data

During the deployment, you will periodically send some or all of your data to NMFS in Seattle. There are several methods of sending data to NMFS including fax, phones, or satellites. Many vessels have computer access and satellite/phone capabilities. On these vessels you will create electronic files of all data and send it to NMFS daily via the ATLAS program.

Mid-cruise & Field Support

During your deployment, you are required to complete a mid-cruise debriefing with NMFS staff if you are in Dutch Harbor, Kodiak, or Anchorage. This is an opportunity to review your work completed so far, answer any questions you may have, deal with problems, or collect more sampling gear or data forms.

While at sea, you may have questions that can be answered via the communication system. NMFS staff will respond to your questions as soon as possible and offer advice for how to best complete your duties. If you are on vessel with ATLAS capability, communication with NMFS is daily, and a NMFS staff person will review your data and any questions you have each day.

Changing Vessels

During a contract, you may collect data from a maximum of four different vessels. Each set of data is separate. Keep your data complete and organized, along with your sampling gear and personal items so that you do not leave anything behind when you transfer to another vessel. Collected data is confidential; you must not show it to, or discuss it with anyone on the other vessels.

Final Debriefing

At the end of your deployment, you will meet with NMFS staff in Seattle, Dutch Harbor, Kodiak, or Anchorage for debriefing. All completed data is submitted to NMFS, reports and surveys are completed. During your debriefing interview, you will discuss your data collection procedures and clarify any questions. Finally, you will make corrections to your data if needed, and return your sampling equipment. This process may take over a week to complete (see "Debriefing" on page 20-10).

Life at Sea

Logistics/travel

Traveling in Alaska can be expensive and unpredictable. To get to any major fishing port, it will require at least one air flight, which is subject to weather conditions. Boats have difficulty getting to and from their destinations on any kind of predictable schedule. Your employer, as part of their certification as an Observer contractor, is required to provide you with travel, housing, and food when you are deployed as an Observer. Your contract with them (or union agreement) specifies wages, reimbursement, and conditions of your travel and housing. Contractors have much experience dealing with airlines, boats, housing, and the pitfalls of this very complicated logistical web; so take their advice and expect changes in plans at any time.

Accommodations

Vessels are obligated by regulation to provide you with adequate and safe living conditions. As a minimum, you should have a bunk of your own and a place to store your gear. The size of the vessel, number of crew, and condition of the boat vary greatly in the fleet.

Communications

Communication from vessels can be as minimal as a radio, or as complex as a network computer system with satellite telephone/modem capabilities. As an Observer, you have access to this equipment for work-related communications, but not for personal calls. Mail can be forwarded to you at your employer's discretion. It may be a slow process to send or receive mail, so do not expect prompt service. There are pay phones in most ports, but calling friends or family can be difficult considering the time difference, poor quality of connections, or waiting lines to use the public phones.

Accidents and Illness

Moving boats, machinery, heavy lifting, and cold, wet conditions create an environment prone to injuries and illness. Boats generally have extensive medical supplies, but are also limited in their access to medical facilities and physicians. If you are unable to work due to injury or illness for more than a day or two, inform your contractor and NMFS. The skipper, as master of the vessel, must (by law) also be informed of any injuries or illnesses aboard the vessel.

Equipment

Raingear/boots/gloves

Mandatory to surviving the marine environment is proper shelter. Heavy raingear, non-skid boots, and heavy rubber gloves are standard equipment for anyone aboard a fishing vessel in Alaska. Raingear should be heavy PVC with a cotton lining for strength. Grundens, Cofish International, Helly-Hansen, and Eriksens are some of the companies that make raingear of this type. You will need a jacket (with a hood), and bibs (with suspenders). Most are available in orange color, which has a the added benefit of high visibility.

Boots should be sturdy, with a non-slip surface. Xtra-tuff brand, a neoprene boot with a chevron-shaped tread on the sole, is the standard for the fishing industry. The softness of the neoprene and the chevron pattern enable the boot to grip wet surfaces and give the most stable footing of any type of sole. Other brands have imitated this style, and may be adequate, but any other style of boot is a threat to your safety.

Sampling Gear

NMFS supplies Observers with sampling equipment. The blue baskets of groundfish Observers are a well recognized item when traveling in ports and airports around Alaska. It is your responsibility to maintain the gear issued to you and return it in a clean, usable condition upon debriefing. Some items are expensive, and you can expect to be charged for misuse or loss of NMFS-issued gear. A list of that gear is provided in the appendix.

Some of the issued gear is for your safety. An immersion suit, a life vest, a hard hat, and ear plugs are provided to reduce your reliance on vessel equipment. The use and care of sampling equipment is described, in part, in the pertinent sections of this manual. Some suggestions:

1) Keep any metal parts well oiled to reduce rust and extend their useful life. Don't put them inside any closed container (plastic bag or box) when they are wet with seawater, or they will quickly rust;

2) Keep all gear as clean as possible. Use deck hoses to rinse off fish slime after use, and fresh water (if available) to rinse of the salt water. Once fish slime dries onto your gear, it becomes difficult to remove. Most catcher-processors and shore plants have high pressure hoses that work well for cleaning gear.

3) Keep your books, forms, pencil, pens, and unused sampling gear in your room, and only leave what is needed in factories or on decks. Too often, gear goes overboard, is "borrowed" by the crew and lost, or is destroyed by leaving it in the wrong place.

4) If something does happen to your issued gear, document the circumstances and you may avoid being charged for what is not your fault.

5) Try to keep gear centralized so that you are less likely to forget something when packing to leave.

Recommended Personal Items

If you are a first time Observer, your employer provided you with some guidelines on what to take to sea. If you have questions, ask a prior Observer, your contractor, NMFS, or OTC staff. In general, first time people take too much. If you brought things to training or briefing that you don't want to take to sea, NMFS in Seattle or the OTC in Anchorage will store excess items for you. This service is provided for Observers at sea, not between contracts.

Standards of Conduct

Standards of Observer Behavior 50 CFR §679.50(h)(2)(ii).

Observers must avoid any behavior that could adversely affect the confidence of the public in the integrity of the Observer Program or of the government, including but not limited to the following:

1) Observers must diligently perform their assigned duties.

2) Observers must accurately record their sampling data, write complete reports, and report honestly any suspected violations of regulations relevant to conservation of marine resources or their environment that are observed.

3) Observers must not disclose collected data and observations made on board the vessel or in the processing facility to any person except the owner or operator of the observed vessel or processing facility, an authorized officer, or NMFS.

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. This includes, but is not limited to:

   - Engaging in excessive drinking of alcoholic beverages;
   - Engaging in the use or distribution of illegal drugs; or
   - Becoming physically or emotionally involved with vessel or processing facility personnel.

Note: Behaviors contrary to these standards or the intent of these standards are grounds for decertification. Falsification of Observer data will be grounds for decertification and may be a basis for prosecution.

Conflict of Interest

The following paragraphs are directly from the Conflict of Interest Standards, 50 CFR §679.50(h)(2)(i). Observers:

- May not have a direct financial interest, other than the provision of Observer services, in a North Pacific fishery, including but not limited to, vessels or shoreside facilities involved in the catching or processing of the products of the fishery, concerns selling supplies or services to these vessels or shoreside facilities, or concerns purchasing raw or processed products from these vessels or shoreside facilities.

- May not solicit or accept, directly or indirectly, any gratuity, gift, favor, entertainment, loan, or anything of monetary value from anyone who conducts activities that are regulated by NMFS, or who has interests that may be substantially affected by the performance or nonperformance of the Observers' official duties.

- May not serve as Observers on any vessel or at any shoreside facility owned or operated by a person who previously employed the Observers.

- May not solicit or accept employment as a crew member or an employee of a vessel or shoreside processor in a North Pacific fishery while under contract with an Observer contractor.

Confidentiality of Data

All data collected by an Observer while assigned to vessels and plants is to be kept confidential. Vessels and plants have a right to see collected data, but do not have the right to see your logbook. Often, vessels want copies of your data for their own use, or for voluntary sharing of bycatch data with other vessels. Only the vessel and plant owners (or others approved by them), NMFS staff, and you are to see the data collected.

Be cautious about discussing activities of your assigned vessel or plant as fishing is a competitive business. This is especially a problem in places like Dutch Harbor, where Observers often meet and discuss aspects of their assignments. Be careful about what you discuss and who is listening.

ESSENTIAL INFORMATION

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Observer Duties and Priorities

Observer duties are listed below in order of priority. Each of the duties will be explained, in detail, in this manual. The tasks listed as the highest priority must be completed. If you find you cannot complete all of the tasks listed, due to sickness or horrible weather, reduce the effort spent on lower priority tasks and concentrate your efforts on the high priority duties.

1. Record incidental take of all short-tailed albatross and collect the specimens. Record all take of marine mammals and collect canine teeth of fur seals and Stellar sealions.

2. Record fishing effort and catch information. Make an independent estimate of as many hauls or sets as possible. Record all calculations for the independent catch estimate in the Observer logbook.

3. Sample selected hauls or sets for species composition.

4. As required, send the data to the NMFS Observer Program in Seattle. This may involve weekly, daily, or by trip data transmissions.

5. Document compliance problems in the Observer logbook.

6. For each haul or set sampled for composition, gather and record additional biological data on prohibited species.

7. For each haul or set sampled for composition, take samples of the selected species for sex, length, and otolith data.

8. Maintain your Observer logbook, including: all calculations, the formulas used, techniques used in sampling, seabird interactions, tagged birds information, records of sampled hauls, scale tests, and sample area diagrams.

9. Collect data and specimens for standard projects.

10. Log sightings of "species of interest" seabirds and marine mammals.

11. Complete any special projects assigned.

Cruise Numbers

The Observer Program refers to the set of your vessel or plant assignments from the time of your training or briefing until you complete debriefing as your "cruise." To enable easier tracking of all the cruises occurring each year, we identify each cruise with a four digit number. This number is referred to as a "cruise number." Observers are given their individual cruise numbers during training or briefing. Your cruise number must be entered in the appropriate place on every data form.

During your deployment your cruise number will change only if you are deployed (and sample) over the change to a new year, your vessel uses more than one gear type, or your vessel changes from fishing in Alaskan waters to the Washington, Oregon, or California coast. A gear type change requiring a different cruise number would be a trawl vessel switching to use pot gear. A trawl vessel switching between pelagic and non-pelagic nets does not require a new cruise number.

Vessel/Plant Code

A vessel or plant code is a unique letter and number identifier which is used to identify exactly the vessel or plant to which you are assigned. It is used, along with your cruise number, to identify your data. Vessel codes are three digits preceded by an "A". Plant codes are three digits preceded by a "P". Plant and vessel codes are listed on page A-20 and page A-23.

Separation of Forms

Forms completed on each vessel or plant assignment comprise a separate set of data. Each vessel you are on will have 1US/2US, 3US, 7US, 9US, 10US, and 11US data forms. Each plant to which you are assigned will have Plant Delivery Information, 7US, and 9US forms. If you are assigned simultaneously to two processing plants, the data forms for each plant must be kept separate. Write your name and the name of your vessel or plant at the top of the first page of each form type. Observers using the ATLAS program need to keep back-up copies of the data for each assignment on separate disks (see "Backing Up Data" on page 16-38).

Page Numbering

You have one data set for each vessel or plant assignment. Within each data set each form type is numbered consecutively. Think of all of your data forms for a single vessel as a set; the 2US is a subset of that set, the 3US is another subset, etc. All 2US pages are numbered consecutively, all

3US pages are numbered consecutively, and so forth.

Each species per vessel/plant assignment comprises a separate set of 9US forms. For example, if you have scale samples from both chum and silver salmon, you will have a set of 9US for the chum salmon scales and a set for the silver salmon scales. The pages within these separate sets are numbered consecutively.

Page numbers must be entered at the top of each form type on the right hand side within the "page __ of __" space. The first blank is for the page number of the current page, the second blank is for the total number of pages present for that form type. For example, "page 3 of 40" indicates the third page of 40 consecutive pages for a form type.

Recording Time

Please record time using the 24-hour clock (0000 - 2359). Record time using Alaska Local Time (ALT) if your vessel is in Alaskan waters or Pacific Local Time (PLT) if the vessel is off the Washington, Oregon, or California coast. In other words, use Daylight Savings Time when in effect and Standard Times otherwise.

Calculations and Decimal Places

All calculations must be recorded in your Observer logbook. It is crucial for you to document all of your calculations, including the formulas used. Please document and label your calculations such that another person could easily understand them. Your logbook will be referred to during in-season and final debriefings, and also throughout the data quality control process.

Use the full field of decimal places on your calculator for calculations. Do not round any numbers used in calculations until you determine the final result. Record the value of the final product in your Observer logbook showing the full field of decimal places. When recording the value of the final product on a data form, round the value to the appropriate number of decimal places for that form. Rounding prior to achieving the final product decreases the precision of the calculation relative to the precision of the original measurements.

Rounding Rule

Look only at the first digit to the right of the number you are rounding;

If $x > 5$ round up, < 5 round down. If $x = 5$, round up

Example: rounding to two decimal places

0.9278 rounds up to 0.93

0.9728 rounds down to 0.97

Use Of Weighing Scales

To obtain accurate weights, you must use the appropriate scale for weighing. In general, use the 2.0 kg scale for items up to 2.0 kg, the 12.0 kg scale for items 2.0 to 12.0 kg and the 50.0 kg or flatbed scale for weighing larger items. See "Appendix W. Use of Flow Scales" on page A-50 for flow scale use requirements.

Ensuring Your Data Are Legible

Please ensure that your data and logbook entries are clear and legible. If your writing is unclear, the wrong number may be entered onto the database, NORPAC. Your efforts in ensuring the correct numbers are entered is crucial to the reliability of the database.

Observer Logbook Entries

The Observer logbook is a crucial component of the data you record while you are deployed. Your logbook is the place for you to record all of your calculations, notes about data collection, scale verifications, seabird sightings, sampling area diagrams, and documentation regarding regulatory compliance issues. Your logbook is your scientific field notebook and must be treated as such; do not use it as a personal journal. The logbook is not the appropriate place for you to vent frustrations. Do not write any slanderous, derogatory, or discriminatory remarks in your logbook. Your logbook and your data forms are property of NMFS and may be released along with your name after debriefing. The logbook is a public document and must be treated as such.

Your logbook is archived as a reference and may be used as evidence. Please be extremely clear and descriptive in your documentation. You may write your calculations in pencil, but all other entries must be in ink. If you

need to make a correction, draw a single line through the incorrect word(s) and write the correct words. Do not completely cross-out anything, use correction fluid or tape, or tear out any pages or parts of pages! If you obscure your original entry, you may inadvertently delete something that later turns out to be important. Also if you completely remove/obliterate an entry, it leaves the reader wondering what was originally there. This may affect the validity of your logbook and data as evidence. Ensure that your logbook is protected from loss or tampering. Do not leave your logbook out in the open. Be aware that whereas vessel personnel may be allowed to view your data sheets taken on that vessel, they must not be allowed access to your logbook.

All calculations made must be recorded directly into your logbook. Do not perform the calculations on other paper and copy the entries into your logbook. In the Daily Notes section please include notes on any problems that occurred while fishing, any difficulties you may be having (such as seasickness or other illness), circumstances surrounding your choice of the method used for total catch estimation and sampling methods, comments on any unusual catches, etc. Please record also the circumstances surrounding these possible violations: Observer interference and/or harassment, violations pertaining to prohibited species, violations pertaining to marine mammals, MARPOL violations, and violations of careful release standards on longline vessels. Record the details of seabird sightings in the Seabird section of the logbook.

Species Identification Forms

Species identification forms are an important tool allowing us to verify and document your correct identification of the species you see while deployed. The protocols are:

- Species ID forms are not needed for invertebrates unless the organism is a crab.
- Fish such as sculpins, smelts, eelpouts, etc.. only need to be keyed to the family level.
- You must write Species ID forms for those keyed to the family level or the species level.
- Sharks are to be keyed to species.

Complete and detailed species identification forms are required of all Observers for all fish and crab species new to the Observer. All first time Observers are required to complete a species identification form for the

first sighting during a contract of any fish or crab. Prior Observers need only to complete species identification forms on species for which they have not previously submitted an acceptable form. If a prior Observer demonstrates a problem with species identification, he or she may be required to complete species identification forms for every species seen during a subsequent contract. Species identification forms must be detailed and the species characteristics must be determined with the fish in hand. During debriefing, you may be asked for complete verbal identification of any species you have seen so keep notes in your logbook.

Do not guess on the identification of species. Use the identification keys provided to you. If you are not sure what species you have, or if a specimen is severely damaged, take notes describing the specimen in detail. You may find that you can later positively identify the specimen after you have seen more fish, or you may be able to determine species after consultation with a staff member. Record the specimen on the species composition form as "rockfish unidentified #1" or "flatfish unidentified #2" or "mystery fish #5" as appropriate. If you have a camera, you could take photographs of the specimen for later review with a NMFS staff person.

Species Sub-sampling

In the course of identifying, weighing, and counting the individual specimens in your species composition sample, you may find within your sample several individuals of a species group which are difficult to distinguish from one another. Identifying each fish to species may take unreasonable amounts of time, particularly if a distinguishing characteristic requires a time consuming task such as counting the number of gill rakers present. In these situations, it is appropriate to do a sub-sample for species. This is frequently used when there are large numbers of rock sole, tanner crab, or individuals of the arrowtooth flounder/Kamchatka flounder group. When large numbers of such species groups are found, you may take a random sub-sample. Collect at least 30 individuals from the group and identify them to species. This are listed on a line of entry on the species composition form with the species name. The remaining individuals from the group are weighed, counted and recorded along with the more general code for that species group. For example, say you have 300 fish of the rock sole group within your sample. From sub-sampling you determine that of 50 these fish, 30 are northern rock sole and 20 are southern rock sole. On the species composition form, you list 250 rock sole unidentified, 30 northern rock sole, and 20 southern rock sole.

How to Select Hauls to Sample for Species Composition

In this section, you will learn your options for selecting hauls to be sampled, when to use each option, the two types of random sample table (RST), how to use the RST to select hauls, how to use the break table on catcher processors and motherships, how to fill out your Observer sampling record, what to do if your sampling schedule is too rigorous, and vessel responsibilities relating to haul selection. A list of frequently asked questions (FAQs) is included at the end of the section.

Options for Haul Selection

There are two options for selecting the hauls to sample for species composition on a trawler during your cruise:

1. Sample all of the hauls; or

2. Use the Observer Program's Random Sample Table (RST).

If it is not possible to sample all of the hauls on your vessel, species composition data must be taken from a random selection of hauls. This ensures it will be legally and scientifically defensible. To this end, we have developed a random sample table which trawl Observers are required to use.

When all Hauls should be Sampled

In pollock fisheries, Observers aboard catcher-only trawlers should sample every haul. The Observer Program has determined that catcher vessels in pollock fisheries make relatively few hauls each day, so that sampling all of the hauls is feasible. If you are in a different fishery and/or on a different type of vessel, sampling all hauls is feasible only if the vessel makes three or fewer hauls per day.

When to use the Random Sample Table (RST)

If there is any doubt in your mind that you will be able to sample all of the hauls that your vessel brings aboard during your cruise, you must use the RST to determine which hauls to sample. It will be necessary to use the RST to select hauls in nearly all fisheries except for the catcher vessel pollock fishery described above. You are required to use the RST in Bering Sea yellowfin, rock sole, and other flatfish fisheries. The bottom line is, you will almost always use the RST to select hauls to be sampled.

Vessel Type and Versions of the RST

There are three versions of the random sample table, one for catcher vessels and two for catcher/processors and motherships. Look at the title of the table to be sure you are using the correct one for the vessel you are on. The difference between these tables is the number of hauls skipped. Catcher boat tables always have only one haul skipped; catcher/processor and mothership tables have one or two hauls skipped between sampled hauls. In addition, Observers on catcher/processors (c/p) and motherships (ms) have a break table to use if needed. Instructions for using both tables follow; the random sample tables will be discussed first, followed by the break table and how to integrate both tables on a catcher/processor or mothership. Be sure you have a complete understanding of the random sample and break tables before you are deployed.

How to Use the RST

In the RST, the bold-faced rows of type indicate the number of consecutive hauls you sample. The normal-faced type rows are the number of consecutive hauls you do not sample. During training you will be instructed how to determine your starting point on the table. From that point move vertically down through the table sampling or not sampling the number of hauls as indicated. If you reach the bottom of a column continue at the top of the next column. If you reach the end of the table (Z,Z) continue on at the top of the table (A, A). (The following is an example of a catcher/processor RST, because there are either 1 or 2 hauls off between sampled hauls; the catcher vessel RST is used the same way.)

Start using the random sample table from your first sampled haul. Sample only the hauls designated by the RST.

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

Figure 2-1: Random Sample Table

How to Use the Break Table on C/P and Mothership Vessels

Break tables were designed to give Observers a six-hour break each day if normal vessel operations did not permit adequate break time. They were developed in response to the difficulty Observers were having in keeping up with the many catches landed on motherships and during flatfish fishing. The break table can only be used by Observers on catcher/ processors or motherships.

If the vessel averages less than four hauls per day, you should disregard the break table but still follow the random sample table. Also, if the vessel does not fish for part of a day, or makes one long tow (usually at night), you should consider that your break and disregard the break table.

You can ignore the break table you are issued or just use it occasionally, when needed. If you use it, track each day on the break table, whether the break time is taken or not. For example, if your break schedule is not used for two days, just record the dates on two lines and use the time on the third line for a break on the third day.

The break table is made up of three columns of cells. Each cell consists of a space for the date and gives a break starting-time for each day. As with sampling data, a day is from 0000 to 2359 ALT. Beginning at the top of the table enter the date of the first day you use the Random Sample Table and check to see when you could begin your six-hour break. Work down the first column, filling in the date of each day, whether or not a break is taken, and taking six-hour breaks when needed (only one per day) using the scheduled time for that date. When you finish the first column, start at the top of the second column and so on.

DATE _____ 0400	DATE _____ 0800	DATE _____ 1600
DATE _____ 1300	DATE _____ 0100	DATE _____ 0900
DATE _____ 0400	DATE _____ 0700	DATE _____ 0400
DATE _____ 1800	DATE _____ 1300	DATE _____ 1300
DATE _____ 1500	DATE _____ 1600	DATE _____ 0500

Figure 2-2: Break Table

Although neither the break table nor the random sample table is particularly difficult to follow, when you put the two together things can get a little confusing until you focus on the haul retrieval time. If a break is to be taken and it is to start one minute after the retrieval time of a haul to be sampled, sample the haul. If a break starting time occurs one minute before the haul retrieval time of a haul to be sampled, don't sample, take your break. At the completion of the break period you should re-enter the random sampling table. If you are in the middle of sampling when your break starts, finish that sample first, then begin your six-hour break. Hauls retrieved during an Observer's six hour break continue to be counted against the random sample table.

Break Table Summary:

- Take breaks only on days when you need them.
- If the retrieval time of a sampled haul is before your break time, complete your sample before taking the six hour break.
- Break for six hours.
- Sample the next "on" haul whose retrieval time is after the six hour break.

Trawler Observer Sampling Record

All Observers on trawlers are required to fill out the Trawler Observer Sampling Record in your logbook. In your table list: the haul number of each haul made, whether it was designated as an "on" or "off" haul, and your place in the table (column and row). Also include whether you were on break and whether you did or did not sample it. Finally, when an "on" haul is not sampled, we need to know the reason. In your Vessel Survey (the debriefing report) we ask for comments on your difficulties, if any, with using this sampling scheme.

Haul No.	RST On/Off	Col. Row	Break On/Off	Sampled Y/N	Samp. Time Start	Samp. Time End	Reason for "On" Haul Not Sampled
34	on	H/C		Y	1630	1825	
35	on	H/C		Y	2005	2200	
36	on	H/C		N			Break
37	off		on	N			
38	on	H/D	on	N			Break continued
39	on	H/D		Y	0715	0930	

Figure 2-3: Record of sampling schedule

Sampling schedule too rigorous?

1. If your vessel is a catcher/processor or mothership, use the break table each day or on some days as needed.

2. Reduce the sampling time by reducing the sample size of one or more hauls in the series. Sampling a catch on a c/p vessel should usually take two to three hours. If you were sampling the entire catch for prohibited species, try cutting back to a smaller sample size so that all designated hauls in the series can be sampled. It is more important to have good sample collection technique, smaller samples and stick to the random sample table than to sample the whole catch and sample fewer hauls.

3. It is important that you look ahead at your schedule and plan to make best use of your rest time. For example, if the table dictates that you have a four on, one off, four on schedule, get more rest before this series and plan on getting paperwork, chores, and meals done in between samples so you have as large a block of rest time in between the sets of four sampling hauls as possible. Consider altering your sampling method. Is it practical to whole haul sample a series of four hauls or will you need to basket sample some to complete the set?

4. If you get caught in an unworkable situation you can, if necessary, skip one of the hauls in the series to be sampled but then complete the remainder of the sample series, counting the unsampled haul as part of the block. As in the example of a four on, one off, four on series, if you need to rest for two hauls, you should sample four hauls, rest for two, and sample three hauls to complete the series. If it is necessary to skip sampling hauls on a continuing basis, get in contact with an Observer Program office for advice.

Vessel Responsibility and the RST

The random sample table (RST) was designed to randomize the selection of hauls to be sampled by an Observer. Working a random schedule can be difficult at times due to our natural biorhythms, i.e., you may wish to sleep through the night. However, it is the vessel personnel's responsibility under CFR §679.50(f) to "notify Observers at least 15 minutes before fish are brought on board, ...to allow sampling the catch, ...unless the Observers specifically request not to be notified." If vessel personnel are not notifying you of retrievals it can affect your ability to sample according to instructions. Talk to the vessel personnel to make sure they understand that you must be notified of haul backs. If problems with notification continue, be sure to document this in your logbook and during debriefing.

Frequently Asked Questions on Using the RST:

- I am supposed to sample 4 hauls in a row. The third haul comes up at 1450, and I am scheduled to begin a break at 1500. Do I sample that haul? Yes, sample the third haul in that block and then take your 6-hour break. When you finish your break you will re-enter the random sampling table. To re-enter, check the fishing schedule against the random sample table to see when the next "on" haul will be retrieved.

- A haul is retrieved at 0945 and my break starts at 1000. According to the instructions I should sample this haul, but they don't begin processing until after the fish have set for four hours. Do I sample this haul? Yes. While you are waiting for them to begin processing you can do paperwork, laundry, eat, etc. After you complete your sampling you may begin your 6-hour break if needed or skip the break for that day.

- Can I skip breaks and only take them on a few days when I need to? Yes. On the table though, record the date of each day whether or not a break was taken. Note: you cannot accumulate break time by skipping a day and taking a longer break or more than one break on a following day.

- Can I sample more hauls than those indicated on the random sample table? No, do not sample additional hauls to the ones designated by the RST unless you can sample all the hauls your vessel takes on.

- My break is over and the haul currently being processed is an "on" haul and is about half processed. Can I basket sample from the remaining portion? No, because you were not present to verify that no presorting of the catch occurred. So, you will have more hours off in addition to the six hour break.

- Suppose a break is just over but the next haul retrieved is an "off" haul, resulting in a longer break than I need. Should I stick to the random sample table and not sample? Yes, you must sample only the designated hauls, resulting in a longer break than the six hours scheduled. Tomorrow you may not need to take a break period.

- I was just assigned to a different vessel (or, my vessel just completed a delivery and is resuming fishing). How does this affect the random sample table? If you are assigned to a new vessel or when fishing resumes after a delivery, continue from where you left off in the table. Begin using the table with your next sampled

haul. If you left off in the middle of a sampling block, continue with that block. If you just finished a sampling block, or if you're in the middle of a non-sampling block, go to next sampling block as you begin your next trip.

Introduction to Theory of Random Sampling

The following section explains the basics of sampling theory. Refer to the sections on your vessel type for specific sampling instructions. It is important that you have a good understanding of sampling theory; if you have any questions regarding sampling theory please contact an Observer Program staff person.

Sampling Theory

Observers take samples from a population because time constraints do not allow for the counting and measuring of every individual within the population. By choosing a random selection method to draw a sample from the population, you ensure that every member of the population has an equal probability of occurring in the sample. If every member of the population is equally likely to occur in your sample, then when you repeat the sampling method over time, these repeated samples are representative of the population. If your samples are representative of the population, they can be used to draw conclusions about the population from which they were taken.

Advantages of Random Sampling:

- The use of a random method of sample selection eliminates any subjectivity on the part of the Observer. The advantage of this to you as an Observer is that you cannot be accused of bias against or for the vessel or vessel personnel if you have used a random method to collect your species composition samples or length samples.

- When random sampling methods are used to collect data, the NMFS is justified in using statistical methods for estimating population parameters based upon that data. The precision and accuracy of these estimates can then be determined.

Steps in taking a random sample:

1. First, define the population. The population is the total set of items that we wish to draw inferences about. In the case of species composition sampling, the population is the entire group of animals of all species caught in a given haul. In the case of length frequency sampling, the population is the entire group of all individuals of the species chosen for length frequency sampling which are caught in a given haul.

2. Second, define a sampling frame. The sampling frame is a conceptual framework which divides the population into independent, countable sampling units (defined below). In practice, you have two general categories of sampling frames on a trawler vessel: spatial and temporal. Use a spatial framework, such as measured portions of a deck or bin, when all of the catch is in one place while you are sampling. Use units of time (five minute increments, for example) when all of the catch is not available in one space, but passes you at one point such as on a factory conveyor belt. On a longliner or pot boat, your sampling frame can be composed of units of gear (skates or groups of pots).

3. Third, define your sampling units. The size of your sampling unit should be defined so that you are able to collect all animals within a single unit. Sampling units are the separate portions of the sampling frame; so if your sampling frame breaks the catch on deck into measured areas, then a single measured area is the sampling unit. Likewise, a single five minute increment of run time is the sampling unit for a temporal sampling frame defined for a factory conveyor. On a longliner, a single skate could be a sampling unit. On a pot boat, the sampling units could be a single pot, a group of 5 pots, or a group of any number of pots as long as the number for the unit is consistent throughout the sampling frame.

4. Fourth, number all of the sampling units in your sampling frame. If your units are sections of deck, assign a number to each section. If your units are time increments, number them consecutively. Skates or groups of pots can also be numbered consecutively (you will need to account for the total number of skates or pots in the entire set).

5. Fifth, generate random numbers between 1 and your maximum sample unit number (inclusive) to determine which sampling unit(s) to select for your sample. Use the random number table found on A-14 and A-15.

How to use the random number table:

To use the random number table, you must enter the table at a random point. The easiest way to do this is by closing your eyes and placing your finger on the table. The column and row nearest your finger is the starting point. Then you determine how many digits in the row you are using: if you need numbers between 1 and 250, use three digits in the row. If you need numbers between 1 and 25, use two digits in the row, and so on. Then proceed in one direction along the column, recording appropriate numbers and skipping numbers too high or repeated, until you have enough random numbers.

For example, to choose 3 numbers between 1 and 25, you enter the table by placing your finger on a given column and row. Your criteria is two digit numbers between 01 and 25 (inclusive). You previously decided you would work up the column from your starting point. For this example using the table excerpt below, your finger falls on column 4, row 22. Moving up the column to row 21, the first number encountered is 14. This is a two digit number between 01 and 25; it fits the criteria, so you write it down. The next number is 09; it also fits the criteria, write it down. The next number is 58 and does not fit the criteria so skip this number. Keep moving up the column, skipping the numbers that do not fit the criteria. In this example, in row 15 is the number 08; this fits the criteria so write it down. You now have three randomly chosen numbers (14, 09, 08) between 01 and 25.

You can go in any direction in the table, even diagonally, as long as you decide the direction before you enter the table. If you get to the end of one column or row, continue in the opposite direction in the next column or row. Your path in the random number table will zig-zag across or up and down the table. Unlike the Random Sample Table (RST) that we have designed to select hauls to be sampled, you do not have to keep track of your position in a random number table. You should decide on a direction and enter the table at a different random starting point every time you use it.

Finally, select the sampling units corresponding to the random numbers. This is your sample. If your sampling units are deck sections, collect all of the animals from each randomly selected deck section. If your units are sections of gear, collect all animals from randomly selected pieces of gear. If your units are time increments, collect all of the fish from the time increment.

TRAWLER CATCH DATA

List of Priorities

- Record fishing effort information from vessel's official NMFS logbook.
- Obtain independent estimates of catch for at least every haul sampled for composition.

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Introduction

This section applies to trawl vessels and to motherships taking unsorted codend deliveries. If you are assigned to a shoreside processing plant or a floating processing plant (a vessel that pumps or brailles sorted catch from the hold of shoreside delivery vessels) you will need to refer to "SHORESIDE PLANTS AND FLOATING PROCESSORS," page 8-1 for record keeping information. *Observers aboard longline and pot vessels,* refer to "LONGLINER DATA COLLECTION," page 6-1 and "POT VESSEL DATA COLLECTION," page 7-1.

This section covers the collection of fishing effort information for trawl vessels. It will also include how to obtain independent estimates of total catch and how to determine the official total catch (OTC). At the end of this section, instructions are given on how to record fishing effort data and total catch estimates onto the 2US - Haul Form for Trawl Vessels.

Terminology

The following terms will be used throughout this chapter to describe the duties on trawl vessels. You will need to fully understand these terms in order to develop a knowledge of work on a trawl vessel.

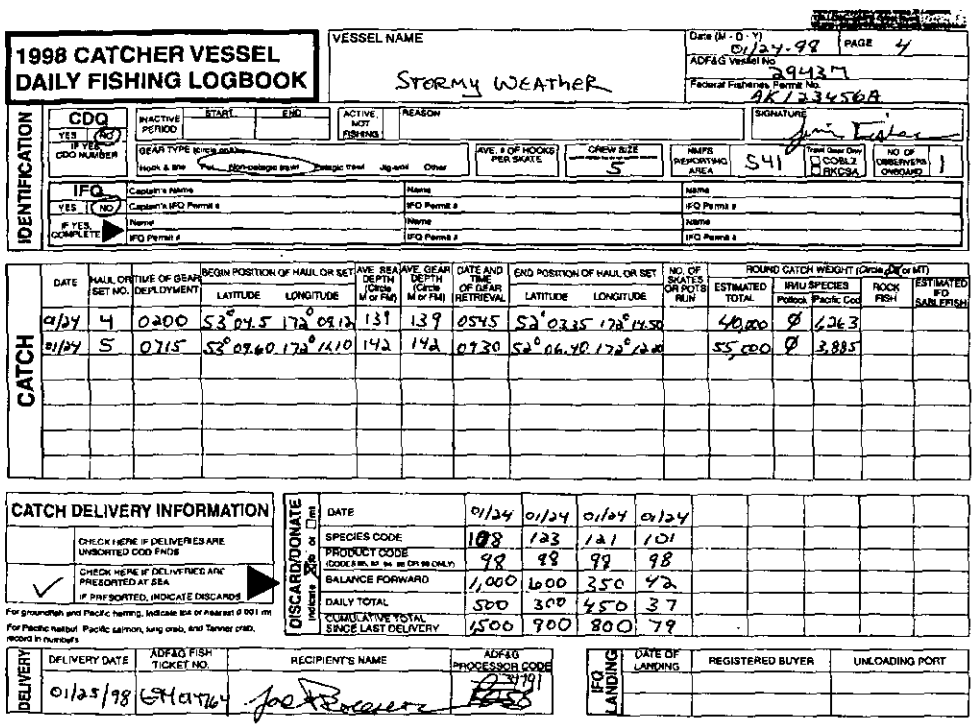
Brailer - a type of netting that is attached to a crane and used to transport fish and other materials from one vessel to the dock or to another vessel.
Codend - the end of a trawl net where the catch is concentrated during haul back.
Haulback - when the vessel lifts the net out of the fishing depth.
Gantry - a frame structure, usually at the aft of a vessel, which supports pulleys (blocks) used in setting and retrieving trawl nets.
Gilson - a lifting cable that is attached to a codend at the end of haulback to pull it on board.
Live Tanks - tanks on factory trawler vessels where the catch is dumped prior to sorting or processing.
Main Wires - the two large cables used to connect the vessel to the trawl net while fishing.
RSW Tanks - holding tanks or bins that use refrigerated sea water to keep fish fresh until delivery.
Trawl Alley - the central passage on a trawl vessel where the codend is placed after haulback.
Trawl Doors or "doors" - two metal plates designed to keep the mouth of the net open while fishing.
Trip - the period time from when the vessel leaves harbor until it returns to harbor to offload product or catch.
Winch - a powerful machine with one or more drums on which to coil rope, chain, or cable for hauling or hoisting.

Fishing Effort Data Collection

Vessel Logbooks

Under regulation 50CFR679.50 (see "(vii) Records." on page 19-19), Observers have the right to inspect and copy the NMFS logbook and all other documentation of fishing effort. You will be required to transfer the following information from the vessel logbook to the 2US- Haul Form for Trawl Vessels (see "Form 2US - Haul Form for U.S. Trawlers Instructions" on page 3-19)

- date and time of gear retrieval
- latitude and longitude of gear retrieval
- type of trawl gear used
- sea depth and gear depth
- the catch weight estimated total
- Community Development Quota (CDQ) number, if applicable
- Individual Fishing Quota (IFQ), if applicable
- delivery number (catcher vessels during CDQ only)



1998 CATCHER VESSEL DAILY FISHING LOGBOOK

VESSEL NAME: STORMY WEATHER

Date (M - D - Y): 01/24-98 PAGE 4

ADF&G Vessel No: 29437

Federal Fisheries Permit No: AK123456A

IDENTIFICATION

CDQ: YES / NO — IF YES, CDQ NUMBER

INACTIVE PERIOD: START / END

ACTIVE, NOT FISHING — REASON

SIGNATURE

GEAR TYPE (circle one): Hook & line / Pot / Non-pelagic trawl / Pelagic trawl / Jig-and / Other

AVE. # OF HOOKS PER SKATE

CREW SIZE: 5

NMFS REPORTING AREA: 541

Trawl Gear Only: COBLZ / RKCSA

NO. OF OBSERVERS ONBOARD: 1

IFQ: YES / NO — IF YES, COMPLETE

Captain's Name / Captain's IFQ Permit # / Name / IFQ Permit # / Name / IFQ Permit # / Name / IFQ Permit # / Name / IFQ Permit #

CATCH

DATE	HAUL OR SET NO.	TIME OF GEAR DEPLOYMENT	BEGIN POSITION OF HAUL OR SET: LATITUDE	LONGITUDE	AVE. SEA DEPTH (Circle M or FM)	AVE. GEAR DEPTH (Circle M or FM)	DATE AND TIME OF GEAR RETRIEVAL	END POSITION OF HAUL OR SET: LATITUDE	LONGITUDE	NO. OF SKATES OR POTS RUN	ROUND CATCH WEIGHT (Circle ☒ or MT): ESTIMATED TOTAL	IR/U SPECIES: Pollock	Pacific Cod	ROCK FISH	ESTIMATED IFQ SABLEFISH
01/24	4	0200	53°04.5	172°09.12	139	139	0545	52°03.35	172°14.50		40,000	Ø	6,263		
01/24	5	0715	53°09.60	172°16.10	142	142	0930	52°06.40	172°12.20		55,000	Ø	3,885		

CATCH DELIVERY INFORMATION

CHECK HERE IF DELIVERIES ARE UNSORTED COD ENDS

✓ CHECK HERE IF DELIVERIES ARE PRESORTED AT SEA — IF PRESORTED, INDICATE DISCARDS

For groundfish and Pacific herring, indicate tick or nearest 0.001 mt

For Pacific halibut, Pacific salmon, king crab, and Tanner crab, record in numbers

DISCARD/DONATE (Indicate ☒ or ☐ mt)

DATE	01/24	01/24	01/24	01/24
SPECIES CODE	108	123	121	101
PRODUCT CODE (CODES 90, 92, 94, 96 OR 98 ONLY)	98	98	98	98
BALANCE FORWARD	1,000	600	350	42
DAILY TOTAL	500	300	450	37
CUMULATIVE TOTAL SINCE LAST DELIVERY	1,500	900	800	79

DELIVERY

DELIVERY DATE	ADF&G FISH TICKET NO.	RECIPIENT'S NAME	ADF&G PROCESSOR CODE
01/25/98	[illegible]	[illegible]	[illegible]

IFQ LANDING

DATE OF LANDING	REGISTERED BUYER	UNLOADING PORT

Figure 3-1: Vessel logbook

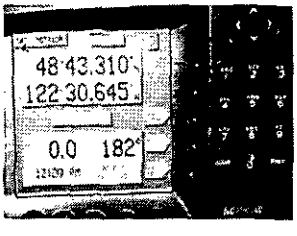
In addition you need to record the haul tow speed and if there were any problems with the trawl gear during the tow. This information is not recorded in the vessel logbook. Ask the captain to enter tow speed and any gear malfunction notes somewhere on the logbook page or on a separate page for you.

Verifying Logbook Information

Before copying anything from the ship logbook to your data forms, you must verify that the data reported are accurate. Misunderstandings are possible about how the log is filled out. Verify the following logbook entries:

Date and time of gear retrieval
When possible, note as the net is being lowered to the fishing depth the time the winches stop and the ship increases speed. Also note the time when the tow is finished. This may be determined by listening for when the winches begin to haul back the net. The fishing start time that should be in the ship's log and on your data form is the time when the winches stopped paying out cable and the ship increases speed (fishing begins). The time when the winches start to retrieve the net should be recorded as the "stop fishing time" in the logbook. Your vessel's logbook may have erroneous times listed. Let the officer in charge of the logbook know about the error. If the incorrect data continues to be logged, consult NMFS for advice on how to record your haul data.

Start and stop times that do not reflect true fishing duration
The codend may be retrieved from the fishing depth, but not landed, and then reset to the fishing depth. This is termed a "fishing duration affected" tow. The captain may do this during turns or to check the net. List all "fishing duration affected" tows on the 2US with a code 9 in the gear performance column. Ask the captain to note when the true fishing duration is not the difference between the start and stop times listed in his logbook.



Latitude and longitude of gear retrieval
The captain or a mate reads the gear retrieval positions from the GPS or LORAN navigation systems located in the bridge. The locations listed in the logbook should be the ship's position when the fishing net started to be retrieved. Question any large changes in position between one haul and the next. There could be a mis-entry or the ship may actually have moved that far. Occasionally check that the latitude and longitude listed in the logbook match that on the LORAN or GPS position finder during haul retrieval times.

The catch weight estimate
Ask the person recording the catch weights how he makes his estimates. Record his response in your Observer logbook, you must justify why you used, or didn't use, any particular method for determining a total catch weight.

Observer Estimates of Total Catch Weight

Occasionally, large items like a crab pot, or a boulder are caught. This weight should be included either in both the OTC and the composition data, or in neither place (see page 4-26).

For as many hauls as possible, make independent, substantiated and unbiased estimates of catch weight. This duty is of the highest priority, so it is important to make time to obtain independent estimates. There are three methods for determining total catch weight: weighing everything using Observer scales, bin volume, and codend volume measurements. For volumetric measurements the total catch weight can be estimated by multiplying the volume by a density. The density is estimated from a subsample of the catch or is prescribed for a given fishery. You may use any or all of these methods on a given vessel.

Weighed Observer Estimates

Weighed independent estimates can only be obtained using the Observer scales. Observer scales are any of the scales provided by NMFS or a certified, motion-compensated flatbed scale. This does not include flow scales, even if they are certified. The weighed method should only be employed if the haul weight is less than 500 kilograms or if you are using it in combination with a volumetric estimate for a small portion of the catch. A weighed Observer estimate is indicated by a W in the B, C, or W column on the 2US Form. If you use this method in combination with a volumetric method indicate the method used for the majority of the catch.

Volumetric Observer Estimates

If the ship is a catcher processor the catch will be held in the codend for a few moments then dumped into a live tank. If the ship is a catcher vessel, the codend will be emptied directly on the trawl deck for sorting, into side checker bins for sorting, or below decks into refrigerated seawater tanks (RSW).

Look at all of the areas where fish will be held before processing and delivery. Determine which "container" is the most accurate and safe to measure. Total catch volume, multiplied by a density factor, will yield total catch weight, termed the Observer Estimate on the 2US form (see "Testing for Density" on page 3-12).

Considerations for making volumetric estimates of the total catch are as follows:

- You must make or verify each component of the estimate. Do not make any total weight estimates by visually assessing the weight of the catch. All dimensions, calculations, and methods must be noted in your logbook to verify and substantiate the estimate.
- Catcher Processors/Motherships: Make volume estimates of live tanks, bins, or codends.
- Catcher vessels: Make volume estimates of checker bins, trawl alleys, codends, or codend sections, adding the sections together for a total volume.
- The following formula is always used to determine catch weight from the volume and density:

$$\text{volume } (m^3) \times \text{density } (mt/m^3) = \text{ catch weight (mt)}$$

- Record your total catch estimates on the 2US Form whether or not you are confident with the accuracy of the estimate.
- If you find that none of the options will provide an accurate catch weight, you need to contact NMFS staff for assistance.

Observer Estimates by Bin Volumes

The steps in making a volumetric estimate of live tanks, trawl alleys, or checker bins are as follows:

1. **Measure the empty bin.**
   Many fish bins or tanks are irregularly shaped and require more than one measurement. Visually break up the floor area of the bin or tank into sections that can be easily measured. Figure 3-2 shows how one fish bin was broken into easily measured shapes and a floor area was obtained.

2. **Determine the appropriate volumetric formulas.**
Consult "Volume and Product Formulas" on page A-13 for the volumetric formula for the identified shape(s). Each mathematic formula will identify what dimensions are required to measure (length, width, and height, short radius, diameter, etc.). Select the appropriate formula for each section of the bin. Measure the dimensions indicated by the selected formula. The summation of the areas of all the sections will provide you with the total area of the bin.

3. **Measure the height of the catch in the bin.**
The height of the fish in the bin provides the final dimension needed to obtain the volume of the catch. There may be permanent marks in the bin that will provide you with a depth measurement of catch in the bin; verify these measurements. If the bin is unmarked, ask permission to mark the bin with a height gauge. Paint, or other permanent writing material may be available from a vessel representative. Be aware that the marks frequently erode and will need to be replaced regularly. The bin or tank should be marked on all four sides. The markings should be visible from a viewing port or from the processing deck. The height gauge should be in increments of 10 cm for legibility. On some vessels, the height of the catch can be measured by placing a calibrated stick into the bin or trawl alley to measure the depth of fish at several points.

4. **Log and calculate bin volume and catch weight**
Record the measurements on your plastic deck form and then copy them to your logbook. Make sure that all of your measurements are as precise as possible and record the details of your methods in your logbook.

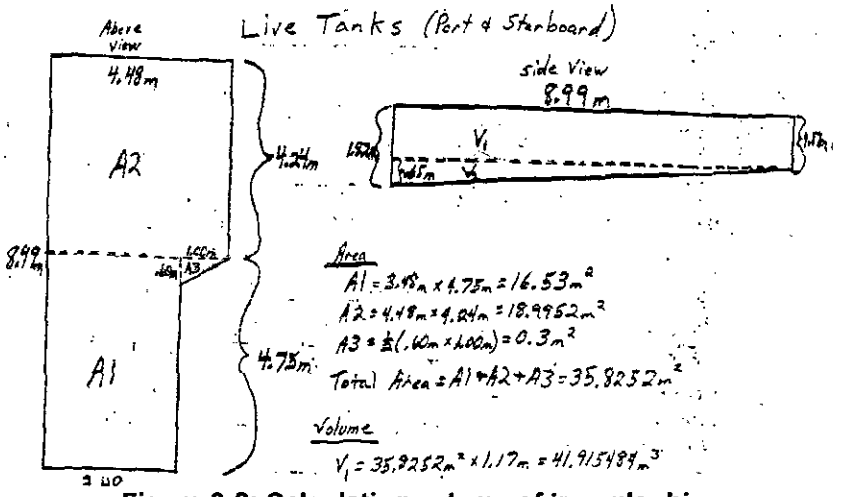
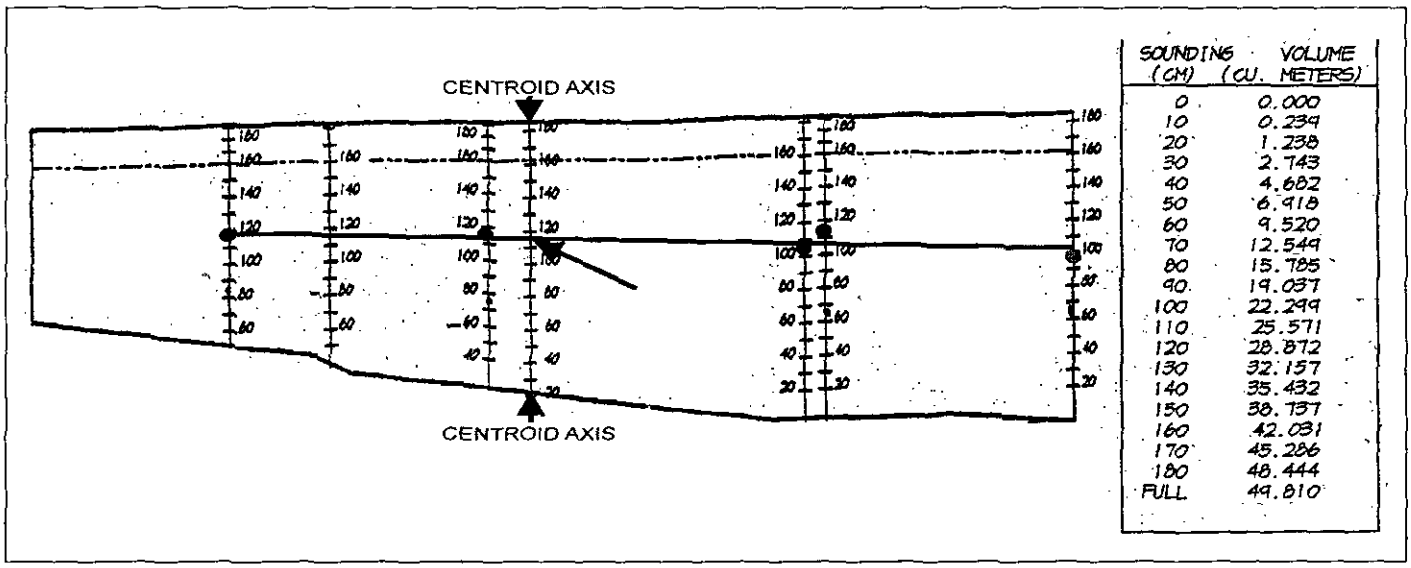


Figure 3-2: Calculating volume of irregular bin

Bins with Nomograms

Some live tanks have been measured, marked, and certified by contracted engineers, and must meet specific criteria. The vessel and NMFS maintain a copy of a bin diagram and nomogram. The nomogram is a diagram of the live tank showing where and how the bin was marked (see Figure 3-3). The numbered increments posted in the tank may not represent centimeters or bin volumes, nor any other unit you could actually measure. The calibrated marks are devised by the engineer to segment the tank into units. Following is the method for obtaining volumes of fish for certified bins or tanks.



SOUNDING (CM)	VOLUME (CU. METERS)
0	0.000
10	0.234
20	1.238
30	2.743
40	4.682
50	6.918
60	9.520
70	12.549
80	15.785
90	19.037
100	22.299
110	25.571
120	28.872
130	32.157
140	35.432
150	38.737
160	42.031
170	45.286
180	48.444
FULL	49.810

Figure 3-3: Bin nomogram

1. Find all of the marks visible from your viewing window.
2. Judge the average fish height near each of the walls where visible marks are installed/painted (the median between the highest and lowest height of fish in each bin quadrant near a visible mark) and compare it to the numbered increments on the wall.
3. Record each number you have read from the walls and consult the nomogram.
4. On the nomogram, plot the recorded heights on each respective vertical line on the nomogram. Do not record anything on the centroid axis.
5. Lay a ruler across the plotted points and draw a straight line that fits best among all the points. Where the ruler crosses the centroid axis is the engineer's calculated average of the marks he made in the tank.
6. Using the ullage table on the diagram, read the volume in cm^3 that corresponds to the number from the centroid axis.

Your line crosses the centroid axis at 118 (see Figure 3-3) Since 118 is not listed on the ullage chart, you must interpolate the volume of 118. Remember, 118 could be an actual unit, such as centimeters, but could also be a generic unit created by the engineer who designed the nomogram.

1. Find the height on the ullage chart just below and above your reading.	In this example, your reading is 118 and the nomogram has a ullage for 110 and 120.
2. Find the difference between the two ullage readings, and the two corresponding volumes.	$120 - 110 = 10$ $28.872\ m^3 - 25.571 m^3 = 3.301 m^3$
3. Divide the difference in volume by the difference in height; this will give you the volume per increment.	$3.301 \div 10 = .3301$
4. Mulitply the volume per increment by the number of increments (which is the difference between your reading and the height just below your reading). Add the resulting volume to the corresponding volume for the height just below your reading. The resulting value is the volume of your reading in cubic meters.	$.3301 \times 8 = 2.6408\ m^3$ $2.6408\ m^3 + 25.571\ m^3 = 28.2118\ m^3$

Potential Bin Volume Biases

Be aware of the following factors that may affect the accuracy of your bin volumetric estimates:

- 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 to measure because of many irregular shapes; or
- the fish level may be too shallow to obtain an accurate reading.

Codend volumes would be a better alternative for catch estimates if bin volumes are not accessible. Document all methods employed, and difficulties encountered, in your logbook.

Codend Volumes

When measuring a codend always remember that safety is your number one priority. Nets tend to slide and roll. Ask crew members for assistance. Any help from the crew will make the task easier and safer. Follow the steps listed below to take an accurate codend measurement.

1. **Determine the appropriate geometric shape(s)**
   Decide on the appropriate volumetric formula(s) you will use to approximate this shape. Using the formula determine which dimensions you will need to measure in order to obtain a volume. Refer to (see "Volume and Product Formulas" on page A-13) for the formulas required to calculate the various volumetric shapes.

2. **Measure the codend**
   Measure the various dimensions of the codend. Take height and width measurements from several segments to obtain the average height and width for the net. You may want to acquire a long stick, or similar item, and measure it to use as a height gauge. When sighting across the net for a height, your eyes should be level with the top of the net. If the net is large, is moving around dangerously, or is brought aboard in segments, you will need to use premeasured areas of the deck to obtain codend measurements.

   Premeasure the deck
   Measure structures on the deck that you can utilize as a gauge for estimating dimensions of the codend. Make easily observable marks on deck structures in increments of 1/10 to 1/4 meters. Verify the measurements of any marks left by previous Observers before use.

   When measuring a codend the net is often greater or less than a premeasured distance. In these circumstances actual measurements from the premeasured marks are preferable over estimated distances. Use the one or more of the following methods to obtain codend estimates:

- Measure the length of the trawl alley and paint calibrated marks along its length to determine the full codend length.

- Measure the width of the entire trawl alley. When the codend is lying in the alley measure the distance between the codend and the trawl alley walls. This may be accomplished by using the tape measure, or by premeasuring your clipboard, a stick, or ribs or planks in the deck. Subtract the measurement from the total trawl alley width to determine the codend width.

- Use pemeasured marks on the ladders, the posts, the gantry, or other hardware on the trawl deck to gauge the height of the net.

- Gauge the codend height based on your height or height of body parts extended, such as your arm, to meet the height of the codend.

Measuring large codends

It is common that a full codend is larger than the trawl deck and must be emptied in several sections at a time. To determine the codend volume in this situation, measure the codend in sections as it is brought onboard. Use the reinforcing cables or "expansion straps" around the circumference to divide the codend into sections. Determine a volume for each segment of the net measured and add them together for a total volume of the codend. Do not use band counts applied to a predetermined or constant volume for your independent Observer estimate. Depending on the amount of the catch in the codend, the size of the codend in between the expansion straps will vary.

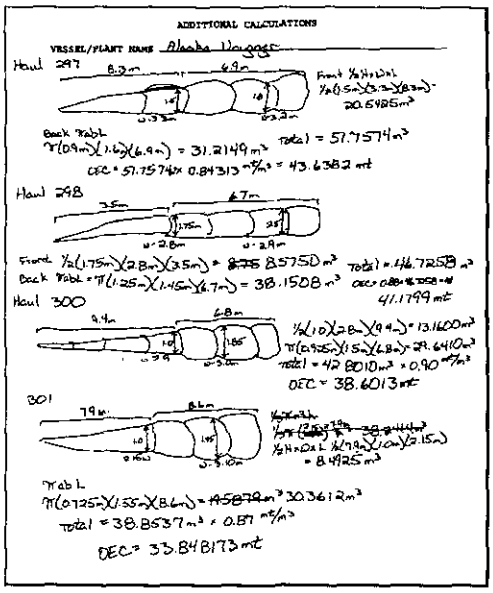


Figure 3-4: Codend calculations

3. Record dimensions, calculations, volumetric formula.

Record in your logbook the methods, dimensions, and calculations used in obtaining your volumetric estimate. Enter the calculated volume in cubic meters. Also document the calculations used to obtain the metric tonnage of the catches, include density calculations if appropriate.

Obtaining Densities for Total Catch

Density Estimation

Density is weight per unit of volume. It is expressed in metric tons per cubic meter. The density is multiplied by a codend or bin volume to obtain a catch weight estimate.

$$volume\ (m^3) \times density\ (mt/m^3) = \text{catch weight (mt)}$$

Densities are either prescribed for a given target fishery or estimated from a sample of the haul.

Prescribed densities:

- If the catch consists of 50% or more pollock, **apply a density of .98 mt/m³ when using bin volume or a density of 1.02 mt/m³ when using codend volume**.

Estimated densities:

- take a random sample of unsorted catch.
- settle or arrange fish to minimize interstitial spaces.
- fill your container consistently to the same level.
- take density samples **at least once per day**, more if there are significant changes in species composition.

Testing for Density

You must measure both the volume and weight of a sample of catch to estimate density.

Choose a container that has a regular shape and will hold 500 kg or less. An oil drum or plastic garbage can will hold about 300 kg and is considered an excellent density container. A plastic tote, filled part way, is also excellent for calculating density estimates. As a last resort, use four or more blue Observer baskets for the density sample. Refer to Figure 3-5 when using the Observer Program's standard blue basket to obtain density estimates.

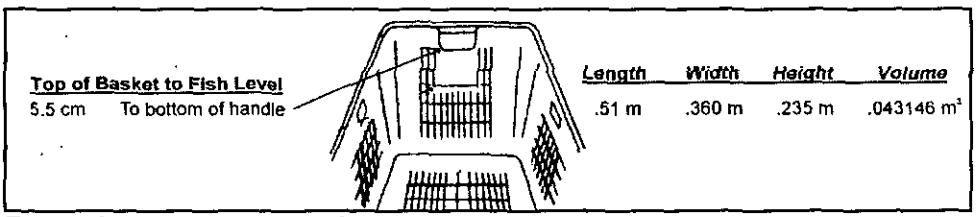


Figure 3-5: Blue basket volume

1. Determine the volume of your container by measuring it using the same methods you would use to measure the volume of fish in a bin.

2. Mark a standard fill level on the container so that you can consistently use the same fill level. Be careful to fill the container(s) to the same level consistently

3. Fill the container with a randomly selected unsorted catch. In many instances it will be easiest to use your species composition sample.

4. Arrange or "settle" the fish so that the interstitial space is minimal. This approximates the way the catch packs itself in the live tank or codend.

5. Weigh everything in your density sample.

density (mt/m^3) = weight of your sample (mt) ÷ volume of your sample (m^3)

Official Total Catch (OTC) Weight

The Official Total Catch (OTC) is the best estimate in your judgment of total catch weight for each haul. Total catch weight is the weight of all species caught whether utilized or not. There are four options for OTC's in order of preference: flow scale weight, proportioned plant delivery weight, Observer estimates of catch weight, and vessel operator's hail weight. If you find that none of the options will provide an accurate catch weight, or you have concerns about the accuracy of an OTC method you are using, contact NMFS staff for assistance. As you gain experience, the method used to obtain the best estimate of total catch may change; record methods and calculations in your logbook.

Options for Official Total Catch on Catcher/Processors and Motherships

Option 1: Some vessels have a motion compensated flow scale which records the weight of catch as it runs over the scale. Use a flow scale for OTC only if it has been tested for that day, has passed the test, and the test was witnessed by a certified Observer. For instructions on flow scale testing, see "Appendix W. Use of Flow Scales" on page A-50. Record the results from the flow scale tests you witnessed in the Observer logbook. Continue to collect independent estimates of catch weight for each haul using volumetric methods. Flow scales have failed accuracy tests or otherwise malfunctioned in the middle of processing a haul.

Option 2: Record the Observer estimate of catch as the OTC. Your estimates must be made by measuring the volume of the catch from the live tank, bins, or codend, or by weighing the total catch using the Observer scales. The Observer estimate of volume is multiplied by a density to obtain an independent estimate of catch weight. If the independent catch estimates are being used as the Official Total Catch, estimate as many of the catch weights as possible.

Option 3: When neither a tested flow scale weight nor an independent Observer estimate of total catch are available record the vessel operator's estimated catch weight as the OTC.

Options for Official Total Catch on Catcher-only Trawlers

Option 1: Obtain the total catch weights for each haul by proportioning the total delivery weight of the catch. Use this method in the pollock fishery when there is little or no sorting of catch at sea. In this fishery the majority of the catch is dumped directly into RSW tanks, or holding tanks. The entire catch for a delivery is weighed on plant scales verified by the state of Alaska. To obtain an OTC for each haul, proportion the delivery weight based on catch estimates made at sea, then add the weight of any catch discarded at sea to each proportioned haul weight.

Several vessels in the pollock fishery sort extensively while at sea. Weighing or accounting for discards is impossible due to the large amount of incidental species removed from the catch. If this is the case on your vessel use the Observer estimate of catch weight for OTC. If it is impossible to obtain Observer estimates of OTC on your vessel, contact NMFS staff.

To obtain OTC by proportioning delivery weight you must:

1. Obtain the total delivery weight for each fishing trip. Work with plant Observers and plant personnel to determine the best source for an accurate weight. You are responsible for your data and must know how all delivery weights were obtained. Delivery weight data can be obtained from the electronic scale readout, scale weights recorded by a factory representative, the Alaska Department of Fish and Game (ADF&G) fish ticket, or the plant's NMFS logbook. See "Proper Use of Fish Ticket Weights" on page 8-7 for information on using the ADF&G fish ticket and potential errors.

2. Proportion the plant delivery weight to the individual hauls. Use the vessel's deck estimate of catch weight, your independent Observer estimate, or your estimate by band count of relative percentage of haul size. Whichever estimate you choose, maintain

consistency by using only one source of a catch estimate for proportioning a delivery.

- Subtract any at-sea discards included in the at-sea estimates of haul weight from these estimates.
- Total the at-sea estimates minus discards to obtain a total estimated delivery weight.
- Divide each estimated haul weight by the total estimated delivery weight to obtain an estimated haul weight to total estimated delivery weight ratio for each haul.
- Multiply this ratio by the total delivery weight to determine a delivered weight for each haul:

$$\frac{\text{weight estimate of delivered catch}}{\Sigma\text{weight estimates of delivered catch for trip}} \times \text{delivery weight} = \text{proportioned delivery weight of haul}$$

Log all calculations in your logbook.

Estimate discards at sea if vessel personnel sort out and discard a few undesirable fish or portions of the catch are dumped from the deck. Account for catch discarded at sea in one of the following ways:

- If the amount of discard is minimal, weigh all discarded catch. This method is only be possible if the crew helps by setting aside the portion of catch they are sorting.

- If all of the discard is put into a checkerbin or small tote, and accumulates to a measurable depth, determine the volume of the discard. Multiply this volume by a density estimate to calculate the weight of discard.

- If one or two undesirable species are prevalent, tally those species and apply an average weight to the total number counted for a total weight discarded. Do not rely on crew members to count fish they are throwing overboard. To determine the average weight of the discarded species, take a random sample of 50 or more individuals. Any other discard would need to be weighed and added in for a total discard weight.

If you are using the Skipper's estimates of catch weight to proportion delivery weight, do not stop making independent Observer estimates. Although *you are not using your estimates* of catch weight for an OTC, this is an opportunity to check and refine your methods of obtaining codend estimates. Compare your Observer estimates to the proportioned delivery weight. If your Observer estimates are comparable to the delivery weight, *you can be confident that* your estimates are accurate.

- If large amounts of catch are dumped back in the water, estimate the tonnage discarded by obtaining a codend estimate or by using the estimate determined by the vessel operator. A visual estimate is the final option. If a large amount of catch is dumped at sea and remains as part of the *at-sea estimate used for proportioning the* delivery weight, subtract the estimate of discard weight before proportioning the delivery weight.

3. Calculate the total catch weight (OTC) by adding in the at-sea discard weight to the appropriate proportioned delivery weight for each haul. Delivery weight is only the weight of fish delivered not the total weight caught, you must add in the weight of any discards at sea

proportioned delivery weight + discard at sea= OTC

Option 2: Use Observer estimates of catch weight for OTC when there is extensive sorting of the catch at sea. The use of delivery weights for OTCs is not possible because plant delivery weights do not account for this discard. Most fisheries, other than pollock, have a diverse composition of catch. In these fisheries the crew sort and discard all non-profitable catch at sea. It is unlikely that you will have access to this discard or have the ability to weigh it.

Option 3: In a non-pollock fishery, when you can measure or weigh catch use your independent Observer Estimate for the OTC. *When you can not* obtain an independent estimate of catch weight use the vessel representative's estimated catch weight for OTC.

OTC's

Delivery #: 3	Hauls inclusive: 7-9

TOTAL DELIVERY WT.:

Total fish delivered (lbs.)	Conversion factor to kg.	Total fish delivered (kgs.)
271203	x .4536 kgs/lb.	123017.6808

OTC CALCULATIONS:

Haul #	proportioning mechanism (haul wt/∑haul wts)	multiply by; delivery wt. (kgs)	then add; At sea discards (kgs)	equals; OTC (kgs)
7	43.0 MT / 118.0 MT	123017.6808	0	44963.477
8	45.0 MT / 118.0 MT	123017.6808	0	46913.522
9	32.0 - 2.0 discard / 118.0 MT	123017.6808	2000.0	33275.682

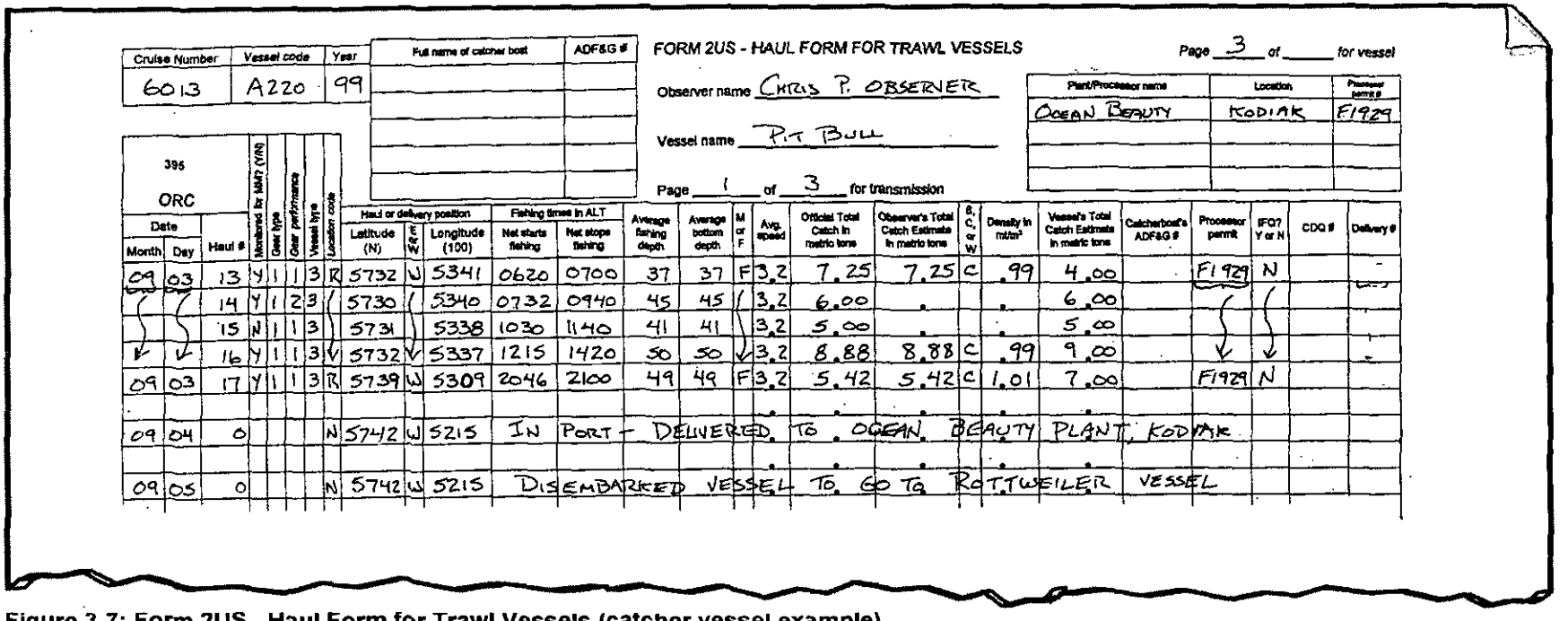
Figure 3-6: OTC calculations

Recording Haul Data

Observer Logbooks

Record all calculations, methods, and justifications for determining the independent Observer estimate and determining the OTC in your logbook. You may be on more than one vessel during your deployment. Keep accurate records on the processes and methods you employed during your deployment. You are responsible for your work and must be able to recall all methods and techniques employed in the collection of your data.

In addition to entering the data and calculations in the Observer logbook, you must fill out a summary of fishing effort and total catch on a 2US haul form. If you are on a vessel with the Atlas AtSea program you must fill out a paper 2US Form and enter the data into the computer. Obtain the fishing effort information required for this form from the official NMFS Fishing Logbook. Check carefully to see that the data are reasonable and that no errors are made in copying the data to the forms.



FORM 2US - HAUL FORM FOR TRAWL VESSELS

Page 3 of _____ for vessel

Cruise Number	Vessel code	Year
6013	A220	99

Full name of catcher boat	ADF&G #

Observer name CHRIS P. OBSERVER

Vessel name PIT BULL

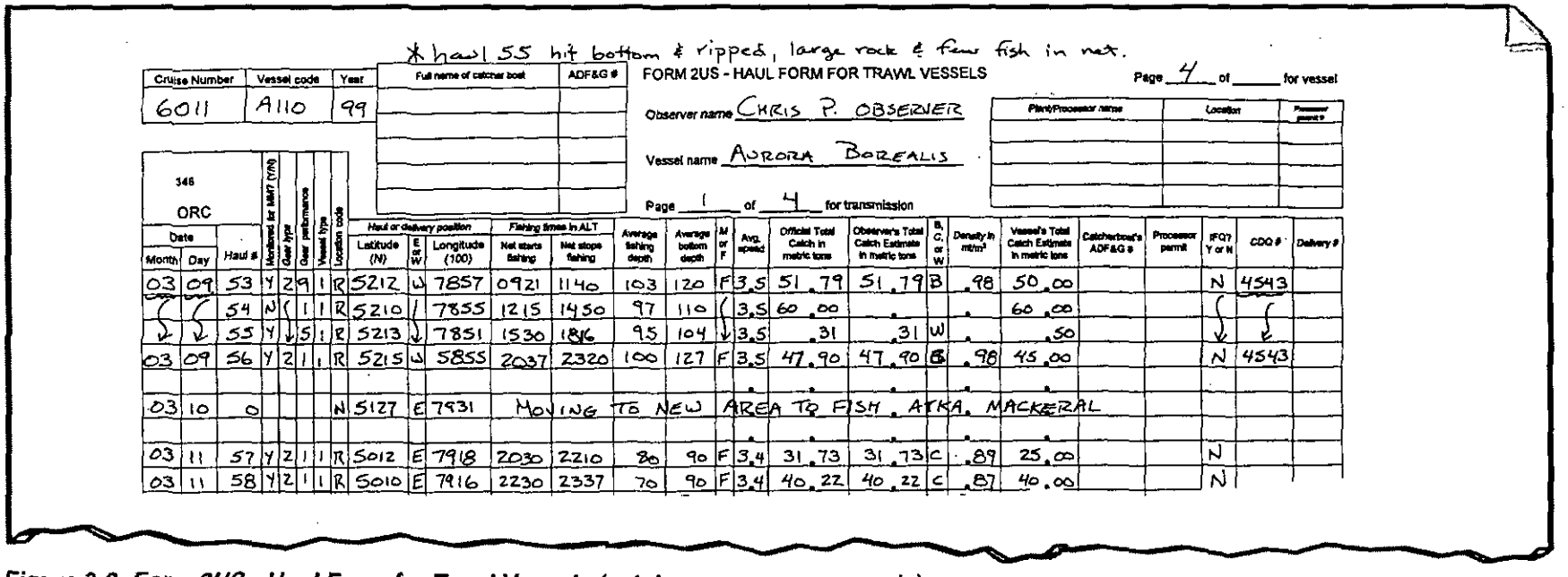
Page 1 of 3 for transmission

Plant/Processor name	Location	Processor permit #
OCEAN BEAUTY	KODIAK	F1929

395 ORC

Date Month	Date Day	Haul #	Monitored for MMR (Y/N)	Gear type	Gear performance	Vessel type	Location code	Haul or delivery position Latitude (N)	E or W	Longitude (100)	Fishing times in ALT Net starts fishing	Net stops fishing	Average fishing depth	Average bottom depth	M or F	Avg. speed	Official Total Catch in metric tons	Observer's Total Catch Estimate in metric tons	B, C, or W	Density in mt/m³	Vessel's Total Catch Estimate in metric tons	Catcherboat's ADF&G #	Processor permit	IFQ? Y or N	CDQ #	Delivery #
09	03	13	Y	1	1	3	R	5732	W	5341	0620	0700	37	37	F	3.2	7.25	7.25	C	.99	4.00		F1929	N		
〃	〃	14	Y	1	2	3	〃	5730	〃	5340	0732	0940	45	45	〃	3.2	6.00	.	.	.	6.00		〃	〃		
〃	〃	15	N	1	1	3	〃	5731	〃	5338	1030	1140	41	41	〃	3.2	5.00	.	.	.	5.00		〃	〃		
〃	〃	16	Y	1	1	3	V	5732	〃	5337	1215	1420	50	50	〃	3.2	8.88	8.88	C	.99	9.00		〃	〃		
09	03	17	Y	1	1	3	R	5739	W	5309	2046	2100	49	49	F	3.2	5.42	5.42	C	1.01	7.00		F1929	N		
09	04	0					N	5742	W	5215	IN PORT - DELIVERED TO OCEAN BEAUTY PLANT, KODIAK															
09	05	0					N	5742	W	5215	DISEMBARKED VESSEL TO GO TO ROTTWEILER VESSEL															

Figure 3-7: Form 2US - Haul Form for Trawl Vessels (catcher vessel example)



* haul 55 hit bottom & ripped, large rock & few fish in net.

FORM 2US - HAUL FORM FOR TRAWL VESSELS

Page 4 of _____ for vessel

Cruise Number	Vessel code	Year
6011	A110	99

Full name of catcher boat	ADF&G #

Observer name CHRIS P. OBSERVER

Vessel name AURORA BOREALIS

Page 1 of 4 for transmission

Plant/Processor name	Location	Processor permit #

345 ORC

Date Month	Date Day	Haul #	Monitored for MMR (Y/N)	Gear type	Gear performance	Vessel type	Location code	Haul or delivery position Latitude (N)	E or W	Longitude (100)	Fishing times in ALT Net starts fishing	Net stops fishing	Average fishing depth	Average bottom depth	M or F	Avg. speed	Official Total Catch in metric tons	Observer's Total Catch Estimate in metric tons	B, C, or W	Density in mt/m³	Vessel's Total Catch Estimate in metric tons	Catcherboat's ADF&G #	Processor permit	IFQ? Y or N	CDQ #	Delivery #
03	09	53	Y	2	9	1	R	5212	W	7857	0921	1140	103	120	F	3.5	51.79	51.79	B	.98	50.00			N	4543	
〃	〃	54	N	〃	1	1	R	5210	〃	7855	1215	1450	97	110	〃	3.5	60.00	.	.	.	60.00			〃	〃	
〃	〃	55	Y	〃	5	1	R	5213	〃	7851	1530	1816	95	104	〃	3.5	.31	.31	W	.	.50			〃	〃	
03	09	56	Y	2	1	1	R	5215	W	5855	2037	2320	100	127	F	3.5	47.90	47.90	B	.98	45.00			N	4543	
03	10	0					N	5127	E	7931	MOVING TO NEW AREA TO FISH ATKA MACKERAL															
03	11	57	Y	2	1	1	R	5012	E	7918	2030	2210	80	90	F	3.4	31.73	31.73	C	.89	25.00			N		
03	11	58	Y	2	1	1	R	5010	E	7916	2230	2337	70	90	F	3.4	40.22	40.22	C	.87	40.00			N		

Figure 3-8: Form 2US - Haul Form for Trawl Vessels (catcher processor example)

Form 2US - Haul Form for U.S. Trawlers Instructions

An entry must be made for every day you are assigned to a vessel. Start your entries with the day you embark a vessel and end them on the day you disembark the vessel. Skip a line between each day's entries. Each delivery or day in port must be noted on a line of the 2US haul form. Observers on catcher boats need to use one line to note a delivery even if there are also hauls made on that day. Make sure that all of the hauls retrieved during your deployment are recorded on your haul form whether you sampled them or not. Keep the data from each vessel you are on separate.

- **Heading**: Enter the cruise number and vessel code supplied in your training or briefing. Each vessel you are on has a different vessel code. For "Year" enter only the last two digits, such as "99."

- **ORC:** When transmitting the 2US haul form data to the Observer Program via a fax, you will need to enter an Observer Routing Code (ORC) number in the box above the date and haul number columns. The ORC is a three-digit security code entry which will be explained to you during training.

- **Date:** Every day, from boarding to disembarking, must be accounted for on the 2US haul form. Enter leading zeros in dates and times (only). Skip a line between each day's entries.

  A haul is assigned to a date according to the time the net is retrieved from the fishing level, which is not necessarily the same day the net was set or the day that you sample. Hauls with retrieval times before 0000 hours are attributed to the previous day and retrieval times on or after 0000 hours are assigned to the next day.

- **Haul number:** All tow retrievals must be recorded and assigned a number. Haul numbers must be unique and should be sequential and ascending. Refer to "Haul Order" on page 5-3 for exceptions. Except for a haul number "0," there can be no duplicate haul numbers within the data set for each vessel. Enter a "0" haul number for each non-fishing day.

  Observers on pair trawlers and mixed gear types may need to skip haul numbers, and if this is done, a general explanation should be written on the head of the form and a specific explanation on a separate line at each occurrence.

- **Monitored for marine mammals:** Enter a "Y" or "N" to indicate which hauls were randomly selected and monitored for marine mammals.

- **Gear type**: Enter a code for trawl gear based on the configuration of the gear, not whether it's fished mid-water or on the bottom. If you are on a vessel using trawl gear not listed, please contact the Observer Program for directions.

1 - Non-pelagic trawl - any trawl net towed by one vessel which does not meet the configuration specified for a pelagic trawl net. See "Trawl Gear Definitions" on page 19-24 for definitions of trawl gear.	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.
2 - Pelagic trawl net - Defined in "Trawl Gear Definitions" on page 19-24	5 - shrimp trawl

- **Gear performance**: One of the following codes must be recorded:

1 - no problem	5 - problem--other problem, put a note of explanation on a non-keypunched part of the Form 2US.
2 - problem--crab pot was in the haul	
3 - problem--net hung up on some obstacle (vessel had to back down)	6 - problem--trawl net or codend lost
4 - problem--net ripped	9 - fishing duration affected

- **Vessel type:** Enter a code which identifies how the vessel received and processed fish for any given tow. The codes are:

  1 - Catcher/processor (c/p). This vessel caught and processed its own catch on this tow. Catch is stored in a freezer hold aboard.

  2 - Mothership. This vessel received unsorted catch in a codend transferred from a catcher vessel on this tow.

  3 - Catcher-only vessel. This vessel caught its own fish and retained it for delivery to a processor (shore-based or "floater"). On board, the catch is kept on ice or in refrigerated seawater (RSW) tanks, not frozen.

4 - A mothership or catcher/processor is receiving this tow as sorted (or potentially sorted) catch from a catcher vessel. Catch was transferred by brailer, or by pumping, or any method other than by codend transfer. (Sorted catches should not be sampled by the Observer.)

5 - The catch from this tow was sold over-the-side to other fishing vessels who will utilize the fish for bait.

- **Location code:** Enter R if the location is a retrieval position. Enter N for noon position for all days when there was no fishing (vessel is in port, steaming, or waiting out a storm). Observers on motherships should refer to for instructions on entering delivered hauls information.

  Noon positions: For all non-fishing days enter "0" in the haul number column, a location code "N," and the latitude and longitude of the vessel at around noon, Alaska Local Time (ALT). On the remainder of the line, comment on the reason there was no fishing. All days aboard must be accounted for with fishing positions or a noon position.

  Delivery locations and dates: If you are on a catcher ship, each delivery must be noted on a line of 2US. For each catcher vessel delivery, use one line to note the date and plant name even if there are also hauls made on that day.

For days spent in these ports, use the coordinates listed below for the noon position:

Port	Latitude	Longitude
Dutch Harbor	**53 53**	**W 166 31**
Kodiak	**57 42**	**W 152 15**
Akutan	**54 08**	**W 165 46**
Sandpoint	**55 19**	**W 160 33**
Seattle	**47 42**	**W 122 13**

- **Haul or Delivery position:** Record the latitude and longitude of the "End Position of Haul or Set" from the vessel logbook into this field. (On a mothership the location entered may be a delivery position if retrieval positions are not available.) One hundred+ degrees of longitude are a given, so do not enter the "1." Record only the whole degrees and minutes of latitude and longitude (see

Figure 3-7 and 3-8.) If the ship logbook has positions to seconds or hundredths of seconds, round the position to the nearest minute for your 2US entry. Enter only numbers in the latitude and longitude columns. Do not enter any marks indicating degrees, minutes or seconds.

- ***Nets starts fishing times and Nets stop fishing times:*** Copy the "Time of Gear Deployment" and the "Time of Gear Retrieval" from the vessel logbook into these fields, unless you have identified a problem with this data then see "Date and time of gear retrieval" on page 3-4 for further instructions. All entries must be in Alaska Local Times (ALT). Always enter 4 digits, no colon marks. Enter all 2400-hour notations as 0000 hours, and 0000 hours starts a new date entry.

- **Average fishing depth and Average bottom depth, M or F:** Copy the "Ave. Gear Depth" and the "Ave. Sea Depth" depths from the vessel logbooks into these fields. All entries must be to the nearest whole number. Record both depths in the same unit of measure and label it as fathoms (F) or meters (M).

- **Average speed:** Record the average trawl speed to tenths of a knot.

- **Official total catch (OTC):** Record the best estimate of total catch weight for each haul (see page 3-13). There must be an entry of OTC for every haul recorded on the Form 2US. OTC must be recorded in metric tons and be rounded to two decimal places.

- ***Observer's Total Catch Estimate, W, B, or C:*** On a trawler, this is your independent estimate of catch weight for the specified haul (see page 3-5). Record the weight estimate in metric tons and rounded to two decimal places. If you did not estimate the haul weight or actually weigh the catch, make no entry. A zero entry means you estimated that no weight was caught. In the next column, enter "W" if the catch was actually weighed by you, "B" if bin volume was used, or "C" to indicate whether the estimate is from a codend volume.

- **Density used:** Record the density used to calculate the Observer estimate. The density is recorded in metric tons cubic meters and is rounded to two decimal places. There should always be a density listed when there is a bin volume or codend volume taken.

- **Vessel's Total Catch Estimate:** Record the "Estimated Round Catch Weight" from the vessel's NMFS log. Convert the estimate to metric tons and round it to the nearest two decimal places. There must be an entry for every haul.

- **Catcher boat's ADF&G number and List of Catcher Boats box:** Fill in these two items on 2US only if you are on a mothership. For all unsorted codends and sorted catch delivered to your ship, record the ADF&G permit number of the delivering vessel, then write in the delivering ship name and the same code in the box at the top of the 2US form (see Figure 5-2 on page 5-4).

- **Processor code and Plant/processor name box:** If you are on a catcher vessel, for each haul enter the plant processor code where the haul was delivered. There is a list of the processor codes for shoreside plants, floating plants, and motherships on page A-20. If the plant your vessel delivers to is not on the list, use code F9999. Fill in the name and processor code of all of the plants where your ship delivered in the Plant/Processor Name box in the right corner of the 2US form. Record only one entry per plant for a set of 2US forms.

  If the delivery is sold in part to one processor and the rest to another processor and you are unable to separate hauls, enter the processor code for the plant that received the greater share of the delivery. If this or any other incident out of the ordinary occurs please make a note in a non-key punch area of the form and explain the incident.

- **CDQ number:** For each haul taken using the Community Development Quota (CDQ), record the last 2 digits of the CDQ permit number (found on the ship's log page) after a "C".

- **IFQ? Y or N**: Enter a "Y" or "N" to indicate which hauls were fished under an Individual Fishing Quota (IFQ). This column is only for vessels fishing IFQ in 1999.

- **Delivery number:** For MSCDQ catcher vessel Observers only, enter the delivery number for all of the hauls for the specified delivery. This number should be copied directly from the vessel logbook. The captain will assign a delivery number to each of his trips. Transfer this number to the 2US. If the vessel logbook does not have a delivery number recorded, leave this column blank.

Any notes, or comments (other than notes for non-fishing days) should be written in the margins or footnoted to the back of the form or the Observer log.

TRAWLER COMPOSITION SAMPLING

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Introduction

Species composition sampling is third in the Observer Program's priority list, after obtaining catch information and collecting data on any endangered species caught by fishing gear. Species composition sampling is the collection of catch samples from a selected haul to determine the proportion of each species caught in the haul.

Fisheries managers need to know the fishing mortality, or how much has been caught, of each species harvested. The total catch estimate for each species is based on the results of your species composition samples, in conjunction with vessel and shoreside plant production reports. This information is used by inseason managers to monitor allowable harvest, and by other scientists for population analyses and stock assessment.

Terminology

The following terms will be used throughout this chapter to describe the aspects of sampling. You will need to fully understand these terms in order to develop a working knowledge of Observer Program sampling protocols.

Bias- Tending to yield one outcome more frequently than others. Factors affecting the randomness of a sample, including possible mechanical sorting of catch by an incline belt, or purposeful presorting by a crew member, will introduce bias.

Bycatch- Anything caught in fishing operations that is not the target species, such as other fish species, prohibited species, marine mammals, seabirds, invertebrates, and inert objects.

Composition - In the groundfish Observer Program, this refers to the makeup of harvested species in a catch, and the sample you collect.

Fishing mortality - Removal (deaths) of fish from a population due to fishing activity.

Population - The total of individuals occupying an area or making up a whole. When sampling aboard a trawler, a population is defined as the catch from a single haul.

Presorting - The segregation and/or removal of any item(s) or organism(s) from the catch prior to the point where you are collecting your composition sample.

Prohibited species or prohibited species group - Species whose allowable retention is zero. Salmon, herring, halibut, king crab, and Tanner crab are always prohibited in North Pacific open access groundfish fisheries. For vessel operators, prohibited species include the above and any other species declared prohibited by a notice of closure.

Random - Relating to a set each of whose elements have an equal probability of occurring in a sample. These elements are chosen as sample units in a manner which eliminates subjectivity.

Random sample frame - The population divided into independent countable units.

Sampling - The process of selecting part of a population for the purpose of determining the parameters, or characteristics, of the whole population. Composition sampling refers to taking samples of a haul in order to determine the fishing mortality of species occurring in the sample.

- **Sample size** - The portion of the population that is sampled.
- **Sample type** - The method used to select part of a population. This includes basket, whole haul, partial haul, and the pre-sorted "X" sample types.
- **Sample weight** - The actual weight in kilograms of a composition sample.

Spatial - Referring to a unit of space used in random sampling. For example: a third of a bin, or a section of trawl alley, are spatial units.

Target species - Vessel personnel will generally call the species they wish to catch the target species. For Observer Program purposes, target species is what the vessel claims as their target. The Sustainable Fisheries Division of the NMFS uses delivery and production data to determine target fishery, which may differ from what the vessel claims as their target.

Temporal - Referring to a unit of time used in random sampling. For example: one hour of processing time, or systematic intervals of ten minutes, are examples of temporal units.

Determining a Sampling System

One of the first things you should do when you arrive on a vessel is inspect your sampling station and determine a sampling system. Refer to "FIRST DAYS ON BOARD," on page 17-1 for what to look for in a sampling station. When you design your sampling system you must determine:

- If using the Random Sampling Table (RST) is necessary (see "When to use the Random Sample Table (RST)" on page 2-8).
- What sample size to gather.
- Where to collect your sample.
- What sampling biases occur in your collection area and how to limit them.
- How to collect your sample.
- How to process your sample.

Draw a diagram of your sampling station in your logbook. On the facing page, *describe your sampling system in detail, addressing each of the* above topics.

First time Observers may need to watch the first haul back to familiarize themselves with the way the catch is handled. Familiarity with this process will allow you to decide on a sampling system that is right for that vessel and fishery. As you gain experience, you may alter your system as you become aware of biases. Your sampling system may change as the species composition, or target fishery, changes. Document all changes in the Daily Notes section of your logbook, and explain why you made them. If you have problems designing or implementing a sampling system, contact your ATLAS Inseason Advisor, or the NMFS field office personnel.

Selecting Hauls to Sample for Species Composition

There are two options for selecting which hauls to sample for species composition on a trawler:

1. Sample all of the hauls; or

2. use the appropriate Random Sample Table (RST).

If it is not possible to sample all hauls brought aboard your vessel, you must use the Observer Program's Random Sample Table to select hauls from which to collect species composition samples. This ensures that the data will be legally and scientifically defensible. Please refer to "How to Use the RST" on page 2-9 for instructions on how to use the RST. Once you become experienced, you are expected to sample all hauls when there

are less than three a day. When extenuating circumstances prevent this, you must document the situation in your logbook.

Guidelines for Composition Sampling

There are three methods for collecting species composition samples on a trawl vessel. Each type is a function of size.

- A **whole haul sample** is when the sample size is the entire haul.
- A **partial haul sample** is when a relatively large portion of the haul is sampled.
- A **basket sample** is when a small portion of the haul is actually weighed as a sample.

When considering which sample type to use, follow the guidelines listed below.

1. Strive to collect random samples using a random sample frame (see "Random Sample Frames" on page 4-19). When this is not possible, document the reasons in your logbook.

2. Allocate your time appropriately. Maximize your sample size according to the amount of time you can afford per haul while keeping to the RST, and completing your other required duties. Keep the following factors in mind when you determine which sample type you should use.

   - **General Health** - The amount of time and energy you can spend on composition sampling will be affected by your general health. Most factory vessels will operate 24 hours a day. It is not expected that you work 24 hours as well! Using the RST will reduce the number of hauls you need to sample, but you still may need to reduce your sample size to keep up with your other duties, or to recover from seasickness or other illnesses.

   - **Size of Hauls** - The amount of catch per haul is a consideration when deciding on a sample type. In some fisheries, 100 metric ton codends taking 4-8 hours to process are not uncommon. Weighing and counting everything in such a haul usually will not be possible due to time constraints and the sheer numbers of fish.

- **Species Diversity** - Simply put, it takes longer to sample a "dirty" haul, one with many different species, than it does to sample a "clean" haul, one with few species. In fisheries with a lot of bycatch, you will need to reduce your sample size in order to process your samples in a reasonable amount of time. Conversely, in "clean" fisheries you will be able to take larger samples.

3. You must sample from unsorted catch and you must be present to sort, or directly supervise the sorting of, all fish in your sample. If you see, or suspect, that you are missing individuals in your sample, reduce your sample size and/or change your sampling method until you can control the sorting and are certain that you can account for all of the fish in your sample.

4. You must sample for all species. You cannot leave out any component of the catch. If you sample for prohibited species, you must also sample for target and other bycatch and vice versa. For each sampled haul there are two main categories, and seven groups, of species that must have a sample type associated with them. Use any combination of sample types for the seven species groups.

    - **Prohibited species** - In the North Pacific Groundfish Observer Program the five prohibited species groups are: king crab group, Tanner crab group, salmon group, halibut, and herring. Each of the five prohibited species groups may have different sample types.

    - **Non-prohibited species** - This is made up of two groups: bycatch species and target species. The sample weight for these groups can be different than that for prohibited species and is usually equal to or less than the sample weight for prohibited species. Bycatch species and target species may also have different sample types.

5. You cannot have more than one sample weight for any sample type within a haul. For example, you cannot have two different partial haul weights. All species found in a partial haul must be from the same sample and have the same sample weight.

6. You cannot have two sample weights for any one species or species group. For example, you may whole haul sample for prohibited species, but basket sample for target and non-prohibited species. Since a basket sample is a sub-set of the whole haul, any halibut that occurred in your basket sample would be placed in the whole haul sample and its weight subtracted from the basket sample weight. The only exception to this rule is for pre-sorted organisms.

Presorted organisms are discussed in detail on page 4-11.

Minimizing Sampling Bias

The goal of the Observer Program is to obtain unbiased samples of the harvested catch in each target fishery. A sampling system must take into account any biases, and you should try to limit their effect on your sample. Two ways to limit sample biases are:

- **Use random sampling:** By using a random sample frame, you will ensure that every member of the population has an equal probability of occurring in your sample and eliminate subjectivity. When you use this method, the Observer Program will treat your sample as a fair representation of the composition.

- **Maximize your sample size:** Weighing and counting everything in a population is the best way to obtain information about the population, since the "sample" size is the whole population. However, in most cases this is not possible, and you will need to take smaller samples. Although large samples are preferred, small samples still fairly represent the population when they are randomly collected. Small, random samples are preferred over large samples if they are biased.

Samples which are not collected randomly may still be representative of the haul. However, the NMFS cannot make that assumption or use statistical methods of estimation, as it can with random samples. If you determine that you cannot use a random sample frame on your vessel, you must document your reasons in your logbook and use another method to collect your samples. Two acceptable methods to collect non-random samples are:

- **Samples of convenience:** These are samples taken from the most accessible portion of the catch. For example, if you were to sample from only one area of the codend or deck, every fish in the population would not have an equal chance of ending up in your sample. Sometimes, due to vessel constraints, this is unavoidable. Document the constraints, and the measures you took to avoid them.

- **Haphazard samples:** These samples are taken without pre-selecting when, or from where, you are going to sample. On some vessels, random sample methods will not be possible, and haphazard samples will the best available data. If you use haphazard sampling techniques, document the reasons why you feel this was best.

Sampling methods to avoid are ones in which you make a decision on when or where to sample based on the perceived composition. Never take a sample from a particular area of the haul because you feel that organisms in that area have not been fairly represented in your sample. For example, if you see halibut while the haul is being dumped, but do not get any in your sample, it is not appropriate to select a portion of the haul to sample because you see a halibut in that area.

Recognizing Potential Bias

The vessels that you will be working on are not research vessels, so most sampling situations you encounter will not be ideal. There will be many factors that affect your sampling, and you must be aware of them. Assess your collection site for possible biases, document what they are, and how you attempt to avoid them. Some biases you need to look for are:

Mechanical biases

Be aware of the flow of fish from the codend to their final destination. Specifically, watch for:

- ***Grates or small openings*** - *These will sort out large individuals* such as sharks, large skates, and halibut. Look for grates on deck hatches and bin doors. Weigh, or estimate the weight of, anything you see sorted out of the catch and include it in your composition samples as either a whole haul or a sample type X (see "Pre-sorted Sample Type" on page 4-11).

- **Inaccessible bins, tanks, or belts** - These will prevent you from setting up a random sampling frame because the fish in the inaccessible bin, tank, or belt will not have a chance to fall into your sample. There is no solution to this problem. Try to randomize your collection as much as possible and note the biases in your logbook.

- **Conveyor belts** - Running a conveyor belt too fast or too deep won't allow you to see or sort everything that passes by you. You must be able to account for all individuals in your sample! Ask the crew to slow the belt and run the fish one layer deep. If the vessel will not comply, or if you are still unable to sort everything in your sample, note this in your logbook and basket sample for species composition.

- **Incline belts** - Incline belts can affect a sample in many different ways. Some are steep, with small tines, that won't accommodate large fish. Others will allow large fish to move up, but potentially

at a different rate than the smaller fish. When this is occurring and you are not whole haul sampling, larger fish will have less of a chance of falling into your sample. To alleviate this bias, try to take your sample before the incline. If you can not avoid the incline belt, be sure to clear all fish from in front of the incline before and after you collect your sample. Fish that did not make it up the incline belt during your sample collection period must be taken from the base of the incline and included in your sample.

Pumping the net- There are very few vessels that can pump fish from their codend into the hold. Transfer tubes sort out large individuals due to their small diameter. They are also frequently fitted with grinders. There is really no way to account for these organisms. Note the practice in your logbook and include the diameter of the pump tube and the maximum size individual you observe. Basket sample for species composition, as if this were not a factor.

Deliberate Interference

In some fisheries it is advantageous for the vessel to remove certain species prior to your sampling. This is especially true for halibut and salmon bycatch. This practice is illegal and biases your samples by misrepresenting the true bycatch rate for these species. Federal Regulation 50 CFR 679.7 states that it is unlawful to "interfere with or bias the sampling procedure employed by an Observer, including physical, mechanical, or the sorting or discarding of catch before sampling." Refer to "Steps to Take if You Suspect a Violation" on page 19-3 for a list of steps to take if you suspect such a violation. There are several ways vessel personnel could sort out individuals prior to your sample, so watch for the following:

- **Dumping undesirable catch overboard** - A vessel may dump an entire codend, or a portion of the codend, overboard because of the high proportion of bycatch. This biases your sample because you cannot get an accurate picture of what is being caught. Ask the skipper not to discard fish from the codend until you have the opportunity to sample. On factory vessels this may mean that you will need to reduce your sample size and sample on deck. If the skipper will not comply, note this in your logbook. If the vessel regularly dumps codends before you can sample, contact your ATLAS inseason advisor, or the NMFS field staff, and inform them of the problem.

- **Removing and discarding unwanted species** - Vessels may have crew members in the trawl alley, fish bin, or on the sorting line to sort out fish prior to you taking a sample. If this occurs, inform the skipper or factory manager of what you are witnessing. To the best of your ability, quantify the amount of fish removed each time it occurs. Notify the Observer Program, or the NMFS Enforcement personnel, of problems. If you feel this may make your position on the vessel unworkable, you can ask the NMFS staff not to confront vessel personnel until you are off the vessel.

- **Crewmen in the bins** - The setup of some factory vessels is such that a crew member is required to push fish out of the bin door or onto a conveyor belt. This is a potential problem because he/she can push select species away from the conveyor belt where you are sampling, or hold these species until you are finished sampling. The best way to combat this is to:

1. Ask the crewman to step out of the bin when you are sampling.
2. Randomly select times to take your sample.
3. Watch the people in the bin.
4. Watch the sorting line to see if specific species concentrations increase when you are not sampling.
5. Look for halibut and/or salmon being held in the bin. Some boats have areas in the bin where fish can be stored until you are out of the factory.
6. Speak with the individual responsible, then talk with the factory managers and the skipper. If this does not help, notify the Observer Program or the NMFS Office of Enforcement.

- **Large animal removal on deck** - Although no presorting is legal, removing large animals on deck to prevent them from entering the factory or RSW tanks is a common practice, and sometimes is unavoidable. You must be notified when this occurs, and you should include the animals in your species composition sample with either a whole haul sample or a sample type "X" (see "Pre-sorted Sample Type" on page 4-11).

Pre-sorted Sample Type

In order to account for pre-sorted individuals, and increase the accuracy of Observer data, a pre-sorted sample type "X" is being implemented. Documenting pre-sorted animals does not validate the practice of sorting in order to bias your composition samples, and this will remain illegal. Most often this sample type will be used for large sharks, skates, and halibut, but it may be used for any pre-sorted organism. When you are certain that you are able to find all of the individuals of a pre-sorted species, you should use the whole haul sample type to account for them, therefore you can never have a species listed in both a whole haul and as an "X". When you cannot be sure that all individuals of the species were removed, you must use the sample type "X," following the guidelines below.

- Animals must have been removed from the catch prior to composition sampling.
- You must observe the animal being pre-sorted.
- You must be able to estimate the size or weight of the animal.
- For halibut, you may estimate the length and use the length/weight table (page A-34).
- A species can have more than one sample type only if one of the sample types is "X," but no species can have an X and a W sample type in the same haul.
- For the sample type "X," the sample weight is always the OTC.

Basket Sampling

In the course of your work as an Observer you will be collecting baskets of fish for various purposes. A "basket" sample is not necessarily collected with the Observer's blue baskets; any container can be used. The definition of a basket sample is:

- A sample in which all items are actually weighed on your NMFS scales, or on a verified motion compensated flatbed scale. Applying average weights to the number of fish to obtain a total weight can not be used in a basket sample. You may use the length/ weight table (page A-34) to determine the weight of halibut over 1 meter long.

- A sample in which the sum of items weighed equals the sample weight.

A basket sample is a sub-sample of catch used for one of three purposes; to determine the species composition, to determine a proportion of two predominant species, or to determine an average weight of one predominant species. The purpose of the basket sample dictates the minimum sample weight expected by the Observer Program.

- When it is used to obtain a species composition sample of the entire catch, the minimum sample size is 300.0 kg.

- When it is used for a sample of the two predominant species to determine their relative abundance, and a larger species composition sample is taken, the minimum sample size is 200.0 kg.

- When it is used to subsample for the predominant species, and a larger species composition sample is taken, the minimum sample size is 80.0 kg.

The weights given above are the Observer Program's minimum sample sizes. They should be exceeded whenever possible. If you find that you cannot routinely obtain species composition sample sizes of 300 kg or more, contact your ATLAS Inseason Advisor, or other NMFS Observer Program staff, as soon as possible. You must record an explanation in your logbook for each species composition sample weight less than 200 kg. Data from small samples can usually be used as long as the sample was collected in a random, unbiased manner. Record your methods and any difficulties you encounter in the Daily Notes section of your logbook.

When To Basket Sample

- A basket sample of the predominant species must be taken to accompany whole or partial haul species composition samples.

- If the catch is diverse in composition, and you cannot use a partial or whole haul sample type, you must basket sample for the species composition of the haul.

- If your vessel is participating in a Bering Sea flatfish fishery, the Vessel Incentive Program (VIP) mandates that you use basket sampling for species composition (see "Vessel Incentive Program (VIP)" on page 4-34).

The methods used to collect basket samples are different depending upon the vessel type you are assigned to, and are discussed in detail below.

Basket Sampling on a Catcher/Processor

Sampling on a catcher/processor or mothership usually takes place in the factory, from a conveyor belt. The belt used should be prior to all sorting activities, so watch the flow of fish to ensure that there are no processors, mechanical size sorters, size sorting incline belts, or pumps prior to your collection site. Usually, the closer you are to where the catch exits the bin or tank, the chances are fewer that the fish are being sorted.

There are three easy methods for collecting unsorted catch off conveyor belts. You do not need to collect the entire sample at one time, and each of these methods can be used within your sampling frame. They are:

- Collecting from the flow of fish--- Hold a container under the flow of fish from the live tank or under the flow of fish falling from one conveyor belt to another. This is a good method for collecting unsorted catch. You must include all fish from the flow in your sample, even if they do not fit into your container.

- Diverting the flow of fish--- Use a diverter board to spill fish into a container. A diverter board is a board hinged to the side of a conveyor belt that, when open, allows the catch to spill off the belt into a basket.

Collecting fish directly off the belt--- Clear the belt of all catch in a prescribed area. If there is no place in the factory that allows collection of fish by diverting the flow of unsorted catch, you can stop the belt and collect all the catch in an area. To do this:

1. Close the bin door and clear the belt by running the fish into the factory. You cannot use these fish, since you cannot be sure that they haven't been sorted.

2. Once the belt is cleared, re-start the flow of fish until the belt is full, or contains enough for your sample.

3. Stop the flow of fish and collect all fish from the belt. If you cannot take all the fish off the belt, use a prescribed area, from point A to point B, and collect all fish in the area, regardless of species or size. Never hand select fish to include in a sample.

Basket Sampling on Catcher Boats

On catcher vessels, obtaining random samples takes creativity and a thorough assessment of how the catch is handled. Catcher boats usually handle their codends in one of two ways.

- The catch is dumped directly down hatches into the RSW tanks. *This is typical on pollock vessels.*
- The entire catch is dumped into the trawl alley and the crew sorts retained fish into RSW tanks. This is typical on Pacific cod, flatfish, and rockfish vessels

Sampling from a Codend

If your vessel dumps unsorted catch directly into the RSW tanks, you may have to fill your baskets by catching the fish as they are flowing from the net to the deck, or from the deck through the RSW hatch. If you choose this method, make sure that any large fish falling out of the codend are included in your sample, even if they don't fit in your basket. You may need assistance from a crew member to hold your basket into the flow of fish, and you should consider your safety when choosing a collection site. Do not position yourself under the codend when taking a sample!

Sampling Using a Checker Bin

If your vessel has checker bins (compartments on either side of the trawl alley) available, you can divert unsorted catch into one by lifting a bin board, or ask for some of the codend to be dumped into the bin, for use as your basket sample. The disadvantage of using checker bins is that your sample comes from only one area of the codend. Try to minimize this bias by implementing a random sample frame (page 4-23).

Sampling from the Trawl Alley

If the catch is dumped onto the trawl alley you must take steps to prevent size or hand selecting your sample. Do not take a sample by shoveling fish into your baskets, or by using your basket as a scoop. Instead, you should try to isolate an area from which to collect all fish. You can use an overturned basket to create a "sampling circle." Any organism touching the rim of the basket is part of the sample. This only works well if the fish are not sliding around while you are collecting them. Another way to cordon off an area is to ask the vessel for extra bin boards. These wooden planks can be used to section off an area of the trawl area, from which you can collect all fish for your sample. Never hand select fish from the trawl area to use as your sample. Not looking at the fish while you grab or

shovel them does not eliminate this bias.

In the Pacific cod, rockfish and flatfish fisheries, the crew will want to start sorting the catch immediately. You must be sure to take your sample before any active sorting by the crew or machines.

Whole-Haul Sampling

A whole haul sample is an account of all organisms in the haul. Since it is not possible to count and weigh the predominant species, a whole haul consists of letting the predominant species pass you, while you remove all other bycatch. The bycatch is weighed and counted, and a subsample of the predominant species is collected for an average weight sample. A whole haul sample must meet the following criteria:

- The sample weight is equal to the Official Total Catch.
- You must sort out, or supervise the sorting of, all bycatch from the entire catch.
- You must be able to see every organism in the catch as it passes you. If you are missing organisms while attempting a whole haul sample, you must reduce your sample type.
- The whole haul bycatch is accounted for by counting and/or weighing.
- A weighed basket sample of at least the predominant species accompanies the whole haul.

Consider that 1% bycatch in a 50 mt. haul is 500 kg., which is about thirteen 40 kg. baskets of bycatch!

To fulfill the above requirements, your vessel must be participating in a fishery with very low diversity. In the Alaskan pollock and Washington hake fisheries, hauls may have less than 1% bycatch, and whole haul sampling for species composition may be possible. Whole haul sampling is usually used when you have access to a sorting line, such as on catcher/processors or motherships, and at floating and shoreside processors. When you are sampling in a clean fishery, you should try to whole haul sample at least for prohibited species. Sometimes it will be possible to whole haul for the entire species composition as well. Keep in mind the factors mentioned on page 4-5 when deciding to whole haul sample. You must have time, energy, space, and a clean haul!

When you whole haul sample on a catcher/processor or mothership for species composition, or at a processing plant for prohibited species, all unsorted catch must pass by you, and you must be able to sort out all

bycatch for weighing and counting. You must be present for the entire sorting process. You cannot leave the sorting area, or do anything other than sort, or supervise the sorting of, the catch. If crew members are assisting you in sorting, you must have direct, visual supervision of them! Make sure that the crew realizes you are sampling, and knows what species you want set aside.

Every whole haul sample must have a randomly collected sub-sample of the predominant species associated with it. Use the guidelines outlined in the basket sampling section above. The minimum sub-sample size for one predominant species accompanying a whole haul is 80 kg.

Partial Haul Sampling

Whole haul sampling may not be possible if you do not have sufficient access to the catch, or space to store bycatch. Hauls which contain large numbers of bycatch, take too long to process, or which are extremely large may also be impossible to whole haul sample. When this is the case, you can sample a portion of the haul, using the same sampling procedures as a whole haul, but the sample species are collected from only part of the catch, and your sample weight is less than the Official Total Catch weight.

How to Partial Haul Sample

Three methods used to determine partial haul sample size are: bin volume, tally method, and verified flow scale readout. Bin volumes will be most commonly used on catcher/processors and motherships during open access fisheries. The tally method can be used aboard any type of vessel, and is the method commonly used aboard catcher boats.

You must obtain your sample weight by one of these three methods. Visual estimates such as "about half the catch" are not acceptable. The only exception is when your pollock catcher boat dumps part of an unsorted codend at sea prior to your sampling. When you sample the delivery for prohibited species at the shoreside plant, you have still only sampled part of the haul that was dumped overboard. If this happens, you must make a volumetric or visual estimate of how much was discarded. Subtract this quantity from your total catch estimate, and use that number to proportion the delivery weight (see "Options for Official Total Catch on Catcher-only Trawlers" on page 3-14). The proportioned delivery weight for that haul will be the partial haul weight.

Partial by Bin Volume

A relatively accurate and easy way to determine sample weight is to

calculate the volume of fish sampled from a bin and apply a density. Measure the height of fish in the bin prior to, and after, sampling. The difference in height, multiplied by the area of the bin will give you the volume sampled. Multiply this volume by the density (see page 3-12), to determine the sample weight.:

difference in fish height (m) × bin area(m^2) × density (kg/m^3)= sample weight (kg)

Refer to "Observer Estimates by Bin Volumes" on page 3-6 for instructions on measuring the amount of fish in a bin. You cannot use bin volume to calculate partial haul sample weight if:

- you have not measured, or verified the measurements, of the bin,
- you cannot see into the bin to accurately read fish depth markings,
- there is standing water in the bin, or
- unknown amounts of fish are added to the bin during your sample period.

Fish tend to stratify in a bin. If you frequently partial haul sample, you should use a random sample frame (see "Implementing a Random Sample Frame on a Catcher/Processor" on page 4-20) to choose the segments of the bin to sample. If you are unable to use completely random sample techniques, you should take haphazard samples from different parts of the catch. If sampling from all parts of the catch cannot be done for each sample, then sample different parts of the catch over several hauls.

When partial haul sampling, remove all bycatch from the sorting line. Count and/or weigh the sorted fish by species, record these on your deck sheet. You must take an 80 kg basket sample for the predominant species to accompany your partial haul sample. Every partial haul sample must have a randomly collected subsample of the most predominant species associated with it. Use the guidelines outlined in the basket sampling section. The minimum subsample for one predominant species accompanying a partial haul is 80 kg. Count and weigh the fish in this subsample, and record this on your deck sheet.

Partial Haul by Flow Scale Readout

Verified flow scale readout must be used during Community Development Quota (CDQ) fisheries. An additional certification is required to observe on CDQ fisheries, and the training emphasizes the correct use of motion compensated flow scales. If your vessel uses a flow scale during an open access fishery, daily accuracy tests must be conducted by the crew, in your presence, before using it to determine partial haul sample weights or OTC. Contact your ATLAS inseason advisor if you plan to use any numbers from the vessel's flow scale during an open access fishery. They will want to ensure that the daily test criteria are being met.

Getting a partial haul weight by flow scale readout is easy and accurate, if you can verify it daily according to the instructions in "Appendix W. Use of Flow Scales" on page A-50. Record the weight from the readout prior to sampling. Remove all partial haul species from a sorting belt after the flow scale. Record the weight from the scale readout after you have completed your sample. The difference between the end weight and the start weight is your partial haul weight. Even though you have an actual weight for the predominant species, you will still need to take an 80 kg basket sample as a subsample.

Partial Haul by Tally

A partial haul sample by tally is an accurate count of the predominant species and a collection of bycatch. The bycatch is sorted, counted, and weighed by species. The count of the predominant species is multiplied by an average weight to determine the total weight of that species. The summed weights of the predominant species and the bycatch species equals your partial haul sample weight. This method can only be used when the predominant species can be reliably counted. It is typically used during the Pacific cod fishery, on both catcher boats and factory trawlers.

To determine the average weight of the predominant species, collect a random sample of at least 50 fish. Weigh these fish, and divide the weight by the number of fish weighed. This will be the average weight..

weight ÷ number = average weight

Multiply the tally of the predominant species by the average weight of this species to calculate the total weight of the predominant species.

average weight × total number tallied = total weight of tallied species

Record only the entries for the sorted (non-tallied) species as sample type "P" for partial haul sampled. Record your sample for average weight of the tallied species as sample type "B" for basket sample. The total weight of the tallied species is only used to calculate the partial haul sample weight.

total weight of tallied species + sorted species weight(s)= partial haul weight

Random Sample Frames

In order to take random samples from a population, you need to establish a framework which assures that all individuals have an equal probability to be included in your sample. A sample frame eliminates subjectivity and removes the decision of when to take a sample out of your hands. Without a defined, documented sampling frame, your samples cannot be considered random. To set up a sampling frame, divide the population, or haul, into equal, numbered units. Select which units to sample using the random number table (page A-14), dice, slips of paper, or some other documented method.

The units which make up your frame can either be spatial (units of space) or temporal (units of time). When the entire population is available at one time; for instance when a codend is dumped out on deck, spatial sampling units should be used. When the entire population is available over time, such as on a factory conveyor belt, you may find temporal units easier to use.

On a trawl vessel, your population will be all the individuals caught in a haul. The frame and units you use will depend on your vessel type and fishery. Once you define your frame and units, and randomly pick which units to sample from, collect your samples from the selected units. Note that random sample frames are used only for partial haul and basket samples. Whole haul samples are a true census of the population, and therefore are not subject to the same biases.

Implementing a Random Sample Frame on a Catcher/Processor

Both temporal and spatial frames can work on catcher/processor or mothership vessels. Commonly, these vessels have bins that are easy to read, and can be divided into spatial units. On other vessels, it may take several hours for them to empty their bins, allowing you to implement a temporal frame.

You can use volumetric units in a fish bin for either basket or partial haul samples. It is a good way to randomize your samples within hauls that take too long to process to effectively sample throughout the haul. On vessels which dump one codend into several accessible bins, you can randomly choose a bin, and sample the entire bin for your partial haul (see Figure 4-1), or take basket samples from only the chosen bin.

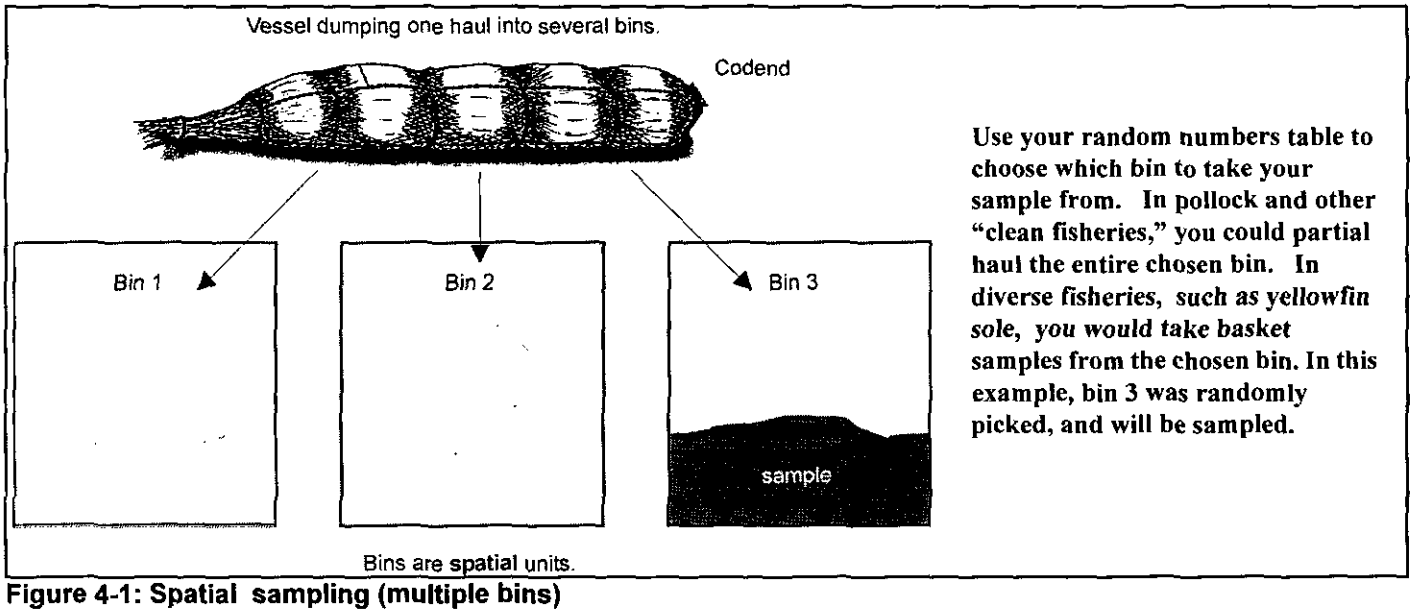


Figure 4-1: Spatial sampling (multiple bins)

If your vessel dumps their codend into only one bin, you should divide the haul into thirds or fourths. Pre-select which third or quarter to sample using your random number table (see Figure 4-2).

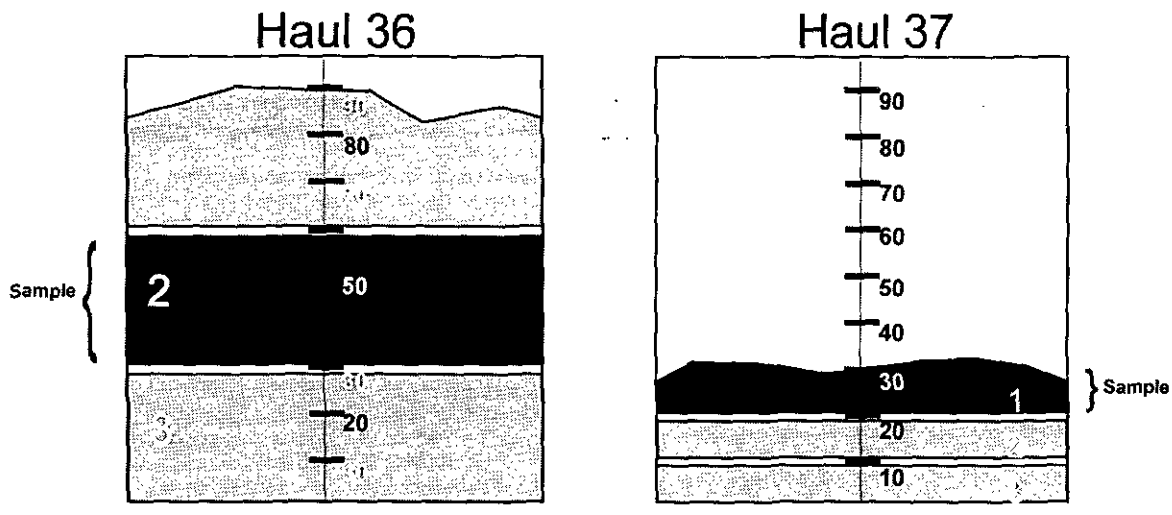
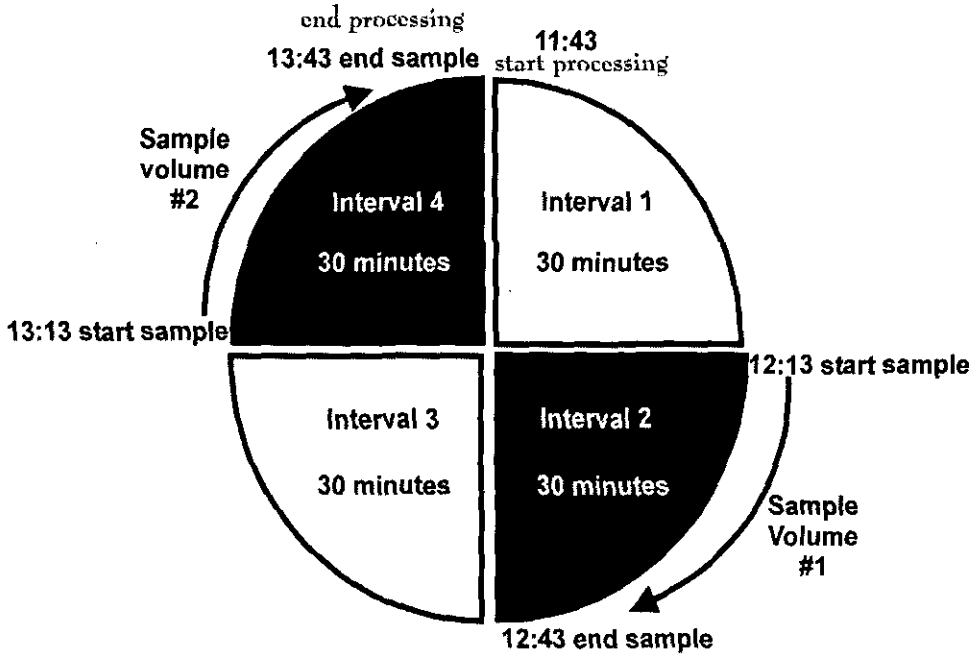


Figure 4-2: Spatial sampling (single bin)



Time intervals can also be used for selecting random basket or partial haul samples in a factory setting. Factory managers will usually have an idea of how many tons of fish their factory can run per hour. Use this as a guideline for how much time it will take for the bins to empty. Divide the total amount of running time into numbered units. Use the random number table found on page A-14. To pick time units in which to sample. Monitor the flow of fish for the entire time unit if you are partial haul sampling. If you are basket sampling, collect fish within these intervals, taking as many baskets as needed, so long as the number of baskets is consistent for all intervals. See Figure 4-3 for an example of a partial haul by using temporal units, and read Example 4-1 for an idea on how to use time units for basket samples.

Figure 4-3: Temporal frame

Your yellowfin sole vessel processes 7-8 tons per hour, and averages 30 ton bags. It takes you 20 minutes to sort through two baskets, and you need 10 baskets to collect 300.0 kg. Divide your time periods into half hour intervals. Using the Random Number Table, you pick intervals 5, 6, 9, 8, 9, 9, 6, 9, and 3. Disregard the "9" since it should only take them four hours to process, and therefore you should only have eight intervals. Collect two baskets of fish in each one of the selected intervals, 5, 6, 8, 6, and 3. Note that you will have four baskets in total from interval 6, and you will not sample all portions of the haul. If you do not have storage space in your sampling area for four baskets of fish, you may disregard duplicate interval numbers, and pick additional numbers from the table.

Example 4-1: *Temporal frame using basket samples*

Another way to use time intervals to sample is to set up a random systematic frame. Systematic sampling involves taking a sample during every defined time interval. In the example above, you could have set up a systematic sample frame by taking a basket every 10 minutes. To make a random systematic frame, you need to randomize your sampling start time. Use the random number table, numbered slips of paper, or some other method to choose the interval in which to sample. In the example above, if you picked the half hour interval number 5 in which to start your sampling, you would wait until two and half hours of processing time had passed prior to taking your basket samples. Once you started, you would collect a basket every 10 minutes until the end of the haul.

Implementing a Random Sample Frame on a Catcher Vessel

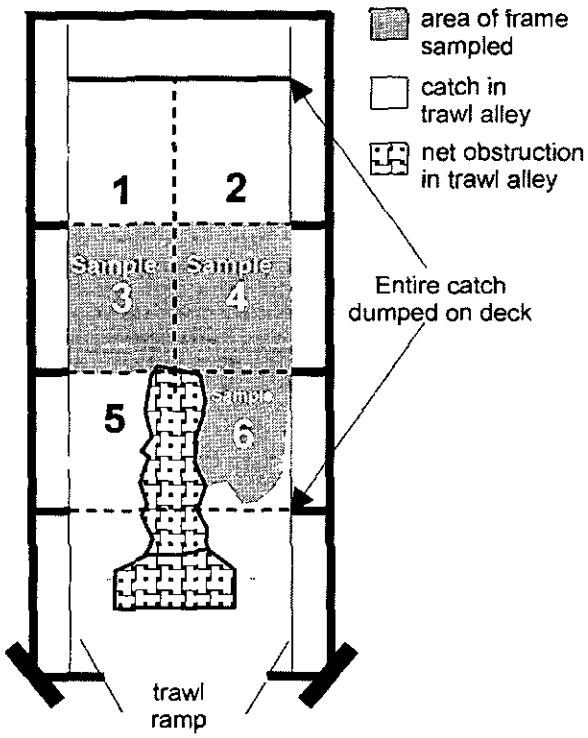


Figure 4-4: Spatial frame using trawl alley

Implementing a random sample frame on catcher vessels can be very challenging. Try the following methods, and document your results. If you determine that sampling using a random frame is not possible you must document your reasons, and give an explanation of the sampling methods used. Both temporal and spatial frames are possible on catcher boats depending on the target fishery. Spacial frames may work on vessels which dump their entire codend onto the trawl alley before sorting retained species into the RSW tanks. One way to implement a spatial random sample frame is to establish a "grid" pattern on the trawl alley. Mark out a grid pattern, if possible, or use reference marks, such as trawl alley boards, hatch, or scupper openings, et cetera. Number the grid section, and use the random number table (page A-14) to pick areas in which to sample. Either collect all fish from within the grid, or toss your basket into the prescribed grids and collect the fish which touch the baskets (see Figure 4-4).

Checker bins are numbered and the Observer uses a random number table to pick bin #1 and #5 to sample. Bin boards are lifted and fish flows in. All catch is weighed and counted as a basket sample.

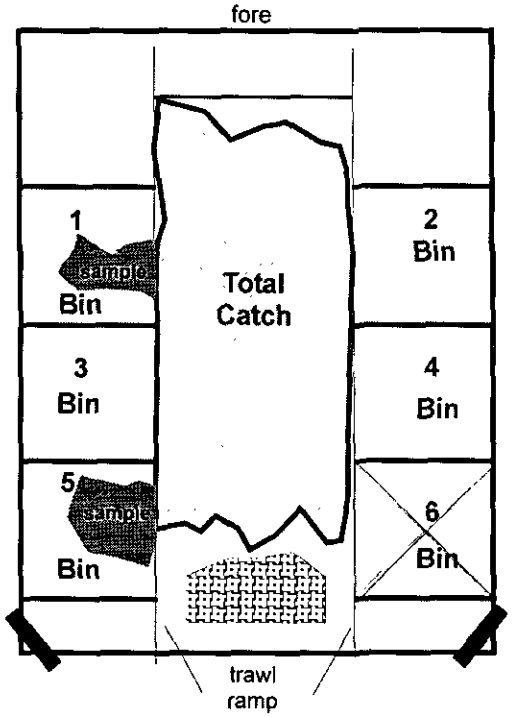


Figure 4-5: Spatial frame using checkerbins

Another possible spatial frame can be used if your vessel has several checker bins that are available for use. Number the checker bins, and use the random number table (page A-14) to pick which checker bin(s) to draw samples into. Lift the checker bin boards, and allow the fish to flow from the trawl alley into the bins. Collect your 300 kg. sample from all chosen bins (see Figure 4-5).

Bin not usable, Document as possible bias. Set up frame using remaining bins

Temporal frames can be used when the codend is dumped directly into the RSW tanks, and sampling requires you to divert the flow of fish directly from the codend into your baskets or other containers. Divide the dumping time into equal numbered intervals. Use the random number table, or other method, to choose during which time intervals to collect your samples. Try to collect samples from several intervals when possible. If your vessel dumps fish very rapidly, you may need to take the entire sample from one interval. If this is the case, make sure that interval is randomly selected! Document your methods and any possible biases in your logbook. Read Example 4-2 for a temporal frame scenario.

Your pollock catcher boat takes approximately 35 minutes to dump their bag into the RSW tanks. To create time intervals, you divide the entire dumping time into three intervals of 12 minutes. You need to collect ten baskets of fish for your sample, but have only enough storage space to keep five baskets of fish at one time. To work within these constraints you decide to sample two intervals and collect five baskets per selected interval. You choose your intervals using the random number table. The 12 minute interval gives you enough time to weigh and count a few baskets of fish in order to free up some storage space. Sometimes the fish is dumped in less than 35 minutes. When the last interval is randomly chosen, you sometimes can collect only two or three baskets of fish, so you document this in your logbook.

Example 4-2: Temporal frame aboard a catcher vessel

Another way to use time intervals to sample is by sampling systematically. Systematic sampling involves taking a sample during every defined time interval. In the example above, a systematic sample could have been taken by collecting a basket of fish every two minutes. You should randomize your sampling start time when using systematic sampling. Use the random number table, numbered slips of paper, or some other method to choose a start time. On this catcher boat you would not want to wait any longer than five minutes before you started sampling, or the fish would be gone before you could collect a sample. Therefore, you could break the first five minutes up into one minute intervals. For example, if you picked the one minute interval number 5 in which to start your sampling, you would wait until five minutes of the dumping time had passed prior to taking your basket samples. Once you started, you would collect a basket every two minutes until the end of the haul.

Processing Your Sample

Species Identification

All commercially important fish and prohibited species must be identified to species. Correct identification of these fish have priority over incidental species such as eelpouts and sculpins, where group codes are appropriate. To verify identification, every Observer is required to fill out species identification deck sheets for every new species encountered. First time Observers will be expected to have a form for every fish listed on their 3US data. A list of described fish will be kept for every Observer, so prior Observers will not be required to fill out forms for species they have seen before. **However, verbal descriptions of all species will be expected during debriefing, and failure to give accurate descriptions will result in a required fish exam prior to your next cruise!** Prior Observers will still be required to fill out a species description form for species which they have not described before.

Counting and Weighing

Once your sample has been taken, there are two ways to weigh the fish. Which one you use will depend on the fishery you are working in. In most fisheries, Observers find it easiest to sort their sample, and then count, weigh, and record each species separately. However, in very clean fisheries you may choose to weigh the unsorted fish and then sort the sample. If you weigh unsorted fish, you will need to weigh the bycatch, and subtract these weights from the total to obtain the weight of the predominant species.

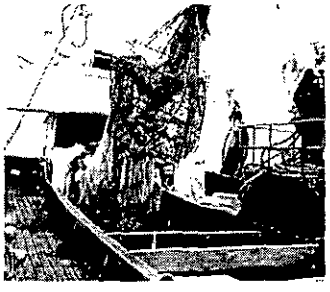
Organisms such as brittle stars and jellyfish are sometimes too numerous, or too broken, to count accurately. It is often easier to weigh them all and use their average weight to calculate their number. Use at least 50 whole individuals to calculate average weight. For basket samples, you must actually weigh all organisms. To calculate the number of organisms in your sample, weigh all organisms, and divide by the species average weight.

total weight of species ÷ average weight of species = number of organisms

Decomposed Fish and Miscellaneous Items

Decomposed fish, or fish waste, are those in an obvious state of decomposition, with a breakdown of muscle and skin. Decomposing fish must be distinguished from damaged, but fresh, fish. Damaged fish should be identified, weighed, and recorded along with other undamaged fish of the same species. Miscellaneous items are garbage, fishing gear, wood, and other debris which may have been caught in the net and appear in your sample. The true weight of decomposed fish and miscellaneous items must be recorded, but the number of these items is irrelevant. Always enter a "1" as the number of miscellaneous items (code 900), or decomposed fish (code 899), on your 3US.

Crab Pots



Trawlers occasionally will pick up a crab pot in the net. The incident is recorded on your 2US (see page 3-20). If the crab pot occurs in your sample, call it a miscellaneous item (code 900) and estimate the weight of it to record on your 3US. Do not count any crab that are in the crab pot in your sample. The crab were caught by the pot, and the pot was caught by the trawl. Note the incident in your logbook, with a description of the pot, any identifying numbers or tags, and an account of the contents.

Large Items

Occasionally a large item such as a boulder, crab pot, 55-gallon drum, or large shark will be caught by your trawler. You can handle these in one of two ways. Either option accomplishes the same thing; it prevents the weight of the object from being labeled as fish when the data is extrapolated.

- Include the weight of the large item in your OTC and include an estimated weight of the item on your 3US. If you are sure that you can sort out all of the large items, record the item as a whole haul sample, with the sample weight equal to the OTC. If you are not sure that you can sort out all of the items, record the item as a pre-sorted sample type "X," with the sample weight equal to the OTC.

- Do not include the weight of the item in either the OTC or on the 3US. If the "object" is a marine mammal, this is the option you should use.

Estimating Percent Retained

Percent retained needs to be estimated for each non-prohibited species. This is an estimation of the percentage of the round weight of a species retained. Round weight is the weight of the whole fish, prior to processing. The entire fish, therefore the entire round weight, is considered retained when more than 15% of its weight is turned into product. Percent retained should be an estimation, and your effort and time spent obtaining it should be minimal.

Percent retained, by species, is often difficult to estimate because discard can happen in a variety of places. Make your estimation based on what you see happening, on a haul by haul basis. Potential types of discard include fish falling off belts, dumping large portions of nets at sea, and size sorting fish. If the vessel dumps a portion of a net at sea, none of the species groups should be considered fully retained. For example, if 30 mt of an 80 mt net is dumped overboard, then 3/8ths all species would be discarded. Therefore, you should record no more than 5/8ths, or 63%, of any group as retained.

Catcher/Processors

In most cases, percent retained will be your visual estimation. Sometimes a catcher/processor will put up product, but later discard it to make room in their freezer for a more valuable product. This is called "high-grading," and it should be noted in your logbook. You do not have to change your earlier figures for percent retained.

Catcher Vessels

You should consider everything that is delivered to the processing plant retained, even if the processor later discards it, or gives it back to your vessel for discard. Anything that is discarded at sea prior to delivering the catch to the plant should be accounted for in your percent retained estimation.

Improved Retention/Improved Utilization (IR/IU)

Through industry initiative, the North Pacific Fisheries Management Council created a regulation which requires all vessels to retain, and utilize, Pacific cod and pollock. When the open access fisheries for these species are open, all vessels operating in all fisheries, must keep 100% of the pollock and cod they catch. Additionally, some product must be made of at least 15% of the whole weight. Once the fisheries for pollock and

Pacific cod close, vessels are required to keep the maximum retainable bycatch amount for these species. Your sample is not covered under the IR/IU regulations, so fish discarded as a result of you working up your sample (taking otoliths, sexing fish, or completing a stomach sample) do not need to be factored into percent retained.

Vessel personnel might challenge you on your percent retained estimations for IR/IU species. You should document your conversations when this happens. **Do not make any changes to your percent retained methodology because of the IR/IU regulations, or pressure from the vessel.** The fishing industry has been informed that your percent retained estimates are visual estimates only. If vessel personnel have questions about this regulation, you may refer them to the Alaska Regional Office at (907) 586-7228, or to the NMFS Enforcement Division at (907) 586-7225.

Sampling in Specific Situations

There are several situations on vessels that make it challenging for Observers to sample, or which have a sample type dictated by policy or regulation. The following brief paragraphs cover mixing of hauls on catcher/processors, how to sample and record data from deliveries to a shoreside plant for pollock catcher boats, and the specific sampling method restrictions for vessels participating in the Vessel Incentive Program (VIP).

Mixing of Hauls on Catcher/Processors

Mixing of hauls creates a sampling problem because it prevents haul specific data from being collected. If your vessel frequently mixes hauls, you should contact your ATLAS inseason advisor. You should try to collect unmixed samples whenever possible, and this may mean you will need to change your sampling scheme, possibly to collecting samples from the codend on deck. If you cannot collect unmixed samples, there are three alternatives:

- Speak to the captain and factory manager about keeping the hauls separate if at all possible. If several bins are emptied onto the conveyor belt you are sampling from, work with the factory manager to arrange for only one bin to be emptied at a time while you are sampling.

- If the fish are completely mixed before you start sampling, and you know in what proportions they are mixed, take a large sample from the combined hauls. The sample you take will really be a sample for two hauls, so the sample size should be twice the minimum, if possible. The sample data must be proportioned to the hauls and

the data entered as separate samples. Refer to "Proportioning Plant Data" on page 4-31 for directions on how to proportion sample data.

- If you are sampling a haul, and another haul is dumped on top of the sampled one, you should stop sampling, and attribute all species seen to the haul you started on. If you were basket sampling, your sample size will be the weight of the baskets you have collected so far. If you were partial or whole haul sampling, you will need to reduce your sample size to keep the hauls discreet. Remind the factory manager and the skipper that you must be notified before each haul back and before they add fish to a bin while you are sampling (see "(vi) Prior notification." on page 19-19).

Most importantly, you should keep detailed notes on when and why mixing of hauls occurs. In the Daily Notes section of your logbook, document each time this happens, how it affected your sample, and the steps you took to try to resolve the problem.

Sampling Policies for Pollock Catcher Vessels

Observers on catcher boats operating in the pollock fishery must basket sample at sea for target and non-prohibited bycatch. Additionally, they must whole haul sample the delivery at the processing plant for prohibited species. Some Bering Sea catcher boats have sorting belts below deck and do some sorting at sea, but the fish is usually run too deep and fast for an accurate whole haul sample. A more thorough sorting should be done at the plant for prohibited species. The only exception to this policy is for boats delivering to the floating processor Arctic Enterprise. The Arctic Enterprise has no main sorting area, and all sorting cannot be monitored by an Observer. Observers on catcher boats delivering to the Arctic Enterprise should basket sample at sea for all species.

Any sampling at a processing plant should be for prohibited species only. The NMFS will not accept proportioned species composition data for the target species and non prohibited bycatch collected at a plant.

Although whole haul sampling at the plant for prohibited species is required by the Observer Program, there will be circumstances which may prevent you from whole haul sampling for one or more prohibited species. Frequently, fish will be run across conveyor belts at high speed and in deep piles, and small fish such as herring may be missed. If you do not feel confident that all the herring in a delivery can be accounted for, you should use your basket sample as the sample for herring.

When basket sampling at sea you must ensure that the crew does not sort out any fish prior to your sample. Collect basket samples as previously described (see page 4-14). Make note of all prohibited species found in your basket samples. These fish should be included in your whole haul sample, but may need to be recorded as part of the basket sample if something prevents you from sampling at the plant.

Frequently, the crew will sort out obvious prohibited species and unwanted bycatch for discard at sea. You must identify, count, weigh, and measure all prohibited species discarded at sea. Record the sex of all salmon and crab species. These fish must be included in the whole haul sample, and the Official Total Catch calculation. If the quantity of prohibited species being discarded at sea prevents you from weighing them all, you may take a sub-sample of 50 individuals and apply an average weight to your total count.

Sampling at the Processing Plant

The first time your vessel delivers to the plant, meet with the plant Observer. The plant Observer will familiarize you with the processing operation, and should show you the following:

- the best location in the plant to sample for prohibited species
- the location to check for after-scale prohibited species
- where you can send catch messages to Seattle
- how to obtain reliable delivery data

If you expect your off-load to take longer than 5 hours, you should make arrangements to have the plant Observer give you a break in sampling. Remember, the entire off-load must be sampled, therefore you cannot leave the sorting area any time fish are running unless the plant Observer takes over! The plant Observer, or dock personnel, should be able to give you an idea of when your off-load will begin. This delivery schedule is tentative, and will change with little notice, so stay with your vessel until it off-loads to ensure you don't miss part of the delivery. If your vessel completes a delivery, and is going back out to sea before you are done sampling, you should arrange for the plant Observer to finish the sample for you. If the plant Observer is not available, you must stay with the catch until your sampling is completed. Assisting vessel Observers is a top priority of plant Observers, but ultimately you are responsible for sampling catch from your vessel. Stay with the delivery you need to sample and notify your contractor and NMFS staff that your vessel wants to leave before you are finished sampling. Do not leave the processing plant before you are finished sampling unless you can get the plant Observer to cover the remainder of the offload.

Proportion the weights and numbers of prohibited species found in the delivery to individual hauls based on catch weight estimations made at sea. Using your independent Observer estimate is preferred, but if you do not have Observer estimates for all tows, you should use the captain's estimate. If you find that your captain's estimates are terribly inaccurate, but you cannot make independent estimates, you may use band counts for proportioning plant data (see page 3-14).

For each haul, add your proportioned numbers and weights of prohibited species from the delivery with any prohibited species discarded at sea. On rare occasions, a vessel may dump each haul in a separate RSW tank and you may be able to attribute prohibited species found at the plant to specific tows. This can only be done if there is no mixing in the RSW tank and you can be sure of which tank the plant is pumping.

Even if you did not basket sample all hauls at sea, you still must sample the entire delivery for prohibited species. Proportion the prohibited species as usual and disregard the prohibited species data for hauls not sampled at sea. You cannot record prohibited species data without a species composition sample for all other species.

Proportioning Plant Data

1. Sample for prohibited species at the plant. Collect all prohibited species from the sorting belt. Record all biological data requested including species, length, and sex for salmon and crab groups and length and viability for Pacific halibut (see page 10-8). Take scale samples (see page 10-11) from salmon species as needed.

2. Proportion prohibited species found at the plant to the individual hauls using the at sea catch estimates. You can use your Observer estimates, the captain's estimate, or band counts to set up a ratio, but be consistent within each delivery. Remember to subtract the at sea discard from your independent or captain's haul estimates. The example below will use Observer estimates to proportion delivery information.

Haul 1: 83.65 mt
Haul 2: 69.63 mt*
Haul 3: 107.28 mt
Total: 260.56 mt

* Haul 2 had a significant amount of jellyfish discard, which you visually estimated at ~20 mt. Your Observer estimate was 89.63 mt, from which you subtracted 20 mt to get the number used for proportioning plant data.

3. Numbers of fish are proportioned and then assigned to hauls. To set up a proportion ratio, divide each haul catch estimate by the sum of all catch estimates and multiply by the number of fish for each prohibited species found. Round the proportion number of fish so that you only have whole fish in each haul. The sum of the rounded numbers should equal the number of fish actually found in the delivery.

$$\frac{(\text{estimated haul weight} - \text{discard}) \times \text{number of fish}}{\text{sum of estimated catch weights in delivery}} = \text{number of fish in individual haul}$$

Individual fish must have the same assigned haul number for all data taken, including length, viability, sex, or specimen sample numbers. Do not be concerned if your haul assignments create the appearance that all female salmon were from one haul, and all males were from another. The whole haul data from these hauls is not assumed to be site specific, rather it is known to be delivery specific.

4. Weights of fish are obtained by summing the individual weights of fish proportioned to each haul.

5. Enter prohibited species data on your 3US form. Remember you must add prohibited species that were discarded at sea to the totals found at the plant, and the data must be combined on your 3US. Since you whole haul sampled at the plant, any prohibited species from your basket sample must be added to the whole haul, and their weight removed from the basket sample weight.

6. On your 3US form, your sample weight for the whole haul sample at the plant will be equal to the Official Total Catch. Remember, this will be the proportioned delivery weight plus haul specific at sea discard and prohibited species, not your Observer Estimate! (See Option 1 on page 3-14.) You must add up the fish ticket yourself, and use your weights for prohibited species. The correct way to read a fish ticket is explained on page 8-5.

ADDITIONAL CALCULATIONS

VESSEL/PLANT NAME F/V North Star (Del #1 to Unisea G2)

Prohibs Found at Plant:

Species	Sex	length	Wt.	Haul Assig.
Chum	F	62	3.3	1
	M	63	3.2	1
	F	59	2.8	1
	F	75	6.2	1
	F	57	2.4	1
	M	55	2.3	2
	F	62	3.5	2
	F	66	4.2	2
	M	60	3.7	2
	M	63	3.7	3
	M	71	5.0	3
	F	53	2.2	3
	M	75	6.2	3
	F	66	3.9	3
Chum	F	57	2.6	3
King Sal.	M	58	2.8	1
King Sal	M	64	3.2	2
King Sal	F	53	2.5	3
Coho	M	51	2.2	1
	F	46	1.8	2
	F	42	1.6	3
Coho	F	53	2.5	3
Halibut	Dead	56	2.0	3
Herring	14 fish @	7.8kg		

Haul 1 : 83.65
Haul 2 : 69.63
Haul 3 : 107.28
Total 260.56 mt.

Proportioning:

Haul 1:

83.65/260.56 mt
- x 15 chum = 4.8 ~ 5 fish
- x 3 king = .96 ~ 1 fish
- x 4 coho = 1.28 ~ 1 fish
- x 1 halibut = .32 ~ ø fish
- x 14 herring = 4.49 ~ 4 fish

Haul 2:

69.63/260.56 mt
- x 15 chum = 4.0 ~ 4 fish
- x 3 king = 0.8 ~ 1 fish
- x 4 coho = 1.07 ~ 1 fish
- x 1 hal. = 0.27 ~ ø fish
- x 14 herring = 3.74 ~ 4 fish

*

Haul 3:

107.28/260.56 mt
- x 15 chum = 6.2 ~ 6 fish
- x 3 king = 1.2 ~ 1 fish
- x 4 coho = 1.6 ~ 2 fish
- x 1 hal = 0.41 ~ 1 fish
- x 14 herring = 5.76 ~ 6 fish

Herring ave. wt = 7.8/14 = 0.5571428

Haul 1 = 4 herring @ 2.23kg.
Haul 2 = 4 herring @ 2.23kg.
Haul 3 = 6 herring @ 3.34kg

* Note - 2 additional king salmon were discarded at sea:
1 F @ 68cm, 3.8kg
1 F @ 59cm, 3.0kg
are also on 3US, 7US and 9US (Sales taken!)

20

Figure 4-6: Prohibited species proportioning

Sampling Flatfish and Pacific Cod Fisheries

Sampling during flatfish and Pacific cod fisheries differs from pollock in that:

- the catch tends to be smaller,
- the catch is usually dumped on deck for sorting at sea,
- tows are more frequent,
- the catch composition is usually quite diverse, and
- the catch of prohibited species is usually higher.

Because of catch diversity, basket sampling is the most common sampling method used in these fisheries. In some cases, you may be able to increase your sample size, and partial or whole haul sample for prohibited species. This is preferred in these fisheries, but is not always possible. In the Bering Sea flatfish fisheries, you must basket sample for all species, even if it is possible to take larger samples. Vessels in these fisheries are involved in the Vessel Incentive Program, which mandates basket sampling for species composition.

Vessel Incentive Program (VIP)

The Vessel Incentive Program was designed to encourage trawl vessels with high bycatch rates of Pacific halibut and red king crab to change their fishing strategies to reduce their incidental catch of these species. The program establishes bycatch rate standards for all North Pacific groundfish trawl fisheries. Vessel operators that exceeded the bycatch standards for their target fisheries may be subject to penalties for not taking appropriate measures to reduce their individual bycatch rates.

A fishery may be closed to further fishing before the target species quota is reached because a prohibited species catch limit has been reached for that fishery. Some vessel operators will tow repeatedly where there are good catches of target species, regardless of whether the hauls have a high rate of prohibited species bycatch. When a fishery closes before the quota of target species is taken, the vessel skippers that took the time and effort to fish cleanly often have less fish than those with dirty hauls. The VIP encourages skippers to use fishing strategies to reduce their bycatch, such as more selective gear, or moving to another area.

Observer data is used to calculate the bycatch rates of halibut and red king crab by VIP target fishery. The NMFS regional office in Juneau posts the rates for all trawl vessels on the fisheries Bulletin Board Service. The rates are posted by means of a personal identification number (PIN) which is used to protect the identity of the vessel. Violations can be issued for each month that the standard was exceeded and penalties of monetary fines,

permit sanctions, or forfeiture of the vessel and its catch can be levied.

In order to provide statistically supportable data, a special rule was made for Observer sampling on vessels targeting Bering Sea flatfish. If your vessel is targeting yellowfin sole, rock sole, or flatfish other than arrowtooth flounder or Greenland turbot, you must basket sample for species composition of all species! In these fisheries, no whole or partial haul sampling is allowed for any species. When you are sampling, watch for pre-sorting of the catch and document thoroughly in your logbook any intimidation or hindrance of your sampling. Vessels operating in these fisheries have more incentive to pre-sort than in other fisheries. Lastly, you must use the Random Sample Table to determine which hauls to sample. The sampling record in your logbook must be complete, including your reasons for skipping any haul.

Do not calculate prohibited species bycatch rates for vessel personnel. The numbers the NMFS uses to manage VIP fisheries are not direct extrapolations from your data, and a vessel operator may not be held responsible for their fishing practices if you provided them with faulty information. The vessel operators may obtain the sample data necessary to calculate their bycatch rates from you, but vessels are responsible for monitoring their own activities. If the vessel personnel have questions about the VIP program, their bycatch rates, or how to calculate their own rates, do not advise them. Refer them to the Alaska Regional Office in Juneau at (907)586-7131.

Sampling Tools for the Wet Environment

There are two tools used to record species composition data while out on deck or in the factory, the blank plastic deck sheet and the ATLAS deck form. The blank deck sheet can be erased and reused, while the ATLAS deck form is a permanent hard copy of your original data.

The Plastic Deck Sheet

The plastic deck sheet is a thin white sheet of plastic 8" x 10" that can be written on with pencil, erased, and reused. You will be issued three when you check out gear. These sheets are used to record data on non-ATLAS vessels while out on deck or in the factory. Please do not use the ATLAS deck forms on non-ATLAS vessels! As long as you can transcribe the data onto the proper paper data forms it does not matter how you format the sheet. However, there are a few tips that can used when writing down data that will make transcribing it easier.

- Divide the sheet into sections. How many sections will depend on how much bycatch you are expecting and the size of your handwriting.
- Title each section with the haul number.
- Leave space to include bin measurements, codend measurements, trawl alley heights, partial haul measurements, et cetera.
- Write as large as you need to be able to read it, remember that you will be writing while wearing gloves.
- Write as dark as possible, with washing your writing will fade.
- Rinse off the plastic sheets often while you are sampling, if you write on top of scales and blood your writing will rinse away with them!

ATLAS Deck Form Instructions

The ATLAS deck from is a lightweight plastic form which replaces the current 3US form and plastic deck sheets. This form is to be used only on ATLAS vessels. Using the deck form allows you to keep the original data and enter it directly into the ATLAS system without having to copy it over to another form. They also serve as a backup in case of a computer crash, so it is important to fill out the forms completely and legibly. Maintain a separate set of forms for each vessel. List sample data from each haul on a separate side of the ATLAS form. An example of a completed deck form is found on page 4-38.

The following fields must be filled out completely:

- **Haul, Date, Page_ of_, Cr #, Vcode:** Enter the number of the haul sampled, and the date on which it was retrieved. The date of the sample should correspond to the information on the 2US form. Number the deck forms in consecutive order. Your cruise number and vessel code will be given to you during training or briefing, or by your contractor. The vessel code is not the same as the vessel permit number. Vessel codes are listed on page A-23, and are comprised of an "A" followed by three numbers.
- **Partial haul sample weight in kg.:** This field only needs to be filled out if you partial haul sampled. Enter the amount of catch sorted through, in kilograms, which yielded your sample.

- **Field:** The sample type you used for each prohibited species group must be checked. Check "W" if you whole haul sampled, "P" if you partial haul sampled and "S" if you basket sampled.

- **Species:** List each species encountered by their common name. Enter the number of each species in the "#" column, and their corresponding weight in the "Weight" column. Use as many lines and columns as necessary for each species.

- **Sex:** Tanner crab, king crab, and salmon should be listed separately by species and sex. Record a "M" or "F" for these species when sex is determined.

- **% Ret.:** Enter your rough estimate of the percentage of each non-prohibited species kept. Retention applies to organisms kept for any reason, including consumption on the vessel, processing, delivery, or for a home pack.

- **Sample type (ST):** Indicate the sample method used for each species listed. Use a "S" for basket (actually weighed) sample, a "W" for whole haul samples, a "P" for partial haul samples, and an "X" to indicate a pre-sorted organism.

- **Halibut Length/Viability:** Use this space for recording actual lengths and viability of halibut. You may also use this space to write in salmon and crab lengths/measurements and sex.

- **Other Data:** This space, and the blank box at the top of the page, are for your use. Record notes such as average weight calculations, codend/bin measurements, weights used for density, and mammal or seabird interactions or sightings.

Haul # 116 | Total sp. wt: 441.0 kg | Page 112 of 221
Date 09-08-99 | Total sp. no: 363 | Cr # 6068 Vcode A069

Partial haul sample weight in kg.: 20919.68 kg

Check Type: W P S L1 L2
Halibut ☐ ☑ ☐ ☐ ☐
Salmon ☐ ☑ ☐ ☐ ☐
King crab ☐ ☑ ☐ ☐ ☐
Tanner crab ☐ ☑ ☐ ☐ ☐
Herring ☐ ☐ ☑ ☐ ☐

Number of hooks/pots in sample.
Sample L1
Sample L2

Species	Sex	#	Weight	#	Weight	#	Weight	% Ret.	ST
Pollock		39	23.7	54	43.6	56	39.8	100	S
Pollock		51	38.6	53	37.0	43	26.2	100	S
Herring		6	2.15	2	1.05				S
Pac. Cod		3	15.6					100	P
Arrow		9	8.5					0	
N. Rocksole		2	0.95						
Yellowfin		2	1.5						
Jelly		26	12.5					0	
Squid		3	0.65	(all retained for consumption on boat.)				100	
Poacher		1	0.2					0	
Sandfish		1	0.4						
Sculpin		5	4.8					0	P
Pac. Sleeper		1	160.0	(estimated)				0	X

Halibut Length/Viability

Too many herring... took subsample for 2 predom. species.

For salmon retention. 3 kings outside sample.

Other data: codend and bin dimensions, marine mammals, birds, violations, etc.
Bin readings for OTC: STB: F: 130, A: 125, M: 145
Port: F: 125, A: 115, M: 125
Total volume for ullage: 96.89 m³ x 0.98 mT/m³ = 94.95 mT.

Random sample frame - flipped 2 coins for which bin, which half: sampled 1st half of port tank for partial haul. Partial from F: 125, A: 115, M: 125 TO F: 65, A: 60, M: 65.

Figure 4-7: Atlas Deck Form

FORM 3US – SPECIES COMPOSITION

Page 10 of _____

Species:	Yellowfin	YFS # = 253.4 kg ÷ ave wt. = 899.5 ≈ 900 fish	
Wt. of above:	86.2		
No. weighed:	306	Subsampled for opilio sexes and lengths	
Avg. weight:	0.2816993	Subsampled for rocksole northerns / southerns	

Cruise	Vessel Code	Year	Month	Day	Haul
6013	A220	99	09	03	16

ST = Sample Type
B = basket L = Longline
P = partial haul T = Trap/pot
W = whole haul

Page 3 of 6 for transmission

Species Name	Sex	Species code	ST	Number	Species weight in kg. w/ decimal	Quantity sampled (hooks, pots, or kilograms)	% retained
(keypunch check)	X	4021	+	1273	383.14	X	600
Salmon, unid.		220	B	0	0	357.76	
King Crab, unid.		2		0	0		
Halibut		101		2	3.4		
Bairdi Tanner	m	4		1	.3		
Opilio Tanner		5		46	10.6		
Opilio Tanner	m	5		17	4.6		
Opilio Tanner	F	5		3	.8		
Herring		611		0	0		
Yellowfin Sole		140		900	253.4		100
Flathead Sole		103		15	13.3		100
Pacific Cod		202		6	8.6		100
Pollock		201		33	28.95		100
Northern Rock Sole		120		23	4.7		100
Rock Sole, unid.		104		62	11.65		100
Sculpin		400		3	2.0		0
Poacher		450		3	.5		
Arrowtooth fl.		141		4	5.8		
Lyre Crab unid.		840		1	.01		
Alaska Plaice		106	B	4	2.4	357.76	0

Species:	3 halibut presented on deck by crewmember who "didn't know it was
Wt. of above:	sampling" Estimated lengths = 95cm, 95cm, 70cm. Length to weight table
No. weighed:	conv. to 10.7 kg, 10.7 kg and 3.98 kg = 25.38 kg total.
Avg. weight:	See logbook pg. 47 for details. "X" quantity sampled = OTC by codend est.

Cruise	Vessel Code	Year	Month	Day	Haul
6013	A220	99	09	03	16

ST = Sample Type
B = basket L = Longline
P = partial haul T = Trap/pot
W = whole haul

Species Name	Sex	Species code	ST	Number	Species weight in kg. w/ decimal	Quantity sampled (hooks, pots, or kilograms)	% retained
(keypunch check)	X		+			X	
Snail		35	B	6	.1	357.76	0
Starfish, unid.		20		136	6.2		
Skate		90		1	.4		
Hermit Crab		15	B	4	.05	357.76	0
Halibut		101	X	3	25.38	8876.32	

Figure 4-8: 3US Form - Species Composition (Haul 16)

FORM 3US -- SPECIES COMPOSITION Page 21 of ____

Species:	whole haul and OTC by bin volume
Wt. of above:	basket sampled for the predominant species
No. weighed:	
Avg. weight:	

Cruise	Vessel Code	Year	Month	Day	Haul
6011	A110	99	03	09	56

ST = Sample Type: B = basket, L = Longline, P = partial haul, T = Trapipot, W = whole haul

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Species Name	Sex	Species code	ST	Number	Species weight in kg. w/ decimal	Quantity sampled (hooks, pots, or kilograms)	% retained
(keypunch check)	X	2360	+	345	249.75	X	200
Pacific Halibut		101	W	0	0	47896.93	
King Crab, unid.		2		0	0		
Tanner Crab, unid.		3		0	0		
Pacific Herring		611		0	0		
King Salmon	M	222		1	2.6		
Chum Salmon	F	221		1	3.2		
Chum Salmon	M	221		1	1.75		
Pacific Cod		202		17	27.8		100
Sculpin		400		4	2.6		0
Arrowtooth fl.		141	W	2	1.4	47896.93	0
Jellyfish		35	B	14	9.6	210.4	0
Pollock		201	B	305	200.8	210.4	100

Species:	Northerns
Wt. of above:	31.3
No. weighed:	52
Avg. weight:	0.6019228

Northern Wt = 172 x ave wt = 103.53 kg. Switched to Atka Mackerel

Partial haul by bin volume, tallied Northerns after enough for average weight collected.

Cruise	Vessel Code	Year	Month	Day	Haul
6011	A110	99	03	11	57

ST = Sample Type: B = basket, L = Longline, P = partial haul, T = Trapipot, W = whole haul

Species Name	Sex	Species code	ST	Number	Species weight in kg. w/ decimal	Quantity sampled (hooks, pots, or kilograms)	% retained
(keypunch check)	X	2917	+	370	247.18	X	490
Pacific Halibut		101	P	1	4.1	10436.82	
King Crab, unid.		2		0	0		
Tanner Crab, unid.		3		0	0		
Pacific Herring		611		0	0		
Salmon, unid.		220		0	0		
Pacific Cod		202		8	36.8		100
Sculpin		400		14	2.4		0
P.O.P.		301		23	9.0		100
Northern R.F.		303		172	103.53		90
Rougail		240		2	.15		0
Dusky Rockfish		330	P	3	1.7	10436.82	100
Atka Mackerel		204	B	147	89.5	89.5	100

Figure 4-9: 3US Form - Species Composition (Haul 56 and 57)

Form 3US - Species Composition Instructions

Record the species composition data for each sampled haul on these forms. Two hauls of species composition data will usually fit on each 3US page. Maintain a separate set of forms for each vessel you are assigned to.

- **Cruise number, Vessel code, Year, Month, Day and Haul:** Your cruise number and vessel code will be given to your during training or briefing, or by your contractor. The vessel code is not the same as the vessel permit number. Vessel codes are listed on page A-23 and are comprised of an "A" followed by three numbers. In the year box, enter the last two digits of the year. In the month and day boxes, enter the date the sample haul was retrieved, with leading zeros if necessary. The date of the sample should correspond to the information on the 2US form! In the haul box, enter the number of the haul sampled.

  You must group your species composition samples together by size, and skip a line between each sample type (see Figure 4-9). List samples in order of size, with the largest sample size first.

  List the prohibited species first. You must indicate how much catch was monitored for each of the five prohibited species groups by listing them on each form, even if no individuals were seen. When no individuals of a prohibited species group are seen, list the group name, species code, sample type, sample weight, and 0 for both the species number and weight (see Figure 4-8).

- **Species name:** List each species encountered by their common name.

- **Sex:** Tanner crab, king crab, and salmon should be listed separately by species and by sex. Record an "M" or "F" for these species when sex was determined. Leave the column blank when sex was not determined. Do not put "U" for unidentified sex. Do not put halibut condition codes in this column. Do not sex halibut or herring. Do not enter data by sex for any other species.

- **Species code:** Enter the species, or group, code for each species listed. A list of codes is given on page A-1. Enter the code that corresponds to the most specific identification that could positively be made.

- **Sample type (ST):** Indicate sample method used for each species listed. Use a "B" for basket (actually weighed) samples, a "W" for whole haul samples, a "P" for partial haul samples and an "X" to

indicate a pre-sorted organism. Individuals with an "X" sample type listed must have a sample weight equal to the Official Total Catch.

- **Number:** Enter the number of each species listed. If you calculated an average number using a known weight, or proportioned prohibited species number from a whole haul sample at the plant, enter the rounded whole number of individuals. You must enter the number of decomposed fish (code 899) and miscellaneous items (code 900) as a "1." The NMFS does not need an average weight for these items, therefore true total numbers are not needed.

- **Species weight in kg. w/ decimal:** Enter the weight of each species. Weights must be written with a well defined decimal and be recorded to the nearest tenth or hundredth. If you feel that your scale could not be read accurately to the tenth, you must fill in at least a trailing zero. Do not enter any weight to more than two decimal places. If an species in your sample was too small to weigh, such as one brittle star, enter the weight as 0.01 kg. When estimated weights are entered on the 3US, an explanation should be written at the top of the form (see Figure 4-8).

- **Quantity sampled**: Enter the amount of catch sorted through, in kilograms with a decimal, which yielded your sample. If you whole haul sampled for a listed species, its sample weight, when rounded, must equal the Official Total Catch. If you basket sampled for listed species, the summed species weights must equal the sample weight.

- **Percent retained:** Enter your rough estimate of the percentage of round weight (weight of the whole fish) of each species kept. Retention applies to organisms kept for any reason such as: consumption on the vessel, processing, delivery, or for a home pack. If the vessel made any product from more than 15% of the fish, the whole fish is considered retained. For prohibited species groups, this column must be left blank. For all other species listed, a whole number entry must be made. Refer to page 4-27 for instructions on how to estimate percent retained.

- **Keypunch check:** You must sum the values in the species code, number, species weight, and percent retained columns and enter them on this line. If your species composition data requires both sections on the 3US page, enter the total sums on the keypunch line in the first section, and leave the keypunch line in the second section blank (see Figure 4-8). Double check your summaries!

- **Worksheet fields:** Record raw data such as average weight samples, numbers and weights of pre-sorted fish, estimated weights and other notes in the worksheet fields at the top of the form. Make note of anything unusual about the catch or your sampling technique for this haul. Complete descriptions of these notes should be documented in your logbook. Making note of unusual occurrences on your 3US will assist in the debriefing process, and help you distinguish one haul from others.

MOTHERSHIP DATA COLLECTION

List of Priorities

- Obtain independent catch estimates by bin, codend, or flow scale readout.
- Collect haul information for delivering catcher boats.
- Send daily catch messages.
- Sample for species composition.
- Collect length frequency data for:
  - prohibited species found within your sample
  - target species per sampled haul.
- Complete assigned standard and special projects.

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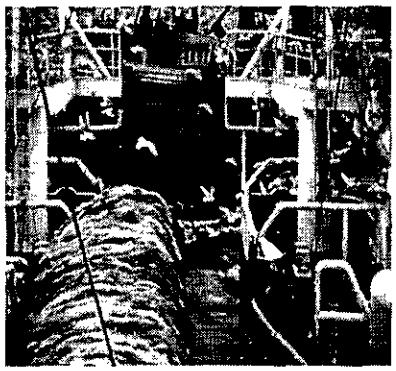
Introduction



A mothership is a factory vessel which routinely takes unsorted catch from other vessels. Unsorted catch is usually delivered by codend transfer. Some catcher/processors will act as motherships, taking catch from smaller delivering catcher boats, while at the same time fishing for themselves. Three vessels always act as exclusive motherships: the Ocean Phoenix, the Golden Alaska and the Excellence. These boats do not have the capability to fish for themselves. The Golden Alaska and the Excellence occasionally receive pumped fish, but the majority of their deliveries are from codend transfer.

If the vessel you are assigned to is routinely pumping fish from delivering catcher boats, then the boat is considered a floating processor, or a "floater." The Northern Victor, the Arctic Enterprise and the Yardarm Knot are floating processors. The fish delivered to these vessels have the potential to be sorted at sea, and the vessel acts the same as a shoreside plant. Follow the directions in "SHORESIDE PLANTS AND FLOATING PROCESSORS," on page 8-1 if your vessel is acting as a floater. If your vessel meets the description of a floater, but is not listed as one, contact the NMFS for information on how to report delivered catch.

Observers on Catcher Boats Delivering to Motherships

It is unusual for catcher boats delivering to a mothership to carry an Observer. However, fishing is unpredictable, and you may find yourself aboard a catcher boat delivering a few hauls to a mothership before delivering landed catch to a shoreside plant. If you are on a catcher boat which is delivering to a mothership, your duties will change depending on how the fish is being delivered.

If the haul is being delivered as a codend, the mothership Observer is completely responsible for the recording and sampling of this haul. Do not record this haul on your 2US form. It will be accounted for by the mothership Observer. Your only duties are to obtain catch information (2US data) for the mothership Observer and monitor the haul back for any marine mammal interactions. If the skipper usually gives haul information to the mothership, you must verify that all the data the mothership Observer will need was given.

If your vessel is landing hauls, dumping them into their RSW tanks, and then pumping the fish to a mothership, you should treat these hauls as if they were being delivered to a shoreside processor. Obtain an Observer estimate and sample for species composition. Collect length frequency and age data from sampled hauls. All data you collect will go on your forms, and you will still need to give the mothership Observer the 2US information for their records.

Catch Information (Form 2US)

As an Observer on a mothership, your most important duty is gathering catch information. This will often take longer than on catcher/processors, and involves a lot more coordination and cooperation with the vessel personnel. Refer to "Form 2US - Haul Form for U.S. Trawlers Instructions" on page 3-19 for rules and instructions on how to fill out a 2US form. The particulars that are specific to motherships are listed and explained below.

Keep only one set of 2US forms. List self-made tows and deliveries together, in the order which they occurred. Most motherships will have a radio schedule, when they will gather the fishing data from the catcher boats. This is usually done by the captain, mate, purser, or in rare cases, the Observer. If a crew member is getting haul data for you, make sure that they are gathering complete and accurate data from the catcher boats. You should use the delivery schedule to match up specific hauls to a catcher boat. Most motherships will follow a catcher boat delivery order, but these are subject to change frequently, and are not reliable. Some Observers create a "worksheet" for the person doing the radio schedule, although most vessels will already have one. Below is an example of an Observer Radio Schedule worksheet.

Please let me know if there are any gear problems or marine mammal interactions reported by the catcher boats.

Haul/Del. Number	Date	Vessel Name	Retrieval Latitude	Retrieval Longitude	Nets on Bottom Time	Nets off Bottom Time	Fishing Depth	Bottom Depth	Trawl Speed	Catch Estimate
40	1/25	Ald.	54°33'	165°17'	1350	1815	102 F	111 F	3.5	25.3
41	1/25	Whis.	54°38'	165°52'	2100	2240	88 F	112 F	4.0	72.9
42	1/25	M.D.	54°37'	165°39'	2215	0025	65F	92F	3.5	36.9
43	1/25	A.D.	55°29'	164°48'	1650	2030	68F	85F	3.5	39.5

Figure 5-1: Observer radio schedule worksheet

Haul Order

The retrieval time always determines the date of the catch. This is not necessarily the same day it was delivered to the mothership. There are two options on how to number hauls, both of which are correct, as long as the catch is attributed to the right date according to retrieval time. Pick a method and stick with it.

Option 1: Use the order of delivery. Your retrieval times will be out of sequence, but most of your haul numbers will correspond to the vessel's delivery numbers. This is the easiest method, and is used most frequently.

Option 2: Reorder the deliveries by retrieval time before entering them on your 2US. Your haul numbers will not match the delivery numbers in the ship's logbook, but your retrieval times will be ordered. Usually this method is only used on a c/p-motherships receiving very few hauls.

Note that Delivery 42 in the worksheet example (Figure 5-1) has been renumbered as Haul 43 in the 2US example (Figure 5-3). Hauls 42 and 43 are out of sequence because Haul 42 was actually hauled back the day before it was delivered. You will often need to re-order and re-number the deliveries around 0000 hours. It is very important that the correct date and

haul number get recorded on the corresponding 3US, 7US and 9US forms. Note the reason why you deviated from the vessel delivery number in your logbook, or in the margin of your 2US.

Vessel Type

On a c/p acting as a mothership the "vessel type" code and the ADF&G column distinguish which hauls were self made and which were deliveries. Use a vessel type "1" for self made tows, and leave the ADF&G column blank. Use a vessel type "2" for codend deliveries. If your mothership pumps fish from the hold of another vessel, enter a vessel type "4", indicating potentially sorted catch. For all deliveries, enter the catcher boat's ADF&G number in the appropriate column (see Figure 5-3). At the top of the 2US, list the vessel names and corresponding ADF&G number for all catcher boats delivering to your ship. One list per data set is sufficient; you do not need a list on each page.

Codend Delivery Rules

1) Date: Enter the date on which the codend was retrieved.
2) Vessel type: Enter a "2" to indicate that the vessel received **unsorted** catch.
3) Location Code: Enter an "R" and the corresponding Latitude and Longitude of the catcher boat's retrieval position.
4) Fishing Time, Depths and Speed: You must get these data from the catcher vessel.
5) Vessel Estimate: Enter the catch estimate made by mothership personnel.
6) Catcher boat's ADF&G#: Enter the ADF&G number for the catcher boat which made this delivery.

Pumped Fish Delivery Rules

1) Date: Enter the date on which the delivery was received.
2) Vessel Type: Enter a "4" to indicate that the vessel received **potentially sorted** catch.
3) Location Code: Enter a "D" and the corresponding Latitude and Longitude of the mothership at the time of the delivery.
4) Fishing Time, Depths and Speed: Leave these columns blank.
5) Vessel Estimate: Enter the weight of the entire delivery to the mothership.
6) Catcher boat's ADF&G#: Enter the ADF&G number for the catcher boat which made this delivery.

Figure 5-2: List of rules for completing 2US form on a mothership

Cruise Number	Vessel code	Year
6015	A316	99

Full name of catcher boat	ADF&G #
Vangaurd	39946
Aldebaran	48215
Misty Dawn	68858
Doña Liliana	55199
Amber Dawn	00028

FORM 2US - HAUL FORM FOR TRAWL VESSELS

Page 8 of _____ for vessel

Observer name Chris P. Observer

Vessel name Whistler

Page _____ of _____ for transmission

Plant/Processor name	Location	Processor permit #

999
ORC

Date		Haul #	Monitored for MMR? (Y/N)	Gear type	Gear performance	Vessel type	Location code	Haul or delivery position		Fishing times in ALT		Average fishing depth	Average bottom depth	M or F	Avg. speed	Official Total Catch in metric tons	Observer's Total Catch Estimate in metric tons	B, C, or W	Density in mt/m²	Vessel's Total Catch Estimate in metric tons	Catcherboat's ADF&G #	Processor permit	IFQ? Y or N	CDQ #	Delivery #
Month	Day							Latitude (N)	E or W	Longitude (100)	Net starts fishing	Net stops fishing													
01	24	32	N	2	1	2	R	5419	W	6555	0320	0605	91	106	M	3.2	29.63	29.63	B	.98	28.00	39946		N	
		33	N			2		5433		6534	0620	0815	87	113		3.5	36.90	.		.	36.90	68858			
		34	Y			2		5511		6423	0915	1045	75	103		3.5	36.96	36.96	B	.98	34.70	00028			
		35	Y			1		5543		6415	0930	1215	73	106		4.0	91.38	91.38		.	86.20				
		36	Y			2		5439		6411	1107	1155	80	110		4.0	33.72	33.72		.	32.60	55199			
		37	Y					5643		6423	1510	1640	70	90		3.2	36.59	36.59	B	.98	36.00	39946			
		38	N					5546		6553	1230	1430	56	90		3.5	37.60	.		.	37.60	68858			
		39	Y					5411		6535	1500	1705	125	144		3.5	37.55	37.55	B	.98	39.50	00028			
		40	Y			2		5433		6517	1350	1815	102	111		3.5	29.13	29.13	B	.98	25.30	48215			
		41	Y			1		5438		6552	2100	2240	88	112		4.0	75.46	75.46	B	.98	72.90				
* 01	24	42	N	2	1	2	R	5529	W	6448	1650	2030	68	85	M	3.5	39.50	.		.	39.50	00028		N	
								.		.	.	.	.	.		.	.	.		.	.				
* 01	25	43	N	2	1	2	R	5437	W	6539	2215	0025	65	92	M	3.5	36.90	.		.	36.90	68858		N	
		44	Y			2		5430		6542	1945	0335	61	95		3.5	38.30	38.30	B	.98	37.50	48215			
		45	Y			1		5502		6533	0530	0945	80	91		3.5	38.96	38.96	B	.98	34.50				
		46	Y			2	R	5433		6423	0700	0900	75	89	M	4.0	32.15	32.15	B	.98	24.90	55199			
01	25	47	N	2	1	4	D	5413	W	6635						.	163.00	.		.	163.00	39946		N	
								.		.	.	.	.	.		.	.	.		.	.				
01	26	0					N	5353	W	6631	Offloading at City Dock Dutch Harbor									.	.				
								.		.	.	.	.	.		.	.	.		.	.				

National Marine Fisheries Service - North Pacific Groundfish Observer Program

* Haul 43 is vessel # 42. Haul 42 is vessel #43.

Revised - 1/1/99

Figure 5-3: Form 2US - Haul Form for Trawlers (mothership)

Monitoring for Marine Mammals

On a mothership, it is not possible to watch the true haul back of the delivered codend for marine mammal interaction, since this is done on the catcher boat. However, it is possible to monitor dumping the codend. This should be done on as many randomly selected catches as possible to monitor for marine mammal catch. If you monitor the entire dumping of the haul, record this haul as monitored for marine mammals. If there is an Observer aboard the delivering catcher vessel, contact him/her to determine if there were any marine mammal encounters during the haul back. If your vessel, or the catcher boats, report marine mammals nearby or possibly interacting with gear during haul back or delivery, this should be noted in your logbook.

Observer Estimates

Refer to "Observer Estimates of Total Catch Weight" on page 3-5 for methods to obtain independent catch estimates. Most motherships have readable fish bins, but not all are "certified'. Check certified bin markings yourself and/or measure the uncertified bins if you are planning to use them to make catch estimates.

Codend Delivery Duties

Treat these deliveries as if your vessel caught the fish. Standard catcher/processor prioritized duties should be followed for each haul. These are:

- obtain an independent Observer estimate
- sampling for species composition and density (if applicable)
- collecting length frequency samples for each sampled haul
- completing your standard and special projects

Refer to the individual manual section regarding each one of these duties.

Pumped Fish Delivery Duties

These fish have the potential to be sorted at sea, so they are treated differently than those delivered by codend transfer. Obtain an Observer estimate, if possible. If the delivery is made up of several hauls, it may be too large to be pumped into a bin at once, or may be pumped into unmarked tanks. In these cases, use the skipper's estimate for the OTC. Note any difficulties you had obtaining independent estimates in your logbook. Do not sample these hauls for species composition or length frequency. If your

vessel takes nothing but pumped fish, contact a NMFS office for recording and sampling duties.

Random Sample and Break Table Use

If you are the only Observer on a catcher/processor which is taking outside deliveries, use the Random Sample Table (page 2-9) if you cannot sample all of the hauls. If there are several deliveries being made each day, you will need to use the Random Break Table (page 2-10).

If you are the only Observer aboard a mothership you will likely need to use both the Random Sample Table (RST) and Random Break Table (RBT). If you find that you cannot get enough rest and complete your Observer duties while using the RST and RBT, you may modify the RBT to take eight hour breaks. Use the RBT as instructed on page 2-10, but lengthen your break to eight hours, rather than the usual six. If you need to use a modified RBT, you must notify your Inseason Advisor through the ATLAS e-mail system and document your reasons in your logbook.

The NMFS prefers that all exclusive motherships carry two Observers, and during the pollock "B" season this is mandatory. The two Observers work twelve hour shifts, and are usually able to sample all of the hauls. In some cases, such as on the Ocean Phoenix, even two Observers cannot keep up with all of the hauls. In these cases, both Observers should follow the "lead" Observer's RST while on shift. Each Observer is responsible for all "on" hauls brought aboard during his/her shift.

Working with Two Observers

During the pollock "B" season, motherships are required to carry two Observers, and some motherships voluntarily carry two Observers all the time. This presents Observers with the unique opportunity to work together. A "lead" Observer will be assigned by your contractor. The other Observer is referred to as the "second." Although the lead Observer is not in a supervisory position, their role is slightly different than that of the second. This applies only to non CDQ fisheries. In all cases, each Observer is to initial each of their own data forms (3us, Atlas etc..) that they complete.

Lead Observer's Role

As the lead Observer in non CDQ fisheries, you are responsible for the entire data set. Therefore, all data must be recorded under your cruise number, regardless of who actually collected it. If your vessel is equipped

with ATLAS, all data entry and text messages should be entered and sent under your cruise number. As the lead, you are responsible for ensuring that catch messages are sent to the NMFS on time.

You and the second Observer can maintain separate daily notes in your own logbooks. However, all calculations must be recorded in your logbook.

As the lead, your role in debriefing is more involved than that of the second. You are responsible for carrying the entire data set through debriefing. You are also responsible for making all necessary corrections to the data set, so it is in your best interest to double check all paperwork according to the instructions given in the debriefing section (see "At Sea Preparation" on page 20-4).

Second Observer's Role

As the second Observer, you must record all the data you collect under the lead Observer's cruise number. The only data that you will collect under your own cruise number are your fish ID forms and your daily notes. Often, both Observers will not debrief at the same time, so you should keep very detailed daily notes in your own logbook regarding how you sampled and any problems you encountered. This will help reconstruct your time aboard the vessel during your debriefing interview. Record all calculations in the lead Observer's logbook.

When you collect salmon scales, these should be recorded under the lead Observer's cruise number and kept in numerical order with scales he/she collects. It is a good idea to write your initials on the back of the envelope, so that verification of identification can be done for scales collected by both Observers.

Your debriefing should be fairly short for this vessel. You will still need to complete a computerized vessel survey, and a short interview.

Shared Duties

While aboard the vessel, each Observer is responsible for the complete sampling, and correct recording, of all the hauls landed during their 12-hour shift. Both Observers should share the responsibility of collecting 2US data and entering data into ATLAS. You should maintain communication between yourselves so that the other Observer is fully informed of decisions you have made and how the work is going. Typically, Observers will see very little of one another when they are

working opposite shifts, but you each should have an idea of how the other one is collecting the data.

Length Frequency and Otolith Sampling

Mothership Observers take lengths following the same protocol as other Observers (refer to "FISH MEASUREMENT AND OTOLITH COLLECTION," page 9-1). However, if you are the only Observer aboard the mothership, you may need to reduce the number of lengths taken. If you cannot keep up with all your duties when following the RST and RBT, reduce the collection by taking target sexed length frequencies on every other sampled haul. Observers on motherships carrying two Observers should be able to collect lengths from all sampled sets, and otoliths from predetermined sets.

LONGLINER DATA COLLECTION

List of Priorities

- Collect marine mammal and endangered sea bird specimens, and document mortalities.
- Record the vessels total fishing effort for every gear retrieval.
- Sample for species composition and the Official Total Catch (OTC) estimates.
- Send catch messages.
- Document any compliance concerns.
- Collect lengths and determine viabilities of prohibited species.
- Collect sexed lengths and otoliths of the target species.
- Record calculations and daily logbook notes.
- Complete standard projects.
- Record endangered sea bird and marine mammal sightings.

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Introduction

Almost one third of all Observer days at sea are served upon longline vessels, and in 1997, Observers spent 5958 days aboard longline vessels. The primary target fisheries for longline vessels are Pacific cod, sablefish (also called blackcod,) halibut, and Greenland turbot. Vessels will also retain incidentally caught species such as skates, rockfish, grenadiers, and flatfish. The fish species that longliners retain depend on the prices they receive from foreign markets.

Longline fishing is labor intensive. It may take a dozen or more crew members to retrieve and repair the gear, and process fish during a given haul. Hauling the gear involves gaffing individual fish and bringing them aboard the vessel. Maintaining the gear involves crew members checking each hook and gangion and inspecting the groundline to repair and replace any of the damaged gear

Your work on a longline vessel consists of counting and weighing fish. Essentially you will count and identify hundreds of fish in a haul. Then you will weigh groups of fish to determine average weights of each species. These numbers and weights will allow you to record species composition, and extrapolate to the Official Total Catch.

During gear retrieval you will be measuring numbers of the target species and determining their gender. On certain numbers of target species you will also collect age structures such as otoliths and scales, and record related biological data. You will be conducting halibut viability assessments and completing special projects. The very nature of longline gear attracts whales, sea lions and sea birds, so a portion of your time on deck will be spent watching and documenting these interactions. When you have completed your data collection on deck, you will enter data into computers, or transfer data to paper forms, depending on the vessel.

Terminology

Set - Entire length of groundline from the first hook to the last hook. This can also be referred to as a string of gear. Referred to as haul during and after retrieval.

Magazine - (Mag) A unit or a section of gear within a set, often containing as many as ten thousand hooks. The length of this section of gear is dictated by the length of the mag rack on which the hooks and groundline are hung.

Magazine rack - (Mag rack or Rails) A piece of equipment into which hooks are slid. The gangions and the groundline then hang from the hooks. This equipment functions in a similar fashion to a coat hanger on a closet rod.

Skates/Tubs/Coils - The terms used to describe the smaller units of gear within a set or a mag, often containing hundreds of hooks.

Groundline - This is the length of line that extends from the first hook, to the last hook and makes up the entire string or set of gear. This is sometimes referred to as the mainline.

Gangion - A smaller length of line that is spliced into the groundline at one end and has the hook on the other end.

Anchor/Buoy lines - Sections of line that join the groundline and the anchors to the buoys or bags on the surface.

Skate or Mag markers - Markers in the groundline that indicate the sections of gear. These may be: florescent tape woven into the line, knots, line splices, c-clamps or carabineers, mag clips, or cannonballs/weights.

Roller - A device that spins allowing the groundline to be retrieved in such a way as to reduce the tension and friction on the line. Similar in design to a rolling pin.

Roller station/pit - The area where fishermen stand, and gaff fish while the groundline is being retrieved.

Crucifier - A pair of rollers or steel pegs which stand vertically with only enough room for the groundline to pass between. The groundline passes between the rollers and the hooks are pulled out of the fish.

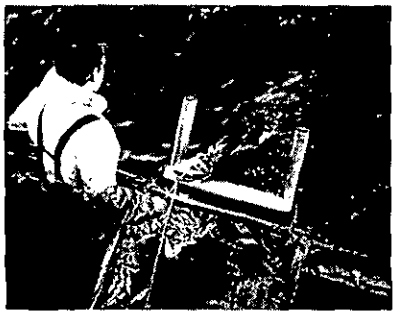
Block/Hydro/Hauler - Hydraulically driven drum into which the groundline is placed. As the wheel spins the groundline is drawn on board.

Combi - A piece of machinery through which the groundline, gangions, and hooks move. The hooks are mechanically placed into the magazine racks allowing the gangions and groundline to be hung in an orderly fashion. This term may also refer to a crew member that works both in the factory and on deck in a factory vessel.

Tuning/Overhauling gear - The work involved in straightening hooks, replacing gangions, or splicing the damaged groundlines.

Auto Baiters - A piece of machinery that cuts up bait and places the bait on the hooks as the groundline is being set.

Safety Concerns on the Longliners



Longline vessels have their own unique set of safety concerns. Of all the vessel types you will encounter, longline vessels tend to be the least dangerous, although there are several safety concerns. Often, to obtain tally samples on a longliner, you will need to stand on the weather deck above the roller station. This location provides a good view of the fish coming over the roller. In this situation you will be outside and exposed to the elements. In the winter months this means that you will be standing outside in freezing conditions, snow, spray, and high winds for long periods of time. Be prepared with the appropriate clothing available.

On other longliners you must be near the roller station to get an accurate tally count. Here the wind may be lessened but waves must be taken into account. Roller stations are wide open areas near the water level. It is not uncommon for a rolling vessel in high seas to be turned by the weather and have waves come through the roller station. In addition, the area between the roller and the block is usually full of moving hooks and line. Moving line is always a safety concern, because if a length of line becomes entangled around a leg or an arm the line can drag a person overboard or into machinery. These lines also have a great number of hooks attached to them, and it is common to have crew members seriously injured by incoming and outgoing hooks.

Longline vessels capture and process hundreds of tons of fish. In the processing operations fish are bled, headed and gutted, and this makes decks very slippery. Often there is wave wash, fish entrails, and fish moving about the decks. Because of this, falling onto a steel deck or into machinery should be a serious concern. It is your highest priority to stay safe and always be aware of what is going on around you.

Sampling on Longline Vessels

Longline tally sampling is the only method for sampling on longline vessels regardless of whether you are on a catcher processor (c/p), or a catcher boat. This method involves two different steps, referred to as the tally period and the weighing period. The tally period is a count of all the fish and organisms that come up on a groundline within a section of gear. To conduct an accurate tally count you must count the organisms and empty hooks on at least 33% of a string of gear. The other step is the weighing period. To determine the weight of your tally sample, a number of individuals of each species are weighed to obtain an average weight. The average weight is then applied to the tallied number of that species to obtain a sample weight. Both the tally period and the weighing period, or average weights, will be discussed in more detail in the following sections.

Tally Period

To conduct an accurate longline tally sample use thumb counters to count the target species and predominant bycatch. Use a plastic deck sheet for the less predominant bycatch. For example, a c/p that is targeting Pacific cod is probably going to encounter a great deal of pollock, skates, arrowtooth, Kamchatka flounder, sculpins, halibut, a variety of smaller flatfish, and crabs. Thumb counters should be used to count cod, pollock, and empty hooks. Plastic deck sheets are used to record tick marks of bycatch like skates, arrowtooth, and lesser seen species such as crabs or rockfish. You should have a tally of halibut in 10 centimeter groups on the deck sheet. As you estimate the length of the halibut place a tick mark next to the appropriate length. An example of how you should organize a plastic deck to conduct a tally sample is illustrated in Figure 6-8 and Figure 6-10.

Sampling Goals

The level of sampling effort, and time taken to sample a string of gear varies between vessels. You must tally sample at least 33% of each string of gear sampled for species composition. For average weights you must weigh 50 of each target species, 50 of each economically important bycatch species, and 15 of each of the less abundant bycatch species.

Selecting the Hauls to Sample

Vessel retrieves 1 - 3 sets a day: you must sample all of the sets.

Vessel retrieves >4 sets a day: you must use the random Sample Table (RST).

In both cases, you can apply the Break Table

Like many commercial fishing vessels, longliners may operate 24 hours a day 7 days a week. These vessels set a string of gear, run to another string that has been soaking and start to retrieve it. Once that string of gear is aboard, the vessel will run to a new position and "set back" the freshly baited string. This constant rotation of setting and hauling gear requires sampling the gear at diverse times. It is important to select sets to sample by following the random sample table (page 2-9).

Random Sampling Frames

Tally Sampling Sections of Gear Within a Set

To determine what part of a longline set will be tallied, you must employ random sampling or systematic sampling. Randomly choosing the sections of gear to tally is the preferred method. It is the most statistically valid method, and attempts should be made to incorporate this method whenever possible.

Spatial Sampling

On most longliners, the easiest way to apply a random sampling frame will be with a spatial sampling method. To apply a spatial sampling method on longliners, divide a set into equally sized units (magazines, skates, or hooks), and then randomly choose which of these sections will be tallied.

Figure 6-1 shows a string of gear with 4 magazines which contain 5 skates each, for a total of 20 skates. Each skate has 200 hooks, so the entire string of gear has 4,000 hooks. You have to tally sample 1/3 of the gear being retrieved which is 1,333 hooks, or at least 7 skates. By what ever means possible, (drawing numbers, rolling dice or using the random number table to chose numbers between 1-20) you have chosen random skates 3, 7, 9, 13, 14, 15, and 19 to tally sample.

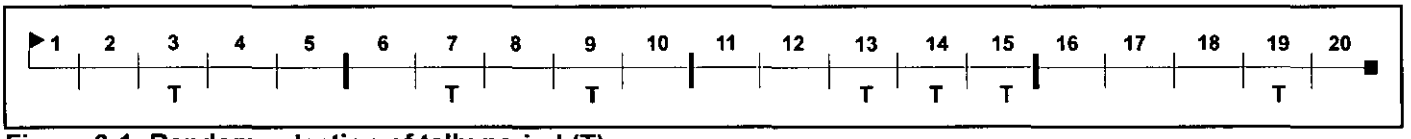


Figure 6-1: Random selection of tally period (T)

Temporal Sampling

Another method of applying a random sampling frame on longliners is a timed sampling method. To apply a timed sampling method to longliners you must divide the total retrieval time of a set into equally timed sections, such as an equal number of hours, or minutes. Then randomly choose which of these timed periods you will tally.

In Spatial or Timed Random Sampling methods - You must define the sections of gear or time and chose those sections randomly.

In applying timed sampling, the manner of randomly choosing the sections is the same. For example, the vessel retrieves the same string of gear shown in Figure 6-1 in 3 hours. This means that 200 hooks are brought up about every 9 minutes. Then randomly choose 7 (9) minute periods to tally sample over a 180 minute period.

This type of sampling can only be used if a vessel operates with a relatively consistent number of hooks per set, on every string of gear. In this way you know ahead of time how many hooks have been set, and how long the retrieval will take.

There are many variables that dictate whether you can employ true random sampling methods, such as time needed to retrieve gear, adverse weather conditions, or the individual abilities of each Observer. Because of these constraints you may have to design a sampling scheme that is systematic in its approach.

Systematic Sampling

There are vessels that operate in such a way even experienced Observers have difficulty using random sampling methods, so a systematic approach must be used. Systematic sampling is choosing a number of sections of gear that you will sample with exactly the same number of non-sampled sections of gear between each sampled section, over the entire period of a gear retrieval (see Figure 6-2). In systematic sampling, the sections of gear are not chosen randomly, although the first sampled section of gear (starting point) in the tally sample will be chosen randomly.

In Systematic Sampling - You must define the sections of gear and chose the start point randomly.

If you want to sample 1/3 of the set, you have to sample every third unit (every 2 units if sampling a half of the set, etc.). You do not want the same starting point for every set. Randomly pick a number between one and three for the unit to start tallying. In the first systematic sampling example (Figure 6-2), the set is divided into 10 units of 2 skates each. The number 2 was randomly picked, so the second unit is where the tally sampling began. Two skates were tallied, two were skipped, another two tallied, etc.

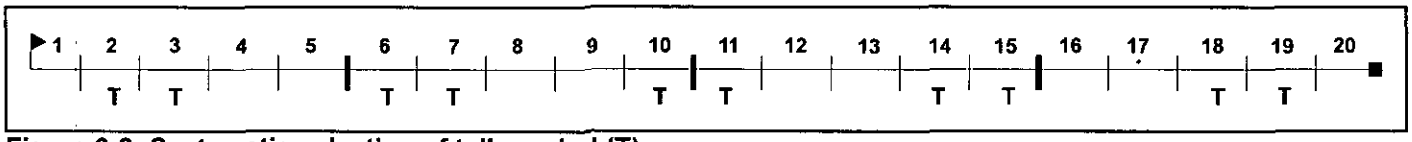


Figure 6-2: Systematic selection of tally period (T)

Average Weights

It is preferred that average weights are collected randomly. The selection should be based on the allowable time, space, and your abilities, but these fish should be collected in a random manner.

It is impossible to weigh all of the fish you will tally on most longliners. To determine the total weight of your tally sample, you need to collect average weights for every species that you tallied. Those average weights will be applied to the total of the tallied species. The complication is not in the actual weighing of the fish, but rather, the way those fish are collected.

The required number of each species of fish you must weigh to determine average weights.

- 50 target species
- 50 of each economically important species
- 15 of all other bycatch species

The amount of fish you collect at a time is your decision. You can take 1-20, or 1-40, but these fish need to be collected in an unbiased fashion.

Available space, time, crew, and weather conditions will be deciding factors of how and when you obtain your average weights. Overall, you will encounter two possible situations for conducting tally counts and collecting average weights on longline vessels; fish collected within your tally period, and fish collected outside your tally period.

Collecting Average Weights

If a random collection of fish for average weights cannot be done on your vessel, you should collect fish haphazardly from all parts of the set. Document the reasons why random sampling could not be done.

In the previously discussed examples (Figure 6-1 and Figure 6-2), the vessel has 200 hooks per skate. By choosing a random number between 1 and 200 you could select a specific hook to start collecting fish for average weights. You could also choose to collect fish at a specific skate or mag marker. In either case you, or the rollerman, start retaining the 1st through the 50th fish after your starting point. These fish will be used for average weights. This collection could be repeated several times throughout your tally periods. If after repeating this collection several times you do not get the required number of fish for average weights, you can take additional fish from outside your tally. You have to start collecting those fish in a random fashion (i.e., the next 5 or 10 of a specific species regardless of size).

Average Weights from within the Tally Period

Obtaining fish within the tally sample is the desired method of collecting fish for average weights. These fish can be weighed at any time. If possible, collect these fish at the roller and make sure that they are getting into the baskets. On some vessels you may not have direct access and the crew will have to collect these fish. This is often the case when you are standing above the roller and can not see the fish getting into the baskets. Even if the vessel is cooperative in keeping fish for your weight collection, there is likely to be discrepancies in the number of fish you counted and the actual number collected

In both these sampling scenarios (Figure 6-3 and Figure 6-4) the fish collected for the average weights came from inside the tally period.

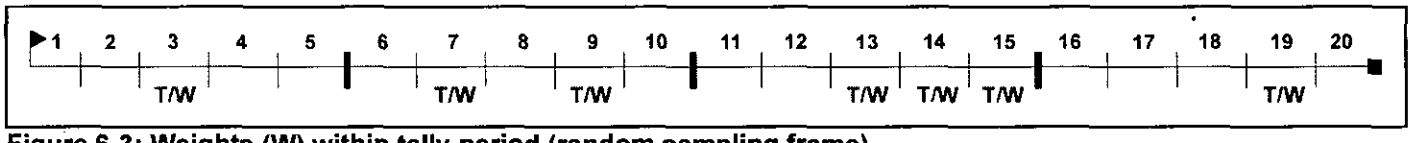


Figure 6-3: Weights (W) within tally period (random sampling frame)

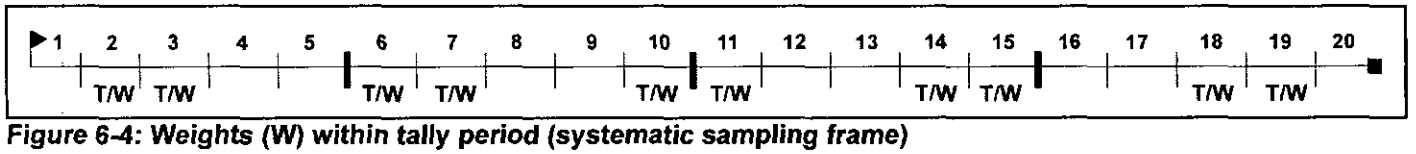


Figure 6-4: Weights (W) within tally period (systematic sampling frame)

Average Weights from outside the Tally Period

On some longliners you will not be able to collect fish from the tally period. Often the vessel has no room for extra fish, or there may be no crew members to collect fish at the roller or trough. In this situation gather fish for average weights before or after you have completed your tally period. You need to start collecting fish from a randomly selected starting point. Estimate the number of fish you can store in baskets or a tote, and simply collect that number of fish, regardless of their size.

In both these sampling scenarios (Figure 6-5 and Figure 6-6) the fish collected for the average weights came from outside the tally period.

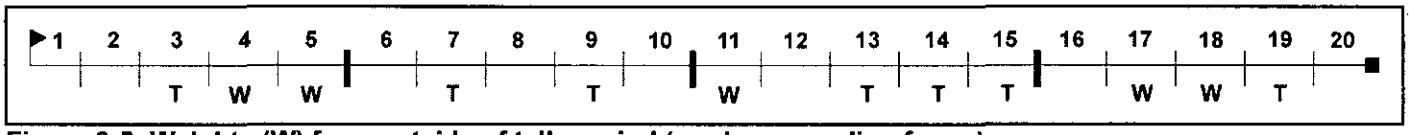


Figure 6-5: Weights (W) from outside of tally period (random sampling frame)

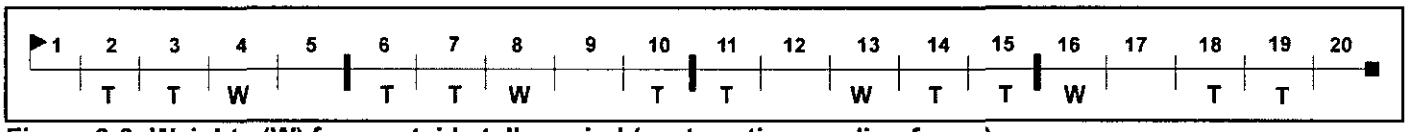


Figure 6-6: Weights (W) from outside tally period (systematic sampling frame)

Average Weights and Length Frequencies

Get new average weights for each species tallied on each haul sampled for species composition.

Use new average weights rather than weights from previous hauls as often as possible.

All average weight calculations must be shown in a clear and orderly fashion in either the logbook or on the 3US or the ATLAS forms.

You may observe fish species in your tally but not get those species in your weight collection. If so, there are two options you can use to get average weights. The first is to have the rollerman retain a group of a specific species. The second is to use weights from previous hauls. In either case you need to record all of the weights in the logbook work pages, or on the top of the 3US species composition forms. If you have to use weights from previous hauls make reference to the weights and hauls used. Figure 6-7 illustrates the documentation of average weights in the logbook.

You must not hand select or choose fish out of a trough or a bin. Collect the fish for both average weights and length frequency measurements in an unbiased fashion. In most instances you will be able to use fish selected for average weights for your length frequency measurements as well. For additional information on length frequencies refer to page 9-1, "FISH MEASUREMENT AND OTOLITH COLLECTION." .

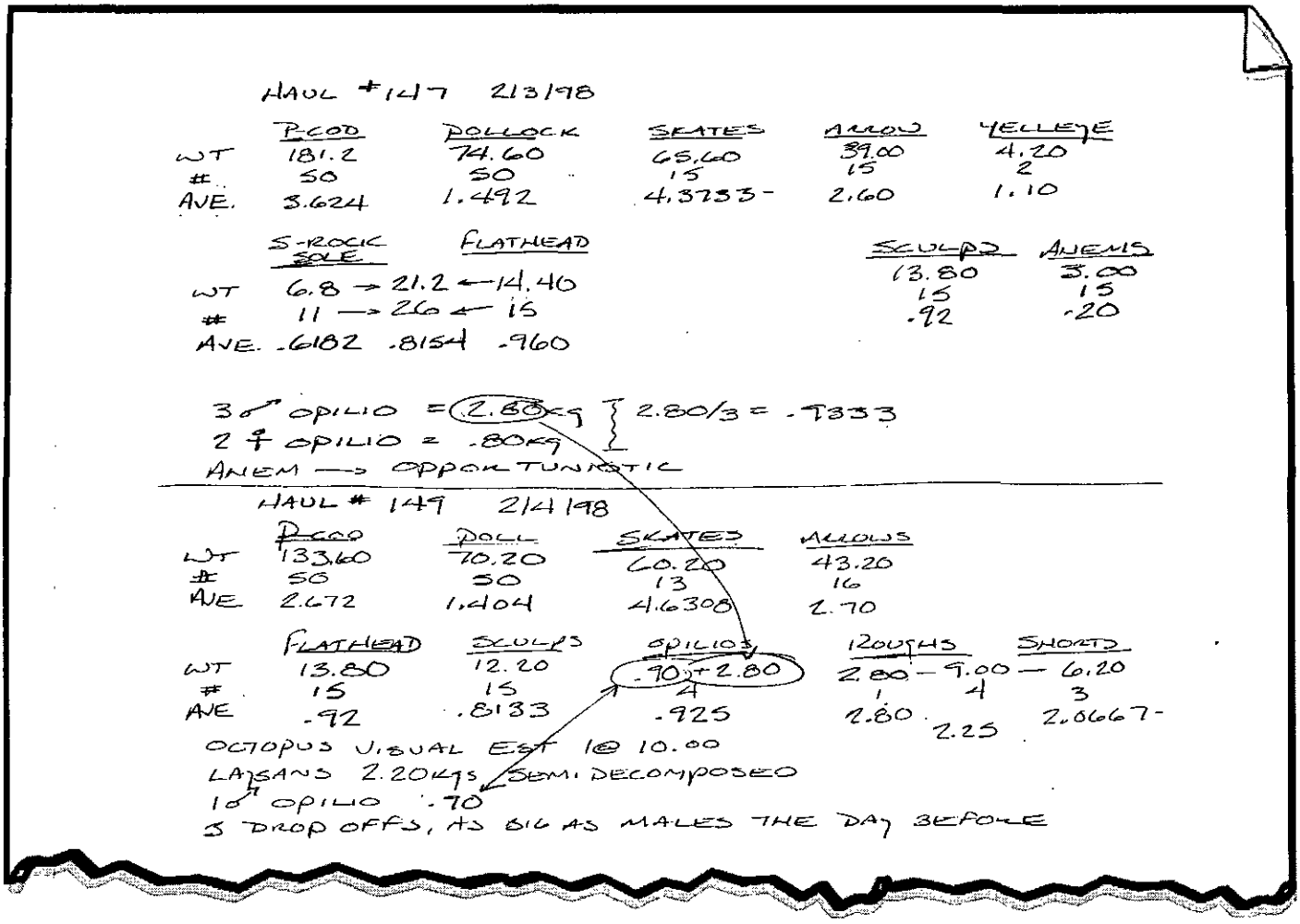


Figure 6-7: Average weight calculations

Halibut Data

Halibut Length Estimates

3US - Non ATLAS vessels

Estimated halibut lengths and their weights should be on the 3US Species Composition Form.

ATLAS Deck Form - ATLAS vessels

Estimated halibut lengths and their weights should be on the ATLAS deck form, and this data will also be entered into ATLAS on the species composition tables.

On most longliners you will not be able to measure the halibut you tallied. During the tally period you must visually estimate the length of halibut as they come up on the line. These halibut will be taken off the line using one of the careful release methods, or they will drop off on their own. The following suggestions will help you estimate the lengths of halibut.

- Measure the distance between the gangions on the groundline and measure the length of the gangions themselves. On many of these longline vessels, the distance between the gangions on the groundline are kept at a consistent length. Under normal operations you will be able to see the fish being pulled by the groundline and gangion. In this way it is easy to estimate the length of the halibut in reference to the length of groundline between the gangions or the length of the gangion itself.

- Use measurements such as the length of the gaff hooks or the pole gaff.

- If the vessel is retaining IFQ halibut, check your estimates on fish the crew retains and you can actually measure.

- Measure the distance from the roller to weld marks on the side of the vessel or the waterline, if weather permits.

Try to be as accurate as possible and use the method that you are most comfortable with. After a couple of days, as you measure more halibut you will become more accurate in your length estimates.

Recording Tallied Halibut

This discussion on halibut only pertains to open access fisheries. For a more detailed discussion on how to handle halibut in the IFQ fishery refer to "Individual Fishing Quota (IFQ)" on page 6-34.

For a detailed discussion on halibut viability assessments refer to "Halibut Viability Sampling" on page 6-32

Recording the number of halibut in a tally sample is comparable to recording numbers of target and bycatch species, although halibut weights are collected differently. During the tally period, you will be estimating the length of each halibut and applying a specific weight to that fish based on the length to weight table (page A-34).

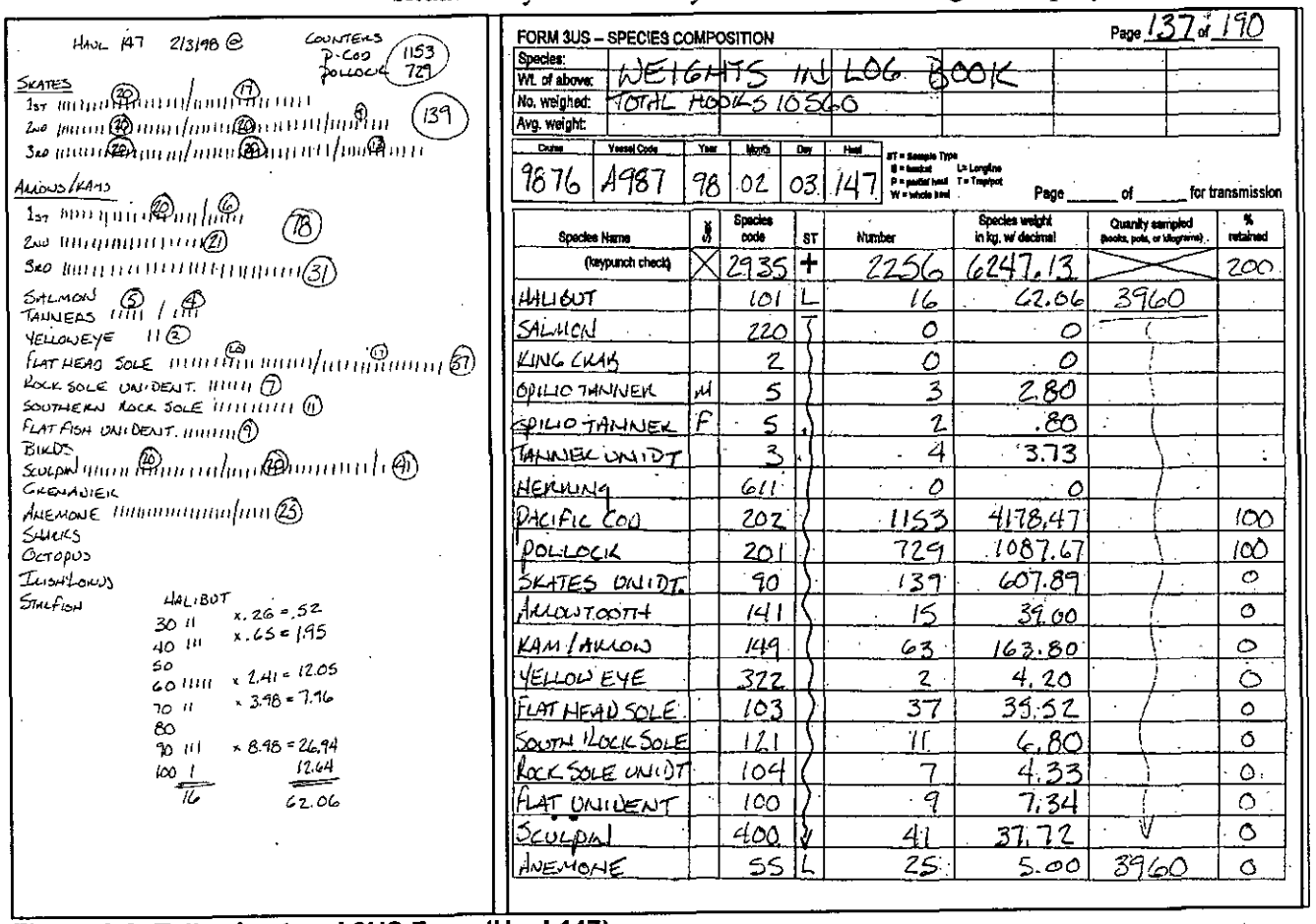
The examples of the ATLAS deck form (Figure 6-12 and Figure 6-13) and plastic deck sheet, both illustrate the methods used by prior Observers to record halibut data. In both examples a range of size categories are listed in increments of 10 centimeters. Then as halibut are seen coming up on the line a visual estimate is made and a tick mark is placed next to the appropriate size category. Later you can simply use the length to weight table to apply the proper weight to a given length. This method provides the total number and total weight of halibut during the tally period. Estimated lengths should never be used for viability samples. See "Halibut Viability Sampling" on page 6-32.

Data Recording and Documentation

3US - Species Composition

If you are assigned to a vessel that does not have the ATLAS computer program you will be filling out 3US species composition forms. A 3US form must be filled out for every haul sampled for species composition. After sampling your first sets you will develop a sense of what tasks need to be completed on deck, and how those tasks apply to the 3US. The accuracy and clarity of these forms is crucial to the interpretation of your data and your deployment.

Figure 6-8 and Figure 6-10 show 2 examples of the 3US species composition forms and corresponding plastic deck sheets, and how they should be organized. There are also explanations as to why the data is entered in this manner (Figure 6-9 and Figure 6-11.) This should answer some of the more common Observer questions and provide insight to situations you will likely encounter on a longline deployment.



HAUL 147 2/3/98 @ COUNTERS P-COD 1153 POLLOCK 729

SKATES 1ST 2ND 3RD (139)

ARROWS/KAMS 1ST 2ND 3RD (78)

SALMON (5) (4)
TANNERS
YELLOWEYE (2)
FLAT HEAD SOLE (57)
ROCK SOLE UNIDENT. (7)
SOUTHERN ROCK SOLE (11)
FLAT FISH UNIDENT. (9)
BIRDS
SCULPIN (41)
GRENADIER
ANEMONE (25)
SHARKS
OCTOPUS
ICISH LOACH
STARFISH

HALIBUT
30 II x.26 = .52
40 III x.65 = 1.95
50
60 IIIII x 2.41 = 12.05
70 II x 3.98 = 7.96
80
90 III x 8.98 = 26.94
100 I 12.64
16 62.06

FORM 3US – SPECIES COMPOSITION Page 137 of 190

Species:
Wt. of above: WEIGHTS IN LOG BOOK
No. weighed: TOTAL HOOKS 10560
Avg. weight:

Cruise	Vessel Code	Year	Month	Day	Haul
9876	A987	98	02	03	147

ST = Sample Type: B = basket, P = partial haul, W = whole haul; L= Longline T = Trapline

Page _____ of _____ for transmission

Species Name (keypunch check)	M/F	Species code	ST	Number	Species weight in kg. w/ decimal	Quantity sampled (baskets, pots, or kilograms)	% retained
	X	2935	+	2256	6247.13	X	200
HALIBUT		101	L	16	62.06	3960	
SALMON		220		0	0		
KING CRAB		2		0	0		
OPILIO TANNER	M	5		3	2.80		
OPILIO TANNER	F	5		2	.80		
TANNER UNIDT		3		4	3.73		
HERRING		611		0	0		
PACIFIC COD		202		1153	4178.47		100
POLLOCK		201		729	1087.67		100
SKATES UNIDT.		90		139	607.89		0
ARROWTOOTH		141		15	39.00		0
KAM / ARROW		149		63	163.80		0
YELLOW EYE		322		2	4.20		0
FLAT HEAD SOLE		103		37	39.52		0
SOUTH ROCK SOLE		121		11	6.80		0
ROCK SOLE UNIDT		104		7	4.33		0
FLAT UNIDENT		100		9	7.34		0
SCULPIN		400	V	41	37.72	V	0
ANEMONE		55	L	25	5.00	3960	0

Figure 6-8: Tally sheet and 3US Form (Haul 147)

Halibut - 16 halibut were counted during the tally sample and their lengths were estimated. The lengths where then applied to the table of halibut lengths to weight to obtain the total weight of the halibut tallied. These fish will not appear on the 7US forms as viability samples because they were not inspected. Refer to the halibut length to weight table on page ???
Salmon - Are not usually caught on longliners, though they have been caught on hooks baited with squid as the gear is being set or retrieved.
King Crab - Are sometimes brought up on longliners. More commonly seen on vessels targeting blacked.
Tanner Crab - There were 3 male and 2 female opilio tanner crabs saved when fish were collected for the average weights. These 5 tanners came from within the tally. There were also 4 tanner crabs counted during the tally period, but were not part of the average weight collection. These 4 crabs could be clearly identified as tanners, but the species of tanner and their gender could not be determined. Although the gender is unknown, the 4 unidentified tanner crabs were the same size as the 3 males that were weighed. The average weight of the 3 known opilios was applied to the 4 unidentified tanner crabs.
Herring - Very seldom seen on longline gear.
Pacific Cod and Pollock - 1153 and 729 respectively, were counted on thumb counters during the tally sample. Average weights were determined (per species) and applied to the total count.
Skates - 139 skates were counted during the tally sample. An average weight was determined from 15 that were retained and that average weight was applied to the total count of 139.
Arrowtooth - There was a total of 78 Kam/arrows seen and counted during the tally period. 15 were gathered during the weight collections within the tally period, and identified as Arrowtooth. Their average weight was determined and applied to the 63 Kam/arrows that were not identified to species.
Kam/arrows - These are the Arrowtooth and/or the Kamchatka flounder that were seen during the tally sample, and because they could not be identified to species they were listed as species code 149 Kamchatka/arrowtooth flounder unidentified species group.
Yelloweye - Two rockfish appeared within the weight collection during the tally period. The observer keyed these rockfish out to yelloweyes.
Flathead - 37 Flathead sole were seen during the tally count. 15 were weighed to determine the average weight, and that average was applied to the 37.
Rock Sole - 18 Rock sole were seen during the tally count. 11 of those were collected and identified as southern rock sole. The average weight of those 11 were applied to the 7 rock sole that were not identified as northern or southern.
Flatfish unidentified - 9 flatfish were counted during the tally period. These fish looked similar to flathead or rock sole but could not be clearly distinguished. They have to be listed as flatfish unidentified and have the combined average weight (flathead/rock sole) applied to the total number.
Sculpins - Various species of sculpin were common throughout the retrieval of this set. Due to the consistency in their relative size an average weight could be applied to the total tally count.
Anemones - Are numerous and 15 were gathered in an opportunistic fashion and an average weight was applied to the total number tallied.

Figure 6-9: Data entry explanation (Haul 147)

Species:	AVERAGE WEIGHTS FROM 147 FLATHEAD AND OPILIO'S USED
Wt. of above:	FOR HAUL 149
No. weighed:	TOTAL HOOKS 10560
Avg. weight:	CONFIRM LAYSAN ALBATROSS AT 2.20

Cruise	Vessel Code	Year	Month	Day	Haul
3000	A987	98	02	04	149

ST = Sample Type; B = basket; P = partial haul; W = whole haul; L = Longline; T = Trap/pot

Species Name	Sex	Species code	ST	Number	Species weight in kg. w/ decimal	Quantity sampled (hooks, pots, or kilograms)	% retained
(keypunch check)	X	4226	+	2302	5523.42	X	200
HALIBUT		101	L	34	295.25	3960	
SALMON		220		0	0		
KING CRAB		2		0	0		
OPILIO TANNERS	M	5		1	1.40		
TANNER UNIDENT		3		3	2.78		
HERRING		611		0	0		
P-COD		202		1203	3214.42		100
POLLOCK		201		687	964.55		100
SKATES		90		120	555.69		0
ARROW TOOTH		141		16	43.20		0
KAM / ARROW		149		117	315.90		0
ROUGHEYE		307		1	2.80		0
SHORTRAKER		326		3	6.20		0
SHORT R/ROUGHE		354		7	15.75		0
FLATHEAD SOLE		103		44	40.48		0
FLATS UNIDENT		100		7	6.44		0
SCULPINS		400		57	46.36		0
OCTOPUS		60		1	10.00		0
LAYSAN ALBATROS		851	L	1	2.20	3960	0

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Figure 6-10: Tally sheet and 3US Form (Haul 149)

Tanner Crab - 1 male opilio tanner crab was collected and weighed .90 kg. This weight was added to the weight of the 3 male opilio tanner crabs that where identified and weighed in haul 147. The combined average weight was applied to the 3 unidentified tanners in haul 149 because they similar in size.

Arrowtooth - There was a total of 133 Kam/arrows seen in the tally sample. The 16 arrowtooth that were gathered during the weight collection were retained within the tally period. Their average weight was determined and that weight was applied to the 117 that were seen in the tally, but not identified to species.

Kam/arrows - These are the 117 Kam /arrows that were seen during the tally sample, and because they could not be identified to species they were listed as species code 149.

Shortraker/Rougheye - 11 shortraker/rougheye rockfish were tallied. Of these, 3 shortraker and 1 rougheye were collected for average weights. The other 7 could not be identified to species but were clearly shortrakers or rougheyes. The average weight of the 4 identified rockfish were applied to the 7 unidentified. Those 7 rockfish are listed as shortraker/rougheye rockfish, species code 354.

Figure 6-11: Data entry explanation (Haul 149)

Form 3US - Species Composition Instructions

These explanations for the data entries refer to both the 3US and the ATLAS forms.

- **Observers Name/Vessel Name** - Write your name and the vessel's name across the top of the first page of each different form type.

- **Cruise Number/Vessel Code** - The cruise number is a 4 digit number that is issued to you before you leave on assignment. A list of vessel codes is on page A-23.

- **Date** - In the following spaces you should enter the retrieval date of the set. For the month and the day you should use leading zeros when needed i.e. 01/01/99 for January 01, 1999.

- **Species Name/Sex/Species Code/Sample Type** - Enter the species name (common name) and species code in the proper columns. Only enter the gender of the prohibited species if you actually identified the sex and the species.

  The sample type on a longliner is L.

- **Number** - This is the total number of all of the specimens of a specific species group that were counted during your tally period. This should be the total of all your tick marks and numbers from your tally counters.

- **Weight of Specimens** - This is the total weight of all of the specimens that were counted during your tally period. You obtain these numbers by actually weighing the specimens tallied or applying the average weights (per species) you obtained during your weight sampling to the total number of fish tallied.

- **Quantity Sampled** - This is the total number of hooks counted during your tally sample or calculated based on the hooks/skate counts. The total number of specimens tallied can not be larger than the total number of hooks tallied.

- **Percent Retained** - This is a percentage estimate based on weight. Never list percent retained of prohibited species, even if the vessel is targeting a prohibited species.

Discussion on 3US Species Composition

For the purpose of explaining these examples, (Figures 6-8, 6-10, 6-12, 6-13) let us assume that on this vessel the crew was able to collect most of the fish for the Observer's average weights during the tally period. The crew could only hold about 50 fish at a time. The Observer has chosen a random start time during the tally to save the 1st through the 50th fish. At the Observer's request the crew has saved these fish. The Observer was be able to gather the 1st through 50th fish three or more times throughout the retrieval of this set.

Explanations of 3US and ATLAS Form

Calculations used to determine average weights are listed on the examples of logbook pages (see Figure 6-7 on page 6-12)

Haul # 147	Total Hooks or Pots Sampled: 3960	Total Mags or Skates Sampled: 24 SKATES 3 MAGS	Page 98 of 123
Date 2/3/98			CR# 9876 Vessel A987

Halibut L☐ T☐ Salmon L☒ T☐ Tanner Crab L☐ T☐ King Crab L☒ T☐ Herring L☒ T☐

Species	Sex	#	Ave. Weight	#	Ave. Weight	Total #	Total Weight	% RET	ST	Length Data, Viabilities, and Measurements
HALIBUT						16	62.06		L	30 II
OPILIO TANNER	M	3	2.80			3	2.80			40 III
OPILIO TANNER	F	2	.80			2	.80			50
TANNER UNIDENT		↓				4	3.73			60 IIIII
PACIFIC COD		9	32.60	10	36.40	1153	4178.47	100		70 II
PACIFIC COD		12	37.00	10	40.00					80
PACIFIC COD		9	35.20							90 III
										100 I
SKATES		7	30.20	8	35.40	139	607.89	0		
ARROWS		9	21.80	6	17.20	15	39.00	0		
KAM ARROWS		↓				63	163.80	0		
YELLOW EYE ROCK		2	4.20			2	4.20	0		VIABILITIES
POLLOCK		11	16.80	14	22.80	729	1087.67	100		53 P
										116 E
POLLOCK		12	15.20	13	19.80					42 P
FLATHEAD SOLE		15	14.40			37	35.52			37 D
SOUTHERN ROCKSOLE		11	6.80			11	6.80			36 D
ROCKSOLE UNIDENT		↓				7	4.33			99 E
FLATS UNIDENT		↓				9	7.34			63 E
SCULPIN		↓				41	37.72	0		
ANEMONE		↓				25	5.00	0		
									L	

Notes:

15 SCULPIN WERE WEIGHED AVERAGE PUT TO TOTAL 41
TOTAL HOOKS IN SET 10560

Figure 6-12: Atlas Deck Form (Haul 147)

Haul # 149 | Total Hooks or Pots Sampled: 3960 | Total Mags or Skates Sampled: 24 SKATES 3 MAGS | Page 99 of 123

Date 2/4/98 | CR# 9376 Vessel A987

Halibut L☒ T☐ Salmon L☒ T☐ Tanner Crab L☒ T☐ King Crab L☒ T☐ Herring L☒ T☐

Species	Sex	#	Ave. Weight	#	Ave. Weight	Total #	Total Weight	% RET	ST	Length Data, Viabilities, and Measurements
HALIBUT						34	295.25		L	30 ||||
OPILIO TANNER		1	1.40			1	1.40			40 ||||||
TANNER UNIDENT		3	3.15			3	3.15			50
P-COD		12	32.00	12	28.60	1203	3214.42	100		60 ||||
		13	36.80	13	36.20					70 ||
										80
POLLOCK		12	20.60	11	16.40	687	1105.17	100		90 |||||
SKATES		6	28.80	7	31.40	120	555.69	0		100 |||||||
ARROWS		8	21.20	8	22.00	16	43.20	0		110
KAM ARROWS		→				117	315.90	0		120 |||||
ROUGH EYES		1	2.80			1	2.80	0		130 |
SHORT RAKERS		3	6.20			3	6.20	0		
SHORT RAKS ROUGH EYES		→				7	15.75	0		VIABILITIES
FLAT HEAD SOLE		8	4.20			8	4.20	0		48P
FLATS UNIDENT		→				32	16.64	0		32D
SCULPIN		→				57	46.36	0		28D
OCTOPUS		→				1	10.00	0		109 E
LAYSAN ALBATROSS		1	2.20			1	2.20	0	L	93 E
										50 P
										50 P
										106 P
										119 E
										94 E

The horizontal arrows going through the average weight fields represent less abundant bycatch species that were only tally counted and had average weights applied to their number. The only species that had a visual estimate used for weight in either haul were rarely seen species that dropped off.

Notes: BIRD-SAW LARGE BIRD DURING TALLY I.D. OUT TO LAYSAN
3 CRABS WERE AT LEAST SPECIES OF TANNER →

Figure 6-13: Atlas deck form (Haul 149)

ATLAS Deck Forms

- If you are assigned to a vessel that has the ATLAS program you will be filling out the ATLAS deck forms rather than the paper form 3US. An ATLAS deck form must be filled out for every haul sampled for species composition on your deployment. Upon completing the haul you will be entering the data from the deck form into the ATLAS program. You should refer to the ATLAS section of this manual for a more detailed discussion on the ATLAS At Sea Program (page 16-1). The explanations of these data entries on the ATLAS forms are the same as the 3US forms, although the format of the two forms is different.

- **Haul Number/Date/Cruise Number/Vessel Code/Observers Name/Vessel Name** - Fill out the headings on this form in the same manner as the 3US form.

- **Sample type** - Indicate the sample type for each prohibited species group by placing an x in the appropriate box across the top of the page. Also indicate the gear type down the vertical column labeled ST.

  Longliners = L **Pot vessels = T**

- **Species Name/Sex** - Enter the species, common name in the proper columns, as neatly as possible.

- **Number/Average Weights** - These are the number of the fish and their weights. Use these numbers and weights to determine the average weight of the species. Use these average weights to calculate the total weight of all the fish you tallied.

- **Total Number** - The total of all of the specimens that were counted during your tally sample. This should include all the totals of all your tick marks and the thumb counters.

- **Total Weight** - The total weight of the fish in the tally sample. Obtain these weights by actually weighing all the specimens of a species group tallied, or by applying the average weight (per species group) to the total number of specimens tallied.

- **Halibut Viabilities** - One significant difference between ATLAS and the 3US forms, is in the documentation of the halibut viabilities. On a non-ATLAS vessel the viabilities are recorded on the 7US form. On the ATLAS vessels the halibut viabilities must be recorded in the far right hand column of the ATLAS deck form, and later entered into ATLAS.

Official Total Catch (OTC) and the Observers Estimate

One of your most important tasks involves calculating Observer Estimates and the Official Total Catch, also known as OTC. The accuracy of these estimates are determined by your species tallies, sample weights of the species, and hook counts.

Sampled Sets

Use the formula shown below to determine the OTC for the sampled sets on longliners.

$$\frac{\text{sample weight}}{\text{hooks sampled}} = \frac{\text{estimated total catch weight}}{\text{total hooks retrieved}}$$

Sample Weight - The total sample weight of all the species counted during the tally period. The sample weight appears on the 3US Species Composition Form, top of the column under species weight.

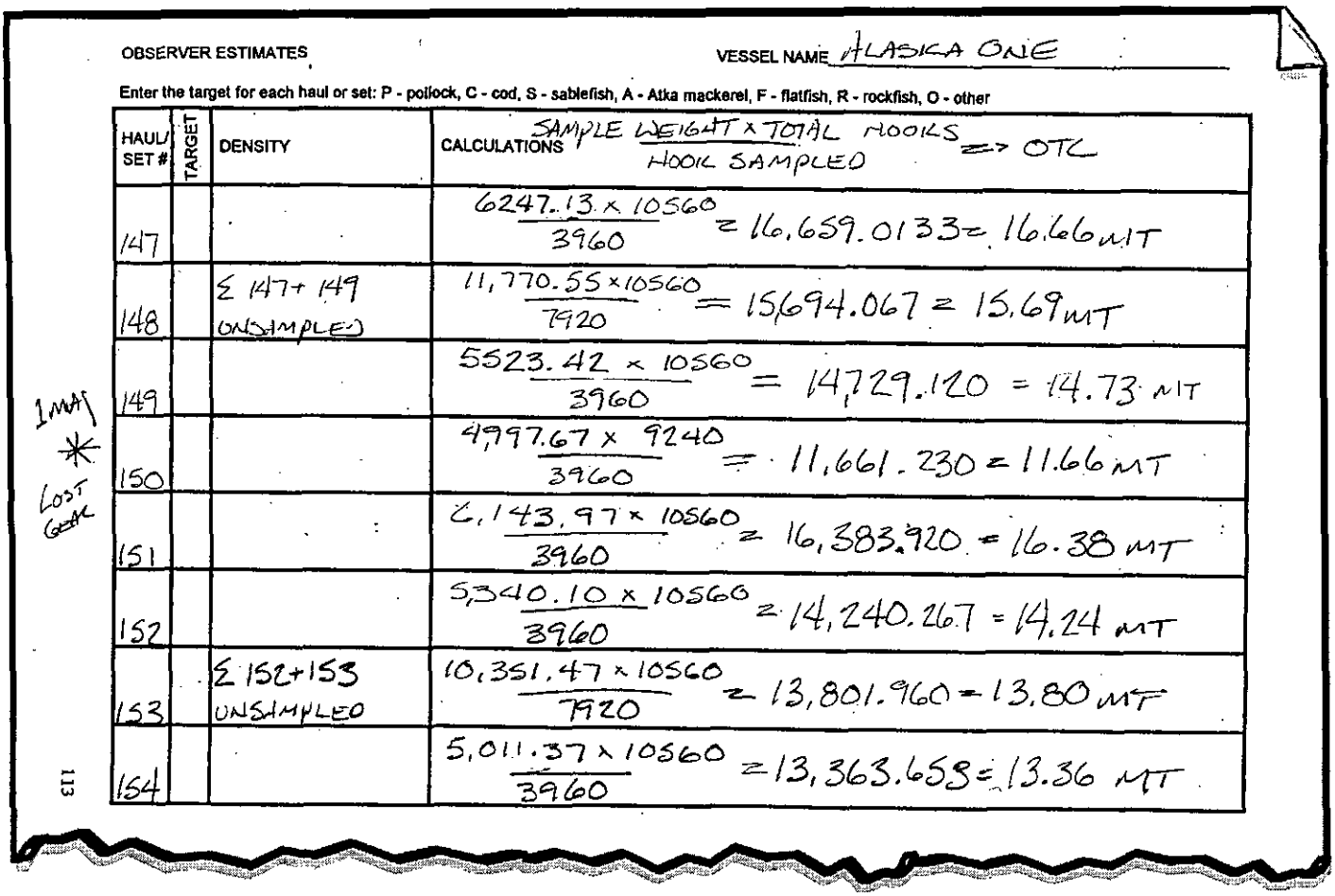
Hooks Sampled - This is the total of all the hooks that were retrieved during your tally periods for a set.

Total Hooks Retrieved - This is the total of all the hooks that were retrieved.

Determining Hook Counts

There are different ways to determine the number of hooks in your tally sample as well as the total number of hooks in a set. One method is to use the average hook counts and the other is to use total hook counts.

Average hook counts - Average hook counts could be used to determine both the number of hooks in your tally sample and the number of hooks in a total set. On vessels that rigorously maintain the gear, there is normally a consistent hook count between skates or mags, and you can accurately determine average hook counts. During one of the first hauls you will need to count all of the hooks on 10 skates or tubs of gear. Start and stop hook counts at the skate or mag markers. Then, simply calculate the average hooks.



OBSERVER ESTIMATES

VESSEL NAME ALASKA ONE

Enter the target for each haul or set: P - pollock, C - cod, S - sablefish, A - Atka mackerel, F - flatfish, R - rockfish, O - other

HAUL/ SET #	TARGET	DENSITY	CALCULATIONS $\frac{\text{SAMPLE WEIGHT} \times \text{TOTAL HOOKS}}{\text{HOOK SAMPLED}}$ => OTC
147			$\frac{6247.13 \times 10560}{3960} = 16,659.0133 = 16.66$ MT
148		Σ 147+149 UNSAMPLED	$\frac{11,770.55 \times 10560}{7920} = 15,694.067 = 15.69$ MT
149			$\frac{5523.42 \times 10560}{3960} = 14,729.120 = 14.73$ MT
150			$\frac{4997.67 \times 9240}{3960} = 11,661.230 = 11.66$ MT
151			$\frac{6,143.97 \times 10560}{3960} = 16,383.920 = 16.38$ MT
152			$\frac{5340.10 \times 10560}{3960} = 14,240.267 = 14.24$ MT
153		Σ 152+153 UNSAMPLED	$\frac{10,351.47 \times 10560}{7920} = 13,801.960 = 13.80$ MT
154			$\frac{5,011.37 \times 10560}{3960} = 13,363.653 = 13.36$ MT

1 MAY * LOST GEAR

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Figure 6-14: Logbook calculations

Total hook counts (tallied in the sample) - It may be possible to keep count of empty hooks on one of your thumb counters during your tally period. The total number of empty hooks, plus the total of all fish tallied on your thumb counters for target and predominant species, plus the total of all the tick marks for your less abundant species, will yield the total number of hooks tallied for the species composition. This method is more accurate and easily used on the smaller catcher boats. Often prior Observers have been able to tally entire sets because of the smaller size, and sometimes cleaner hauls.

empty hooks + total number of tallied fish = total hooks sampled

- If hook counts per skate vary between 0-10 hooks, reverify and adjust the average hook count once a week.

- If your hook counts per skate vary by 10 or more hooks, reverify and adjust your average hook count at least twice a week.

- To verify the number of hooks/skate or tub, for average hook counts, you must tally count all the hooks on at least 10 skates or tubs.

To confirm total hooks in the set - Catcher processing vessels usually have magazine racks where gear is hung. Entire sets of gear are hung in this fashion so the entire compliment of mag racks that the vessel is carrying can be counted. You will be able to tell how much gear is set by counting the amount of gear still hanging in the gear area. For example, if a vessel consistently works 30 mags of gear and there are 20 on board, you know there are at least 10 mags of gear out fishing. The same can hold true with tubs of gear on the smaller longliners. Then simply multiply mags or tubs by the average hook count to determine the total hooks per set.

Some vessels have hook counters that supposedly keep an accurate count of the hooks being deployed. Do not use these numbers or the hook counts given to you by the Captain or the crew. You must verify the accuracy of the vessels hook counts and their method of counting hooks.

Unsampled Sets

As with other vessel types there must be an entry for every set of gear retrieved on a deployment whether you sampled the set or not. In many instances, you will not be able to sample all of the sets that are retrieved. On longliners never use the vessel estimate for OTC; calculate the ratio of weight per hook for like sampled sets. Multiply the hooks retrieved in the unsampled set by the ratio. Like sets are strings of gear that are set in similar areas, at similar depths, and with similar soak times. You should always try to use strings of gear that are set in similar areas first. Follow the guidelines listed below for applying like sets. The examples of the OTC calculations in Figure 6-14 illustrates examples of using like sets to calculate the OTC for unsampled sets.

- You must use at least two sampled sets to calculate the OTC of an unsampled set.
- Like sets should be close in proximity to each other, with similar soak times and depths.
- The lengths of the sets or the number of hooks in the sets do not need to be similar because this is taken into account in the proportion calculations.

"like sets"		**unsampled set**
$\frac{\Sigma \text{sample weights}}{\Sigma \text{hooks sampled}}$	=	$\frac{\text{official total catch weight}}{\text{total hooks retrieved}}$
sum of the sample weights = total sample weight of two "like sets". sum of the hooks sampled = total number of hooks tallied in two "like sets". total hooks retrieved = the total hooks retrieved in the unsampled set.		

Cruise Number	Vessel code	Year
9876	A987	98

Full name of catcher boat	ADF&G #

FORM 1US - HAUL FORM FOR LONGLINE AND POT VESSELS

Page 21 of 28 for vessel

Observer name JOHN J. OBSERVER

Vessel name ALASKA ONE

Page _____ of _____ for transmission

Plant/Processor name	Location	Processor permit #

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ORC

Date		Set #	% Monitored for marine mammals	Gear type	Gear performance	Vessel type	Location code	End position of set			Soak time hrs.. : min.	Average bottom depth	M or F	# of skates or # of pots in set	Skate length or pot set length	# of hooks or pots per skate	Total hooks in the set	Official Total Catch in metric tons	Observer's Total Catch Estimate in metric tons	Vessel's Total Catch Estimate in metric tons	Catcherboat's ADF&G #	Processor permit	IFQ? Y or N	CDQ #	Delivery #
Month	Day							Latitude (N)	E or W	Longitude (100)															
02	01	0					N	5353	W	6631	:	TIED UP AT PETRO MARINE DOCK DUTCH HARBOR													
02	02	0					N	5721	W	7401	:	VESSEL CRUISING TO SET GEAR (NEW AREA)													
02	03	146	33	8	1	1	R	5751	W	7507	03:40	80	F	64	180	165	10560	15.28	15.28	10.00			N		
02	03	147	33	8	1	1	R	5801	W	7534	11:45	82	F	64	180	165	10560	16.66	16.66	9.00			N		
02	03	148	0	8	1	1	R	5809	W	7559	20:50	91	F	64	180	165	10560	15.69	.	8.00			N		
02	04	149	33	8	1	1	R	5821	W	7620	22:10	89	F	64	180	165	10560	14.73	14.73	8.00			N		
02	05	0					N	5815	W	7609	:	WEATHER'S GONE BAD (NO FISHING)													
* 02	06	150	33	8	6	1	R	5816	W	7612	42:10	82	F	56	180	165	9240	11.66	11.66	5.00			N		
02	06	151	33	8	1	1	R	5819	W	7619	51:30	76	F	64	180	165	10560	16.38	16.38	10.00			N		
02	07	152	33	8	1	1	R	5812	W	7623	12:20	90	F	64	180	165	10560	14.24	14.24	7.00			N		
02	07	153	0	8	1	1	R	5823	W	7628	21:40	85	F	64	180	165	10560	13.80	.	5.00			N		
02	07	154	33	8	1	1	R	5826	W	7630	23:20	87	F	64	180	165	10560	13.36	13.36	7.00			N		

National Marine Fisheries Service - North Pacific Groundfish Observer Program

* VESSEL LOST 1 MAG OF GEAR - FOUL WEATHER STARTED FISHING @ 13:30

Revised - 1/1/00

Figure 6-15: Form 1US - Haul Form For Longline and Pot Vessels

Form 1US - Haul Form for Longline and Pot Vessels Instructions

You must have a data entry for every day aboard a vessel whether it is at sea or in port.

The 1US form is a record of the vessels overall fishing effort. This data form is used for recording areas fished, amount of gear used, and soak times. It is a NMFS regulation that commercial fishing vessels maintain an accurate log of the vessels fishing activities. The captain or a mate will be responsible for maintaining the vessel's log, where information such as position, soak times, and the vessel estimates are kept.

- **Cruise Number/Vessel Code** - Your cruise number and vessel code will be given to you during training or briefing or by your contractor. Vessel codes can be found on page A-23.

- **Observers Name/Vessel Name** - Each form must have your name and the vessels name.

- **ORC** - When transmitting the 2US haul form data to the Observer Program via a fax, you will need to enter an Observer Routing Code (ORC) number in the box above the date and haul number columns. The ORC is a three-digit security code entry which will be explained to you during training.

- **Dates** - Enter two digits for the month and day using leading zeros where needed.

- **Set Numbers** - There should be an entry for every string of gear retrieved. Each set should have its own distinct number. You may want to number your set numbers so that they correspond to the set numbers in the vessels logbook, especially if you are deployed to a vessel in the middle of their fishing season. This may make it easier to track the vessels hauls and enter the corresponding data to your forms. Number all sets in consecutive order.

- **Marine Mammals** - Record the percentage of the set where you actually monitored for the presence of marine mammals. Typically, on longliners this is done during the tally sample while you are up on the weather deck and have a better view. In most instances this will reflect the third or 33% of the time needed on the weather deck to complete the tally sample.

- **Gear Type** - Because the 1US form is used for recording longline, pot, and jig information this code is used to distinguish between the three in the data. The gear type code for all longliners is 8.

- **Gear Performance** - There are five different codes that may be applicable to longline fishing.

  1 - no problem

  7 - considerable predation of the catch by sea lions

  5 - problems, retrieving the gear, tangle in the line coming up

  Longliners can routinely have tangles in the line so only use this code if their are significant problems that may have compromised your tally or weight sampling.

  8 - considerable predation of the catch by killer whales

  When either code 7/8 are used there should be a 10US Marine Mammal Interaction Form that will detail these event.

  6 - problem, Longline gear cut, skates/pots or the entire string is lost. Use this code if the vessel **loses** hundreds of hooks, entire skates, or strings of gear.

  Note: If you enter a gear performance code other than 1, place an asterisk on the 1US next to the haul indicated. Then write a brief statement on the bottom of the haul form, outside the data field, describing what happened. If there was significant problems that may have effected your OTC, make reference to the incident and document with more detail in your logbook. In this way the haul number can be referenced to the corresponding dates in the logbook for easy review. This is especially true if the problem led to complications in obtaining an accurate OTC.

- **Date** - The month and day must both be two digits as in 01/01 for January 1st. The date to be entered is the day the last hook of a set has been retrieved. The date listed as the retrieval day may not be the same day that a retrieval is started. Sets retrieved at or before 2359 hours are attributed to that day, sets retrieved after 2359 are assigned to the following day.

- **Vessel Type** - There are three Vessel Type codes relevant to longline vessels:

  1 - Catcher Processor, (c/p) Vessel processed and froze it's own catch.

  5 - Bait, the vessel used the catch, or sold the catch to other vessels

to use as bait.

3 - Catcher Vessel, retained fish for delivery to a shore based plant or a floating processor.

- **Location Code**

R - Enter R if the coordinates represent the position of the sets retrieval.

N - Enter N if the position listed is the noon position. A noon position should be entered for every day that you are on a vessel and there is no fishing activity. Reasons to use a noon position are:

- The vessel is steaming to or from different fishing grounds.
- The vessel is leaving or returning to port.
- The vessel is not retrieving gear due to foul weather.
- The vessel is off-loading or taking on stores in port.

A very brief description of the situation should be entered adjacent to the Noon position longitude entry on the 1US. This is the only time you should enter text in the data field.

- **Positions** - This is the vessel's position and must be entered in the coordinates of latitude and longitude. The latitude and longitude is the position of the last hook of a set to be retrieved. The first digit of the longitude is understood to be 1 and does not need to be entered. Enter the four digits following the 1. The coordinates are read in degrees.minutes. There will be no coordinates with minutes greater than 59. The set position is used to determine which NMFS statistical area the catch will be attributed. Periodically check the positions you have entered to make sure they are actually possible. Check the listed position on a chart and compare these positions to your current position on the vessel's GPS.

- **Soak Time** - The soak time represents the time, in hours and minutes, that has elapsed from the moment that the first hook enters the water until the last hook is retrieved. The field must be four digits, use leading zeros where necessary. The soak time is listed in hours and minutes, the minutes will never be greater than 59. Often the captain or the mate will record these numbers as an approximation of the start and stop times. Double check these numbers occasionally to see if your times are approximate to the vessel's times. It is not uncommon for the vessel to record the time that the buoys entered or exited, rather than the time that the hooks entered or exited the water. This is acceptable.

If the mainline parts during the retrieval of a set, usually the vessel will run and haul that set from the opposite end. The soak time will be recorded as the time between the first hook in and the last hook out of the water. Soak time will not be affected by the parting of the line, whale predation, or any other factor such as weather conditions or mechanical problems.

- **Average Bottom Depth** - Record the average bottom depth over the entire string. Most vessels will record this number in fathoms but you need to verify whether the number you entered is in fathoms or in meters. Record depth in whole numbers; no decimals should be recorded in this field. In many cases, due to the length of the set, there is a great variety of depths and no way for you to verify them; rely on the vessels logbook for these numbers.

- **Skates per Set** - Must be a whole number and represents the total number of sections of longline gear in the set. Some vessels do not use skates as a measurement of gear and you may be counting mags, tubs, or coils of gear. The unit of gear that is designated as a "Skate" may differ but you must remain consistent in the units used throughout a cruise. Record only the number of skates retrieved, do not record gear that has been lost.

- **Skate Length and Hooks per Skate** - This should represent the average length of the groundline and the number of hooks per skate, tube, or coil. Most of the catcher processors tune and maintain their gear with such effort that these numbers will remain fairly consistent. On the contrary, on many of the smaller catcher vessels this number may be difficult to obtain because of the way in which the gear is maintained. The length and the hook count may vary considerably between skates. Simply do your best to get an accurate number. This must be entered as a whole number.

- **Total Hooks** - Having an accurate total hook count is probably the most important number you will determine because the total hook count will be used to extrapolate to the Official Total Catch (OTC). Total Hooks must be a whole number and is a required field.

Refer to the OTC section for information on determining the hook counts and official total catch.

- **Official Total Catch** - The OTC should be filled in for every set of gear that the vessel has retrieved. The Official Total Catch estimate must be entered in metric tons and you must enter two decimal places.

- **Observers Total Catch Estimate** - You should only fill out the Observers Total Catch Estimate when you have conducted a species composition sample and have extrapolated an OTC. If you

did not complete a species composition sample for a set, this field must be blank.

- **Vessels Estimate** - Obtain this number from the vessel's official NMFS logbook. Never use the vessel estimate for OTC.

- **Processor Codes** - If you are on a catcher vessel you must enter the plant or processor name, its general location or port, and the NMFS processor code in the table on the top right of the 1US form. An entry must be completed in this table once for each catcher vessel in a cruise. There must be a processor code listed for each set entered on a 1US for catcher only vessels. If you are on a c/p vessel this column is to remain blank. Refer to the list of processor codes on page A-20 of this manual.

- **IFQ - Individual Fishing Quota** - Y or N must be entered in this field indicating whether the set was or was not designated as an Individual Fishing Quota set.

- **CDQ-Community Development Quota-** If you are on a vessel participating in CDQ, identify which haul is attributed to CDQ by entering the appropriate number. Each CDQ group has a designated CDQ number which is obtained from a vessel's Captain or logbook. The number the vessel records has a given format, (CDQ9953); 99 is the year, and 53 is the CDQ group number. The code entered in this field must be 3 digits and the format you enter should C then the number i.e. C53.

Halibut Sampling on Longliners

Target fisheries may be closed because prohibited species catch limits have been reached. The halibut bycatch quota is based on the estimated halibut mortality rather than the amount of halibut caught. Thus, halibut viability assessments are used by fisheries biologists to estimate the annual mortality of the population, and can determine when a fishery will be closed if the quota of the target species is not met first.

Research conducted by the International Pacific Halibut Commission (IPHC) has shown that halibut do survive after having hooks removed if the proper release methods are employed and damage is kept to a minimum. In addition to proper release methods, on most longline gear halibut are returned to the water immediately so the trauma of being out of the water is far less than other gear types. Based on this research and in an attempt to reduce halibut mortality in the longline industry, NMFS, IPHC, and the North Pacific Fisheries Management Council has implemented the

careful release program. This program requires by regulation that vessel personnel not allow halibut to reach the crucifier nor use a gaff hook to puncture halibut while removing them from the hook. The regulation also requires that the rollerman use at least one of the careful release methods.

Careful Release Methods

- Cutting of the gangion.
- Twisting the hook
- Straightening the hook

Regardless of whether you are on a vessel that is halibut friendly or on a vessel where you question the release methods, you have to give an accurate assessment of the way halibut are handled. The guidelines to follow are:

- Document the methods that the crew employs to release halibut.
- Determine which method the rollermen uses. Different crew members will use different methods so viabilities will change.
- Conduct halibut viability assessments with each rollerman.
- Determine if the crew is using the same careful release methods when you are conducting a tally sample on the weatherdeck.
- Are halibut hitting the crucifier and how often?

If the vessel or the crew is not in compliance with the careful release methods, document this in your logbook. Refer to any conversations with the captain and note whether he knew the halibut where poorly released. Were improper methods used by only one crew member, or was their a lack of regard throughout the vessel? Include estimates on the amount of halibut that where killed and how they where handled. Note whether the captain and crew were cooperative with your sampling efforts. If you thought they were purposely biasing your samples note how it was done. Bring these concerns to the attention of the NMFS staff upon your return.

Halibut Viability Sampling

As discussed earlier in this chapter, the methods that you use to sample for species composition will vary between vessels. This will hold true for halibut viabilities as well. The way you choose to sample sections of gear will not change. You will simply incorporate the halibut viability samples

into your overall sampling scheme. On most vessels the only time you will be able to take viabilities on halibut is when you are down by the roller during the weighing period or when you are measuring target length frequencies. Thus, on longliners not targeting halibut, it will be necessary to get halibut viabilities from outside your sample composition. This will not be the case on the IFQ longliners, which will be discussed later.

Halibut viability sampling will need to be done near the roller station. You will have to get the length of the halibut, check the condition, check for tags, and return the fish to the water. Attempt to obtain viabilities from 20 halibut per set. Assess the viability of halibut from within your average weight collection. If you cannot get halibut viabilities within the weight collection, they at least need to be chosen in an unbiased manner. Only take viabilities from hauls sampled for species composition. Do not take viabilities on hauls not sampled for species composition.

Recording Halibut Viabilities

7US - Non ATLAS vessels

Halibut that were measured and assessed for viability will be on the 7US length frequency form.

ATLAS Deck Form - ATLAS vessels

Halibut assessed for viability will appear on the ATLAS Deck Forms and this data will also be entered into ATLAS on the length frequency table.

A chart of halibut condition criteria can be found on page A-37. When doing halibut viabilities there are some fundamental rules that you should keep in mind.

- To assess viability, you must check the mouth, eyes, and gill covers for damage.
- You should look at the eyes and vent for signs of sand flea predation and invasion.
- All of the injuries and the conditions of the act of fishing have to be taken into account.
- Halibut checked for viability must be released inboard in the same manner that they are released outboard of the roller.
- Attempt to rotate viability sampling among all crew at the roller.
- Distribute viability sampling across the entire set.
- All halibut selected for viability sampling must be brought aboard the vessel despite the size of the fish or the severity of the injury incurred while being brought aboard. Injuries as a result of landing the fish for you must be ignored when assessing halibut viability.

Individual Fishing Quota (IFQ)

In 1993, after nearly 20 years of debate and policy reviews the North Pacific Management Council and the Secretary of Commerce approved the Individual Fishing Quota (IFQ) program for the halibut and sablefish fisheries. This was a change from an open access type of fishery with a short limited season, to a fishery managed by individual quotas, for each fishermen. This individual quota is allocated first to fishermen with a history in the fisheries, and there individual shares of the quota can be sold or transferred to different individuals or companies. IFQ fisheries are handled under a different management structure than the open access fisheries, and now entitles fishermen to fish their individual quota any time of the year.

Vessels and Gear

Typically the vessels that fish sablefish and halibut IFQ's are smaller vessels, although the larger c/p's also hold quota. The smaller vessels are commonly less than 100 feet in length, carry smaller crews, and set shorter strings of gear. These vessels are not as mechanized as the c/ps and often re-bait gear by hand. The skates of gear may be tied together with simple knots.

If an IFQ vessel is targeting both halibut and sablefish in the same set, hook counts could vary considerably over the length of the set.

To fish for sablefish the vessels typically have to set gear much deeper and on slopes. There may be more hooks on the sablefish gear because the fish are relatively smaller. To target halibut the vessels set gear shallower and on flatter bottoms. Halibut gear may have less hooks or hooks farther apart to prevent larger fish from tangling lines.

Sampling

Methods of choosing hauls and sections of gear to tally are the same as discussed earlier in this chapter for both halibut and sablefish. You should refer to the discussion on random and systematic sampling on page 6-6. The IFQ vessels are less automated and gear retrieval is slower than on vessels targeting Pacific cod. You will often be able to weigh all bycatch and tally the entire set. When obtaining average hook counts you will be counting hooks while the gear is being set, retrieved, or while it is on deck. Gear is maintained by hand, not repaired as diligently as on c/p's, and the numbers of hooks may vary considerably. It may be difficult to obtain an accurate average hook count per tub.

There are four methods that may be used to obtain weights of halibut in sampled sets. Any combination of the first three methods is acceptable. If you use the fourth method it must not be used in conjunction with any other. Below they are listed in order of preference:

- Weigh every halibut seen during your tally period. On a longline vessel this method will almost never be possible due to the number and size of the halibut in each sample.

- Actually measure every halibut during your tally and refer to the length to weight table for weights. This will almost never be possible again due to the number of halibut per sample.

- Estimate the length of every halibut in the tally and refer to the length to weight table for weights. This method is possible. The problem is when the vessel is targeting halibut the fish may be coming aboard too quickly to obtain an accurate estimate of length.

- Randomly collect 50 halibut. Multiply their average weight by the total number of halibut tallied. This will be the most common method used when retaining halibut. Include non-retained halibut in your average weight sample. The halibut length to weight table may be used to determine the weight of halibut too big to weigh, but the fish must be measured.

Refer to "Halibut Viability Sampling" on page 6-32, for information on measuring and estimating halibut lengths in open access fisheries.

If an IFQ vessel is targeting both halibut and sablefish in the same set, follow the sablefish length and otolith collection protocols defined below as a first priority. If you have time, collect additional biological data on IFQ halibut and rockfish bycatch according to the protocols defined above.

Length Frequencies and Viabilities

- Measure or weigh all the halibut selected in your average weight collection, but only assess viability from fish that will be discarded (sublegals.)

- List the viability of retained (legal) halibut as "U" for unknown.

- Collect a minimum of 20 viabilities per day.

- Do not use curvilinear lengths.

Average weights

The required number of each species of fish you must weigh to determine average weights.

- 50 Halibut - weights, or lengths to weights. You can use fish measured and/or weighed for the 20 viabilities.
- 50 of each economically important bycatch species (rockfish species, sablefish, cod).
- 15 of each bycatch species - predominant (grenadiers, skates) and less abundant (sculpins).

Refer to page 9-1, "FISH MEASUREMENT AND OTOLITH COLLECTION," for more detailed information on how to conduct measurements, weights, or collect otoliths.

Otoliths

.If you are on a vessel targeting halibut do not collect halibut otoliths unless you are assigned a project to do so. Instead, collect up to 5 pairs of otoliths per sampled set on one of the predominant species of rockfish in each set. Use Table 9-2 on page 9-6 to determine which rockfish species should have priority in your collection. You may pick a different species for each sampled haul, if you wish.

Sablefish Fishery

Length Frequencies

20 sexed lengths per sampled set.

Sexed lengths can be taken from outside the sampled sets, only on longliners.

Average weights

The required number of each species of fish you must weigh to determine average weights.

- 50 sablefish
- 50 of each economically important species (rockfish species).
- 15 of each bycatch species. Predominant (grenadiers, skates) and less abundant (sculpins).

Otoliths

- 2 sablefish otoliths per sampled haul.

Marine Mammals

The nature of longline fishing encourages a higher incidence of marine mammal interactions than any other type of fishing vessel. Longliners tend to have interactions while trawlers tend to have marine mammal mortalities, although an occasional mortality may occur on longliners when a seal or whale becomes entangled. Interactions between longline fishermen and marine mammals are brought about simply because marine mammals feed on the fish targeted by longliners. As the longliners are retrieving their gear, the hooked fish are being brought to the surface. It is easy for marine mammals to feed on this concentration of fish. In most instances the predation of the fish by marine mammals is very predictable.

Killer whales tend to feed on Greenland turbot, arrowtooth flounder and halibut, while sperm whales tend to feed on sablefish, grenadier, and halibut. When whale predation is taking place often only the heads or just the mouths of fish are left on the lines. The result of a pod of killer or sperm whales feeding off a line can be devastating to a vessel. Entire strings of gear are picked clean. Sea lions tend to feed on Pacific cod, pollock, and halibut. Sea lion and seal predation is a much smaller problem and usually they will only eat a small quantity of fish.

If a vessel is retrieving gear and whales start to feed off the line, the crew may "bag off" the gear. This is simply cutting the line and putting anchors and buoys on the cut end. The vessel will move in an attempt to lose the whales or set a string of gear miles away. If a Captain knows that a specific area has the best fishing, but also knows that the area has a high occurrence of whales, he may actually set "alternating" strings of gear at different depths to target different fish. When whales arrive at the deeper strings to feed on Greenland turbot, the vessel may "bag off" that string and move to another string set shallow for Pacific cod. When the whales arrive they tend to loose interest in the vessel because now it is retrieving less desirable Pacific cod.

Marine mammal biologists read all communications on marine mammal mortalities and interactions. This information is very important. Observers working on ATLAS vessels should send detailed descriptions of their observations regarding feeding behaviors.

If your vessel is setting and retrieving alternating strings of gear to avoid whale predation, continue to collect length frequencies from the predominant species for each haul.

Regardless of the situation, these are marine mammal interactions and need to be documented on the 10AUS Interaction and the 10BUS Specimens forms. For a more detailed explanation of the forms and how to fill them out properly please refer to "Marine Mammal Interactions" on page 12-3.

Seabird Interactions

Longline vessels attract significant numbers of birds which feed on the fish discards. In addition to feeding on the discards, sea birds dive on the hooks baited with squid as the gear is being set. In the past there has been nothing to prevent these birds from diving on the baited hooks, which are trailing behind the vessels only a few feet under the water. When the birds do get the bait they are often hooked and dragged down with the gear. The result is bird mortalities. For information on what Observer duties are in regards to seabird interactions refer to "BIRD SIGHTINGS AND INTERACTIONS," page 13-1.

POT VESSEL DATA COLLECTION

List of Priorities

- Record catch effort from the skipper's logbook paying attention to how strings are defined.
- Tally, or whole haul when possible, for catch estimates and species composition.
- Collect average weights or total weights for every sampled set.
- Assess viability on randomly selected halibut and watch for safe release.
- Verify pot counts.
- Collect sexed length frequency and age data.
- Observe for marine mammal interaction (becomes first priority when interactions occur).
- Observe for sensitive seabird sightings and interactions.
- Calculate catch estimates. Input data if equipped with ATLAS, transfer data if using paper forms.
- Send catch messages; weekly with ATLAS, weekly for non-ATLAS.

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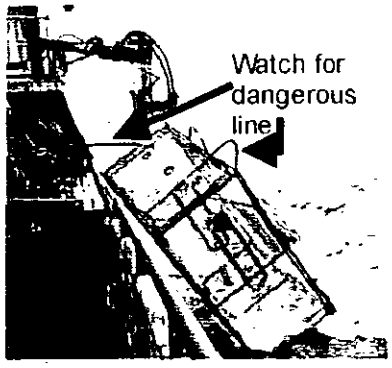
Introduction

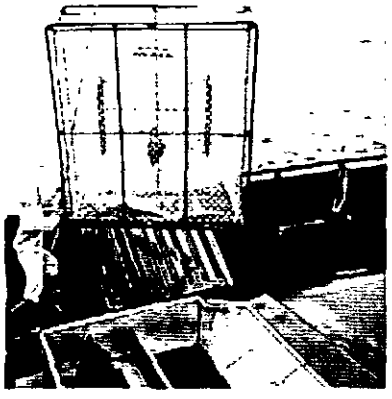
Sampling duties aboard a pot vessel are generally the same as those for other gear types, and are most similar to longliners. This section will focus on the unique aspects of pot fishing, while referring often to the longline section for generalities. Regulations concerning pot vessels can be found on "Groundfish Pots Requirements" on page 19-27.

Pot Fishing Operations

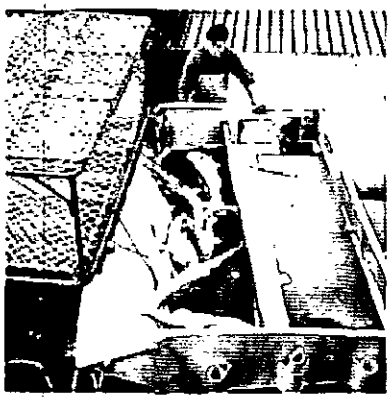
The pot is launched



After soaking, it is retrieved;



and the catch is dumped for sorting



Pot fishing is defined by the NMFS as a stationary, buoyed line attached to a single trap, or traps attached to a longline, for the purpose of capturing fish. Although various species of crab are also fished with pots, groundfish Observers are only deployed to sample Pacific cod fisheries and some sablefish fisheries.

A pot used to fish groundfish consists of mesh panels attached to a rectangular metal frame. Pots vary in size, but cod pots are most often two meters by two meters by one meter. Fish are attracted by bait attached inside the pots. Mesh tunnels on either side of a pot allow fish to enter and plastic "triggers" prevent them from escaping. Halibut excluders, sturdy dividers in the tunnels, are fitted into pots to restrict tunnel widths, thus restricting access to halibut while permitting round fish to enter.

The deck of a pot boat is equipped with a launcher and a boom used to set and retrieve pots. The launcher is a hydraulic lift usually located on the starboard side of the vessel. The boom is a hydraulic crane usually on the port side of a vessel. To deploy a pot, the crew will use the boom to move a pot into the launcher, metal hooks or "dogs" from the sides of the launcher grab the pot and hold it secure, the pot is then adjusted by lifting the launcher so that it is horizontal to the deck. The single length of line attached to the pot is placed in a coil on the deck next to the launcher. The pot is baited, the doors shut, and the pot is "launched" over the side. The coil of rope pays out as fast as the pot is sinking. A set of marker buoys is attached at the end of the line with the vessel's permit number and often a pot number.

To retrieve a pot, a crew member tosses a grappling hook to snag the marker buoys. The buoys are dragged on deck and the line is placed on a winch, "the block," which rotates, retrieving the line and pulling the pot from the water. When the pot reaches the side of the boat, the pot bridal, a line attached to two sides of the pot, is hooked to the boom and the pot is lifted onto the deck and placed onto the launcher. The angle of the launcher can be adjusted to remove the catch. The "dogs" grab the pot and hold it secure as the pot door is opened and the contents are dumped into totes or onto a table. The crew may shake the pot on the launcher by pumping the hydraulics. If pots are to be set back or redeployed, the bait bag is replaced, the doors are tied, and the launcher is lifted to slide the pot back into the water. If the pots are being stacked, the boom drags or lifts the pot to the back of the deck where it is secured by ties and chains.

Pots are deployed in units called strings. When the skipper decides to set gear, the crew readies the pots and drops them overboard one at a time as the vessel moves along the set location. The result is a row, or string, of pots. Pots may also be deployed in a cluster fashion, grouped around favorable fishing bottom. Skippers use various means of recording the numbers and locations pots for each set. Most use a computerized plotter, marking the latitude and longitude of each pot. Strings can be viewed on the screen as points connected with lines, each point representing a pot. Some skippers record detailed data on location, depth, and soak time into the NMFS logbook for each string, while others simply record the total number of pots retrieved in a day as one string; regardless of the set information. When this is the case, ask the skipper if detailed set information is recorded in a separate notebook.

Though pots within a string may be set at varying depths, areas, and may have different soak times, some skippers list every pot set on the same day as one long string. Try to work with the skipper, consult the plotter, and track the gear retrieval yourself. Data from multiple strings per day is preferred but, depending on the rate of fishing may require excessive work. You should attempt to get the most discrete data and be sure to document any difficulties you encounter.

Safety Concerns on Pot Vessels

On a pot vessel all work is on the weather deck. Be conscious of your surroundings at all times. Pot vessels have low rails over which the pots are lifted. Waves can easily wash crew and gear overboard. When you first arrive on a vessel discuss with the deckboss or skipper which area would best allow access to the catch; the area needs to have a clear view of the pots as they are retrieved from the water and dumped, but also must be outside the reach of swinging pots. On many vessels this will be close to the house, under an overhang, but will differ from boat to boat. Discuss with the crew how best to collect samples. Obtaining the totes after the crew has dumped a pot may be the best option. Have the crew push the totes to you or time your activity around the movement of the pots. Be aware of coils of line attaching the buoys to the pot. These are deployed as the pot is launched and have been known to wrap around ankles and drag crew overboard. Pots may slip or jump from the launcher when the dogs fail or may break free from ties on the stack. Pots are very heavy, between 350 and 450 kg, and have crushed crew members. Watch for swinging pots especially during high seas. While sorting and weighing samples, check deck activity frequently and be attuned to crew for danger warnings. If a problem arises, get out of the way. You can best assist the crew by giving them one less body to worry about. Be aware of possible hazards and pre-plan a safe response.

Sampling Methods

Tally Sampling

Collection of species composition samples will depend on the intensity of gear retrieval. When sets are small and there is little catch, all catch may be sorted, counted, and weighed. Most often this method will not be possible. When counting and weighing everything in a pot is not an option, tallying the predominant species and applying an average weight to the number while counting and weighing all other catch may be the best option. For more detail see "Tally Period" on page 6-6.

As a pot is dumped into a tote or onto a sorting table, count the predominant species using hand counters, and collect all other bycatch species in a separate tote or your blue baskets. At the same time randomly collect fish of each species you are tallying for average weights. You must collect at least 50 individual fish of each species tallied for every set sampled.

Methods for collecting average weight samples will depend on each vessel operation. If the catch is dumped into a tote, try to count and weigh the entire catch for that pot. This may be the easiest method to obtain samples from the crew and allow time for sorting bycatch. If there are too many fish to weigh all of them from an entire pot then try to devise a system to avoid hand selection. For example, if a common crab tote is used, you could weigh all of the fish from the slanted end of the tote. If you are collecting fish from off a table, mark the table off into sections and pull the fish from the randomly predetermined section. If safety issues prevent full access of the table, collect the fish from a predetermined area, such as gathering all of the fish that touch a certain side of the table.

As the vessel is running to, grappling, and hauling in the next pot there is generally enough time to weigh predominant fish for average weights and weigh bycatch. There may even be time enough to obtain some length frequencies. Sometimes it helps to have the crew show you how to bleed or cut the fish as they would. This will allow you access to fish you are using for average weights and lengths. Processing fish is not required and should not be done if you find yourself running low on time, but the crew tends be more willing to cooperate with your sampling needs when you are able to compensate slowing processing by cutting the fish yourself.

Coverage Sampling Goals

In the pot fishing fleet, there are vast differences in the amount and rate at which gear is fished. Some vessels work around the clock fishing multiple sets per day while others spend days prospecting or pulling a few short strings. Many catcher vessels do not fish at night, while catcher processors, with larger crew sizes, fish around the clock. Observers are required to develop sampling strategies to randomly sample as many sets and as many pots within a set as possible, while keeping in mind all the other Observer duties.

For many pot boats it is possible to sample all sets. If it is not possible in your situation, as when fishing a 24-hour schedule, use the Catcher Boat Random Sampling Table (see "How to Use the RST" on page 2-9) to predetermine which sets to not sample.

The number of pots in a set can vary between sets. If the set is small, less than 20 pots, sample every pot. For larger sets use a random sampling frame to sample at least 30-60 %.

Random Sampling

Sampling all the pots in a string is preferred to using a Random Sampling Frame (see "Introduction to Theory of Random Sampling" on page 2-14). Sampling all pots is the most preferred sampling method, but this requires you to count and/or weigh everything in every pot of a set. This may be possible in many situations but when it is not, you must use a random sample frame to preselect which pots to sample.

1. Determine the sample units. For example, divide the string into units or groups of pots. A string of 70 pots could be split into individual pots, seven units of 10 pots, or any other grouping where there are an equal number of pots in each unit.

2. Use some method to randomly select the units to be sampled. The random number table, dice, or numbers from a hat could be used to predetermine which units are to be sampled.

This method requires the ability to identify when the selected units are pulled and may be accomplished by working closely with the skipper and crew. You may be able to track this information using the plotter, or for smaller sets, using actual counts while sampling on deck.

For larger strings, a temporal sample frame may be easier. To design a temporal sample frame:

1. Determine the total amount of time taken to pull a string of pots.

2. Split the time the vessel is pulling pots into even time intervals.

3. Use some method to randomly select the intervals to be sampled. The random number table (page A-14), dice, or numbers from a hat could be used to predetermine which intervals are to be sampled.

A less preferable method would be to sample systematically, such as sampling every "nth" pot. Systematic sampling is not random sampling but is preferred to an opportunistic method of sampling, as when a sampling schedule is determined by the completion of other duties or around meals. Be sure to describe your Random Sampling Frame in the logbook, include your rational and difficulties.

Calculating Observer Total Catch (OTC)

Verifying the Vessels Pot Counts

The total number of pots in a string is a key piece of data needed to determine total catch. Due to the variability in gear recovery, Observers need to develop a method for tracking pots.

Actual counts are the most reliable. While on deck the Observer may be able to tally all the pots in a string as they come on board. If it is not possible to count all the pots, count pots for a section of a string and cross check these numbers with the plotter and skipper's logbook on a regular basis.

Remember to keep a tally of the number of pots sampled, as this will be required for extrapolation calculations.

Sampled Sets

To calculate the Observer's total catch estimate for sets that have been sampled, the sampled pot weights are extrapolated to the entire string:

$$\frac{\text{weight of sample}}{\text{\# of pots sampled}} = \frac{\text{OTC and Observer Estimate}}{\text{total \# of pots retrieved}}$$

Unsampled Sets

For an unsampled set, the OTC is calculated using sets similar in soak time, depth, and latitude/longitude coordinates. The sum of the sampled weights divided by the sum of sampled pots is extrapolated to the total pots set in the unsampled set. At least three like sets should be used:

$$\frac{\Sigma \text{ like sets sample weight}}{\Sigma \text{ like sets sampled pots}} = \frac{\text{unsampled set OTC}}{\text{unsampled set total pots}}$$

Vessel Estimates

The skipper will typically have the crew report retained cod as the pots are brought on board. Estimates based on the production or the quantity of catch in holds may also be used. These numbers can not be verified and should never be used for an OTC.

Recording Data

Form 1US - Haul Form for Longline and Pot Vessels Instructions

For most of the columns on the 1US you may refer to "Form 1US - Haul Form for Longline and Pot Vessels Instructions" on page 6-27. Listed below are some specific rules for pot vessels.

- **Gear Type:**

  6- pot vessel

- **Gear Performance codes (pot vessels only)**:

  1- No Problem
  6 - Problem pots lost
  5- Miscellaneous problems in retrieving gear, requires a note in the margin

- **Vessel Type:** One of the following must be recorded:

1 - Catcher/processor (c/p). This vessel catches and processes its own catch on this set. Catch is stored in a freezer hold on board.

3 - Catcher-only vessel. This vessel caught its own fish and retained it for delivery to a processor. On board the catch is kept on ice or in refrigerated seawater (RSW) tanks, not frozen.

5 - Bait. The catch from this string was sold over-the-side to other fishing vessels who utilize the fish for bait.

- **Latitude and Longitude:** Record the position of the last pot retrieved.

- **Soak Time**: Record the duration between when the first pot of a string is set and the last pot of a string is retrieved.

- **# of skates or # of pots:** Record the number of pots retrieved in a string. (As described above, be aware of how the skipper is reporting strings. Obtain discrete data when possible.)

- **Skate Length or pot set length**: Leave blank unless the pots are tied together in a string.

- **#s of hooks or pots per skate and the total hooks in the Set:** Leave blank.

For all other fields follow the instructions on page 6-27.

Form 3us - Species Composition Instructions

Recording of data on the 3US for pot vessels is very similar as for recording data from a longliner. Please refer to page 6-17 for further instructions on completing a 3US form. There are two differences:

- **Sample type:** Enter "T" for trap.
- **Hooks Sampled** enter the number of pots sampled

For non-ATLAS vessels, use the plastic deck sheet to record data needed, and transfer it to the 3US.

ATLAS Deck Forms

ATLAS vessels will use the deck forms instead of the 3US paper forms. Average weights and tallies should be recorded in the first two columns; total number and weight should be listed in the right-hand column. All fields must be complete. See "ATLAS Deck Forms" on page 6-21 for more information on completing Atlas Deck Forms

Halibut Viability on Pot Vessels

Halibut caught in a pot can be in different condition, depending on the soak time. Check the gills, eyes, and orifices for sand fleas. Also be aware of how the crew is discarding halibut. The fish should be supported as it is lifted or slid off the deck. Record any incidence of lifting by the caudal fin or lifting using a crane and line around the caudal peduncle. Please refer to "Appendix Q. Pacific Halibut Discard Condition Criteria - Groundfish Pot Gear" on page A-38 for criteria in assessing halibut viability on pot vessels.

SHORESIDE PLANTS AND FLOATING PROCESSORS

List of Priorities

- Collect Form A data..
- Record delivery information on the Form A.
- Assist vessel Observers.
- Collect lengths and age structures.
- Submit a weekly report.

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Introduction

When you are assigned to a shoreside plant or floating processor, your duties and priorities are different than that of a vessel Observer. You are responsible for gathering data from incoming vessels making deliveries to your facility. You are also responsible for assisting vessel Observers and informing them of the particulars of your plant. Lastly, you may be responsible for gathering length frequency data and age structures on the target species your plant is accepting. Plant Observers are required to send in a Weekly Plant Coverage form, rather than a catch message.

How your contractor assigns an Observer to a plant can vary, and some Observers may be assigned to cover two plants at once. Regardless of how many plants you are assigned to, your time will be under a great deal of demand. It is important that you understand all of your duties and their relative priority when you arrive. This assignment will be very different than sampling aboard a vessel, so please read this entire section carefully, and refer to it often.

Delivery Schedule

As a plant Observer, you will need to know when to expect vessels to deliver, in order to gather fishing effort and biological data. Most plants have a "radio schedule" between one and three times daily. From the radio schedule, the plant personnel will prepare a delivery schedule. You will need to either attend the radio schedule, or get a reliable copy of the delivery schedule. It is vital that you communicate with the person(s) responsible for updating these schedules. They are not definitive schedules, and changes occur frequently, so it is important to check them often in order not to miss vessels! Check in with the plant frequently. Your physical presence at the plant is important, and plant personnel are more willing to cooperate with a person whom they see on a regular basis.

Contractor Responsibilities

According to 50CFR679.50 (I) (2) (v) Observer contractors are responsible for "Providing all logistics to place and maintain the Observers aboard the fishing vessels or at the site of the processing facility. This includes all travel arrangements, lodging and per diem, and any other services required to place Observers aboard vessels or at processing facilities." Therefore, it is the contractors responsibility to ensure that you have adequate transportation to the plant from your lodging. In some cases, the processing plant has taken over the responsibility for your transportation, and it has been unreliable. If you are unable to perform your duties as an

Observer because there is no reliable transportation to the plant, you must contact a NMFS office.

Collecting Delivery Information

Gathering haul information from the various vessels delivering to your plant is the primary duty and top priority of a plant Observer. This is the Observer Program's only reliable method of linking fishing effort with deliveries and ADF&G fish ticket information. This data is recorded on the Form A, which is much like the haul form 2US for vessels. Each day you are assigned to the plant must be accounted for on this form, even if there are no deliveries that day. The information required can be gathered in a variety of ways. You will likely use a combination of the following:

Ask the vessel Observer. This is a great way to get reliable data for a delivery, but obviously only works when there is a vessel Observer. Asking the Observer is the most accurate method of getting information.

Consult the vessel's logbook. If there is no Observer aboard, you can get the gear type, NMFS area, number of tows, and average duration of the tows from the delivering vessel's NMFS logbook. You should always introduce yourself as the plant Observer, and inform the skipper of what information you are looking for in the logbook.

Interview the captain. Vessels under 60 feet long are not required to carry NMFS logbooks, so you will need to ask the skipper for the pertinent data. At King Cove-Peter Pan, Trident-Sand Point, the southeastern Alaskan and Kodiak plants, these boats will make up the majority of your delivering fleet. In the past, Observers have made up "worksheets" for the captain to take with him for each trip, and this is occasionally successful (see Figure 8-1).

Regardless of which method you use, it is important to meet each vessel at the dock when it comes in, and to establish a working relationship with the captain and Observer onboard.

Vessel_____		Date_____
Haul Date/Nets Down	Haul Date/Nets Up	
_____	_____	Salmon Retention:
_____	_____	(Total for Trip)
_____	_____	King _____
_____	_____	Other _____
Target Species Discarded (lbs.):_____		Unid. _____

Figure 8-1: Catcher vessel trip information

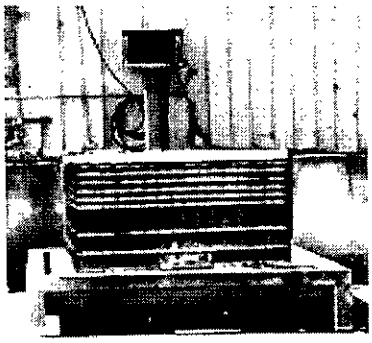
Verifying Delivery Weights

As a plant Observer, you will often need to provide delivery weights to vessel Observers. During your first few days at the plant you should determine the best method of obtaining this number. Two ways to obtain delivery weight are: actually sum the scale weights, or interpret the ADF&G fish ticket. Summing actual scale weights is preferred, but if you find that the fish tickets are consistently accurate when checked against summed weights, you may use them. If you determine that the ADF&G fish tickets are not reliable, do not use the fish ticket amount. Record your verified delivered weight whenever possible. When you are not on hand to record the scale readouts, or check the ticker tape readouts, you will have to use the fish ticket weight.

Plant scales are required to be tested annually by the State of Alaska, so it is not necessary to verify that the scale displays the correct weight. Rather, plant Observers need to check that plant personnel are recording the weights accurately and that the entire delivery is weighed.

Items to check:

- Does the scale weigh the entire catch, or is bycatch sorted out first, and weighed separately?
- Do summed scale readouts equal the total delivery weight on the ADF&G fish ticket?
- Do plant personnel subtract a percentage of the pollock weight for water before filling out the fish ticket?
- Does the fork-lift driver record weights for every tote, and how are the tote weights tared on the scale?



If you determine that data are not being recorded accurately at your plant, you must verify as many delivery weights as possible. Document how the fish ticket and delivery information is recorded by the plant personnel, and what you think the problem is. The problem may be easy to correct. For example, if you notice that the plant deducts 3% of the delivery weight as water weight, but you never see any water go over the scale, you can correct the problem by adding the 3% back as the target species weight. This practice is common in the pollock fishery, but not appropriate at all plants. In the Pacific cod fishery, the catch is often weighed in totes. If the totes are not properly tared, the delivery weight will be inaccurate. Check the tare weight by asking the forklift drivers to weigh empty totes for you. If you find that the totes are not being weighed properly, you must work with the dock personnel to assure correct recording or calculate the weights yourself.

The "after-scale" area is another place where weights may not be accurately recorded. Sorting lines at plants are not perfect, and occasionally bycatch gets into the factory. This bycatch has been weighed as the target species. The processors will usually bring these fish over to a specific area, to be weighed and discarded. Check to ensure that after-scale bycatch is being recorded as the correct species, and not as the target species. If you find prohibited species from deliveries being whole haul sampled by a vessel Observer at the after-scale area, you must identify, weigh, sex, and measure them. Give these data to the vessel Observer.

If you find that the fish ticket weights are recorded properly, continue verifying one or two deliveries per day. In your logbook, document how you are checking these weights. Once you determine the best method for obtaining delivery weights, you should inform vessel Observers to use that method. All vessel Observers delivering to your plant should use the same method. In your logbook, document your reasoning for picking the method you did, and any problems or concerns you have with that data.

ADF&G Fish Tickets

If you determine that ADF&G fish tickets are the most reliable way to obtain verified delivery weights, it is important that they are read correctly. Familiarize yourself with how the processor personnel fill out the fish tickets at your plant. You will need to pass along this information to vessel Observer's on delivering catcher vessels, and make sure that they are getting the information they need to calculate Official Total Catch for the hauls delivered.

Round (Whole) Weight Delivered

Round weight is the weight of the entire fish, as it was when it was alive. In some fisheries, such as Pacific cod and sablefish, the catcher vessels begin processing their catch at sea. Pacific cod is usually bled and sablefish are usually headed and gutted. Since parts of the fish have been removed prior to delivery, the recorded delivery weight will not be the delivered whole weight. You must convert the weight using a NMFS product recovery rate (PRR). The product recovery rate the average percentage of the fish used to make a product. By dividing the delivery weight by the PRR, you calculate the round weight of the fish (see page A-17).

Proper Use of Fish Ticket Weights

A. Fish tickets will only contain accurate information on the catch delivered. A condition code "98" will indicate an estimate of catch discarded at sea. Any catch sorted out or dumped back to sea must be weighed, or estimated, by vessel Observers and added to the haul weights for OTC.

B. Fish tickets may contain only numbers of the prohibited species delivered. If the fish ticket does include a prohibited species weight, it is often inaccurate, therefore an Observer must weigh them. In the pollock fishery, you and the vessel Observers will be sorting prohibited species from the entire catch at the plant. Vessel Observers should use their own numbers when they calculate the proportioned delivery weight calculations.

C. Completion of fish tickets is often delayed. Coordinate with vessel Observers to ensure that they get the delivery weights when they have finally been recorded. This may be during their next offload, or it may require you to fax the information to another port.

D. Condition codes -Sometimes bled fish are delivered (throat cut to bleed the fish and retard spoilage). You need the whole weight of fish caught for your Form A Plant Delivery Form. Vessel Observers will need whole weights to calculate OTCs. Look at the condition codes for the fish weights on the fish ticket. If the code listed is not a "1", the whole fish has not been weighed. You will need to convert any partially processed fish weight to whole weight using a product recovery rate. A list of NMFS PRRs is provided on page A-17.

E. Not all species weights on the fish tickets are delivery weights. Any condition code 98 fish weights are to be ignored in your sum of total delivery weight. Code 98 weights are for a rough estimate of discard weight at sea. Vessel Observers should have a real weight for the discard at sea, and use that to calculate OTC.

F. Some of the weights listed may not be correct. Fish of no value to the plant may have weight estimates rather than scale weights. Check for this before using fish tickets.

G. The bycatch species listing is often incorrect, unless the species was paid for. Bycatch species may all be lumped together. You must check that the weight for total bycatch was recorded properly somewhere, even if it is combined under one species listing and one weight. This should not be a concern for you, as you only need the total weight of bycatch and not the species breakdown. Check only that the weights are not estimates and don't worry about species identification.

H. The total weight sum at the bottom of the fish ticket is often not the total weight of the delivery! This usually is the weight for which money was paid. You must add up the weights in order to get a correct total weight.

I. Water weight deductions may appear on the fish ticket. These deductions are common in the pollock fishery, but are not appropriate at all plants. If you do not see water passing over the scale, and feel that the water weight deduction is not necessary, then add the deducted amount back in as target weight and document your reasons in your logbook.

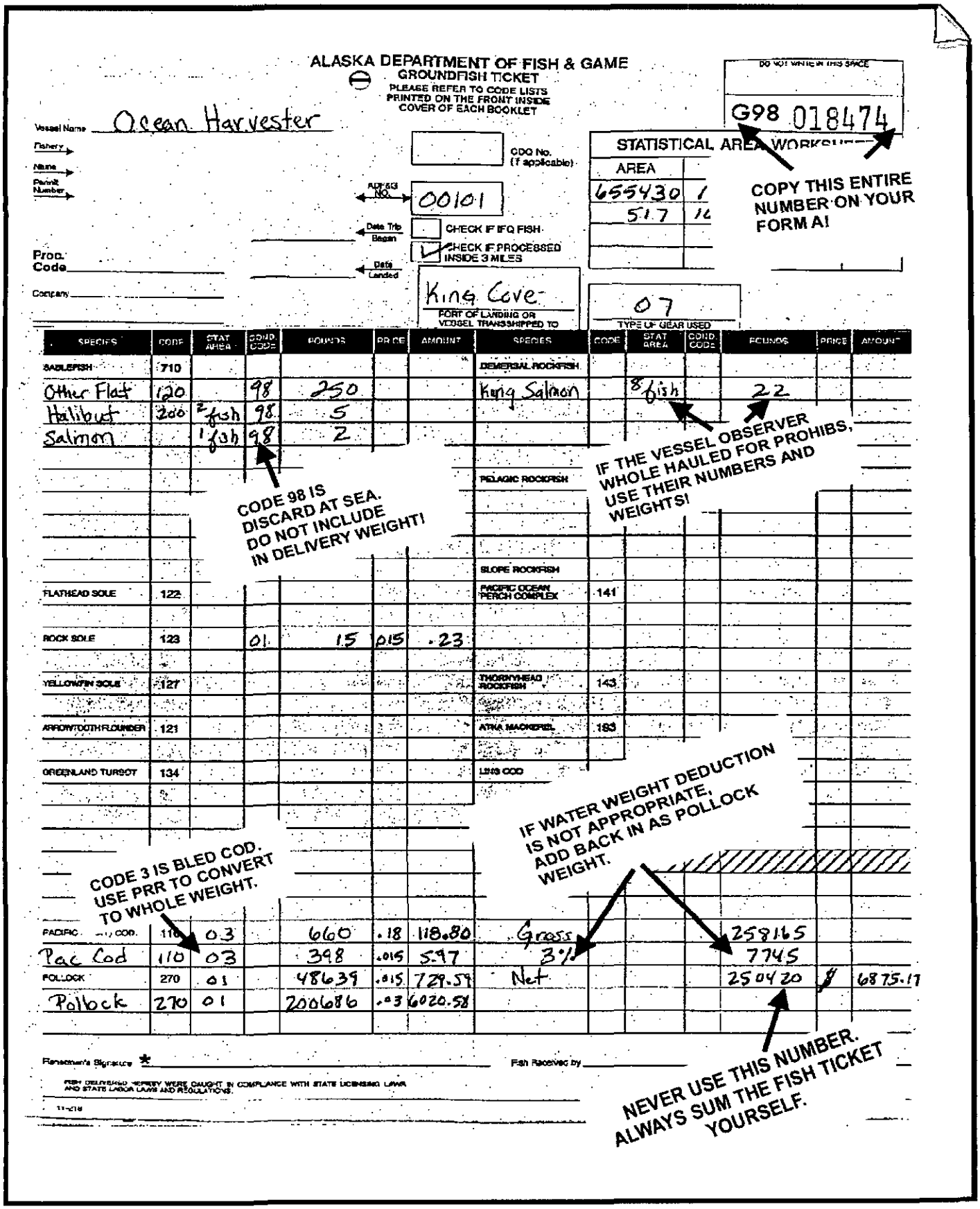


Figure 8-3: ADF&G Groundfish Ticket

FORM A - Plant Delivery Form

PAGE 1 OF _____

Cruise #	Plant code	Year
6013	P015	99

Catcherboat Name	ADF&G #	CG #	Permit #
Aleutian Spray	00991		
Forum Star	59687		
Hoover	21702		
Sea Venture	08225		
Tordenskjold	36037		
Ocean Harvester	00101		

Delivery sampled ?	Observer onboard ?	Delivery date Month	Delivery date Day	Delivery Number	Gear type	NMFS area number	No. of tows	Average duration (minutes)	Total wt. delivered (round wt.)	LB or MT	ADF&G # of catcherboat	ADF&G fish ticket number
		01	15	0	No deliveries, No processing, Observer present							
		01	16	0	No deliveries, No processing, Observer present							
		01	17	0	No deliveries, No processing, Observer present							
✓	✓	01	18	1	2	517	3	192	187297	LB	00991	G99018470
	✓	01	18	2	8	519	6	1132	6534		59687	G99018471
✓		01	19	3	2	517	4	240	205639		08225	G99018472
✓	✓			4	2	517	6	164	258190		00101	G98018474
				5	8	521	12	1440	849		36037	J97013626
	✓			6	6	519	24	2880	11375		24255	G99018475
	✓	01	19	7	2	517	4	180	17396	LB	32817	G99018477
		01	20	0	No deliveries, No processing, Observer present							
✓		01	21	8	6	519	11	2160	9853	LB	59578	G99018476
✓	✓			9	2	517	4	183	216293		00991	G99018473
	✓			10	8	521	8	2136	8946		14891	G98639222
	✓			11	8	521	10	2160	9348		53825	G99018478
				12					1257649		06525	
✓	✓			13	2	517	4	210	195793		08225	G99018479
		01	21	14	2	517	5	260	263111		00101	G99018481
		01	22	15	8	519	7	936	736		59687	J97013627
✓	✓	01	22	16	2	517	5	230	237692		08225	G99018482
✓		01	22	17	6	519	6	2230	6275	LB	53247	G98639223
		01	23	0	No deliveries, No processing, Observer Present							
		01	24	0	Released from plant to do 2 day trip on vessel Aleutian Spray							
		01	26	0	Returned as plant observer, No deliveries, No processing							
✓	✓	01	27	18	2	517	4	190	199386	LB	00991	G99018483
✓				19	7	519			326		55395	G98639224
✓	✓			20	2	517	4	260	216867		08225	G99018484
	✓			21	2	517	4	150	213322		00991	G99018486
		01	27	22	7	519			490		57765	G99018485
		01	28	23	1	517	6	186	134520		23131	G98639225
		01	28	24	1	517	5	174	113692		598380	G99018488
✓	✓	01	28	25	2	517	5	194	205394	LB	00991	G99018487

National Marine Fisheries Service
North Pacific Groundfish Observer Program

Created 1/1/97

Figure 8-4: Form A- Plant delivery Form

Form A - Plant Delivery Form Instructions

Record the information that you obtained from the skipper interview, vessel Observer, and/or vessel logbooks on this form. Maintain a separate set of forms for each plant.

You must make an entry for every groundfish delivery made to the plant. Enter at least one line every day. For days with no deliveries, write in a zero for delivery number and note whether you were assigned to the plant that day, and whether or not they were still processing groundfish. These notes are required by NMFS to verify coverage days.

- **Cruise number, Plant code, Year:** Your cruise number and plant code will be given to you during training or briefing, or by your contractor. The plant code is not the same as the processor code. Plant codes are listed on page A-23, and are comprised of a "P" followed by three numbers. In the year box, enter the last two digits of the year.

- **Catcher boat name:** Enter the name of each catcher boat delivering to your plant and the corresponding ADF&G number. You only need to list each boat once per data set, and the vessel does not have to be listed at the top of the page where it's deliveries are listed. When all the lines on the first page are used up, go on to page 2, etc... Keep the catcher boat list together on the first several pages of your Delivery Forms.

  You can find the ADF&G number written in one foot high numbers on the wheelhouse of each delivery boat. It is also recorded in the vessel and plant logbooks. If the vessel does not appear to have an ADF&G number, use the Coast Guard number or the NMFS permit number on the Form A.

- **Place a check mark** in the far left column to indicate which deliveries you sampled for length frequencies or assisted a vessel Observer. Check the "Observer Onboard" column if the delivering vessel is carrying an Observer.

- **Delivery Date:** Enter the date of **completion** of each delivery to the processing plant. If the delivery continues over two or more days, use the date when the delivery is complete. This delivery date must be used on the 7US and 9US dates if you collect lengths or age data, even if it is not the date the information was collected. This date should coincide with the one used in the NMFS processing log and on the fish ticket.

- **Delivery number:** These should be sequential numbers, with only one line of data for each delivery. Do not split delivery data due to fishing in two NMFS areas. On your 7US and 9US forms, the "Haul Number" must correspond to the delivery number on the Form A.

- **Gear Type:** Enter the appropriate code from the list below:

1= Non pelagic trawl gear	6= Pot or trap gear
2= Pelagic trawl gear	7= Jig gear
3= Mixed trawl gear	8= Longline gear
4= Pair trawl gear	9= Gill net
5= Shrimp trawl gear	10= Scottish Seine

- **NMFS area code:** This is the three digit code for the area in which the delivering vessel fished. If the vessel fished in two or more areas for the delivered catch, record the area in which most of the fish was caught. Do not divide delivery data by area. To determine NMFS areas, see pages A-31, A-32, and A-33.

- **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. If the vessel fished with jig gear, leave this column blank.

- **Average Duration:** Record the average duration of the tows or sets in minutes. Obtain the actual length of the haul or set from the NMFS logbook or captain. Add the durations and divide by the number of hauls to calculate average duration. Leave this column blank for jig vessels.

- **Total weight delivered (round wt.), lb. or mt.:** Record the total round weight of the catch delivered to the plant for that trip. Delivery weights reported in pounds must be recorded to the nearest whole pound. Weights reported in metric tons must be recorded to the nearest tenth of a metric ton. Remember that when cut or bled fish are delivered, the round weight must be calculated by dividing by the appropriate product recovery rate. A list of NMFS product recovery rates is found on page A-17.

- **ADF&G # of Catcher boat:** Record the ADF&G number of the delivering catcher vessel. This number should correspond to the vessel name written at the top of your first few Plant Delivery Forms.

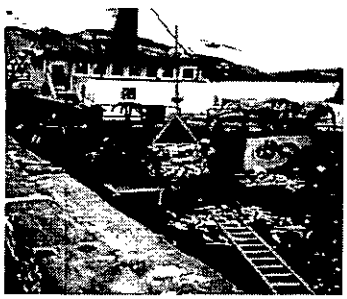
- **ADF&G fish ticket Number:** Record the fish ticket number

associated with the delivery from this vessel. This number should be recorded in the NMFS fishing and production logs. You can also get it directly off the fish ticket. Record the fish ticket number **exactly** as it appears on the ticket. Fish ticket numbers usually start with a "G" or "J," followed by eight numbers.

Deliveries from Tender Vessels

Tender boats are vessels which receive catch from catcher boats. They do not carry Observers and they are not set up to process any fish. Rather, they serve as a "middle-man" by picking up fish from several vessels and bringing it to a processing plant. Tender vessel deliveries are potentially sorted and are usually from several different vessels. Tenders will issue their own ADF&G fish tickets to delivering vessels. The fish ultimately delivered to your shoreside plant already have several fish tickets associated with it. To avoid double recording, **do not** write a fish ticket number on the Form A for tender deliveries. Do not fill out the gear type, NMFS area, number of tows or average duration fields on the Form A for tender deliveries. Record only the date on which the delivery was completed, the delivery number, the total weight delivered and the ADF&G number of the tender vessel (see Figure 8-4).

Halibut Deliveries



When IFQ boats fish for halibut, they are required to keep all the Pacific cod and rockfish that they catch incidentally. As the plant Observer, you need to record only the groundfish portion of the delivery. In the Total Weight Delivered column on your Form A, record the round weight of catch other than halibut. If no groundfish are in the delivery, you do not need to record it on the Form A

Assisting Vessel Observers

Helping vessel Observers is the next highest priority of a plant Observer. It also is the most difficult and most time consuming. It is very important to keep in contact with Observers aboard vessels delivering to your processor, so meet with them every time they come in. Your first few weeks at the plant, you will need to give each vessel Observer an orientation tour of the plant. This should include:

- the area in which they can sample for prohibited species
- the "after-scale" area
- areas of potential size or composition bias (sorters, incline belts etc...)

- the area in which they can process their samples
- the location of the office, fax machine, and computer
- what they should use for their official delivery weight and where they can obtain that information

You will also need to set up a method for vessel Observers to reach you whenever they are in. Vessel Observers will need to reach you to schedule their breaks and to receive delivery data from previous deliveries. Most plants will have quarters with a phone and answering machine available to you, but in some cases you may have to establish a "message board" which is accessible 24-hours a day.

Relieving Vessel Observers During Offloads

Offloads of pollock can last between one and 24 hours, depending on the plant and the vessel. It is usually required that the entire offload be sampled for prohibited species. It is important that vessel Observers are given breaks during this time, and that the plant Observer periodically take over monitoring for prohibited species. You should ask vessel Observers what type of assistance they will need at every offload, and take this into account when scheduling your other duties. You will likely need to give vessel Observers breaks for rest, meals, and time to do paperwork. You are required to give longer breaks to Observers who need to complete a mid-cruise evaluation. As with any other whole haul sample, an Observer must be present to monitor the entire offload. **Do not rely on plant personnel to sort and save fish when there is no Observer present!**

There is no required amount of time that you have to give vessel Observers, but a general guideline is: one hour off for every five hours of sorting. For example, an Observer with a 10 hour delivery should be given a break after the first five hours to eat and rest. An Observer with a 10-12 hour delivery may choose to take two breaks for one hour each, or one break for two hours. Many Observers with extremely long offloads prefer one long break, rather than several short ones. You will need to work out a fair schedule with each Observer.

While you are monitoring the haul for the vessel Observer, you must pull out any prohibited species. Collect the appropriate biological data for these prohibited species including species, length, weight, and sex or condition code. Do not leave it up to the vessel Observer to collect data on fish you collected.

Referring Sampling Questions

Plant Observers are a tremendous help to vessel Observers, but it is important that they do not overstep their boundaries. Plant Observers should not answer sampling questions that do not pertain to their plants. Vessel Observers should be encouraged to contact a NMFS staff member if possible. If the Observer is not at the plant during NMFS hours, have them write their question down and fax it to one to the NMFS offices. Give the written response back to the vessel Observer. Do not interpret answers or relay the answer to the Observer. If your plant is equipped with ATLAS, follow the same procedure for a text message.

Length Frequency Sampling

This is third in the list of Observer priorities. Please refer to "Collecting Fish for Length and Otolith Samples" on page 9-3 for instructions on how to collect a length sample and how to sex and measure fish.

Plant Observers take **20-30 sexed lengths per unobserved, unsorted delivery** of delivered species based on the priority lists below. You need to take lengths from deliveries meeting the following criteria:

- The delivery is from a vessels with no Observer onboard. **If all vessels delivering to your plant are carrying Observers, do not take lengths.**

- There is no at sea discard of target species associated with the delivery. Prior to gathering lengths, ask the skipper if any of the target species was discarded at sea. At sea discard could introduce a size bias, and lengths should not be taken. The only exception to this rule is in the flatfish fishery (see "Requested Flatfish in Order of Priority" on page 8-15). **If all roundfish deliveries are sorted at sea, do not take lengths.**

If more than one of the preferred target species is delivered, you should take lengths from each species. Take 20-30 sexed lengths per sampled delivery for each target species. Please refer to "Collecting Fish for Length and Otolith Samples" on page 9-3 for the correct methods to sex and measure different species of fish.

If you find that the majority of delivering vessels are carrying Observers, or if they are all sorting at sea, you may not be able to collect lengths everyday. If only a few of the vessels meet the above criteria, track these boats carefully and take lengths from their catch whenever they deliver. Alternatively, you may find that the majority of the delivering vessels are

small, unobserved boats which report no sorting at sea. In this case, you need to attempt to spread out your length sampling. Attempt to get lengths from a variety of vessels and NMFS areas.

Requested Roundfish in Order of Priority:

Bering Sea	Gulf of Alaska
sablefish	sablefish
rockfish	rockfish
pollock	pollock
Pot/Jig/Longline caught Pacific cod (DO NOT take lengths on trawl caught cod.)	Pot/Jig/Longline caught Pacific cod (DO NOT take lengths on trawl caught cod.)

Requested Flatfish in Order of Priority

Your plant may be accepting various species of flatfish during your deployment. Follow the priority list below to determine from which species to preferentially take lengths. You may be able to gather lengths on several of these species. Flatfish vessels will always sort at sea for preferred species. During this process, some size sorting may occur. If all the flatfish vessels delivering to your plant report at sea sorting of delivered species, take lengths anyway, and document this in your logbook.

Bering Sea	Gulf of Alaska
yellowfin sole	rock sole (northern or southern)
rock sole (northern or southern)	flathead sole
Greenland turbot	rex sole
flathead sole	Dover sole
Alaska plaice	arrowtooth flounder *
*Do not take otoliths from arrowtooth flounder. Collect sexed lengths only on these fish.	

Collect your lengths randomly and throughout the delivery to collect unbiased samples. If unsorted mixed fish are being delivered, divert the flow of fish to half fill a basket. Sex and measure all species in the basket. This will allow you to take randomly collected lengths on a variety of species at once.

Fill the 7US form out according to standard directions (see page 9-19). Use the delivery completion date on your 7US, even if that is not the day you took the lengths. This date should correspond to that on the Form A.

Age Structure Sampling

Otoliths are a standard duty for plant Observers. Refer to "Taking Otoliths" on page 9-15 for collection methods and criteria. The number you collect will depend on the number of target species being delivered to your plant.

- If only one species is being delivered that can be measured for length frequencies, collect **five** pairs of otoliths per delivery sampled for lengths.

- If two or more species are being delivered that are measured for length frequencies, take **two** pairs of otoliths per species per delivery sampled for lengths.

It is preferred that you take otoliths as a subset of your length frequency sample. If you are unable to, the fish you use for your collection **must** be randomly collected. Follow the length priority table for roundfish (page 8-15) and flatfish (page 8-15). Do not take otoliths from arrowtooth flounder.

If you are collecting otoliths from pot, jig or longline caught Pacific cod, you must also collect scales. Put the scales in the vial with the otoliths. If the cod have been bled before delivery, you must divide the weight of the individual fish by the PRR of 0.98. Record the calculated weight on the 9US. Do not collect otoliths from trawl caught cod.

$$\frac{\text{bled weight of individual cod}}{0.98\ \text{PRR}} = \text{whole weight of cod recorded on 9US}$$

If the species you started with is no longer being delivered, you may switch your collected species. You should never discard a collection. Small collections can be combined with other collections from the same NMFS area and used. Vials from different species must be kept separately.

The 9US form section should be filled out according to directions on page 9-22. Use the delivery completion date, even if this is not the date which the otoliths were taken. This date should correspond to that on the Form A.

Special Projects

Plant Observers have the unique arrangement of having access to lots of fish, freezers, field offices, and airports. Therefore, they will frequently be asked to complete fish collections for training use. When you arrive at the plant, request freezer space to store your collection. Work with the plant personnel to find a secure, easily accessible area. During fisheries where sorting at sea is common, you should work with vessel Observers to collect requested species. The special project will be assigned to you, so lack of cooperation from vessel Observers is not an excuse for not completing it. Please note that prohibited species cannot be collected without a permit. Fish should be freshly delivered, and frozen individually. Rockfish spines should be folded down, and the fish frozen flat. Small fish are preferred, since more fit in a box, but do not hesitate to bring back fish that are outside of normal size or geographical range. The NMFS will not extend the range of a species if the specimen is not brought back.

Checking Plant Logbooks

You should compare the NMFS Plant Daily Cumulative Production Log against your Form A. This log is used to prepare the plant's Weekly Production Report, which is used for inseason management of the catcher boat fleet. It is important to check that all catch and discards are accounted for in the log and that you note discrepancies in your logbook. Areas to check in the Production Log are:

Part B should be checked for the date of delivery, catcher boat name and ADF&G number, and delivery weight.

Part D should be checked to verify that the plant log reflects the species groups you know to be discarded by the vessel (condition code 98 on the fish ticket) and by the plant (condition code 99 on the fish ticket).

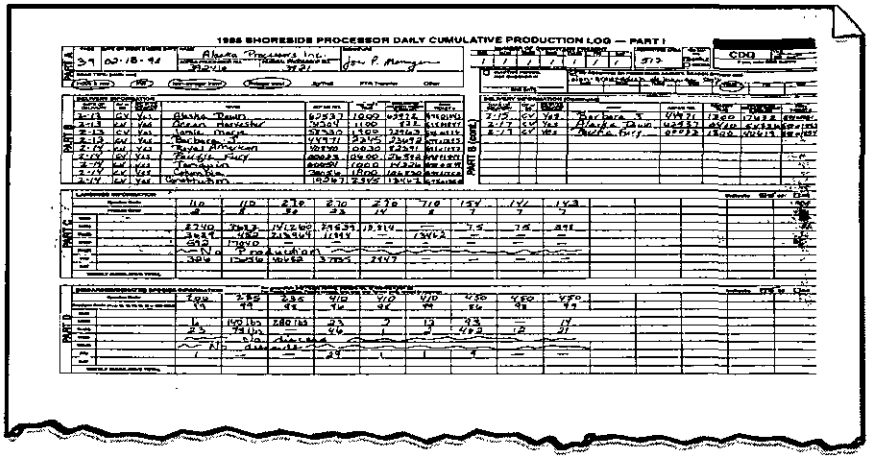


Figure 8-5: The Processor Daily Cumulative Production Logbook

Weekly Plant Report Form

If you are not at a processor equipped with ATLAS, you will need to fill out the Weekly Plant Report Form. If you are assigned to two plants, you may use one form for both. Fax in the Plant Report Form every week, and any time you enter a Release Date. The Release Date is the day you were told by your contractor that you are no longer assigned to the plant. You can be assigned to a plant if you are also assigned to a vessel. However, anytime you are assigned to a vessel, you have been released from the plant, and the appropriate date must appear in this field. You may have several Release Dates for one plant if you go out to sea and return as the plant Observer. We want to hear from you each week, even if there were no deliveries. Please fill in a new line of entry for each plant you were assigned to that week. Fill in the week ending date for the Sunday through Saturday reporting period.

WEEKLY PLANT REPORT FORM

Cruise No. 6013 Observer Name Chris P. Observer

Plant Name and Location	Week Ending Date (Saturday)	Release Date
Peter Pan King Cove	01/16	
Peter Pan King Cove	01/23	
Peter Pan King Cove	01/30	01/24
Peter Pan King Cove	01/30	

Figure 8-6: Example of weekly plant report

WEEKLY PLANT REPORT FORM

Cruise No._____ Observer Name_____

Plant Name and Location	Week Ending Date (Saturday)	Release Date

Fill in the Release Date field to indicate the **end of your deployment** at this plant. Any time you are assigned to a vessel, you have been released from the plant, and the appropriate date must appear in this field. You may have several Release Dates for one plant.

FISH MEASUREMENT AND OTOLITH COLLECTION

List of Priorities

- Collect length-frequencies from priority species.
- Collect otoliths from randomly selected fish from length-frequency sample.
- Collect length-weight information from Bering Sea pollock.

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Introduction

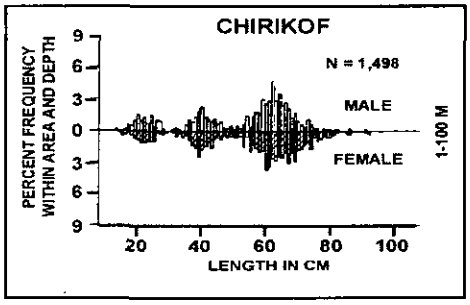
Goals for Biological Data Collection

The goal is to collect approximately 20 sexed lengths of the predominant groundfish species for each sampled haul, and to collect a very small number of otoliths from a subset of the measured fish (no more than 5 pairs of otoliths will be collected from any sampled haul). This means that a variable number of lengths and otoliths will be collected per day, depending upon the number of sampled hauls. The rate of otolith collection will vary depending on which fishery you are in (see Table 9-2 on page 9-6).

It is important to collect lengths from each sampled haul. You may have to measure less than the requested amount per haul, due to time needed for higher priority tasks. If that is the case, log the reasons, and measure and sex as many fish as you can from each sampled haul. Do not measure additional fish from other hauls to compensate for shortages in a given haul, taking more than 20 fish per haul does not significantly increase the precision of your data.

Uses of Biological Data

Researchers and resource managers use the lengths for:



- age-length relationships (growth rate);
- length-weight relationships;
- sex composition and differences in growth between sexes;
- abundance of year classes and occurrence of year classes in commercial fisheries; and
- verification of the length data collected during research cruises by NMFS surveys.

All vessel Observers are now assigned otolith collections. The otoliths are read to determine the age of the fish, then the data are combined with the fish length and weight to provide the length-age ratios. Lengths collected also provide a picture of the abundance of each year class in the catch.

Sexed length, weight, and otolith collections provide information on the sex composition and the differences in the sizes of each sex in the catch All of these components are used in the determination of the stock size and health, and are applied in setting levels of sustainable yield. Commercial fishery quotas will be set, in part, based on Observer length data from this and previous years.

Collecting Fish for Length and Otolith Samples

In selecting fish for measurement and otolith collection, **ensure you are not introducing size or sex bias in your selection technique.** Watch how fish are sorted, dumped, and moved to ensure no vessel-caused bias exists. If you suspect that there is bias in your sample, contact NMFS staff immediately. Please get our assistance before proceeding.

Selection of Species for Length and Otolith Samples

To determine which species to select for length-frequency measurements and otolith collections refer to the following guidelines:

- where there is a predominant species which is listed on the Otolith Priority list on Table 9-2, select it;
- if there are dominant species of equal proportions, select the highest priority of these;
- if the dominant species are relatively in the same proportions in the catch, and are listed at the same priority, alternate between these species from haul to haul.
- In the GOA, if the predominant species in the catch is arrowtooth, measure arrowtooth for every first through fourth sampled hauls. On every fifth sampled haul measure a priority flatfish species listed in Table 9-2. Collect otoliths from this species.

You may change the species measured from haul to haul when species composition changes and different priority species dominate the catch. For example, cod may be the predominant priority species for the first two sampled hauls of the day, but the third sampled haul may contain a large proportion of sablefish. In this situation, measure around 20 cod from each of the first two sampled hauls, but measure around 20 sablefish from the third sampled haul.

Lengths

Samples of selected species should be collected in a random fashion for the length measurement and otolith collection. The easiest way to collect fish for length samples when basket sampling is to collect unsorted catch for the species composition sample, then measure and sex all of the predominant target fish in one or more of the sample baskets. You should randomly predetermine which of your sample basket(s) will be used for

lengths at the same time you are predetermining when to fill baskets for the composition sample. If you are whole or partial haul sampling, collect unsorted catch for the required subsample of the predominant species and sort out all of the target fish in one or more baskets.

The number of baskets you designate to collect lengths from depends on the size of the predominant target species: for example, if you are measuring pollock, you will only need to measure pollock from one basket of unsorted catch to get around 20 sexed lengths per haul. If you are measuring cod, you may need to measure all of the cod in your composition sample to get 20 sexed length measurements per haul. It is important to measure fish collected from unsorted catch using a non-size selective method; do not under any circumstances, select by hand 20 fish from your sorted composition sample for lengths. You may collect sexed target lengths from inside composition samples or outside of composition samples, as long as you are sure there is no bias.

If you are aboard a catcher vessel delivering to a plant, collect lengths at sea for each haul rather than at plants, where fish are mixed from several locations. The data users prefer to have the length data associated with a catch location.

Once you have devised an unbiased selection method to pick the individuals to measure, look for ways the layout of the vessel or factory, or the actions of the crew that can aid you in carrying out your duties. If there is a diverter board or a belt that can be reversed into a basket, utilize those tools. If you have to collect from the deck, use a gaff or shovel on the selected fish. Never use a shovel, gaff or your hand to **select** the fish, but you may use them to collect the fish after they have been selected in an unbiased manner. Ask the crew for help in getting all the fish you selected; for example, if the individual fish selected falls back on an incline conveyor belt, ask a crewman to grab it or push it up, ask roller men to gaff aboard those selected on longliners, or ask sorters not to pull out the large fish until you have your sample.

Before you begin length sampling, set up an area to measure fish. You will need to use or create a "table" large enough to lay a fish on the plastic length strip. If there is no table set up, use the NMFS aluminum board or baskets for a table, or use deck bin boards or the deck. The size of your length station will be a determining factor in how many fish you can collect at one time.

Frequently Asked Questions	Answers
Which Observers/vessels are to conduct length-frequency measurements?	ALL Observers on ALL vessels are to collect length-frequencies.
Which species should be sampled for length-frequency measurements?	Where there is a predominant species which is listed on the otolith priority list select it. If there are dominant species of equal proportions, select the highest priority of these. If the dominant species are relatively in the same proportions in the catch, and are listed at the same priority, alternate between these species.
How many fish are to be selected for length-frequencies?	On average you should measure 20 fish per sampled haul/set. Fish may be collected outside of your species composition sample.
How should fish be selected for the length-frequency sample?	Pre-select which basket(s) to measure fish from, then measure all of the fish in the basket(s). It would be preferable to use the composition basket samples or "B" subsamples for predominant species.
Which fish should be Sexed?	Sex all of the fish measured. If you cannot sex all the fish, sex a random subsample of the measured fish.

Table 9-1: Length Sampling Summary

Otoliths

Otoliths should be collected from a subset of fish in the length sample. Depending on the number of otoliths needed for each commercially important species and the number of hauls you sample in a day, you may collect otoliths a few times per day, or only every few days (see Table 9-2). Use a systematic sampling system to determine which sampled hauls to collect otoliths from. To collect otoliths from every 10th sampled haul, you would pick a random number between 1 and 10. Let's call this number *h*. You would then collect otoliths from the *h*th sampled haul, the *h*+10th sampled haul, the *h*+20th sampled haul, etc. If $h = 4$ then you would sample from the 4th, 14th, 24th, etc. sampled hauls until the vessel changes fisheries or your cruise ends.

If you miss a sampled haul for some reason, collect otoliths from the next sampled haul; do not skip the otolith collection.

Predominant Species	Size and frequency of length samples	Frequency of otolith samples	Number of otolith pairs to be collected
pollock / Bering Sea	20 from every sampled haul/set	every 5th sampled haul/set	2 otoliths & 18 length-weight samples
pollock / Gulf of Alaska	20 from every sampled haul/set	every 2nd sampled haul/set	5
Pacific cod	20 from every sampled haul/set	every 10th sampled haul/set	2
sablefish	20 from every sampled haul/set	every sampled haul/set	2
Atka mackerel	20 from every sampled haul/set	every 5th sampled haul/set	5
Pacific hake	20 from every sampled haul/set	every 5th sampled haul/set	5
flatfish / Bering Sea 1st - yellowfin sole 1st - N/S rock sole 2nd - Greenland turbot 3rd - flathead sole 3rd - Alaska plaice	20 from every sampled haul/set	every 5th sampled haul/set	5
flatfish /Gulf of Alaska 1st - N/S rock sole 2nd - Dover sole 3rd - rex sole 4th - flathead sole	20 from every sampled haul/set	every 5th sampled haul/set	5
5th - arrowtooth flounder	20 from every sampled haul/set	**NO OTOLITHS** **Choose another species**	**NONE Choose another species**
rockfish 1st - Pacific ocean perch 2nd - northern rockfish 3rd - dusky rockfish 4th - all thornyheads rockfish 4th - shortraker rockfish 4th - rougheye rockfish	20 from every sampled haul/set	every sampled haul/set	2

Table 9-2: Otolith and Length Sampling Priorities

Collect otoliths from the selected sampled haul using a systematic method. Never use a haphazard method or hand pick your fish. Divide the number of lengths you collect by the number of otoliths you need to collect. Let's call the resulting number or quotient *x*. Randomly choose a number from 1 to x. Let's call this number *k*. Collect otoliths at *k*, *k* +*x*, *k* +2*x*, *k*+3*x*, etc. until you reach the number of otoliths needed. For example: If you were to collect length measurements from 20 fish and needed to collect 5 otoliths. Thus $x = 20 \div 5 = 4$. Using a random number generator pick a number

between 1 and 4, let's say $k = 3$. So you would collect otoliths from the 3rd, 3+4=7th, 3+8=11th, 3+12=15th, and 3+16=19th fish. To collect 2 fish from the length sample of 20, pick a random number k between 1 and 10, and put aside fish numbered k and k+10.

This otolith collection technique should result in ages and lengths sampled in proportion to their occurrence in the catch. Do not under any circumstances select the fish for the otolith samples according to your perception of the size distribution you "should" be getting. Previous Observer Program collection methods involved keeping track of the size distribution of fish and sampling only in certain size categories as time progressed; these length-stratified collection methods are no longer in use. Please do not pay attention to the sizes of fish collected for otolith removal. Use the techniques outlined above to remain as "size-blind" as possible.

Frequently Asked Questions	Answers	Notes
Which Observers/vessels are to collect otolith samples?	ALL Observers on ALL vessels are to collect otolith samples	Since we are only asking for a few otoliths per day every Observer will be able to collect otoliths.
Which species are otoliths to be collected from?	Otoliths should be a random subsample of the length-frequency sample.	
How many hauls/sets are to be sampled for otoliths?	Depending on the target fishery, and area fished, it may be: - every sampled haul - every 5th or 10th haul.	See Table 9-2, "Otolith and Length Sampling Priorities"
How many otoliths are to be collected?	No more than 2 or 5 pairs per sampled haul, dependent on species	See Table 9-2, "Otolith and Length Sampling Priorities".
How should the individual fish be selected for the otolith sample?	Use a systematic sampling system.	See page 9-6.

Table 9-3: Otolith sampling summary

Length-weight Sampling for the Bering Sea Pollock Fishery

In prior years the only information available to NMFS for length-weight samples were from the otolith samples. NMFS has reduced the number of otoliths required from the Bering Sea pollock fishery. Because of this reduction Observers no longer collect enough length-weight samples for this fishery. To supplement the number of length-weight samples, we are requiring Observers in the Bering Sea pollock fishery to collect length-weight samples from the hauls designated as otolith collection hauls. On every fifth haul, the same haul as you collect otoliths, weigh and measure

the fish from your length-frequency sample not used for otolith samples. Record the data **on a separate 9US form** with a specimen type of 3 "Length-weight Sample". **Attention ATLAS vessel Observers:** For ATLAS vessels you will need to enter a code 9, "Maturity & Otoliths," for specimen type of length-weight samples when the code 3, "Length-weight Sample," is not allowed by the ATLAS program. The data will be changed to 3"Length-weight Sample," in Seattle when the data is transmitted.

Sexing Fish

Sexing the collected fish is the first step in the length-frequency task. The sexes have to be recorded together as a group on the plastic strip, the paper 7US, or the ATLAS length form; therefore, it is best if the fish are sexed before the measurements are taken. After the fish are collected in a random/systematic fashion, cut the fish to determine the sex. While sexing, separate the males and females and then measure one group at a time. That way, when you grab a fish from the basket or pile, you will already know its sex and can make the length mark on the plastic strip quickly.

Roundfish

Roundfish gonads are in the visceral cavity, ahead of the anus. Insert your knife or scalpel blade in or near the anus and cut forward toward the head. There will be only two organs attached directly to the anus - the intestine and the gonads. If you carefully move the other organs aside until you get a clear view of the tubes attached to the anus, you can then pull on the tubes and discern which is the intestine, coiled and end at the stomach, and which is the gonad, ending in paired structures near the backbone.

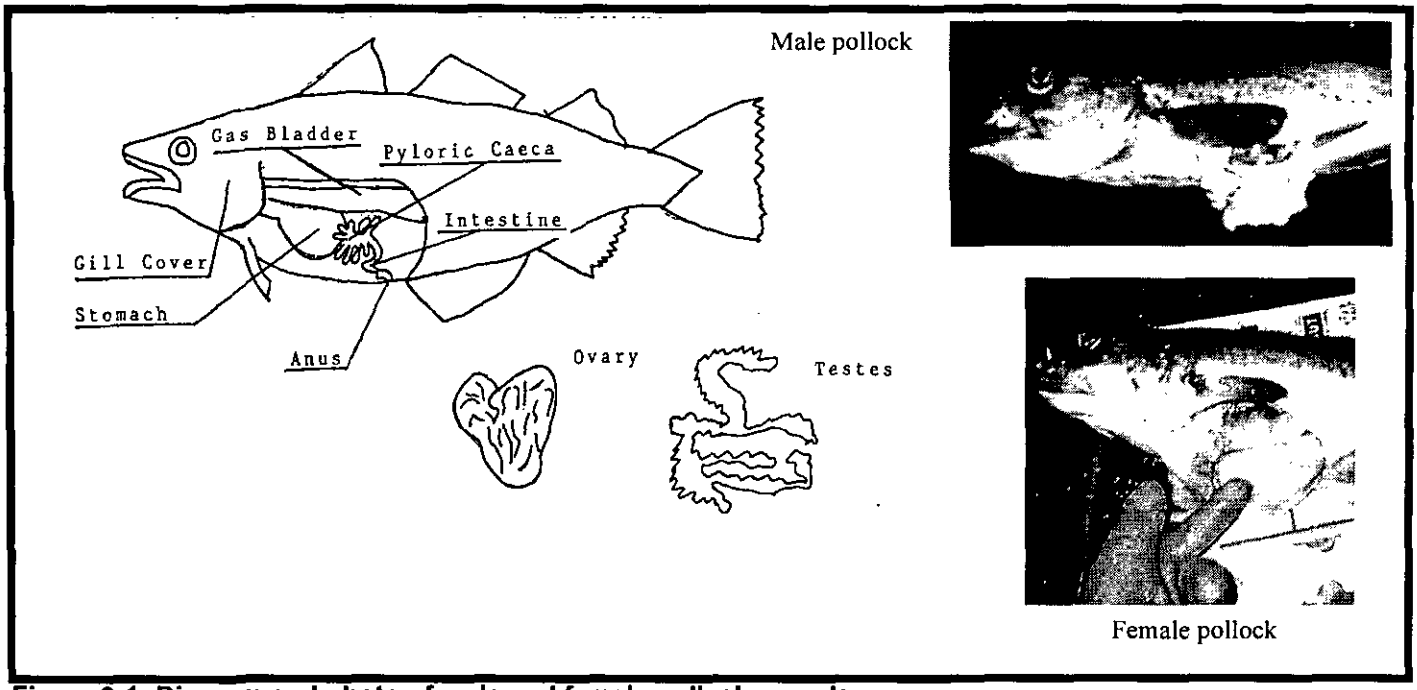


Figure 9-1: Diagram and photo of male and female pollock gonads

Cod, Pollock, and Hake

The gonads are directly above the vent and are attached to the vent. Slit the skin of the belly near the vent and look behind the stomach area for the paired organs.

The ovaries are paired sacs which are typically pink or orange (or clear when immature). When the ovaries are mature, you should be able to see the eggs inside. The sacs should look granular. Pacific cod ovaries often have a black covering on each sac.

The testes look very different from ovaries. When mature, the testes are convoluted, opaque and smooth in texture. In a mature male, the testes are best described as "greasy-looking, white, twisted Ramen noodles." Immature testes will be pink or cream colored, have a ruffled look to the edges of the tubes, and be located near the backbone. Often, the paired gonads are fused together as if one structure.

Rockfish

Rockfish gonads will be found near the backbone in the visceral cavity. Trace the gonad strings from the vent upwards until you see the paired organs. There will always be two strings near the anus that have to be traced some ways before you can find the sacs. Sometimes there is another structure directly at the vent that appears to be a single gonad sac, but do not assess this as the sex organ! You must follow the string-like tubes up to the paired gonads.

The ovaries will be elongate ovals with granular insides. They will be pink, orange, yellow, or white. The two sacs will have smoothly rounded sides, as opposed to the male testes which have a three-sided, triangular shape in cross-section. If immature, look closely or cut the gonad open to see the granular insides which identify it as female. Rockfishes are live spawners, so a spawning female will have larvae in the cavity.

Rockfish testes are cream colored or pink, elongate (5 times as long as they are wide) and smooth in texture. They have three "edges" to the tubes. Instead of a rounded oval tube, testes look triangular in cross section due to the distinct edges. Testes will look like flat tubes when immature, but when examined closely you will see the sharp edges and the triangular shape.

Though you may notice external structures at the vent that seem sexually dimorphic, never sex rockfish using external characteristics. It is too easy to judge an immature male as a female or a huge female as a male when using external characteristics.

Atka Mackerel

Like rockfish, Atka mackerel gonads are at the top of the visceral cavity, close to the backbone. Externally, mature males have a yellow tinge to the white stripes but external color differences cannot be used to sex these fish. The cut and gonad location is the same as with rockfish.

Ovaries are two clear sacs filled with small round eggs that are olive green, tan or brown. Atka mackerel spawn in spurts, so eggs in the ovaries will be a mix of different sizes and stages of development.

Atka mackerel testes are similar to those in rockfish. The two tubes will be smooth in texture, cream colored and longer than wide. Be aware that males eat the eggs from other Atka mackerel nests. Don't confuse a stomach full of eggs, or eggs loose in the cavity as a female mackerel.

Sablefish

The gonads of sablefish are very different from all other roundfish. They will be located directly on the backbone, forward toward the fish head. Remove all the other organs from the visceral cavity and peer at the backbone area near the anterior of the cavity for the gonad tubes. Immature fish will have nearly see-through ribbons, so you will need to probe them apart to count the number of tubes.

Both females and males have fleshy smooth tubes of a cream or pink color. Mature fish have liver colored gonad tubes. There are no reliable differences in color or texture between males and females. However, males will have four lobes and females will have two lobes. When mature, the ovaries may have a partial fold through each of the two lobes, giving a false impression of four lobes. Cut across the gonad strands and distinguish the true number of lobes.

Flatfish

Flatfish gonads are also paired, but are located behind the visceral cavity. If the flatfish has an anal spine, the gonads will begin just behind it. Cut from the anal spine location back toward the tail of the fish. When you gain experience determining sexes using a larger cut, your cut can be made smaller, faster, and in the correct spot for seeing the sex difference. Practice the cut in the fish lab.

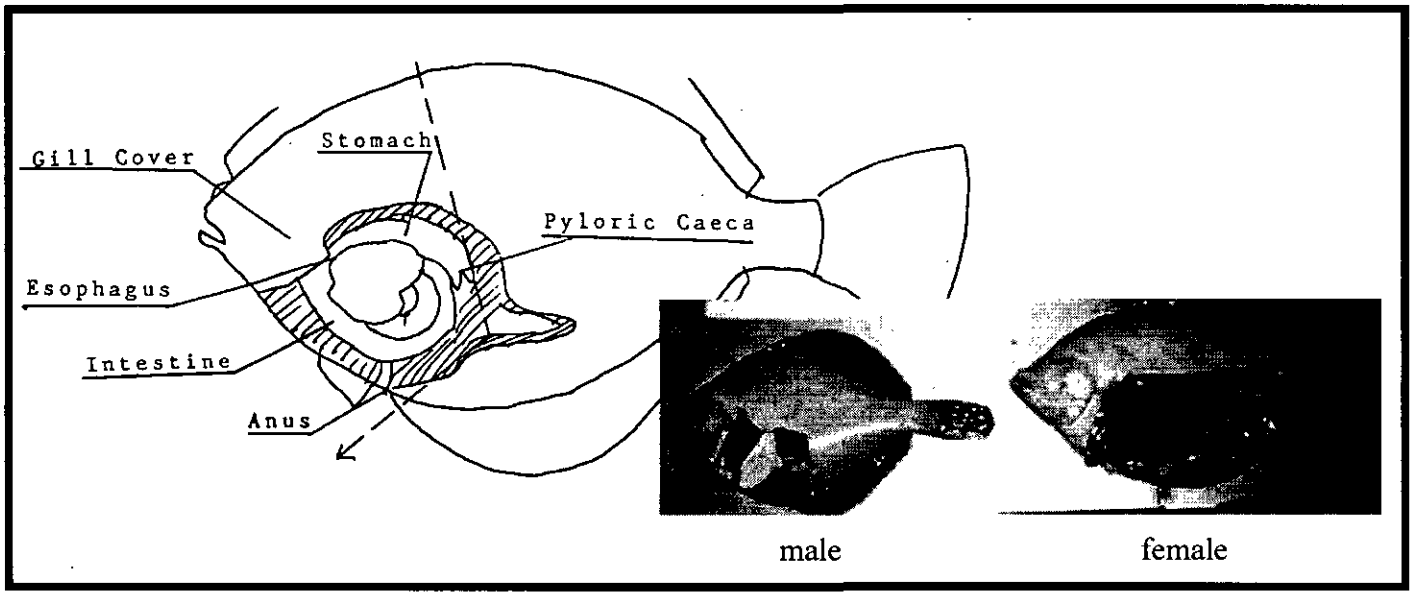


Figure 9-2: Diagram of flatfish and photo of male and female flatfish gonads

Flatfish gonads are posterior to the visceral cavity (and the anal spine if there is one) and extend just under the flesh on both sides of the fish, though it is easier to cut on the blind side. Cut back toward the tail from the anus as if skinning the fish. Lift the skin flap and check for a triangular shaped gonad.

Female flatfishes have elongate triangle ovaries that extend from behind the anal spine area almost to the tail when mature. When immature, the ovaries will be almost equilateral triangles with one angle shaped like a smoothly rounded tube extending only slightly back toward the tail (the triangle looks like a funnel in shape). The color will be pink (spent, immature) or orange (ready to spawn). Ovaries always have rounded edges on the triangular gonad.

Male flatfishes have a white, equilateral triangle shaped gonad on each side. The triangle will not have a tail extending back toward the caudal fin. Immature males have a small crescent moon shaped, tan colored gonad laying right at or behind the anal spine location. All male flatfishes have "edges" to the triangle. If you lift the gonad with the knife or scalpel and examine the sides of the triangle, you can distinguish the sharp edges (male) or rounded sides (female), even on an immature flatfish.

There are instances where the crew will want you to not cut the fish because it may destroy or reduce the value of the product. The only alternatives to cutting all of the measured fish are as follows:

- If the fish are spawning, you could squeeze the fish to see milt or eggs, but you **must** cut the ones in your length sample that are not yet spawning to discern the sex.

- If the target species is yellowfin sole, you can sex the mature yellowfin by "candling" them, without cutting the flesh (hold the fish up to a strong light and look through the blind side to see the gonad), yet immature fish **must** be cut to discern sex. Do not use this method for species other than yellowfin sole!

- Ask if a "pectoral cut" would be acceptable on the product (slicing the throat area just under the pectorals across the body, the same way as the crew heads the fish by hand or machine). The gonads can be seen in the opened cavity or pulled out to examine.

- If the target is a flatfish, make a very small cut, parallel to the anal spine, about an inch behind the anal spine and check the gonad (make sure you try this technique in the training or briefing session to see how it is used). The small cut may not be a problem for the product.

- If there is no other way to sex the fish without cutting them, work out a number with the captain for the random subsample that you can cut, and the rest you can list as unsexed. The subsample size should be about 1/5 to 1/4 of the sample.

- If the vessel refuses to allow you to cut any of the fish because it would destroy a major percentage of the target species product, leave all measured fish as unsexed. Notify NMFS and document the reasons in your logbook. You will be asked to complete an affidavit on the matter in debriefing.

Regulations Supporting the Observer Cutting Fish for Obtaining Sexed Lengths

The sexing of the target species provides essential data for managing the fishery. Because of its importance, a regulation was passed supporting the Observer's cutting of fish for sexed lengths. It states "Provide all other reasonable assistance to enable Observers to carry out their duties, including, but not limited to: (E) Allowing the Observers to determine the sex of fish when this procedure will not decrease the value of a significant portion of the catch." (CFR 679.50, subpart E, part viii)

Measuring Fish

Fork length is the measurement used in the Observer Program and on research cruises, for fish. Fork length refers to the length from the tip of the snout or jaw (whichever sticks out most) to the end of the middle rays of the caudal fin (see Figure 9-3). The only exception to this rule is grenadier length, which is measured from the snout to the insertion of the anal fin.

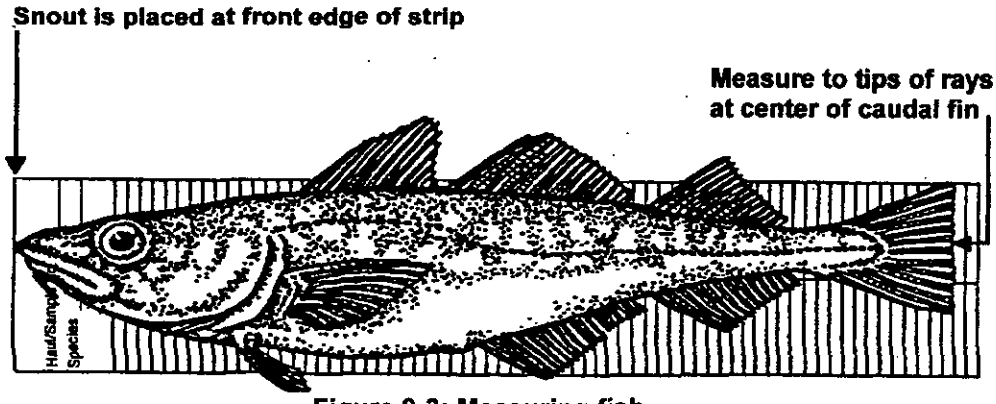


Figure 9-3: Measuring fish

You will be given plastic measuring strips marked at centimeter increments. The first line printed on the strip is 4.5 cm, and the space between that line and the next line represents a measurement of 5 cm. Check your plastic strip, on both sides, to insure that the first line is really 4.5 cm. Sometimes the manufacturer has cut the strip incorrectly. Notice that the 10 centimeter increments are not marked with a number. That is so that you can offset the strip by 10, 20, or 30 centimeters for the larger fish (in which case, the first 10 centimeter increment mark would be changed to 20, 30, etc.). The figure (9-4) shows offsetting the plastic strip for measuring large fish. Position the plastic strip on the NMFS aluminum board, the labeled end should be toward the lip of the board so the snout of the fish may be nudged against it. Alternative materials to the aluminum board may be used for doing measurements, but you must be able to nudge the snout against something. The plastic strip can be held down with thumbtacks, tape, or fish slime (rub the back of the strip on the fish and it will "glue" temporarily to the board).

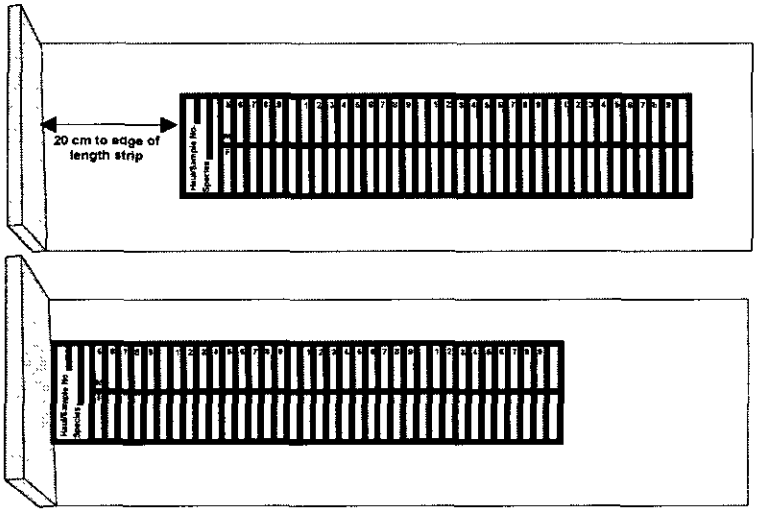
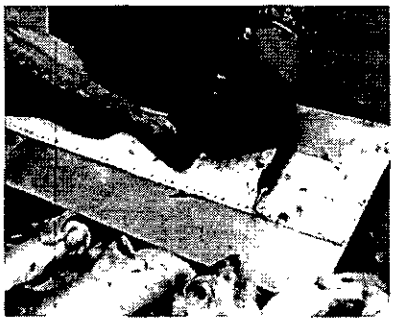


Figure 9-4: Measuring strip placement

The steps of measuring a fish are as follows:



1. sex the fish first, if possible;
2. lay the fish flat on the plastic measuring strip parallel to the center line;
3. close the jaws;
4. nudge the fish snout against the end of the aluminum board;
5. stretch out the tail to find the middle rays (see Figure 9-3);
6. make a mark on the plastic measuring strip in the space where the fork length falls (above the center line for males and below the center line for females).

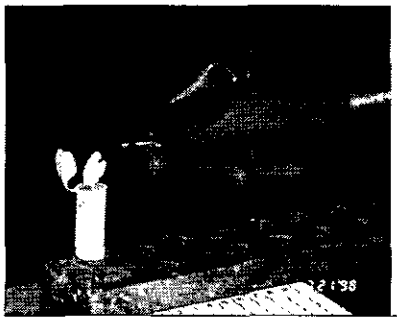
If the fork length falls on a printed line on the strip, try re-measuring the fish first, then if the length falls on the line again, use the lower centimeter measurement. Transfer the number of pencil marks (frequency) made at each centimeter measurement (size group) from the plastic length strip to computer or paper form 7US. The length strip should be cleaned with scouring powder to remove the marks and ready it for the next haul's lengths. Don't scrub too hard because you will scour off the centimeter lines.

Taking Otoliths

After obtaining the length measurement, weigh the fish. Record weight, sex, and length on your plastic deck sheet next to the vial number in which the otoliths and/or scales are placed. It is important to fill the otolith vials in numerical order, and ensure that numbered vials match the data for that fish. A mistake in the numbering sequence or procedure used to relate the otoliths to associated biological data makes the collection useless.

The otoliths are located ventrally, and to either side, of the brain tissue, just above where the preoperculum is located. The common methods of cutting into a fish's head to remove the pair of otoliths are; a vertical cut through the head above the preoperculum, or a horizontal cut through the head just above the eyes. The easiest method to use for most fish 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 a simple rule of thumb: imagine the two points on either side of the fish's head at which, if the lateral lines were extended, they would meet the pre-opercular bones, plan to cut down to these points (see Figure 9-5). Species with tiny otoliths are best cut using the horizontal technique (see Figure 9-6).

Firmly grasp the fish by putting thumb and forefinger into the eye sockets or grasp the fish just behind the head, holding it dorsal side up. 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, ease off pressure on the knife or you will slice through the otoliths. Break the head open with two hands.



Care should be taken not to break or crack the otoliths. Otoliths with only small pieces broken off may be kept, but please include all pieces in the vial. Shattered otoliths, otoliths broken through the core, and completely crystallized otoliths cannot be aged; if otoliths are in this condition, please randomly select another fish and try again.

Carefully clean the otoliths by rubbing them between your fingers in water, or on a wet sponge or cloth to remove slime and tissue. Dry them as much

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. The otoliths **must** be wiped clean before storage in the vials or they will rot and become useless!

Figure 9-5: Location of roundfish otoliths

as possible and place one pair of otoliths in each vial. It is important to get the otoliths clean and as dry as possible before storing them to prevent their rotting. At the end of the collection period, transfer the data from the plastic form to the paper Form 9US or the ATLAS specimen collection form.

Collecting Otoliths from Atka Mackerel and Sablefish

Sablefish and Atka mackerel have very tiny otoliths. For many Observers, the vertical cut into the head produced no otoliths found. Blood runs into the head cut and flushes the tiny otoliths out of their pockets and they often cannot be found again. Using a horizontal head cut has proven successful for both these species.

To collect otoliths using the horizontal cut, hold the fish's head and make a horizontal slice into the snout just above the eye. Stop slicing when the knife reaches just before the preopercle. Make a second cut down into the head until you reach the level of the first cut. Remove the wedge of head cut (see Figure 9-6). If you have made the cut correctly, you should have no blood flooding the cavity and you should see the brain tissue lying in a cavity. The otoliths are just under and beside the brain. Grasp the brain tissue with forceps and pull it out or peel it back from the cavity. On either side of the brain cavity there is a fluid-filled pocket containing an otolith. The otoliths may not be visible yet, but if you insert forceps into the pockets, you will find the bony structures floating within the fluid. If blood fills the cavity, you have cut too deep, and the otoliths may be washed out, so perfect this cut and the collection will become easy.

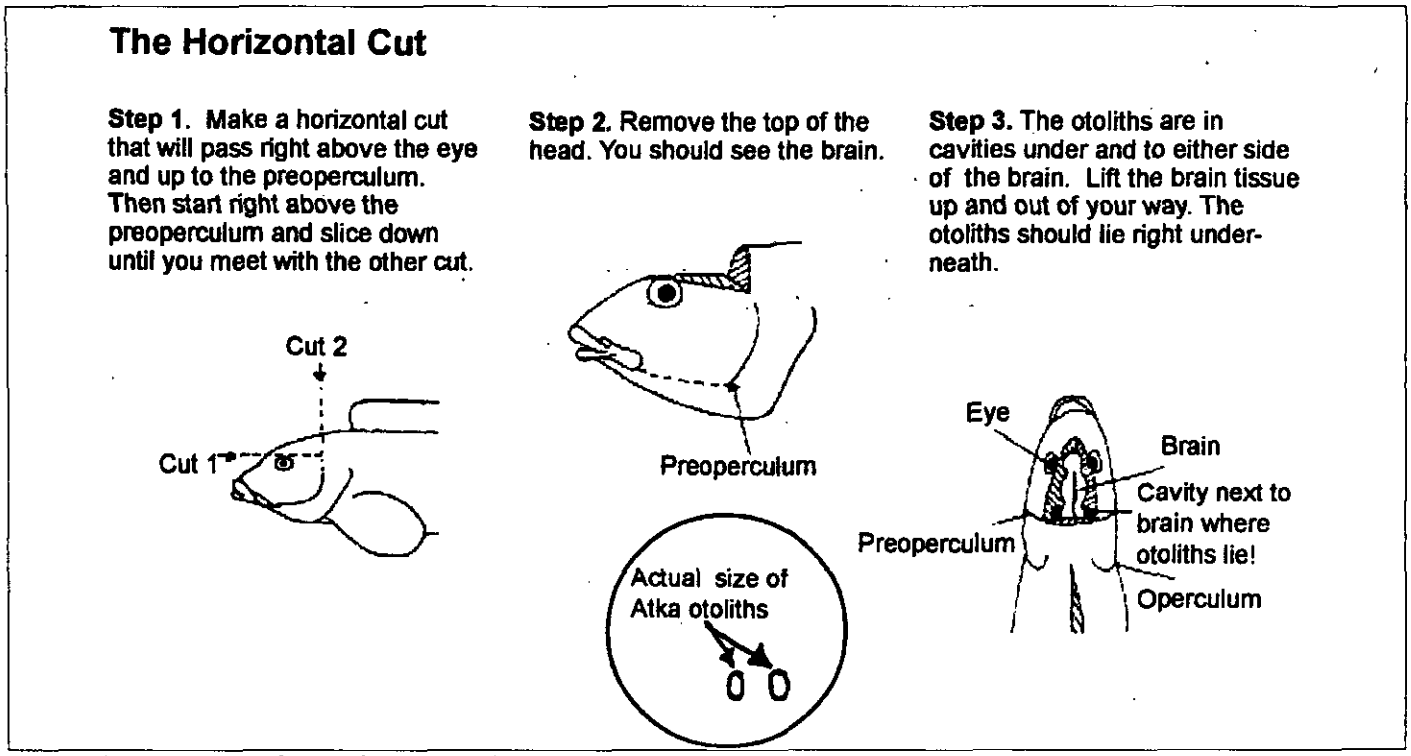


Figure 9-6: Horizontal cut of Atka mackerel

Collecting Otoliths from Pacific Cod

For Pacific cod, collect scales as well as otoliths. The vertical cut into the fish head works very well for collecting otoliths from Pacific cod, though you will need a strong knife or a hacksaw. To collect scales, first rinse the fish off or lightly wipe down the sides with a very wet sponge to remove scales of other fish and fish slime. There are two preferred body zones from which to take scales (see Figure 9-7). Zone "A" is preferred over zone "B." Use a clean, thin-edged instrument (knife, scalpel, forceps) to scrape in an anterior direction (toward the head), within zone A or B if possible. Collect 5-7 scales and put them into the vials with the otoliths instead of into scale envelopes. Smear the scales into the vial as opposed to scraping them off on the vial rim. Clean any remaining scales off the instrument before sampling the next fish.

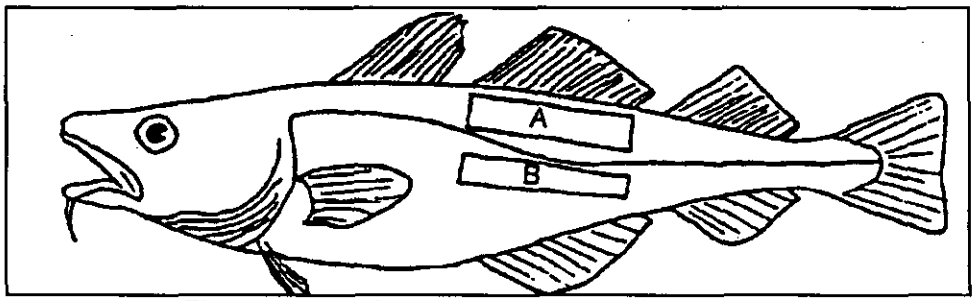


Figure 9-7: Scale collection zones of Pacific cod

Cruise	Vessel Code	Year	Month	Day
6011	A110	99	03	09

FORM 7US-LENGTH FREQUENCY OF MEASURED SPECIES
(includes halibut, salmon, and crab measurments)

Page 13 of ____

SIZE GROUPS: Fish by 1cm. Crabs by 5mm

M = male
F = female
U = unknown sex

Species name	Species code	Set/haul no.	Sex	Eggs?	Keypunch check	Size groups	Freq.	Size groups	Freq.	Size groups	Freq.	Size groups	Freq.	Size groups	Freq.	Size groups	Freq.	Size groups	Freq.
POLLOCK	201	53	F		318	39	1	41	2	42	2	43	3	45	1	47	2	48	2
POLLOCK	201	53	M		177	41	1	42	3	43	1	45	1						
KING SALMON	222	53	M		129	63	1	64	1										
POLLOCK	201	55	F		237	42	1	43	2	44	3	47	4	49	2				
POLLOCK	201	55	M		223	40	3	41	2	42	1	45	1	47	1				
BAIRDI TANNER	4	55	M		79	78	1												
BAIRDI	4	55	F	Y	109	108	1												
OPILIO TANNER	5	55	M		198	93	1	103	1										
OPILIO	5	55	F	Y	99	98	1												
POLLOCK	201	56	F		275	40	1	41	2	43	3	45	2	47	2	48	1		
POLLOCK	201	56	M		180	40	2	42	3	43	2	46	2						
CHUM SALM.	221	56	F		72	71	1												
CHUM SALM.	221	56	M		69	68	1												

National Marine Fisheries Service - North Pacific Groundfish Observer Program

Revised 1/1/97

Figure 9-8: Form7US - Length Frequency of Measured Species

Form 7US - Length Sampling of Measured Species Instructions

The paper form 7US is used for recording the lengths of the target species, measurements of prohibited species, presence of crab eggs, and halibut viabilities. **All lengths on the 7US form MUST be from a random or systematic collection of fish or crabs.** Never list estimated lengths on this form. Observers using the ATLAS software will not fill out this paper form, but will transfer data directly from the plastic length strip to the computer.

- Fill in the cruise number and vessel code of your ship or plant. The plant code will start with an "P" and all ship codes start with an "A". A list of these codes can be found on page A-23.

- Fill in the date of the haul/set retrieval, or if at a plant, fill in the delivery date. This date should match 1US, 2US, or Form A for that haul number. Use leading zeros in dates to record month and day to two digits.

- Number the pages "Page ___ of ___" starting with page one for that vessel or plant and ending with the total number of pages in the 7US set. Keep separate sets of 7US for separate vessels or plants. Put your name and the ship name on the first page in each set.

- Record the common name of the fish or crab in the first column and the species code in the next column. The species code column is keypunched so use brackets and arrows if you need more than one line for that species. Never use ditto marks in the species code column.

  Pollock catcher vessel Observers note - target lengths will be done at sea but prohibited species lengths will be taken at the plant. Leave several lines blank after the target fish lengths to later fill in that haul's prohibited species lengths.

- Record the haul, set, or delivery number. Use arrows and brackets on continuation lines.

- In the **Sex** column, record the fish or crab sex as "F"(female), "M"(male), or "U" (unsexed or uncertain). For all halibut, list viability codes in this column. Use condition codes "E" (excellent), "P" (poor), "D" (dead), or "U" (condition not assessed).

- The **Eggs?** column is filled out for **crab measurements only**. For

female crabs with eggs, enter a "Y" in this column and follow with all female crab lengths for those carrying eggs. Use another line for female crabs without eggs and enter a "N" in the column. Leave the column blank for male crabs and all fish.

- The **Keypunch Check** column should contain the sum of all of the lengths in that line and all of the frequencies in that line. Sum this more than once to ensure it is correct.

- Under **Size Groups**, list the length readings from the plastic length strips. The list must be in **ascending order** across the line. List only size groups that have a frequency of one or more.

- **Frequency** is the number of marks counted from the length strip for that length increment, for that sex or viability.

- Start a new row every time there is a change in sex, viability, or presence of eggs. Skip a line between different species or hauls. Do not enter leading zeros in any columns except the date.

NMFS area 542

Form 9US - Biological Sampling Form

Page 1 of ____

Cruise	Vessel Code	Year	Month	Day	Species name	Species code	Specimen type	Sampling system
6011	A110	99	03	09	POLLOCK	201	1	2

For Observer use only
Total # of specimens ____
Catalogue ____
date ____

	Set/haul number	Specimen number	Sex	Length (cm)	Weight (kg)	Form 7?	Maturity stage	Notes	Age	Remarks
1	56	114	M	40	.87	Y				
2	56	115	F	43	.92	Y				

Figure 9-9: Form 9US - Biological Sampling Form (otolith data)

AREA 542 FORM 9US - BIOLOGICAL SAMPLING FORM Page 8 of ___

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
6011	A110	99	03	09	Pollock	201	3	2

Total no. of specimens ____
Catalogue date ____

	Set/haul number (25-27)	Specimen number (28-30)	Sex (31)	Length (cm) (32-34)	Weight (kg) (35-39)	Form 7 (41)	Maturity stage (42-43)	Notes (44-45)	Age (47-49)	REMARKS
1	56	19	M	41	.70	Y				
2	"	20	M	43	.72	"				
3		21	M	45	.78					
4		22	F	43	.68					
5		23	M	43	.70					
6		24	F	48	.84					
7		25	F	40	.65					
8		26	F	43	.66					
9		27	M	47	.76					
10		28	M	48	.82					
11		29	F	46	.84					
12		30	F	41	.66					
13		31	M	45	.75					
14		32	M	41	.60					
15		33	M	43	.66					
16		34	M	47	.74					
17	↓	35	F	40	.63	↓				
18	56	36	F	42	.65	Y				

Figure 9-10: Form 9US - Biological Sampling Form (length/weight data)

Form 9US- Biological Sampling Form Instructions

The 9US Form is used for otolith collections, pollock length-weight collections, and salmon scale collections by all Observers. It is also frequently used for special assignments such as maturity studies.

Keep separate groups of pages for each species. Do not list one otolith collection species on the back page of another species. Start all page 1's with your name and vessel name in the upper margin.

- **Form sets and page numbering** - Each set of 9US forms must be numbered separately by species, by specimen type, and by ship. Start a new page for a new species, a new set of pages for a separate ship, a new set of pages for otoliths vs salmon scales.

- **Area** - On the top left, fill in the three-digit NMFS area corresponding to the hauls/sets recorded on that page. All hauls listed on that page must come from the listed NMFS area. Use separate pages for different NMFS areas. NMFS area designations can be found in the Appendix (page A-31, A-32, A-33).

- **Heading** - Fill in your cruise number and vessel code in the first two boxes. Fill in the date of the hauls sampled for otoliths or scales (record the date corresponding to that haul number from your 2US, 1US, or Plant Delivery Form). Leading zeros should appear in the month and day only. Enter the common name and the species code.

- **Specimen type** - Record the specimen type code from this list:

1 -- otoliths only	4 -- otoliths and scales (cod)
2 -- salmon scales	8 --maturity only
3-- lengths and weights only	9 -- maturity and age structures

- **Sampling system** - List code 2 for the sampling system.

- **Total no. of specimens, Catalogue date, and Remarks** - Leave these areas blank. Also leave blank the columns for Notes and Age. Write any of your notes at the page bottom.

- **Set/Haul number** - List the haul, set, or delivery number for the otolith or salmon scale collection in the first column. You may list multiple hauls on the same page, so long as the hauls listed are from the same date, NMFS area, specimen type, species and same ship.

- **Specimen number** -

  Otoliths: Copy the number on the otolith vial for each pair of otoliths taken for that haul. List the vial numbers in ascending order. If there is a vial number missing, make a note on the page bottom about it.

  Salmon Scales: Label your salmon scale envelopes with specimen numbers. Start with specimen 1 and continue, in numerical order until you have numbered all of the salmon scale envelopes you needed for that species and vessel. Start with a new number 1 when changing to a new species or new ship. Record the specimen numbers from your envelopes for the hauls sampled in ascending order.

- **Sex** - Try and group your data listing by sex group. List all the males first, or females first. Use M, F, or U.

- **Length** - Record the fish length in centimeters. Use whole numbers.

- **Weight** - Record the individual fish weight in kilograms. Always list the weights to 2 decimals. **Important** weigh these fish on the brass 2kg, 5 kg, or 12 kg scales, or your motion compensated platform scale and not the 50 kg salter scale!

- **Form 7** - This column should always be filled in with a "Y". The "Y" indicates that the lengths on 9US area a subset of the randomly chosen lengths from the 7US, as they should be. If you have otoliths or scale samples that are not from randomly sampled measured fish, call NMFS before entering here.

- **Maturity** - This column is used for certain assigned special projects only.

PROHIBITED SPECIES SAMPLING

List of Priorities

- Collect data from prohibited species in your species composition sample.
- Collect and record crab measurements.
- Collect and record salmon and halibut length measurements.
- Collect and record halibut viabilities.
- Collect salmon scales.

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Introduction

Certain bycatch species, because of their high commercial value in independent fisheries, are considered to be of higher significance to the Observer Program than other bycatch species. These species are referred to as prohibited species and include all Tanner crab species, all king crab species, all salmon species, Pacific halibut, and herring. In addition to data on the abundance of these species in the composition of commercial catches, Observers are asked to collect measurements and other significant biological data from most of these animals. Observers collect no biological data from herring even though it is a prohibited species.

Just as the length measurements on target species help provide information on what populations are being targeted by fishing operations, the measurements of prohibited species provides information as to which parts of the populations of prohibited species are being caught as bycatch. Data collected on halibut is used in the monitoring of the total prohibited species cap (PSC) for halibut. A total of 15% of the total halibut quota is reserved for groundfish fisheries bycatch. The assessment of viability is important because not every halibut caught by groundfish vessels as bycatch are killed. Many halibut are released alive and remain a part of the stock. To determine what percentage of the bycatch should be counted as dead, and therefore part of the halibut PSC, the International Pacific Halibut Commission relies on Observer data to determine what number of halibut captured are actually killed. Knowing the length as well as the viability shows the trends of how different sized halibut are affected by capture and handling, thus allowing for a more accurate assessment of halibut mortality.

Forms Involved

Sex and length data from salmon and crab, halibut length and condition data, and crab egg presence will be recorded on the Length Frequency Form 7US. Data from salmon scale collections will be recorded on Biological Sampling Form 9US.

Subsampling

All fish and crab listed on 7US or 9US must be identified to the species level, as biological data from unidentified salmon or crabs is useless. If there are too many crab or salmon in a haul, and you cannot sample them all, collect a random or systematic subsample of 20 to identify to species, sex, and measure. If there are many halibut in a haul or set, collect at most 20 per haul/set or at the least 20 per day to measure and assess for viability. Refer to the Target Lengths section for how to collect a random or systematic subsample.

Tasks for Crab Data Collection

Introduction

Complete crab tasks in the following order of priority:

- Collect species composition data, identifying crab to species.
- For prohibited species only, sex the crab and look for the presence of eggs in the females.
- Measure crabs.
- Look for tagged crabs.

Species Composition of Crab

In your species composition samples, identify all crab to species or species group. For the two prohibited species groups, Tanner and king crab, identify the crabs to species and sex, then record their numbers and weights on the 3US Form. If there are too many crab to identify, or too many to weigh or count, refer to "Subsampling" on page 10-3 .

Crab Measurements, Sex Determination, and Egg Presence

Other biological data such as measurements, determination of sex, and the presence of eggs should only be collected from Tanner crab and king crab species from within your prohibited species composition sample. The nine species of concern to the Observer program are: C. bairdi Tanner crab, C. opilio Tanner crab, C. hybrid Tanner crab, C. angulatus Tanner crab, C. Tanneri Tanner crab, brown or golden king crab, blue king crab, red king crab, and Couesi king crab.

Exceptions to the Guidelines:

Measuring Crab in the Pollock Fishery

Measure all species of crabs that you see in a haul, not just the prohibited crabs and not just in your composition sample. Measure the non-prohibited crabs across the carapace. Do not sex the non-prohibited crabs or look for eggs. This is because in 1999 all pollock fisheries must be pelagic. The pelagic trawl definition includes a performance standard based on the number and size of crabs on board at any time. The presence of 20 or more of any species of crab indicates non-pelagic fishing, so Observers are asked to count and measure any crab during this fishery.

Measuring Crab in the Flatfish Fishery in the Bering Sea

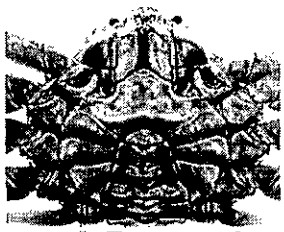
If you see more than 100 king crab, measure and sex 50-100 randomly selected king crab. These crab do not need to come from the composition sample as long as they are randomly collected. The Alaska Department of Fish and Game needs more length data from the incidentally caught king crab to design time-area closures of Bering Sea trawl fisheries to protect crab stocks in low abundance. Female red king crab abundance is sometimes below the threshold needed to conduct a crab fishery, so more data are essential to monitor the stocks.

Sexing Crab and Checking for Eggs

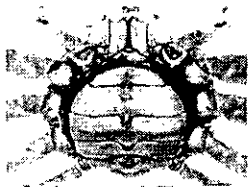
Refer to Figure 10-1 for the differences in the shape of the abdominal flap indicating the sex of the crab. Remember to sex each crab before measuring it.

- Female king or Tanner crab have an abdominal flap that completely covers the carapace bottom. It will be round and extend to the leg insertions on mature females. If you lift the flap slightly, you can determine if the females are carrying eggs.

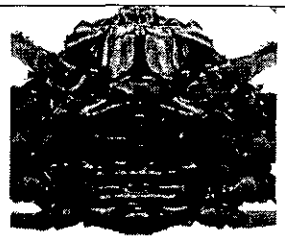
- Male king and Tanner crabs have a V or U-shaped abdominal flap that does not cover the bottom of the carapace. When immature, the abdominal flap is shaped like a finger. When crabs are mature, the abdominal flap is more V- shaped in king crabs and U-shaped in Tanner crabs.



male Tanner crab



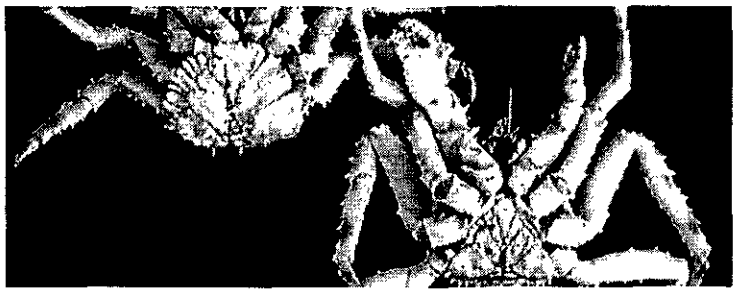
female (mature) Tanner crab



female (immature) crab

Figure 10-1: Male and female tanner crab

female King crab



male King crab

Figure 10-2: Female and male King crab

Measuring Crab

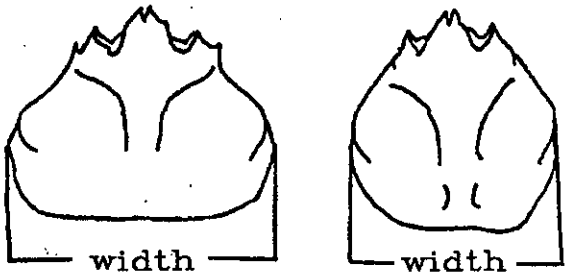
All crab must be measured using the calipers provided by NMFS. If you do not have calipers, do not measure crabs, as all other measurement techniques are invalid. Never use a tape measure or fish length strip for crabs since these are only accurate to the nearest centimeter.

Lay the crab on a flat surface and hold the body down with one hand while you work the calipers with the other hand. Spread the calipers across the top of the crab and close the arms until the very tip of the calipers is touching on the designated spots (see Figure 10-3).

- King crab are measured from the right eye socket to the middle of the posterior margin of the carapace. Be careful not to let the caliper tip slip into the eye socket; keep the tip only at the socket rim (see Figure 10-6).
- Tanner crab are measured across the carapace. Measure the width across the back, at the widest part of the carapace, but exclude any spines at the carapace edge (see Figure 10-6).
- For hermit and sponge crab inside of their shell or sponge, measure the width at the widest point of the shell or sponge. On the 7US form make sure to indicate that these measurements were of the shells and not the actual crabs. If you are using ATLAS note this in your logbook.

- All other crabs should be measured in the same manner as Tanner crabs.

Proper measurement technique for Tanner crab



Proper measurement technique for King crab

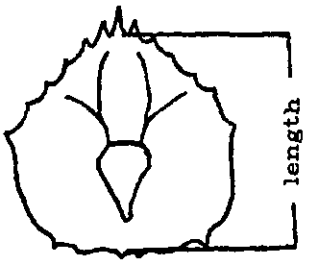


Figure 10-3: Measurement techniques for crab

Transferring Measurement to the Plastic Sheet

You will be given a plastic measuring sheet to record crab measurements. After measuring the crab and without moving the arms of the calipers, lay one arm of the caliper on the "start line" at the bottom of the plastic form and lay the other arm perpendicular to the start line on the plastic form. At this point make a pencil mark under the appropriate sex category. If the caliper arm falls directly on a line use the lower measurement. Use only this plastic sheet for crab lengths.

The plastic length sheet for crabs is marked in 5 mm increments starting at 3 mm. Crab lengths read from this sheet will always end in digits 3 or 8. For example, all crabs 41 to 45 mm in size would be recorded as 43-mm, crabs 46 to 50 mm would be recorded as 48 mm.

Recording Biological Data

Record the sex, presence of eggs (females only), and measurements by haul, species, sex, and presence of eggs on either the paper or electronic 7US form. This could result in a total of three lines on the 7US Form for each haul and species of crab; male, female without eggs, and female with eggs.

Check for Tagged Crab

Refer to "Tagged Crab" on page 11-3 for information on what sort of tags are used and what data to collect.

Tasks for Halibut Data Collection

Introduction

Complete halibut tasks in the following order of priority:

- Determine species composition
- Measure Halibut and assess halibut viability at the point of discard.
- Check for tagged halibut

Species Composition

Count and obtain the total weight of Pacific halibut in your composition sample. Halibut are never sexed by Observers unless they are tagged and dead.

Measurements and Viability Assessment

Viability without a corresponding length **cannot** be used, but lengths without viabilities **can** be used. The viability assessment is to determine if the condition of the halibut about to be returned to the ocean are excellent (code E), poor (code P), or dead (code D). For the Discard Condition Criteria table, see page A-36, A-37, and A-38. If the halibut is not assessed or you cannot tell the viability, record the condition as "U" and measure the length.

You may measure and assess viability on halibut from your species composition sample or from outside your composition sample. Viabilities must always be from a sampled haul or set. Use appropriate methods to insure that your sample for halibut length measurements and viabilities is a random or systematic subsample of all halibut in the catch.

Technique for Measurement

All halibut are measured by fork length, see the definition of fork length in your Species Identification Manual or see page 9-13 of this manual. Lay the halibut on the plastic length strip or on top of a tape measure. **Never** use the tape measure over the top of the fish and "sight down;" inaccuracies can be introduced as you move your head and hands. **Never** obtain a curvilinear length.

For large halibut, offset your length strip by twenty or more centimeters, or

create a measuring device that is accurate to the nearest centimeter. For example, mark a piece of plywood or cardboard in centimeter increments. As you measure the fork length ignore the F and M for sexes on the top of the plastic length strip and write in E, P, D, and/or U. Record the number of halibut of each length and viability code on the Length Frequency Form 7US. Even though there are instructions for estimating halibut lengths in order to obtain approximate weights on page 6-12, never record estimated lengths on the Length Frequency Form.

Determining the Viability of Trawl Caught Halibut

This section only refers to assessment of viability from trawl caught halibut. Halibut caught in longline or pot operations have a different set of criteria. Refer to page A-37 for criteria to be used on longline vessels and page A-38 for criteria to be used on pot vessels. The trawler criteria for determining if the fish are in excellent, poor, or dead condition are listed on page A-36. The guidelines listed below must be followed, or the data collection cannot be used.

- Halibut lengths and viabilities must be from sampled hauls or sets.
- A halibut must be in your hands and closely examined on both sides for a valid viability assessment. Never guess the condition of the halibut, and never use only one of the criteria listed on page A-36.
- The condition of all halibut must be determined at the point of final discard. You are trying to ascertain the condition of the animal when it enters the sea. The halibut viability you record must reflect the normal handling of the fish by the crew

Deciding Where to Sample for Viability

An Observer has two possible locations in the trawler factory where he/she could collect halibut to assess their condition. The first is at the conveyor leaving the live tank, and the second is at the discard area as halibut drop out the discard chute. Between the live tank door and the discard are several belts, some with inclines, that the halibut have to pass over, falling back and getting squeezed and spined by other fish, until they reach the discard belt, some 30 minutes later. A halibut that seems to be in excellent condition when it exited the bin may end up in poor or dead condition by the time it is discarded. To determine how the fishing practices and conditions in the factory have affected halibut viability, the Observer should choose the discard belt station for measuring halibut and assessing viability, or measure the halibut at the first conveyor but not assess viability until the fish has reached the discard chute.

Deciding When to Sample for Viability

An Observer is on a shoreside catcher trawler and the crew normally sorts fish from the trawl alley. As they encounter halibut, they throw them over the side. The Observer collects his entire basket sample, then tells the crew they can begin to sort. The Observer should not pull out all of the halibut in the sample first to measure and assess viability. The crew has not tossed all the halibut over yet, so the viability of the ones assessed would probably be better than the normal crew handling. A better option would be for the Observer to inform the crew to throw all halibut into a separate checker bin or tote. Assess the viability of each halibut as it is thrown into the bin/tote.

- If you cannot assess halibut condition at the time of discard and your sample is not an indication of the normal handling practices of the crew, do not record viability data at all.

- If you are on catcher vessel delivering **unsorted** catch to a plant, assess and measure halibut at the plant, the place of discard. If any halibut are sorted out at sea, assess them as they are discarded.

Check for Tagged Halibut

Refer to Table 11-1,"Duties for tagged fish and crab" on page 11-5 for information on what sort of tags are used and what data to collect.

Tasks for Salmon Data Collection

Introduction

Complete the following salmon tasks in order of priority:

- Identify the salmon in your species composition sample to one of the six species.
- Sex all salmon from your composition sample.
- Measure all salmon from your composition sample.
- Collect scales from all salmon in your composition sample.
- Look for tagged salmon
- Collect scales from tagged salmon outside of your species composition sample.

Species Composition

Determine the species of each salmonid in your composition samples and record the sexes, numbers, and weights for each species on the Species Composition Form 3US. The six species of salmon encountered in the North Pacific are: king (chinook), silver (coho), steelhead, sockeye (red), chum (dog), and pink (humpback) salmon.

Sexing Salmon

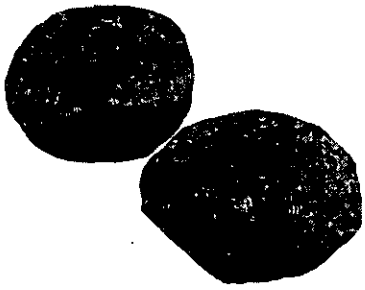
There is no need to measure or sex salmon from outside of your species composition samples. Do not collect scales from salmon outside of your species composition unless they are tagged (see "Duties for tagged fish and crab" on page 11-5). Cut open all salmon in your composition sample. Salmon gonads are far forward in the body and immediately under the backbone. Make an incision on the salmon from the pectoral fins and across about mid way up from the belly, to see into the top of the peritoneal cavity near the head. The gonads will be two long tubes laying parallel to the backbone. Females, mature and immature, will have tubes containing granular eggs in sacs that are pink, yellow, or orange. Mature males will have smooth textured tubes of white or cream color. Immature males will have translucent white tubes that appear empty.

Length Measurement

Measure all salmon within your composition sample to the fork length (see "Measuring Fish" on page 9-13) As you encounter salmon in your sample, cut the fish to determine the sex, and then measure it using the plastic length strip. Record salmon length data on the Length Data 7US form. Do

not measure salmon from outside of your species composition sample. The salmon recorded on the 7US form must be the same salmon recorded on the 3US form.

Scale Sample Collection



Salmon scales are used to verify your species identification during your debriefing. The scales are then passed on to professional scale readers. Salmon lose scales easily and lost scales are replaced with regenerated scales. Regenerated or lateral line scales are unreadable. To make sure you have usable scale samples, always collect at least 5 scales and never collect scales from the lateral line.

SPECIES King Salmon SPECIMEN NO. 3
HAUL/SET 41 DATE 02/19/99
FORK LENGTH 63 (CM) SEX male
WT. 6.10 (KG) MISSING ADIPOSE? Y or (N)
CRUISE/
SCALE ZONE A VESSEL CODE 60231 A432

Each group of scales taken from an individual is put into a paper envelope. Paper allows the scales to dry so they will not rot. Enter the data on the salmon length, weight, etc., on the scale envelope and then transfer the data to 7US and 9US forms.

The salmon scale sampling guidelines are: -

- Only record data on the Length Data (7US) and Biological Data (9US) Forms from salmon that are within your salmon composition sample.
- Outside of your composition sample only collect scales from tagged salmon. Refer to "Tagged Salmon" on page 11-2 for how to handle the data recording for tagged salmon outside the Observer's samples. **If you collect salmon scales from outside the composition samples, do not record the length and weight data on 7US or 9US.**
- Collect no more than 20 scale samples for each species, for the entire time you are deployed for a particular cruise number.
- Collect at least 5-10 scales preferably from the optimal "A" zone (see Figure 10-4). If scales can not be found in the "A" zone then search for and collect scales from the "B" zone, then the "C" zone if necessary.

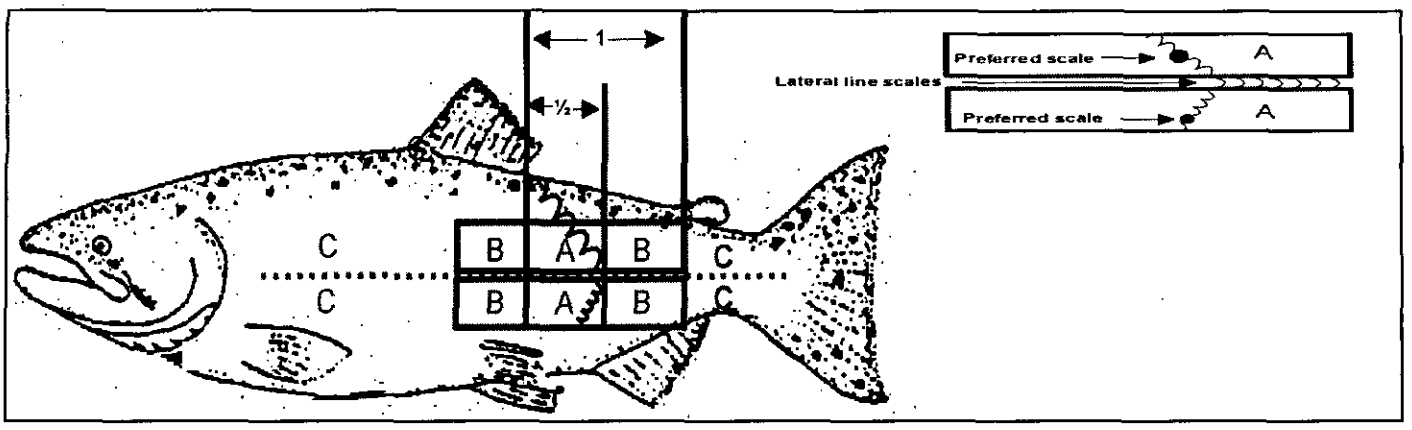


Figure 10-4: Salmon scale collection zones

If you are taking scales from salmon outside the composition samples, do not use the small manila-colored envelopes. The large Manila envelopes with red writing are for salmon scales from outside samples. All data recorded on the large envelopes are not recorded on the 7US nor 9US forms.

- To spread the collection over more time at sea, collect scales from the first 10 salmon per species you encounter in your salmon composition samples, then collect 10 more scale samples from salmon found in your salmon samples throughout your time at sea.

If your scales are coated with tissue or blood, or the sample is contaminated with other fish scales, it may be useless. Remember, your salmon rubbed against many other fish, even other salmon of different ages and species. To insure your hard work produces usable data, make sure your scales are clean. Here is the procedure:

1. Wipe the area on the fish where you plan to collect scales. This ensures no other fish scales will be mixed in with the individual's scales. It also removes slime, which causes scales to decompose in the scale envelopes.

2. Pluck salmon scales out of the flesh using the forceps or knife. Try to minimize mucus on the scales by plucking rather than scraping.

3. Open a salmon scale envelope and wipe the scales inside. Make sure you collect enough scales. Seal the envelope closed.

4. Weigh the salmon, determine the sex, and measure the length of the fish. Record all of the information on the scale envelope. Remember to include your cruise number and vessel code. Select and record a unique specimen number for the species (1-20 for kings, 1-20 for chums, etc).

5. Clean the forceps before collecting scales from another salmon.

Check for Tagged Salmon

Refer to "Tagged Salmon" on page 11-2 for information on what sort of tags are used and what data to collect.

NMFS area 518 — **Form 9US - Biological Sampling Form** — Page 2 of ____

Cruise	Vessel Code	Year	Month	Day	Species name	Species code	Specimen type	Sampling system
6023	A432	99	02	19	KING SALMON	222	2	2

For office use only: Total # of specimens ____ Catalogue data ____

	Set/haul number	Specimen number	Sex	Length (cm)	Weight (kg)	Form ??	Maturity stage	Notes	Age	Remarks
1	41	3	M	63	6.10	Y				
2	"	4	F	59	2.50	Y				
3	"	5	F	55	2.10	Y				
4	"	6	M	62	3.20	Y				
5	41	7	M	64	3.60	Y				
6										
7	43	8	F	55	2.00	Y				
8	"	9	F	78	5.40	"				
9	"	10	M	55	1.80	"				
10	"	11	M	68	3.60	"				
11	43	12	F	70	4.40	Y				

Figure 10-5: Example of salmon scale recording on 9US form

For instructions on how to fill out the 9US Biological Data Form, see "Form 9US- Biological Sampling Form Instructions" on page 9-22.

ONLY RECORD SALMON SCALE DATA ON THE 9US FROM SALMON FOUND IN YOUR SAMPLE!

TAGGED FISH AND CRAB INFORMATION

When tagged fish or crabs are encountered, the tag (except from live King crab) and pertinent biological information should be collected. Do not interrupt your normal sampling to take this information unless it is convenient. If you are busy completing other tasks simply put the tagged fish or crab aside and collect the information after your sample is complete. Collecting information from tagged fish or crabs does not take precedence over other sampling duties, but is an important part of your job.

List of Priorities

- Identify tagged organism to species
- Collect pertinent biological data
- Complete tagged fish information form

Introduction

Fish and crabs are tagged for a variety of reasons. Currently there is research being conducted on fish migration, stock separation, fishing related mortality, and population dynamics. These studies are being conducted by the International Pacific Halibut Commission, NMFS, the University of Washington, and the Alaska Department of Fish and Game. Data from tagged fish and crabs is vital to the success of these studies and Observer data is an excellent way for fishery biologists to obtain this information.

Species that have been tagged include Pacific cod, Pacific halibut, pollock, sablefish, salmon, shortspine thornyhead, turbot, yellowfin sole, and king crab. These species may have an external tag on the dorsal surface or on the gill cover, or they may have an internal tag in the snout of the fish. Spaghetti tags are the most common type of external tag, but some fish may have disc-shaped tags.

When you arrive at a plant or vessel you should inform the crew that tagged fish or crabs should be saved for you. If vessel or plant personnel give you an external tag or an externally tagged animal you should write down the person's name and address so they can receive a reward for returning the tag. If you are given just the tag without the animal, collect as much information as possible about the animal. For example, find out

what species the tag was from, where it was caught, what haul it was in. Observers can not collect rewards for tags they submit, so if you find an externally tagged fish or crab in your sample list the captain as the person who found it.

Tagged Salmon

Tagged salmon usually have internal coded wire tags inserted into their snouts but may have external disc shaped tags as well. Coded wire tags are about 1 mm in length, have a distinct code, usually a series of slashes at different intervals engraved in them, and are inserted into the snout of an animal. Salmon with coded wire tags can be identified by a missing or clipped adipose fin. *Collect scale samples from all tagged salmon (see "Scale Sample Collection" on page 10-11).

To remove the salmon snout make a cut one centimeter behind the eye down through the head to the base of the upper jaw. You do not need to include the lower jaw since tags are placed in the upper snout. Once you have removed the salmon snout fill out the Coded-Wire-Tag Recovery Information tag and affix the tag to the snout. For any salmon snouts collected from deliveries, fill out the snout tag with only the NMFS area where you think the salmon was caught, and not a latitude and longitude. Place the snout in one of the bags you were issued and put several handfuls of table or rock salt in the bag. Periodically, drain off any liquid that accumulates in the bag and change the salt. If no salt can be found, you can freeze the snout.

You do not fill out a Tagged Fish Form for tagged salmon, as the snout tag replaces the form.

NMFS HI-SEAS SALMONID
CODED-WIRE-TAG RECOVERY INFORMATION

SPECIES_____

HAUL_____MONTH_____DAY_____YEAR_____

VESSEL_____CRUISE#/VESSEL CODE_____

LOCATION: LAT_____°_____'N LONG_____°_____'W OR E

LENGTH
TIP-SNOUT
TAIL-FORK:_____mm

NMFS AREA_____
ADDITONAL
FINS MISSING_____

BODY
WEIGHT:_____g

GONAD
DIAMETER_____mm

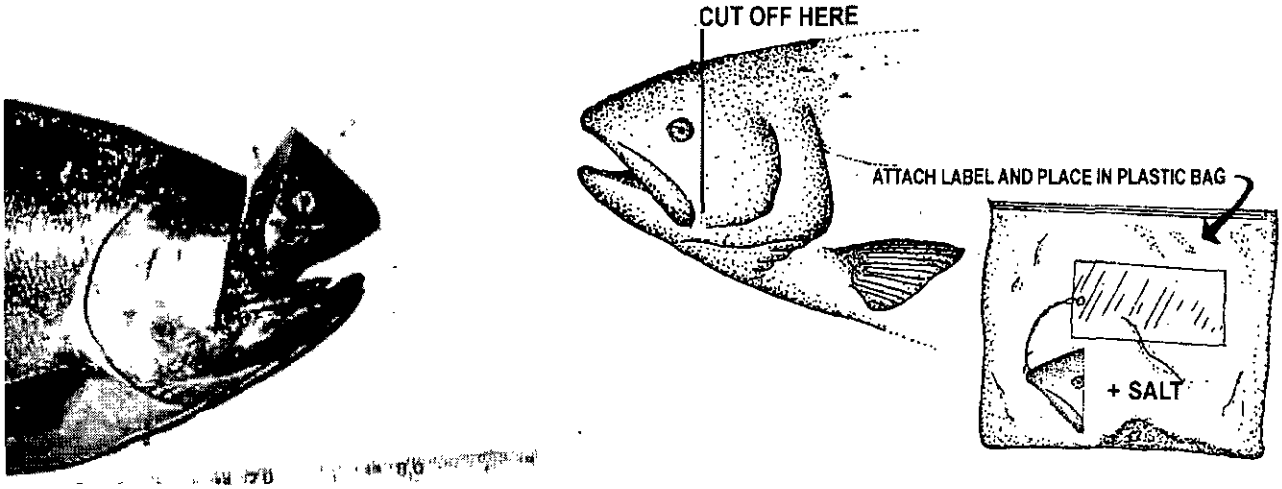
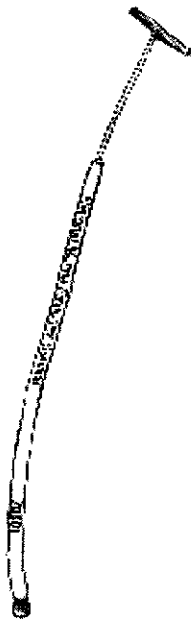


Figure 11-1: Proper method for collecting a sample from a tagged salmon

REMEMBER TO GET FROZEN SNOUTS OUT OF THE FREEZER BEFORE YOU DISEMBARK.

Tagged Crab



Spaghetti tag

King crabs are tagged with external spaghetti tags which are found in the abdominal flap. If you find a live tagged king crab record the pertinent information, but do not remove the tag. King crab should be released with the tag intact so they can be captured and identified again. If you find a dead king crab remove the tag and return it to NMFS with the pertinent information.

After you have collected the necessary information from your specimen you need to record it on the Tagged Fish Form (see Figure 11-2). For the most part the form is self explanatory, be as clear and concise in your descriptions, and affix the tag and vial with scales and/or otoliths to the form. Remember to include the tag serial number on the form. Often tags are lost in processing and without a copy of this information the rest of the data on the form is useless.

Vial # 114

TAGGED FISH INFORMATION FORM

Cruise No.: 9921 Vessel Code: A567 Observer Name _____

Ship Name: Banaut

Permit Number: AK991248A

Captain (or reward recipient's) Name:

Address:

Species: Sablefish

Tag Prefix (often a two letter code) and Serial No.: B 96 22726 (Nanaimo B.C. CANADA

Tagging Agency (circle one): Seattle Auke Bay (Nanaimo) Shimizu IPHC Other _____

Time and Date of Capture: 1430 5/22/98

Capture Location (lat. & long.): 53°39.55'N 164°34.61' W

Sex and Maturity of Gonads (immature, mature, spawning): Male mature

Length (fork length in cm): 71 cm

Weight (total wt. in kg): 3.8 Kg

Capture Depth (fathoms): 280 F

Vessel/Gear Type: longline catcher/processor

General Appearance (poor body condition, good body condition):
good body cond.

Condition of Tagging Wound (healthy healed tissue, open wound):
open wound, did not appear infected

Other Comments:
only 1 otolith recovered

Affix the tag or vial here (with tape):
Vial # 294

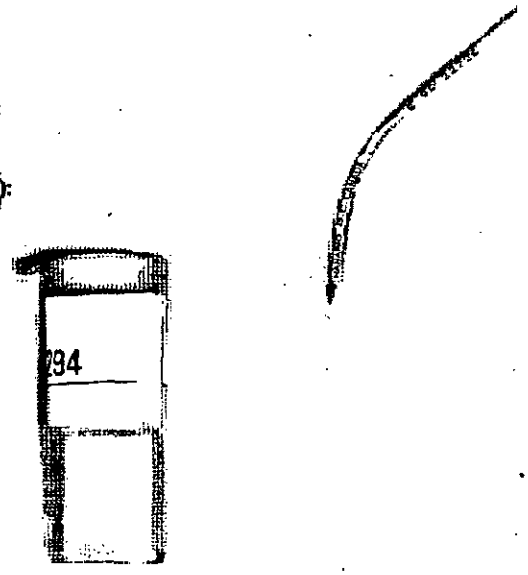


Figure 11-2: Tagged Fish Form

Halibut	**Live** 1. remove tag 2) measure fish 3. weigh fish if possible 4. note body condition 5. note condition of tagging wound 6. fill in remaining information on Tagged Fish Information Form.	**Dead** 1. remove tag 2. measure fish 3. weigh fish if possible 4. collect otoliths, determine sex 5. note body condition 6. note condition of tagging wound 7. fill in remaining information on Tagged Fish Information Form.
Salmon	**Live or Dead** 1. measure fish 2. weigh fish 3. collect scales* 4. determine sex 5. collect salmon snout 6. fill out a NMFS Hi-Seas Salmonid Coded-Wire-Tag Recovery Information Tag and affix to salmon snout. *(see "Scale Sample Collection" on page 10-11)	
Pacific cod	**Live or Dead** 1. remove tag 2. measure fish 3. weigh fish 4. collect scales and otoliths 5. determine sex 6. note body condition, 7. note condition of tagging wound, 8. fill in remaining information on Tagged Fish Form.	
Greenland turbot, pollock, sablefish, yellowfin sole, shortspine thornyhead	**Live or Dead** 1. remove tag 2. measure fish 3. weigh fish 4. collect otoliths** 5. determine sex 6. note body condition 7. note condition of tagging wound 8) fill in remaining information on Tagged Fish Form ** For sablefish- if you find a blue spaghetti tag, collect the entire head and freeze it. The otoliths have been treated with a light sensitive chemical.	
King crab	**Live** 1. do not remove tag 2. write down tag number 3. measure crab 4. weigh crab 5. determine sex 6. determine condition 7. release crab 8. fill in remaining information on Tagged Fish Form.	**Dead** 1. remove tag 2. measure crab 3. weigh crab 4. determine sex 5. fill in remaining information on Tagged Fish Form.

Table 11-1: Duties for tagged fish and crab

MARINE MAMMAL SIGHTINGS AND INTERACTIONS

List of Priorities

- Record marine mammal interaction data.
- Record marine mammal specimen data.
- Record marine mammal sightings.

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Introduction

The North Pacific Ocean and Bering Sea support one of the largest fisheries in the world and are home to a vast number of marine mammals. Interactions between fishing operations and marine mammals are unavoidable. Observers provide reliable estimates of marine mammal mortality and other interactions due to fishing operations. Vessel owner and operators are also required to submit reports of marine mammal injury and mortality that occur as a result of their fishing operation. The Observer Program's independent data determine the reliability of these reports. Observer data are also used to identify changes in fishing methods or technology that may increase or decrease incidental serious injury or mortality to marine mammals.

Marine mammal sighting data contributed to the National Marine Mammal Laboratory (NMML) by Observers provide important information on the distribution and behavior of marine mammals in the North Pacific Ocean and Bering Sea. There are several species in the North Pacific Ocean, Gulf of Alaska, and Bering Sea which are threatened or endangered, and information on the abundance of these animals is greatly needed.

Marine Mammal Protection Act

The Marine Mammal Protection Act of 1972 (MMPA) was most recently reauthorized in 1994. In passing the MMPA in 1972, Congress found that:

- certain species and population stocks of marine mammals are, or may be, in danger of extinction or depletion as a result of man's activities;
- such species and population stocks should not be permitted to diminish beyond the point at which they cease to be a significant functioning element in the ecosystem of which they are a part, and, consistent with this major objective, they should not be permitted to diminish below their optimum sustainable population level;
- measures should be taken immediately to replenish any species or population stock which has diminished below its optimum sustainable level;
- there is inadequate knowledge of the ecology and population dynamics of such marine mammals and of the factors which bear upon their ability to reproduce themselves successfully; and
- marine mammals have proven themselves to be resources of great international significance, aesthetic and recreational as well as economic.

The MMPA established a moratorium, with certain exceptions, on the taking of marine mammals in U.S. waters and by U.S. citizens on the high seas, and on the importing of marine mammals and marine mammal products into the United States. As a NMFS certified Observer you are authorized, under provision 50 CFR 229.7 (5-6) of the Federal Code of Regulations, to take and possess marine mammal specimens (see "Marine Mammal Regulations" on page 19-30). The only specimen samples you should ever have in your possession are pinneped snouts or tissue samples from large cetaceans. **Do not collect bones, skulls, or any parts as specimens, they are not needed and will be discarded.** Walrus and sea otters are under the jurisdiction of the Alaskan Fish and Wildlife Service

and you are not allowed to possess any specimen material from them. Possession of any part of a walrus or sea otter is a federal offense.

Marine Mammal Monitoring

The role of Observers under the MMPA is to conduct statistically reliable monitoring of fishing operations and to record information on all interactions between fishing operations and marine mammals. Observers are asked to determine sex and measure the length of any marine mammal found dead in the catch. If possible, Observers should take photographs of any marine mammal involved in an interaction. If Steller sea lions or northern fur seals are found dead in the catch Observers are required to collect the upper canine teeth, which are used for age and stock determinations. Observers are also asked to collect tissue samples from any large cetaceans captured and killed in fishing operations. Interaction and specimen data are recorded on the 10US.

Random Sampling

To provide statistically reliable information, you must randomly select which hauls or sets are to be monitored for incidental take of marine mammals. If there is any doubt in your mind that you will not be able to monitor all of the hauls or sets during a trip then you must use a method to randomly select the hauls to be monitored. To select which hauls you are to monitor you may use the random sample table for the fishery you are in and monitor the same ones you sample for composition (see "How to Select Hauls to Sample for Species Composition" on page 2-8). Indicate which hauls or sets you have monitored for marine mammals in the appropriate column on the 1US or 2US. You may monitor additional sets, but if there are any marine mammal interactions you must indicate in the remarks section of the 10US that they are not from randomly selected hauls or sets. In the trawl fishery where you are unable to watch the entire dumping of a haul it is acceptable to spot check the dumping and still mark the haul as being monitored for marine mammals. You must be certain that you would have been able to observe any discard of any marine mammals. Spot checking means observing the dumping of a codend at times throughout the dumping process, not just at the beginning or end.

Marine Mammal Interactions

The Form 10US is used to document interactions between fishing operations and marine mammals. This form is made up of two parts: the 10AUS and 10BUS. The 10AUS is used to document any interaction between fishing operations and marine mammals. This may include

marine mammals feeding on fish from longline gear, deterrence from feeding, or catches of marine mammals (whole or parts) in fishing gear. The 10BUS is only used when marine mammals (whole or part) are caught in fishing gear or specimen data is taken. Specimen data can include measurements or photographs of the animal. Record all information on marine mammal interactions in the daily notes section of your logbook as well.

Form 10AUS

Complete the Form 10AUS only if there are direct interactions between *fishing operations and marine mammals. These interactions include:*

Steller sea lions have additional protection under the Endangered Species Act. Discharging a firearm within 100 yards of a Steller sea lion is a violation of federal law, even if the intent is a warning shot to frighten the sea lion away.

Deterred- Marine mammals are subjected to deliberate actions intended to frighten or harm them in order to limit, discourage, or avoid interaction with fishing operations. The animal may be in direct contact with gear or in very close proximity. Authorized deterrence include yelling at the animal, and banging pots or other objects. Whatever method is used, it should not result in the serious injury or mortality of the marine mammal. At this time, using firearms on marine mammals and seal bombs on cetaceans are prohibited.

Feeding-Marine mammals feed on fish from the fishing gear prior to landing. Marine mammals such as killer whales, sperm whales, and sea lions are often seen pulling fish from nets or more commonly from longline gear. On a longline vessel having marine mammals around the vessel and seeing empty hooks is not necessarily an indication of feeding. Look for fish heads, lips, or fish that have been bitten or raked by teeth. Do not record feeding on discarded fish or intentional feeding of marine mammals by humans on the Form 10US unless they occur in conjunction with other interactions "Intentional Feedings" on page 12-18, and "Marine Mammal Sightings" on page 12-18.

Captured and Released/Escaped Alive- Marine mammals are entrapped or entangled in fishing gear but escape or are released by vessel personnel alive.

Captured Freshly Dead-Marine mammals are killed by entanglement or entrapment in fishing gear during a particular haul or set. The animal is not decomposed and did not show any evidence of death by something other than the fishing gear. Evidence of a fresh kill include free flowing blood or other body fluids and bright red blood or meat. Freshly dead animals can be warm or cold depending on the length of the tow or set and the time of death. Rigor mortis is not a good indicator, as period of time an animal is in rigor can vary greatly depending on its physical condition and the environment.

Captured Previously Dead-An animal was already dead before coming in contact with fishing gear. There may be a putrid, rotted smell, bloating, discoloration of the flesh, or loss of the skin/fur. Vessels often catch bones and/or masses of decomposed flesh, these are also considered previously dead. Look for signs of trauma which may have been caused by something other than the fishing gear (i.e., gunshot wounds, decapitation, skinning). If you believe that the same dead animal has been caught in the gear more than once, record it each time and indicate in your remarks why you believe it to be the same individual.

Lethal Removal-Marine mammals are killed by vessel personnel to prevent serious damage to or loss of gear, catch, or human life. The death of these animals is caused directly by the actions of vessel personnel and not solely through contact with the fishing gear.

Hit Propeller and Died- marine mammals are struck by the propeller of the fishing vessel and die. This has been observed with killer whales and sea lions feeding on vessel discards.

Marine Mammal Boarded Vessel on Own Volition and Escaped- When marine mammals board the fishing vessel and then escape. Sea lions and seals will infrequently board vessels to look for food or to escape predators.

Chris P. Observer
F/T Aurora Borealis

Cruise #	Vessel code	Year
6011	A110	99

Form 10AUS - Marine Mammal Interaction Data

Page 1 of _____

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

Date Month	Date Day	Haul, or set number	Species Name	Species code	Number of individuals	Did you observe mammal?	Condition code	Interaction code
03	15	83	Dall's Porpoise	PX	1	Y	1	4

Remarks: (see manual for list of required information)
Dall's porpoise was found in bin while sorting. There was bright red flesh exposed on abdomen from a jagged gash running from the right flipper to the navel. Several scratches on the animal were still oozing blood. Markings on the animal were exactly like those portrayed on page 38 of The Guide to Marine Mammals of Alaska.

Date Month	Date Day	Haul, or set number	Species Name	Species code	Number of individuals	Did you observe mammal?	Condition code	Interaction code
03	18	108	Steller Sea lion	EJ	1	Y	1	4

Remarks: (see manual for list of required information)
Sea lion was found as haul was dumped on deck. It was not decomposed and only 2 wounds near the mouth were observed. Animal was over 2 meters long, light brown color, large fore flippers, external ears.

Date Month	Date Day	Haul, or set number	Species Name	Species code	Number of individuals	Did you observe mammal?	Condition code	Interaction code

Remarks: (see manual for list of required information)

Date Month	Date Day	Haul, or set number	Species Name	Species code	Number of individuals	Did you observe mammal?	Condition code	Interaction code

Remarks: (see manual for list of required information)

National Marine Fisheries Service
North Pacific Groundfish Observer Program

Created on 1/1/07

Figure 12-1: Form 10AUS

Form 10AUS - Marine Mammal Interaction Data Instructions

Enter the cruise number, vessel code, and the last two digits of the year in the heading. Start a new sheet for each vessel you are assigned.

- **Date** - Record the date with the leading zeros where appropriate, i.e. 01/09 for January 9.

- **Haul or Set Number** - Enter the haul, delivery, or set number for each catch in which there was a marine mammal interaction. If the interaction occurred outside of fishing operations on a fishing day enter the haul number of the nearest haul in this field. Include an explanation and the actual position in the **Remarks** field. If the interaction occurs on a non-fishing day place a zero in this field, enter an explanation and the position in the **Remarks** field.

- **Species Name** - Write the common name of the marine mammal species involved into the **Species Name** field. If you are unsure of the identification use a broader classification, such as unidentified pinniped or unidentified dolphin/porpoise, but be as specific as possible. Do not enter different species in the same record. If more than one species of marine mammal are involved in an interaction, repeat the date and haul/set/delivery number in the next box down the page and enter the second species on its own line.

- **Species Code** - Record the two digit species code found in "Appendix C. Species Code List - Marine Mammals." on page A-10 in the Species Code field.

- **Number of individuals** - Enter your best estimate of the number of individuals animals which were involved in the interaction. If there are more than one species involved in the interaction each species must have a separate 10AUS record. The number must be an exact number. Do not enter a number range. If you are unsure about how many individuals there are, enter your best estimate of maximum and minimum, and describe the circumstances and number range in the remarks field.

- **Did you observe mammal?** - Record "Y" if you actually saw the animal, and "N" if you did not actually observed the mammal but were informed about the interaction. Note the exact circumstances in the **Remarks** field.

- **Condition code** - Enter the condition code. Code the outcome of the interaction while the interaction is occurring, for example a live animal that has been lethally removed is to be considered a carcass and an injured animal released alive is considered alive even if you believe it may eventually die.

1 - Carcass, dead animal
2 - Bones other than the skull
3 - Live animal
4 - Skull
5 - Skull and bones
6 - Tusk/teeth only (no skull)
7 - Baleen only

- **Interaction code** - Enter the interaction code (Figure12-2). If an animal is involved with more than one interaction during one haul or set record the code which had the most serious consequences for the mammal, then record the other interactions in the **Remarks** field.

- **Remarks** - Write a paragraph describing the interaction. If you did not observe the animal, briefly explain why not and where you received your information. Each remark must include the following:

- **Species Identification** - Write a description of the animal and what features led you to believe it was this species. If possible, try to include descriptions of features which are specific to the individual i.e., scars, saddle markings for killer whales, spot patterns, etc.

- **Condition of the Animal** - Write a description of the general welfare of the animal, e.g. did it look healthy, injured, or rotting, perhaps only a bone?

- **Description of Interaction** - Write a description of the interaction you observed between the vessel and the marine mammal, be as descriptive as possible. Include names of crew members involved and their actions. For feeding interactions describe evidence of marine mammals feeding out of the net or off the line and name the fish species eaten. Draw pictures of rare or unusual marine mammal species involved in interactions in the logbook or on the paper 10US form.

1 - Deterred, condition unknown - marine mammal was deterred from feeding by the vessel and the Observer did not view its condition

2 - Released/Escaped uninjured - vessel captured a marine mammal with the fishing gear and the animal was released/escaped without apparent injury and without fishing gear attached

3 - Released/Escaped injured - vessel captured a marine mammal with fishing gear and the animal was released/escaped but with apparent injury but without fishing gear attached

4 - Freshly dead - vessel captured an animal that died during fishing operations

5 - Unknown condition - vessel had some interaction with a marine mammal but the Observer did not directly view the animal or was not able to determine its condition

6 - Previously dead - vessel captured an animal with fishing gear that was dead prior to coming into contact with the vessel or fishing gear

7 - Lethal removal (not entangled) - vessel personnel killed a marine mammal not entangled in fishing gear

8 - Lethal removal (entangled) - vessel personnel killed a marine mammal entangled in fishing gear, but death was not due entirely to that entanglement

9 - Deterred and released /escaped uninjured - deterrence used but caused no physical injury to the animal

10 - Deterred and released/escaped injured - deterrence used and caused injury to a marine mammal directly or indirectly

11 - Deterred and lethal removal (not entangled) - deterrence was used and a marine mammal not entangled in fishing gear was killed

12 - Deterred and lethal removal (entangled) - deterrence was used and a marine mammal entangled in fishing gear was killed

13 - Hit propeller and died - marine mammal hit propeller and died

14 - Mammal boarded vessel on own volition and escaped uninjured

15 - Mammal boarded vessel on own volition and escaped injured

16 - Feeding - marine mammal observed feeding on catch not yet landed

17 - Deterred and feeding - deterrence used and marine mammal observed feeding on catch not yet landed

18 - Released/Escaped with fishing gear attached to body - vessel captured a marine mammal with fishing gear and the animal was released/escaped but with fishing gear attached to body

19 - Deterred released/escaped with fishing gear attached to body - vessel attempted to deter marine mammal but captured a marine mammal with fishing gear and the animal was released/escaped but with fishing gear attached to body

Figure 12-2: Interaction codes for 10AUS

Form 10BUS

This form should only be used when there is specimen data. There are four situations where data should be recorded on the 10BUS:

- length and sex data from all dead marine mammals
- collection of canine teeth from pinnipeds (except walrus)
- tissue collection from dead cetaceans
- photos of marine mammals

Before touching a marine mammal remember that there are many diseases that are transferable from marine mammals to humans. Always wear gloves when handling a marine mammal.

Length and Sex Data from All Dead Marine Mammals

All dead marine mammals captured during fishing operations must be measured and when possible the sex determined. Do not record an estimate of length in the length fields on the 10BUS form; these fields are for actual measurements only, but do include length estimates in the remarks section.

There are two acceptable methods for measuring marine mammals:

Standard Length

This is the preferred method where the length of the animal in a straight line from the tip of the snout or rostrum to the tip of the tail flesh or tail notch on the unskinned body. The animal should be belly up, ideally with the head and vertebral column on a straight line (Figure12-3).

Curvilinear Length

This is the shortest surface distance from the tip of the snout or rostrum to the tip of the tail or tail notch along the back, belly, or side. This method is used if rigor has set in or the animal is too large or deteriorated to maneuver.

Take measurements with the flexible measuring tape provided by NMFS.

Sexing Marine Mammals

Sexing of marine mammals is not difficult, see diagrams in Figure 12-4 to view the morphological differences between male and female pinnipeds and cetaceans.

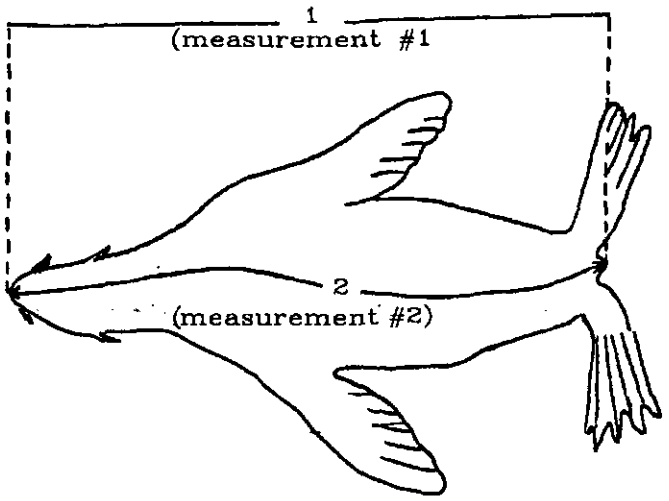


Figure 12-3: Example of Sea Lion and Seal measurements

In cetaceans, The distance between the anus and the genitals is greater in males; otherwise, the sexes appear similar because males have external teats, and females have enlarged clitori.

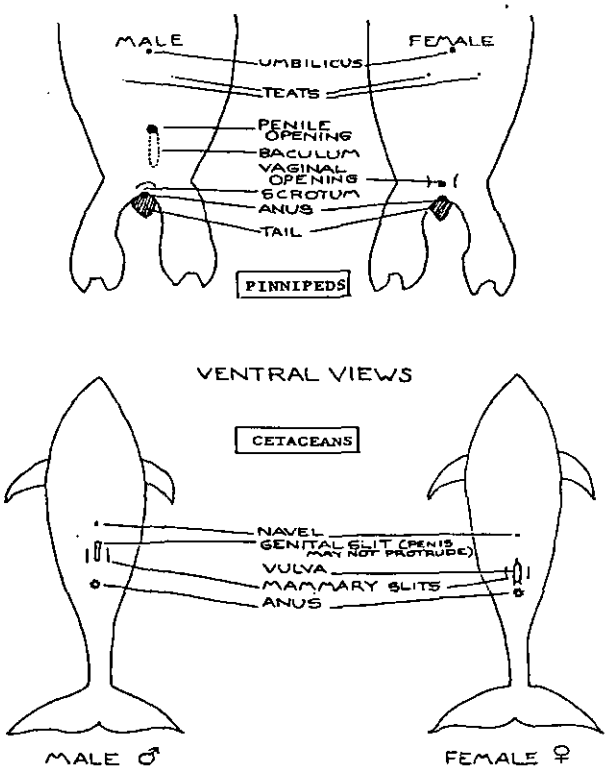


Figure 12-4: Diagram of Pinnipeds and Cetaceans Sex differentiation

Collection of Canine Teeth from Pinnipeds (except walrus)

If a Steller sea lion or northern fur seal is caught and killed or found dead in the fishing gear you must collect the canine teeth of the animal. You should also collect the canine teeth from other dead pinnipeds, except

walrus, when possible. Steller sea lions have been listed on the endangered species list for much of the Bering Sea and Aleutian Island chain. Data on these animals are greatly needed to try to determine the causes of the species decline. The canine teeth can be used to determine age, and combined with your length data, can help determine the general health of the sea lion population. Teeth from other pinnipeds may be used to aid species identification.

The end of the upper snout must be cut off without damaging the root of the canine teeth. The procedure for the collection of canine teeth from a pinniped is as follows:

1. The roots of the canine teeth arch back. To ensure that the entire canine root is collected, cut the snout between the second and third post-canine teeth. Use a hacksaw to remove the snout. You should be able to obtain a hacksaw from the vessel.

2. Preserve the snout by placing the snout within three of the plastic bags provided by NMFS and either freeze the specimen or salt it. The AFSC National Marine Mammal Laboratory (NMML) will later extract the teeth for study. Never preserve the snout in formaldehyde or alcohol because this will destroy the area of the tooth needed for age reading.

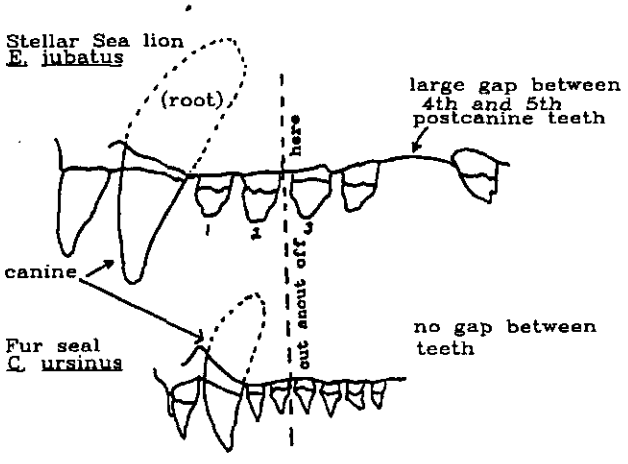


Figure 12-5: Canine teeth of Sea Lions

Tissue collection from dead Cetaceans

Currently, commercial fishing vessels in the Gulf of Alaska and the Bering Sea take several cetaceans per year. Genetic information on these species is limited, and more data are needed to identify stock structures. Observers have access to cetacean carcasses and can easily collect tissue samples. The National Marine Mammal Laboratory has asked that Observers take

tissue samples and have provided the necessary equipment. You have been supplied with a sterile scalpel, a pair of latex gloves, and three vials of the preservative Dimethyl Sulfoxide (DMSO). Skin samples should be taken from all cetacean carcasses, regardless of their condition.

Warnings about DMSO: Dimethyl Sulfoxide has exceptional solvent properties for organic and inorganic chemicals and is widely used as an industrial solvent. It has also been used to administer drugs topologically. DMSO is able to penetrate intact skin and will carry anything dissolved into it directly to the blood stream. Side affects from DMSO include nausea, headache, and skin rash. Further since DMSO is a "carrier" chemical, it could deliver harmful substances into the bloodstream if they are present in impure DMSO or on the skin. Great care should be taken when handling DMSO and you should never allow it to come into contact with your skin. **Always wear gloves when handling DMSO**.

To collect a sample:

1. After recording length data for the 10BUS, exchange your fishing gloves for the latex gloves provided by NMML. This is to protect you from possible disease and to protect the sample from you. Any DNA contamination from any mammal may compromise the sample.

2. Lightly scrape the sample area on the cetacean clean with a knife to remove fish slime and reduce contamination of the sample. The sample collection area can be anywhere on the animal, but preferably from the back just posterior to the dorsal fin.

3. Using a sterile scalpel cut out a strip of skin approximately 2 cm by 1 cm. Remove any excess blubber from the strip before placing it the vial of DMSO. If you do not have a skin collection kit or run out of vials and you have the opportunity to collect a cetacea skin sample, follow the same directions as above but store the specimen covered in table salt in a plastic bag. This is of less value than the samples stored in DMSO but still usable for some studies.

4. Place the skin sample in the vial of DMSO provided. Try not to take a large sample, the skin sample must fit in the DMSO vial and be completely covered by solution.

5. Label each specimen vial with the cruise number, vessel code, haul number, and species name. There should be no more than one specimen to a vial. If you do take more than one specimen from a haul the vials should be labeled appropriately. Record interaction infor-

mation on the 10AUS, and record specimen information on the 10BUS including length and how you obtained the specimen.

Do not freeze samples, store them at room temperature. More vials of DMSO, gloves, and sterile scalpels can be obtained in the field offices in Dutch Harbor and Kodiak.

Like all 10BUS samples, specimens should be numbered by the haul. For example; if you caught three Dall's porpoise, one in Haul 1 and two in Haul 2, you would number the first porpoise Specimen 1 from Haul 1. The second would be Specimen 1 from Haul 2, and the third would be Specimen 2 from Haul 2.

Photos

Record any photographs taken of marine mammal interactions with a fishing vessel or vessel personnel on the 10BUS. When taking photos try to include distinguishing marks of the individuals, old scars and scratches are useful as well as the saddle patch on Orcas. **The NMFS flash pocket cameras have been supplied only for photographs of incidental take interactions, photographic records of tissues collection samples from dead cetaceans, and (when possible) some types of groundfish catch feeding interactions by the same pods of sperm and killer whales. These cameras must be returned to NMFS at the time of debriefing, whether used or unused..**

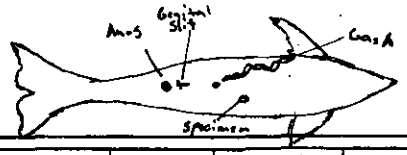
Cruise #	Vessel code	Year
6011	A110	99

Form 10BUS - Marine Mammal Specimen Data

Data describing indivisual specimens; sexing criteria, methods of measurement, types and extent of injuries; etc..

Date Month	Date Day	Haul, or set number	Marine mammal species code	Interaction code	Sex? (M, F, or U)	Specimen number	Standard length in centimeters	Curvilinear length in centimeters	Tooth taken (Y/N)?	Photo taken (Y/N)?
03	15	83	PX	4	F	1	179		N	Y

Remarks : (see manual for list of required information) Genital slit was 5cm from Anus. Tissue sample was taken from abdomen 15cm forward and lateral of navel. Tissue sample was stored in vial of DMSO.



Date Month	Date Day	Haul, or set number	Marine mammal species code	Interaction code	Sex? (M, F, or U)	Specimen number	Standard length in centimeters	Curvilinear length in centimeters	Tooth taken (Y/N)?	Photo taken (Y/N)?
03	18	108	EJ	4	M	1		260	Y	N

See remarks on 10A. Sexing was pretty clear using diagram in Spp. I.D. manual. Animal was too large to move for straight line Measure. Borrowed hacksaw and took off the whole end of snout for the teeth and froze it.

Date Month	Date Day	Haul, or set number	Marine mammal species code	Interaction code	Sex? (M, F, or U)	Specimen number	Standard length in centimeters	Curvilinear length in centimeters	Tooth taken (Y/N)?	Photo taken (Y/N)?

National Marine

Date Month	Date Day	Haul, or set number	Marine mammal species code	Interaction code	Sex? (M, F, or U)	Specimen number	Standard length in centimeters	Curvilinear length in centimeters	Tooth taken (Y/N)?	Photo taken (Y/N)?

National Marine Fisheries Service
North Pacific Groundfish Observer Program

Created on 1/1/97

Figure 12-6: Form 10BUS - Marine Mammal Specimen Data

Form 10BUS - Marine Mammal Specimen Data Instructions

Each entry on the 10BUS should correspond to an entry on the 10AUS. If more than one animal of the same species were involved in an interaction on the 10AUS you may have two or more records on the form 10BUS that correlate to it if specimens were taken from each mammal involved. Fill out one 10BUS record for each animal from which measurements, specimen, or photos were taken.

Enter the cruise number, vessel code, and the last two digits of the year in the heading. Start a new sheet for each vessel you are assigned.

- **Date** - Record the date with the leading zeros where appropriate, i.e., 01/09 for January 9.

- **Haul or Set Number** - Enter the haul, delivery, or set number for each catch in which there is a marine mammal specimen. If the specimen was collected outside of fishing operations on a fishing day enter the haul number of the nearest haul in this field. Include an explanation and the actual position in the **Remarks** field. If the specimen was collected on a non-fishing day place a zero in this field, enter an explanation and the position in the **Remarks** field.

- **Species Code** - Record the two digit species code (page A-10) in the **Marine Mammal Species Code** field. This should match the corresponding 10AUS.

- **Interaction code** - Enter the interaction code as given in Figure 12-2.

- **Sex?** - Record as M = male, F = female, U = unknown

- **Specimen number** - Start a new set of specimen numbers for each haul or set. The specimen number should always be 1 unless there was an interaction with more than one animal of the same species in a single haul or set.

- **Standard length in centimeters** - (see "Standard Length" on page 12-10) Recorded to the nearest centimeter.

- **Curvilinear length in centimeters** - (see "Curvilinear Length" on page 12-10) Recorded to the nearest centimeter.

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

- **Photo Taken (Y/N)?** - Record "Y" if you took photographs; otherwise, record "N".

- **Remarks** - There are five topics which must be discussed in the remarks field:

  Describe how the sex was determined.

  Document any uncertainties you have concerning the data.

  Document any distinguishing characteristics of the individual animal that would help differentiate it from others of its species i.e. Saddle patches in killer whales, spots and scars on other marine mammals.

  If a tooth, snout, or tissue specimen was collected, describe the specimen, your collection method, and your method of storage.

  If you used the flash pocket camera to photograph an interaction, please record the roll frame numbers of the photos corresponding to that interaction in the remarks section.

Any comments not directly related to the specimen data, such as cooperation or hindrance by the crew should be recorded in your logbook

Tagged, Branded, and Tattooed Marine Mammals

The National Marine Mammal Laboratory and several other state and federal programs have projects tracking marine mammals. To do this they may place a tag, brand, or tattoo on the marine mammal. Radio tags have been affixed to several Steller sea lions and elephant seals as well as several species of cetaceans. Inert ear tags have been placed on several species of pinnipeds. Brands and tattoos are more common, usually the brand or tattoo can be found under the flippers or on the belly of the animal.

If you observe one of these animals record the number, color, and location of the tag or marking in the Daily Notes section of your logbook. Also include its behavior and the latitude and longitude of where it was observed. An 11US (Figure12-7) should also be filled in with all pertinent information.

If the animal is killed in the catch, retrieve the tag, and/or record the numbers, color, and location of the marking, and retrieve any research instrumentation/attachments affixed to the animal to return to the NMML.

Just like any other marine mammal killed in fishing operations (see "Marine Mammal Interactions" on page 12-3), measure the animal and determine its sex. If it is a northern fur seal or Steller sea lion collect the snout, if it is a cetacean collect a tissue sample. These animals are being tracked for population assessments and any extra information you can provide will greatly help researchers at NMML.

Intentional Feedings

Under the Marine Mammal Protection act it is illegal to intentionally feed any marine mammal in the wild. Intentional feeding is considered a form of harassment; if you observe anyone intentionally feeding a marine mammal you should document the incident fully in your logbook. Please include the name/s of the person(s) involved in the incident, a description of the marine mammal, and a summary of where and how the violation occurred.

Marine Mammal Sightings

The 11US Marine Mammal Sighting form helps NMML determine the distribution and behaviors of marine mammals. Data from these forms are integrated into the NMML Platforms of Opportunity database, which has information on marine mammals from throughout the North Pacific Ocean. The 11US Marine Mammal Sighting form is not only used by the Observer Program but is also given to the U.S. Coast Guard, research ships, and amateur marine mammal enthusiasts on commercial and private vessels. Marine mammal sighting is the lowest priority Observer responsibility. These forms should be completed only if it does not interfere with any of your other Observer duties.

If you have time, NMML is interested in every species of marine mammal that you encounter. We have provided a marine mammal identification manual 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 animals tend to lend credence to those records that include identification. Give a complete description with comprehensive notes and sketches, to fully describe any species you encounter for the first time each cruise.

For more common species (e.g., Dall's porpoise), you do not need to give detailed descriptions of subsequent sightings within one cruise. However, if sighting involves unusual behaviors or warrants some extra description (e.g., humpback whales mating), give a detailed account.

Form 11US

MARINE MAMMAL SIGHTING

NOAA/NMFS/AFSC/NMML
Platforms of Opportunity
7600 Sand Point Way NE
Seattle, WA 98115

Observer(s) Chris P. Observer Vessel Aurora Borealis

year 98 month 02 day 15 local time (24 hr. clock) 13:34

latitude 56° 24.3' N/S N

longitude 167° 10.7' E/W W

sighting conditions: ☐ xlnt ☒ good ☐ fair ☐ poor Beaufort 2 +/- water temp. +05.0 °C

species (common and/or scientific name) Please fill out a form for each species: Fin whale confidence: ☐ sure ☒ likely ☐ unsure

sighting cue: Saw blows about 200 m off port

closest approach 100 number sighted (best) 8 number (minimum) 5 number (maximum) 10

For Office Use Only

observer | platform | vis. | species | conf. | sighting cue | photos | roll | frames | behaviors, cues and interactions | behaviors, cues and interactions | length multi

Narrative

Make identifications only on specific features seen. Mention them here. Include body features, markings and coloration, associated organisms, elaborate on behaviors, etc. The most valuable sightings contain a good amount of detailed information.

Blows were followed by falcate dorsal fin. Animals got closer to vessel; slender bodies dark in color, lighter on dorsal part of head. Final Id. based on saw color pattern: right side almost white (farthest visible part). No flukes seen. Similar to sei whale description but much bigger & sei whales not likely north of Aleutians

Body Length Estimate

- ☐ < 3 m (< 10')
- ☐ 3–8 m (10–25')
- ☐ 8–16 m (25–50')
- ☒ 16–26 m (50–80')
- ☐ >26 m (>80')

Some common behaviors

(circle these or add your own in narrative section)

Small cetaceans

Bow riding ,
Leaping entirely out of water
Porpoising (swimming fast, body out of the water)
Rooster-tailing (usually a Dall's porpoise cue)
Slow rolling

Large cetaceans

Blow visible from a distance
Breaching
Flipper slapping
Group feeding
Lob-tailing
Spy-hopping
Tail raised on dive
Side wake riding
Stern wake riding

Pinnipeds

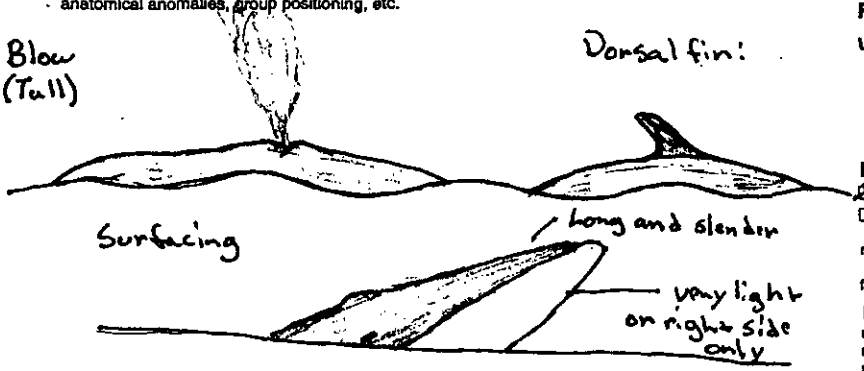
Jug handle (flippers in air)
Porpoising (swimming fast, at least partially out of the water)
Rafting
Spooked from haulout
Vocalizing

Fishing interactions ?

Use form 10US

Sketches

When possible, make a sketch noting pigmentation, anatomical features, scarring, posture, anatomical anomalies, group positioning, etc.



Photos/Video (optional)

☒ photographs
☐ video

roll/tape # ____
frame(s) 2-6

☐ Check here if there was more than one species of marine mammal present at this sighting.

cruise number and vessel code: 6011A110

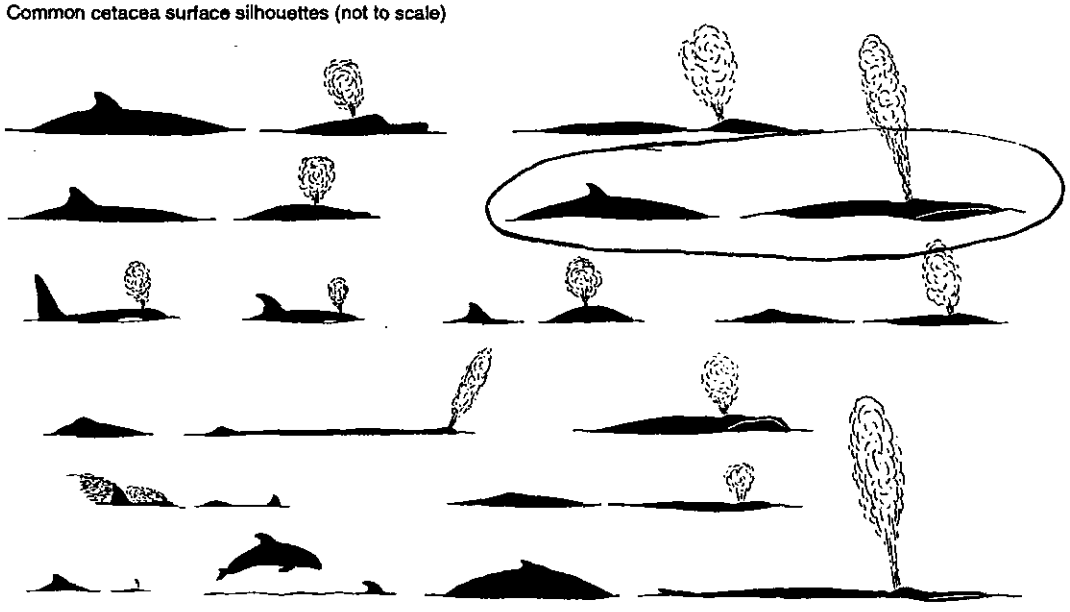
Form 11US: ver. XII.97: Salle, Harkness, Hill, Folkens, Lowell, Mizroch

See silhouettes on other side

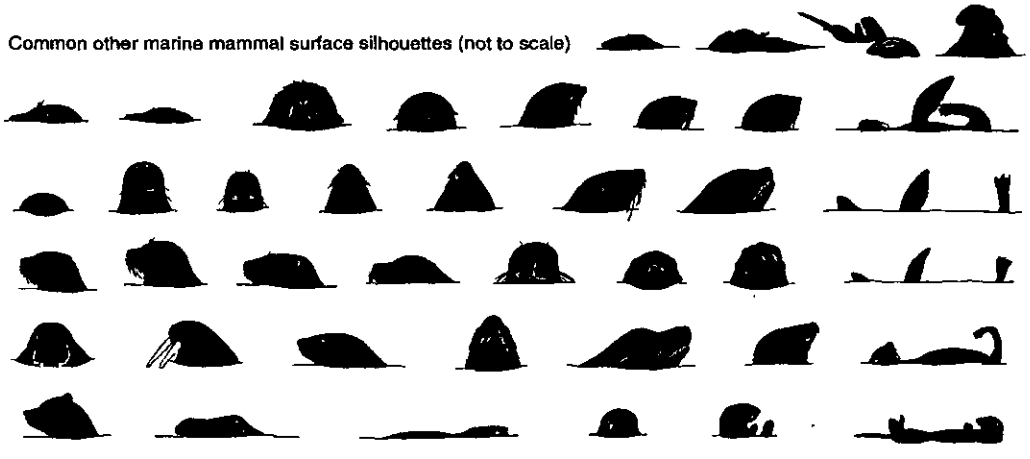
Figure 12-7: Form 11US - Marine Mammal Sighting Form (front side)

These are silhouettes of most genera of marine mammals known to occur in and around North America. Subtilties exist between closely related genera. Care should be taken in identifying species. Assessing one's level of confidence with copious notes and observations is more valuable than a brief misidentification. **Please circle appropriate silhouette(s).**

Common cetacea surface silhouettes (not to scale)



Common other marine mammal surface silhouettes (not to scale)



BEAUFORT SCALE (Sea Condition)		*wind*	*wave height*	
0	glassy, calm	0 , 1 kts	calm	
1	light ripple	1 < 4 kts	light air	1/4'
2	*small wavelets*	4 < 7 kts	*light breeze*	1/2'
3	scattered whitecaps	7 < 11 kts	gentle breeze	2'
4	small waves, frequent whitecaps	11 < 17 kts	moderate breeze	4'
5	moderate waves, many whitecap	17 < 22 kts	fresh breeze	6'
6	all whitecaps, some spray	22 < 28 kts	strong breeze	10'
7	*breaking waves, spindrift*	*28 < 34 kts*	*near gale*	*14'*
8	medium high waves, foamy streaks	34 < 41 kts	gale	18'
9	high waves, dense foamy streaks	41 < 48 kts	strong gale	22'
10-12	not meaningful (time to go home)			

Figure 12-8: Form 11US - Marine Mammal Sighting Form (back side)

Form 11US - Marine Mammal Sighting Instructions

Fill out the 11US as completely as possible. The more information you provide, the more useful the data is to NMML in determining species abundance.

- **Observer, Vessel** - Write your name and your vessel's name in these blanks.
- **Date** - Enter year (e.g., 99), month, and day, in that order.
- **Time** - Log the time that the animal was first seen. Use Alaska Local Time (ALT).
- **Latitude** - Record the latitude to tenths of minutes, if possible.
- **Longitude** - Record longitude to tenths of minutes, if possible. Place E or W in box 30.
- **Sighting conditions** - Give a qualitative evaluation of the overall sighting conditions. Excellent: unlimited visibility, flat seas. Good: sighting conditions affected somewhat by glare, sea state, weather, or distance. Fair: Sighting conditions affected by a combination of problems, e.g. heavy seas, poor weather, or distance. Poor: Severely limited visibility due to high seas, poor weather, or distance.
- **Beaufort** - Use the scale of sea and wind conditions (listed on the back of the 11US) to choose the Beaufort scale number that best describes the conditions during your sighting. (Note: Although the Beaufort scale actually goes up through 10 - storm, 11- violent storm, and 12 - hurricane, it is not expected that you will be looking for marine mammals during these weather conditions.)
- **Surface water temperature** - Record water temperature in degrees centigrade, rounded off to the nearest whole degree. If below freezing, place a "-" in box 28. If above freezing, place "+" in box 28. The surface water temperature often can be obtained from the skipper or fish master. Many new sonars, plotters, and net detectors will also record the surface water temperature. You could also ask the engineer, surface water temperature is taken at the engine inlet thermometer. The conversion from Fahrenheit to Centigrade is: $C° = (5/9)(F° - 32)$
- **Species** - Write in either the common or scientific name of the

marine mammal. Make sure you indicate your level of confidence in your species identification by checking the boxes to the right of the species section. If more than one species are sighted at the same time, note any association in the comments section and fill out a separate sighting form for each species. If you cannot determine species, enter the most accurate description possible, e.g., large whale unidentified, porpoise unidentified, pinniped unidentified, etc. Remember that an inaccurate or erroneous identification is worse than none at all.

- **Sighting cue** - Note what first attracted your attention to the presence of the marine mammal.

- **Closest approach** - Note the distance in meters of the closest approach of the marine mammal. A table of equivalents for converting English to metric is in "Appendix D. Weights, Measures, and Conversions" on page A-12.

- **Number sighted** - Give the best estimate of the number of individuals observed. If you are unable to count all the animals with certainty, estimate the number seen in terms of range (e.g. Best estimate: 15, minimum present: 12, Maximum present: 20) For Dall's porpoise note if you see splashes from more animals than you can clearly observe.

- **Cruise number and Vessel code** - At the bottom of the page enter the cruise number and vessel code.

- **Body length estimate** - Check the box that best represents the length of the animal(s) you observed.

- **Behaviors Seen** - Circle all of the behaviors observed during this sighting.

- **Narrative and Sketches** - This section is the most important section of the form and should be completed as fully as possible. Everything that you observed about the animal should be entered. There are several important points that you should address to verify the species and individual marine mammal:

- **Shape and size of dorsal fin and its position on the body** - This is useful in identifying cetaceans, Also note the size and shape of the tail and flippers.

- **Length of animal** - Size is difficult to estimate at sea, so compare unfamiliar species with a species with which you are familiar. You

may also compare an animal to a known length on the ship.

- **General shape of the body** - Slender or robust?

- **Shape and size of snout** - Is it long or short? Estimate the length. Is there a definite beak? Is the forehead markedly bulbous?

- **Color patterns on the fins and body** - Look for spots, stripes, patches, or mottling. With Orca sightings, make sure to note the exact shape and shade of the saddle spot on dorsal side directly posterior to the dorsal fin. If possible try to take a photo of this area. Researchers are able to identify individual Orcas by the saddle patches.

- **Shape, location, and direction of blow** - In cetaceans, note whether the blow is single or double. Note where the blowhole is located on the head and whether it goes forward or goes straight up. Note the general shape of the blow, is it bushy or tall?

- **Scars and scratch marks** - Look for scars or scratch marks that will help identify the individual mammal or help determine its past behaviors. Some seals will have hook scars on their snouts and a number of Orcas may have bullet wounds on the dorsal fins. This will help NMML determine migratory patterns and determine behaviors of individual marine mammals.

- **Behaviors of animals** - Describe in detail the behaviors of the animals observed. If there are several animals describe how they interact with each other. Describe their diving behavior, and whether the animals were attracted to the vessel because of fishing operations. Were they feeding on discarded fish and fish parts?

- **Silhouettes** - On the back of the 11US are a number of silhouettes of the common marine mammals found in the North Pacific Ocean and Bering Sea. For each sighting circle the silhouettes that best represent the mammal you observed.

BIRD SIGHTINGS AND INTERACTIONS

List of Priorities

- Record takes of short-tailed albatross, Steller's and spectacled eiders, red-legged kittiwakes, marbled murrelets, and Kittlitz's murrelets.
- Record take of all birds inside your species composition sample.
- Record take of all banded and tagged birds.
- Record seabird bycatch avoidance initiatives used by your vessel.
- Record sightings of species of interest.
- Record other seabird mortality.

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Introduction

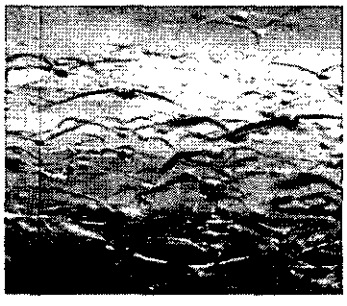
The National Marine Fisheries Service and the U.S. Fish and Wildlife Service (FWS) are cooperating to obtain accurate information on the mortality of birds in groundfish fisheries in the Gulf of Alaska and the Bering Sea. Bird monitoring activities began in 1990 and were expanded during the 1993 season. The major change was to ask Observers to identify incidentally caught birds to genus or species. Of special concern are six species whose populations are very small, or are declining, referred to here as "species of interest".

Although the amount of seabird bycatch is usually minimal in comparison with other species groups, it is important to collect accurate and reliable information. In addition to recording incidental take, you will have the

opportunity to record sightings of endangered species, report leg bands found on dead birds, document collisions of birds with the vessel superstructure, and report the methods vessels are using to reduce seabird bycatch. Although important, these other duties are secondary to all other Observer duties and should be considered the last priority for Observer work.

Observer data are crucial for the management of seabirds by the FWS, which analyzes each year's incidental mortality and its effect on the health of bird populations. The FWS annually receives the data collected by Observers as a data feed from the NORPAC database and copies of appropriate Observer Logbook pages (Seabird Daily Notes).

Incidental Take



Approximately 100 million marine birds of over 80 species occur over Alaskan waters. These birds spend most of their lives foraging at sea for small fish, squid, and crustaceans. Birds are attracted to fishing vessels because of the presence of "free" food in the form of offal, discard, and bait. More than 90% of seabird bycatch among monitored groundfish fisheries takes place on longline gear; only a few birds are caught in trawls and pots. Birds taken during longline operations are attracted to baited hooks when the gear is set; they become hooked at the surface and are dragged underwater and they drown. Although there are many different species that are caught during fishing operations, the most likely species to be caught in longline gear are northern fulmars, black-footed and Laysan albatrosses, and gulls. The most likely seabird species to be caught in trawl gear are shearwaters and alcids (puffins, murres, etc.). The most likely seabird species to be caught in pots are murrelets and murres.

Species Composition

Most of your bird observing tasks will involve those found in your species composition samples. Birds in your samples are treated similarly to other bycatch in that a number and weight are recorded on your 3US form. Most fishermen will try to throw birds overboard as quickly as possible; there is a superstition that dead birds on a vessel are bad luck.

What To Do with Birds in your Composition Sample

1. Using the identification manual, divide the birds into major taxonomic groups.

2. Identify the birds to the species level where possible. If it is a species of interest, see "Species of Interest" on page 13-4.

3. Weigh each bird individually using the 2 or 12 kg scale (remember to drain as much water as possible from the carcass).

4. Look for leg bands, nasal tags, and radio tags. If it has a band or tag, see "Banded Birds" on page 13-7.

5. Record diagnostic criteria for each species or group in the Seabirds Daily Notes section of your Observer logbook. This should be done for every species of interest and banded bird you encounter, and the first time you identify any other species groups for each cruise.

6. Find the code for each species or group in the species code list and record species, number, and weight information on the Species Composition 3US form.

For birds that drop off of longline gear, or are thrown overboard before you have a chance to weigh them; identify them as closely as you can and use an average weight from hauls where you were able to obtain weight for that species or group. If no other birds were caught from this group, estimate the weight as closely as possible; remember birds look much heavier than they really are. If you record an estimated weight, note clearly on the 3US or deck form that the weight was estimated, not measured.

Dead Bird Identification

Identification of marine birds in the Gulf of Alaska and Bering Sea is not easy; some closely-related species are virtually indistinguishable. Most field guides are written to identify live birds, not dead and bedraggled ones. When a specimen is wet and sand flea eaten, many of the plumage characteristics used in field guides are no longer evident. For FWS to assess bird mortality associated with commercial fishing they need birds to be identified at least to the genus groupings (murre, gull, shearwater, etc.). Observers are asked to identify birds to the species level where possible. This is crucial for species of interest (e.g., short-tailed albatross) and those species that could be confused with a species of interest (e.g., black-footed and Laysan albatross). In cases where you do not feel comfortable with

your identification, use the appropriate species group. For example, you will not be able to identify immature gulls to species and should instead use the group code for "unidentified gull."

Dead birds do offer a few advantages for identification. The bills of birds have characteristic shapes and sizes and can be measured precisely on birds in hand. The identification manual has been designed with keys and life-size drawings that allow you to compare bills and other characteristics of dead birds.

To Identify a Bird with a Key:

1. Using the characteristics listed and the bird at hand follow the key to the species level where possible

2. Once you have determined the species using the dichotomous key, turn to the last pages of the Seabird section of the Identification Manual. The 1st page is "Identification of the Sensitive or Most Common Species." If you are able to find the species you just identified, hold the bill up to the page. The bill should match almost exactly if the identification is correct.

3. If you believe you have a species of interest, albatross, or kittiwake, consult the detailed description for each one at the end of the identification manual.

4. If you cannot identify the bird to species, do not guess. Use the species category you are sure of and describe the animal in the Sea Birds Daily Notes section of your logbook

Note that all characteristics of the bird should match the key or description at each step; if some characteristics do not match, backtrack and try another path. It is important to take into account that colors of soft parts (bills, legs, feet) tend to fade if the bird soaks in the water for a long time. You should also use caution with plumage patterns; wet, ruffled black plumage may appear to have white spots showing through.

Species of Interest

Four groups of marine birds are of special concern because the populations of some species in the group are very small or are declining. These are albatrosses, kittiwakes, murrelets, and eiders. Reliable and accurate identification, to the species level where possible, is the goal for these groups. In addition, there are special requirements for the endangered or threatened bird species.

Albatross and Eiders

Three species of albatrosses and four species of eiders commonly occur in Alaskan waters: Laysan, black-footed, and short-tailed albatross, and common, king, Steller's, and spectacled eiders. The short-tailed albatross is an endangered species and the Steller's and spectacled eiders are threatened (a formal category under the Endangered Species Act). Observers are required, under the Endangered Species Act, to report all short-tailed albatross, Steller's eider, and spectacled eider encountered and to save all dead individuals of these species. You must report **any** catches of these three species, not only those in the species composition sample.

Murrelets and Kittiwakes

Two species of kittiwakes and three species of murrelets commonly occur in Alaskan waters: black- and red-legged kittiwakes, and ancient, marbled, and Kittlitz's murrelets. Red-legged kittiwakes, marbled murrets, and Kittlitz's murrelets are species of interest because of declining populations. Make every effort to identify kittiwakes and murrelets to species and if possible take photos. Do not retain specimens unless the bird is banded or tagged (see "Banded Birds" on page 13-7). For red-and black-legged kittiwakes, determine maturity stage, using the bird identification section in the Species Identification manual.

What To Do with Species of Interest in Your Composition Sample

1. Use the key as described on page 13-4 to identify the bird to species.

2. Use the key to verify identification.

3. Record the attributes that led you to identify the bird as a species of interest in the Seabird section of your Observer logbook.

4. Weigh the bird and, for the short-tailed albatross and red- and black-legged kittiwakes, record the maturity stage (adult = A, sub-adult = S, immature = I, and unknown = U). For two eider species record the sex (male = M, female = F, and unknown = U) as identified in the Species Identification Manual.

5. Record all tag numbers, characteristics of the bird, measurements and weight in your logbook.

With any bird specimen you retain you must notify a NMFS Observer Program office as soon as possible so that NMFS can arrange a bird specimen permit for you from the U.S. Fish and Wildlife Service.

For Short-tailed albatross, or Steller's or spectacled eider, seal the bird carcass in a plastic bag and preserve it in the freezer or cooler of the vessel. Include a note with cruise number, vessel code, date of capture, latitude and longitude. If there are more than one, include a specimen number correlated with the information in the Daily Notes section of your logbook. **Notify a NMFS Observer office as soon as possible.**

6. For all other species of interest look for leg bands, if the bird is banded refer to the Banded Birds on page 13-7, if the bird is not banded, discard bird carcass.

Seabird Avoidance Initiatives

In May of 1997 the NMFS put into law that all longline groundfish fishing vessels must use measures to avoid seabird bycatch (see "Seabird Avoidance Gear and Methods For Longliners" on page 19-26). These steps were necessary to mitigate longline fishery interactions with the endangered short-tailed albatross, and other species of interest. Monitor what, if any, avoidance measures the vessel is taking, document the effectiveness of this measure, and report any non-compliance. Write all pertinent information on this subject in the Seabird Daily Notes section of your logbook. Be thorough, you may be asked to write an affidavit at the end of your cruise concerning seabird avoidance issues.

Other Seabird Mortality

Not all incidental seabird mortality is caused by fishing gear interactions. Another source of incidental mortality results from birds colliding with vessels. Incidents range from the occasional bird found on deck to flocks of birds hitting the ship, often referred to as " bird storms." Birds hit the vessel because they become confused, primarily at night during inclement weather, and when bright lights are being used. Data are needed for this kind of mortality.

All bird strikes should be reported in the Seabird Daily Notes section of your logbook, whether you are sampling at the time or not. Document the number and the species of bird, the weather conditions, the date and time, and the position (lat /long) of the vessel. If the birds are alive, note any bands or tags, and release them (many species are unable to fly off of a deck and will need to be dropped over the rail). Note that thoroughly wet birds cannot fly or keep themselves warm. If possible, they should be allowed to dry out in a sheltered spot before being released. You must retain the bird specimen if the birds are dead and are Short-tailed Albatross, Spectacled or Steller's eider, or are banded or tagged.

Intentional killing or maiming of seabirds sometimes occurs. If you see this, record the details in the Seabirds Daily Notes section of your logbook with all necessary information. This includes date, location, species, numbers, vessel name, crew members involved in the incident, and any other pertinent information. You should let the skipper know that you are documenting these incidences and the data will be shared with the USFWS.

Banded Birds

Every year the U.S. Fish and Wildlife Service, the Canadian Wildlife Service, state wildlife management agencies, and provincial wildlife management agencies band about 300,000 migratory game birds. Management agencies, ornithological institutions, researchers, and private individuals also band approximately 700,000 non-game birds annually. These banded birds and their recoveries are an important data source used in the management of migratory birds. The Bird Banding Laboratory (BBL) of the U.S. Geological Survey and the Banding Office of the Canadian Wildlife Service jointly manage the bird-banding program in North America. Analysis of banding data allows calculation of important population parameters such as survival rates and harvest rates.

The calculation of harvest rates is one of the most important uses of banding data. Annually, 87% of all recoveries reported to the BBL are from waterfowl. However, of all the banded birds recovered, only 30-40% are reported to the BBL. Given the tremendous cost associated with the banding effort and the reliance on banding as an essential management and research tool, the loss of data associated with this low band-reporting rate is regrettable.

Report any tagged or banded bird on the Banded Seabird Form in your logbook. If you encounter more than one, copy the format of the Banded Seabird Form into the Seabird Daily notes section of your logbook. Always include the complete tag/band number, colors and configuration of plastic bands, and which leg each band was on. If the bird is dead, label and freeze it; if this is not feasible, remove the tag/band and return it to NMFS. The tag/band is used to determine rates of wear and other information that contributes to data analysis. Even if you retain the bird specimen or bands record all pertinent data in your logbook, bands are often lost and birds may be discarded by vessel crew. If the bird is alive, do not remove the band; record the complete tag/band number, colors and configuration of plastic bands, which leg each band was on, and the position and date of capture, then release the bird. Observers are to obtain a bird collection permit from their contractor. **If a banded bird is caught, and it is a short tailed albatross, contact NMFS immediately. Do not wait until debriefing!**

Sightings of Species of Interest

In the course of fulfilling your duties you will see many birds gathered around the vessel. The distribution of a few species are poorly known, and records of sightings are valuable. It is very important that you record sightings of the extremely rare short-tailed albatross. Sightings of the other species of interest are also valuable to marine ornithologists, in particular red-legged kittiwakes, spectacled and Steller's eiders, and marbled and Kittlitz's murrelets. (Note however, that these two murrelets are very difficult to tell apart at a distance in their brown summer plumage.) Steller's eiders are commonly seen near ports and do not need to be reported when spotted there. Note any recorded sightings to your debriefer when you return.

Record each sighting in the Species of Interest Encounter Form in the Seabirds section of your logbook. If this section is filled note the sighting in the Seabirds Daily Notes Section in the format of the "Sightings" form. Include Cruise number, vessel code, date location, and your name. Also include identification criteria, numbers of species, behavior of the birds, weather, and vessel activities.

Observers no longer need to log sightings of non-sensitive species of birds (such as fulmars and gulls). It is required to log what sort of avoidance device was used and how well it worked. If observers find the only method used is the sinking of bait quickly, then they will be asked in debriefing to write an affadavit about the bird regulation compliance.

STOMACH COLLECTION

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Introduction

Each month, several Observers will be assigned during training or briefing to collect fish stomachs and scan pollock stomachs from the Bering Sea and the Gulf of Alaska. The purpose of this collection is to compile data for species which are major sources of predation mortality on commercial stocks of fish and crabs, and to estimate the degree of this mortality.

Each Observer assigned to collect stomach samples should choose one of the species listed here in order of priority:

1. ** Walleye Pollock-80 stomachs
2. ** Pacific Cod-80 stomachs
3. *Yellowfin Sole-80 stomachs
4. Sablefish-80 stomachs (GOA only)
5. *Flathead sole-80 stomachs
6. *Greenland Turbot-80 stomachs
7. **Arrowtooth Flounder-80 stomachs
8. *Pacific Halibut-80 stomachs

*collect from Bering Sea only

**collect from Bering Sea or GOA

You have each been assigned a specific species from which to collect stomachs. If the vessel which you are aboard is not encountering the assigned species, please select an alternate species from the stomach priority list above. If you change boats or fishery please continue to do the project.

In addition to collecting stomachs for laboratory analysis, we are asking each Observer to examine stomachs and record their contents while in the field. *These "scans" should be done on pollock only* (see "Pollock Scanning Procedure" on page 14-14).

- PLEASE READ ALL INSTRUCTIONS CAREFULLY
- PLEASE COME BACK TO THE LAB ANYTIME YOU HAVE QUESTIONS
- CONTACT US WHEN YOU RETURN--WE NEED TO *DEBRIEF YOU:*

FOOD HABITS LAB
ROOM 1093
CHRIS DERRAH (206) 526-4238
GEOFF LANG (206) 526-4196
geoff.lang@noaa.gov

Formalin Handling Protocol for Observers

- Formalin is a relatively hazardous chemical and must be handled appropriately to ensure your safety. You are dealing with a small quantity of formalin and if these guidelines are followed your exposure will be well below established safe exposure levels.
- *Read the Material Safety Data Sheet (MSDS, picked up with* formalin and data sheets from Observer field office) before using formalin to understand its properties.
- ALWAYS wear gloves, rain gear, and goggles/safety glasses (available from the Observer gear supply) when directly using formalin.
- ALWAYS use formalin on an open deck---DO NOT use below decks or in your cabin.
- Inform captain and crew that you have formalin onboard , where it is stored, location of Material Safety Data Sheets (MSDS),

potential hazards, and what to do in case of spill.

- IF spilled--this is a small enough quantity to dilute with water and wash overboard.
- Add formalin to bucket that is already half full with seawater, rather than adding seawater to the formalin. This will ensure that the formalin is quickly diluted, and will lessen the chance of getting formalin splashed on you.
- Use extreme caution when adding formalin to bucket with seawater, hold the bucket lid over as much of the bucket as possible while pouring the formalin, creating a 'shield'.
- IF formalin comes into contact with your skin or eyes--rinse immediately, and thoroughly with water for 15 minutes as per MSDS.
- IF ingested--consume large quantities of water, and induce vomiting, seek medical attention as soon as possible as per MSDS.
- IF overcome by fumes--move to fresh air, administer oxygen if necessary and available as per MSDS.

Where to keep formalin onboard?

- Formalin should be stored in a well ventilated space. It should be stored at or above $50°F$, below this temperature it will lose its potency as a component of the formalin precipitates from the solution.
- It is best to store your bucket securely tied to an immobile object. Leave the bucket in place and carry samples to the bucket after you are done with your sampling. This will avoid the potential of spilling formalin in the factory and will keep the formalin away from fish processing operations.
- Do not to submerge your gloves in the formalin when you add samples to the bucket. If the samples float, use a pair of forceps or some other sampling tool to submerge the samples. Rinse with water after formalin contact.
- Anytime formalin gets spilled and/or inadvertently comes into contact with any object other than your samples, flush the object or area with plenty of water.

Discard of formalin:

- Remember to discard your formalin at sea over the side of the boat, without spilling any formalin on deck or inside the boat.
- Do not discard formalin once you are in port.
- Do not dump formalin down the drain on the boat.

Materials for Stomach Project

(to be picked up in the field offices)

- 1 liter formalin
- 1.5-gallon bucket
- 2 bucket lids (1 cut and 1 uncut)
- 2 large plastic bags
- 1 plastic graduated cylinder (100 ml)
- 2 plastic beakers
- 2 small glass jars
- 1 petri dish
- 125 specimen bags (50 small, 50 medium, 25 large)
- 100 specimen labels
- 1 pair latex gloves
- 1 notebook containing:
  - 6 haul position forms
  - 15 specimen forms
  - 10 stomach scan forms
- 1 MSDS for 100% formalin
- 1 MSDS for 10% formalin

- PLEASE RETURN ALL UNUSED FORMS AND SUPPLIES TO ROOM 1093
- DO NOT PLACE UNUSED SAMPLING GEAR IN BUCKET WITH SAMPLES!!
- LEAVE PLASTIC FORMALIN BOTTLE AT THE FIELD OFFICE

Stomach Sampling

Stomach Collection Procedure

Please collect all stomach samples as soon as possible so that they are well preserved.

1. Prior to the first haul from which you plan to collect stomachs, fill the white five gallon bucket half-full with sea water and add the contents of the one liter bottle of 100% formalin (37% formaldehyde) creating a 10% formalin solution (3.7% formaldehyde).

2. Seal with cut lid. Add samples to this bucket as you collect them. One stomach per bag.

3. Collect stomach samples according to time of day and length of fish (see "Sample Stratification" on page 14-7).

4. Use the tally sheet (page 14-18) to keep track of the time and length categories that you need to fill.

- You may sample fish from any haul, not just those required by the Observer program.

- Collect fish which show no sign of either net feeding or regurgitation.

- Signs of net feeding and regurgitation (DO NOT KEEP THESE!):
  - prey items (fresh or digested) in mouth or gill rakers
  - flaccid (loose and bloated) stomach

- Signs of "natural" stomachs (KEEP THESE!):
  - stomachs appear tight around any prey inside
  - naturally empty stomachs appear tight and contracted

NOTE: If a fish is discarded due to regurgitation, take the next fish in the basket. If the second fish has food in its stomach, go ahead and collect the specimen. If the second fish is empty (naturally empty or regurgitated), discard it and go on to the next fish. This special note applies only to the fish selected immediately after a regurgitation discard, because we don't want you to replace a regurgitated stomach with an empty stomach. A naturally empty stomach is a valid collection when not collected immediately following a regurgitated stomach.

5. Determine the sex, fork length, and spawning condition of each fish and collect the stomach (see methods for individual species).

6. *Record all information on the Specimen Form and Specimen Label* as described in the "Labels and Records" section, (page 14-12).

7. Place each stomach in an individual cloth bag of appropriate size, include a specimen label, and preserve.

- Stop collecting when you have collected 80 stomachs or a full bucket that is loosely packed.

When Your Sea Time Is Finished

1. Just prior to your return to Seattle, decant the formalin from the bucket and place sample bags in large plastic bag.

2. Seal the plastic bag, return it to the bucket and the seal bucket with the uncut lid.

- Now the bucket is permanently sealed and does not contain formalin, only stomach samples.

3. Return the bucket with samples to the food habits lab (Room1093) as soon as possible, so that we can add formalin to the samples.

- Please do not freeze your bucket or have the airline put your bucket into cold storage.

If you are scheduled to debrief in the field, and will not be coming back to Seattle, leave your bucket and data with the NMFS contact person. Do not decant the formalin from your bucket in this case.

When you meet with your debriefer, show him or her your completed scan and specimen forms. Then contact our lab so we can debrief you and collect your data forms.

For debriefing contact: Food Habits Lab, Room 1093, Building 4, Alaska Fisheries Science Center, 7600 Sand Point Way N.E., Seattle, WA 98115. Phone: (206) 526-4238.

- IF YOUR BOAT ASSIGNMENT CHANGES AND YOU CANNOT COMPLETE THE PROJECT ON THE NEW BOAT, RETURN YOUR GEAR TO THE NMFS OBSERVER FIELD OFFICE.

Sample Stratification

We would like you to stratify the stomach collection by size of fish and time of collection. (Net off bottom/haul back time)

Below we provide a chart with species length and time categories and sample numbers (Figure 14-1). There are four length categories (1-4). For your particular species, see page 14-13 and fill in the appropriate length categories in the blanks provided. At the same time fill in the lengths on the tally sheet (page 14-18), and use it as a guide.

Try to collect a minimum of 5 stomachs from a time category in one haul and a maximum of 20.

	LOCAL TIME				
Species length (cm)	0101-0700	0701-1300	1301-1900	1901-0100	Total samples/ length
1 _____	5	5	5	5	20
2 _____	5	5	5	5	20
3 _____	5	5	5	5	20
4 _____	5	5	5	5	20
Total samples/ time category	20	20	20	20	80

Figure 14-1: Example of a tally sheet

You could collect all stomach samples in a minimum of 4 hauls. However, due to the availability of certain sizes, you are likely to sample from more hauls. You must complete the project in a maximum of 16 hauls.

You may have difficulty finding specimens for a particular time or size strata (especially if your boat targets large fish). If this happens take more from the ones you are finding, or wait a few hauls if you think your vessel may catch a different size group.

The total number of samples to be collected is a maximum number. If your bucket is full (i.e. loosely packed) before you have reached 80, STOP COLLECTING. The number which will fit in a bucket will depend on the size and fullness of the stomachs collected.

Determining Sex and Spawning Condition of Flatfish and Gadids

Give the abdomen a light squeeze. The extrusion of milt (male) or eggs (female) indicates a fish in spawning condition.

The ovary is generally triangular with a long lobe which extends posteriorly. Testes do not have the lobe and are white in mature specimens.

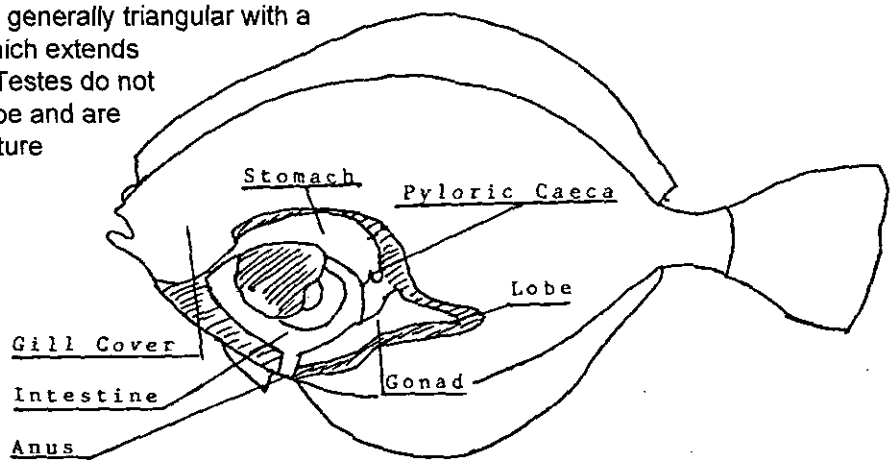

Figure 12-2: Illustration of flatfish gonads

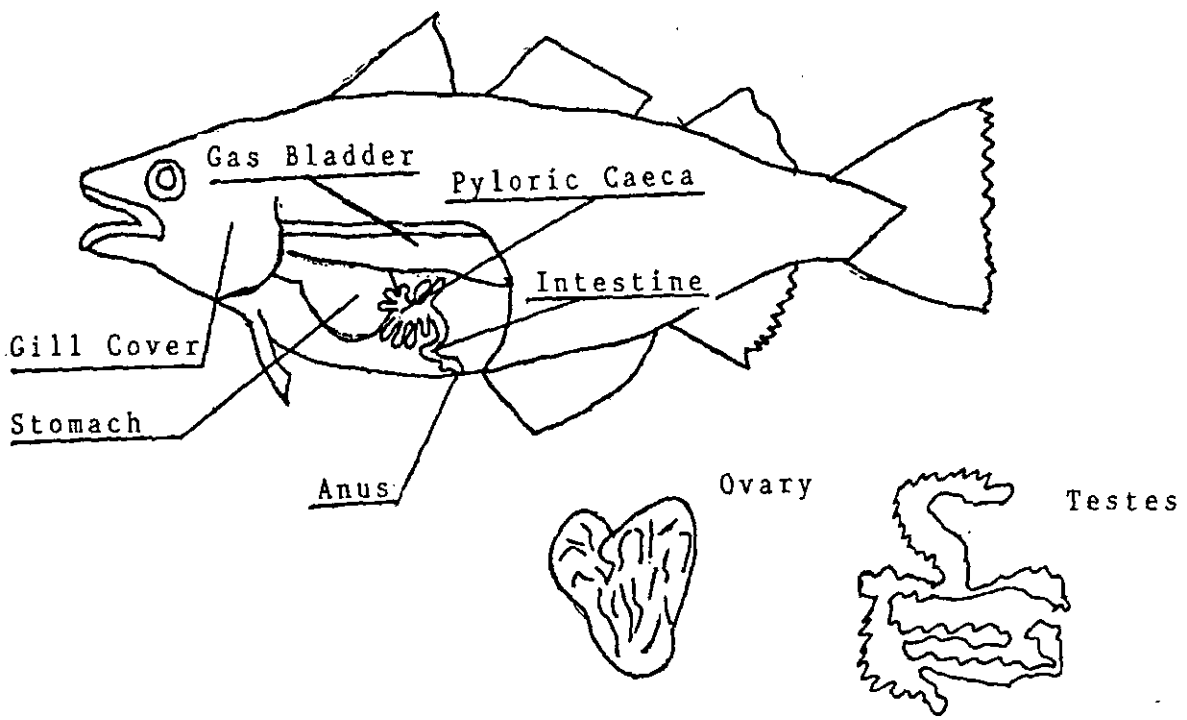

Figure 12-3: Illustration of Gadid gonads

Method of Collecting Gadid Stomachs

1. To examine a stomach for regurgitation, first examine the mouth and gill rakers, then cut through the skin of the fish as illustrated with the dashed line (Figure 14-4). Be careful not to cut into the stomach.

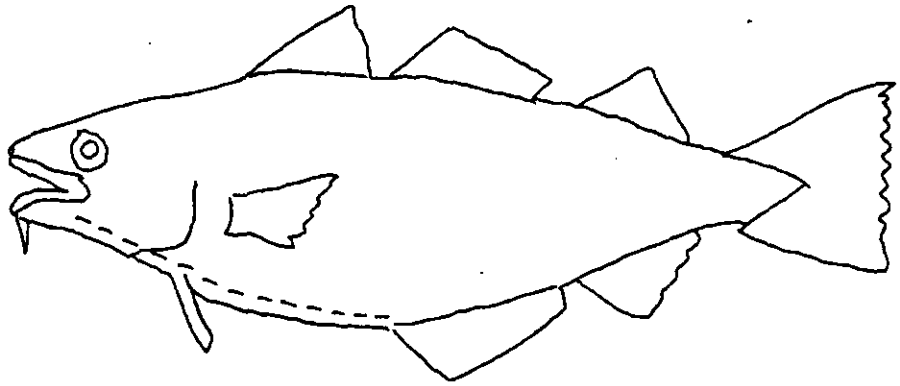

Figure 14-4: First cut of gadid

2. Open at incision and examine stomach, if there is no sign of regurgitation:

3. Excise stomach by cutting just anterior to the pyloric caecaand posterior to the gill chamber (Figure 14-5). This should include all of the esophagus.

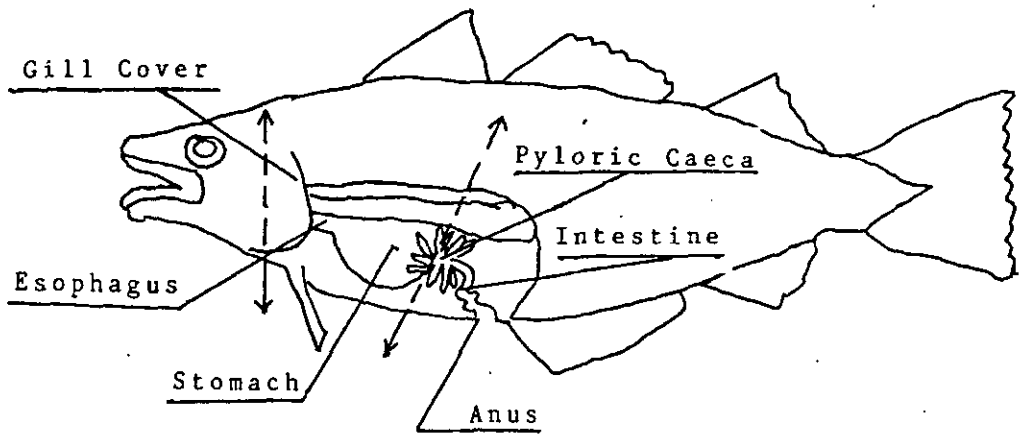

Figure 12-5: Final cut of gadid

4. Place stomach in bag with a specimen label and preserve.

Method of Collecting Stomachs from Yellowfin and Flathead Sole

1. To examine stomachs for regurgitation, cut through the skin of the blind side (Figure 14-6). (Be careful not to cut through the stomach).

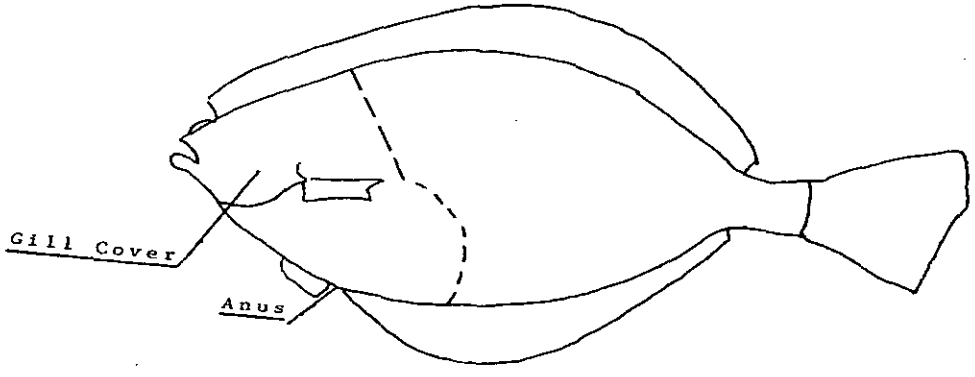

Figure 12-6: First cut of flatfish

2. Lift flap and examine body cavity, if there is no sign of regurgitation: make a cut as illustrated by the dashed line below.

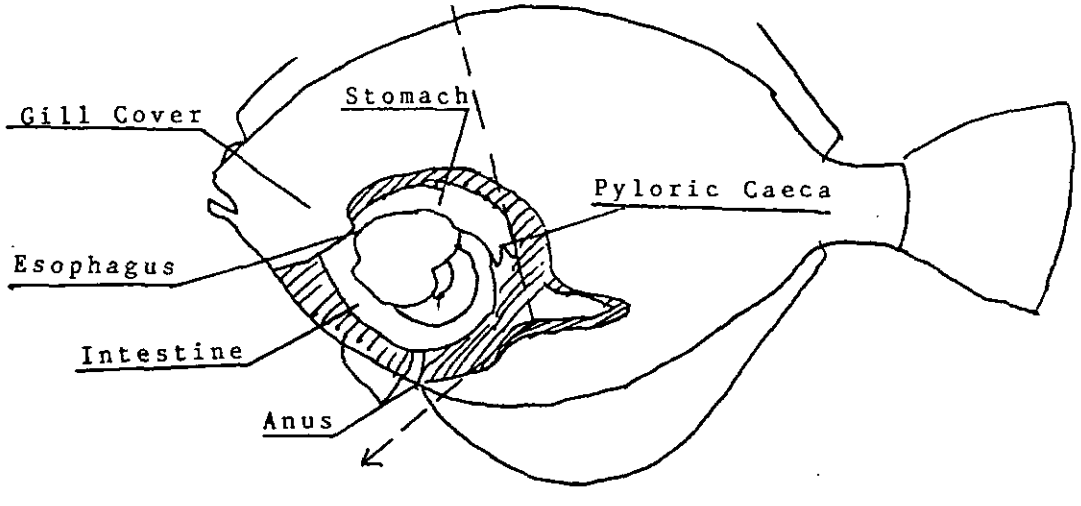

Figure 12-7: Final cut of flatfish

3. If the fish is less than 20 cm in length, remove the entire head along with the digestive tract attached and put it in a sample bag with specimen label and preserve.

4. If the fish is 20 cm or larger, remove the entire digestive tract from the beginning of the esophagus to the posterior end of the intestine just above the anus. Place the stomach with the intestine attached into a stomach bag with specimen tag and preserve.

NOTE: For all of the large flatfishes (arrowtooth flounder, Greenland turbot, and Pacific halibut) remove only the stomach and leave the intestine behind. Make an incision posterior to the gill chamber and anterior to the pyloric caeca. Be aware that arrowtooth are prone to regurgitation.

Pacific Halibut

Remember, stomachs from Pacific halibut (Hippoglussus stenolepis) are FROM BERING SEA ONLY.

We have been given permission to collect stomachs from Pacific halibut by the International Pacific Halibut Commission (page 14-23). In order to prevent possible problems, we have set up the following guidelines for you to follow:

First and foremost, NO halibut will go to the freezer. NO halibut will go to the galley. ALL halibut will go overboard after sampling. Make sure that you personally put the fish overboard after you have collected your stomach samples. No fillets, no cheeks.

Labels and Records

- always use pencil
- Fill out a Tally Sheet for your species (page 14-18).
- Fill out a Specimen Form for each haul (1 line/fish)(page 14-19).
- Fill out a Haul Position Form (page 14-21) for each haul.
- Fill out a Label (page 14-20) for each sample and place in bag with sample.

Specimen Form

Record only the following where indicated: (page 14-19)

- vessel name
- haul number
- specimen number (number assigned consecutively throughout the entire cruise to each sample as it is collected)
- predator name
- predator length in mm (fork length)
- predator sex (1=male, 2=female, 3=juvenile)
- predator spawning stage (1-spawning, 0=not spawning)
- your name
- date

Label

Record the following where indicated

- vessel name
- haul number
- specimen number
- predator name
- predator length
- predator sex (1, 2 or 3) and spawning condition

Haul Position Form

Fill out separate forms for stomach and scan collection with:

- haul number
- date
- latitude and longitude specifying east or west
- average depth (gear and bottom)
- water temperature if available
- net off bottom or haul back time (Alaska local time)
- haul duration (hrs) and haul type
  0 = bottom trawl
  1 = mid water trawl
  2 = longline
  7 = pot

Species Lengths for Use in Sample Stratification

Fill in the blanks on your stratification chart and your tally sheet according to your species listed below:

Pacific cod, Pacific halibut, Greenland turbot, and arrowtooth flounder:

1) <31 cm
2) 31-50 cm
3) 51-70 cm
4) >70 cm

walleye pollock:

1) <30 cm
2) 30-39 cm
3) 40-49 cm
4) >50 cm

yellowfin sole:

1) <20
2) 20-24 cm
3) 25-29 cm
4) >29 cm

flathead sole:

1) <21 cm
2) 21-30 cm
3) 31-40 cm
4) >40 cm

sablefish (Gulf of Alaska only)

1) <50 cm
2) 50-60 cm
3) 60-70 cm
4) >70 cm

Pollock Scanning Procedure

Number to be Scanned

- walleye pollock: > 30
- Only scan pollock stomachs. Try to scan at least four pollock per haul.

Recording

1. Fill out a Haul Position form for every haul at which scans are done. Please keep these separate from your Haul Position forms for stomach collections.
2. Fill out the top of the Stomach Scan form. Make sure that the time in the upper right hand corner of the Stomach Scan form is the same time as on the Haul Position form, net off bottom/haul back time, local Alaska time, rounded to the nearest whole hour.
3. Record specimen numbers consecutively throughout the cruise (e.g. pollock specimen numbers 1-30).
4. Record fork length in whole cm (right-justified).
5. Record sex (1=male, 2=female, 3=juv.) and maturity (1=spawning, 0=not spawning) as on the specimen form.

Biological Sampling

1. Open the stomach from esophagus to pyloric caeca. Estimate and record the fullness from 1 to 6 (1=empty, 2=trace, 3=<25% full, 4=25-50% full, 5=51-75% full, 6=76-100% full).
2. Measure the total volume of the stomach contents (cc=ml) by water displacement. Put some water into a container of appropriate size (100 ml graduated cylinder, 250 or 600 ml beaker) and note the level. Add the stomach contents (material must be completely submerged) and note the difference between the initial water level and new water level. Record this volume in whole cc (e.g. 1.0 cc, 10.0 cc, 27.0 cc, etc.) in col 40-44. If fullness=2(trace), use 0.1 for the volume.

3. After measuring the stomach content volume dump the stomach contents into a petri dish and add enough water to separate individual prey items by using forceps to stir the stomach contents around.

Note: that this procedure is important because it will help separate the unidentifiable, digested mush from the identifiable prey items making them more visable.

4. List the prey items, to the best of your ability, as either pollock, cod, myctophid, herring, unidentified fish or miscellaneous prey using the codes listed below. Estimate the percent of the total volume which is represented by each prey item (col 48-50); these should sum to 100%.

5. Record the state of digestion of each prey item, using codes 1-5 (1=empty, 2=trace, 3=wholly digested, 4=partially digested, 5=fresh).

6. Record the number of any fish prey in the stomach, if these prey are already broken up, try to estimate the number (e.g. count heads, or backbones).

7. Record standard length, when possible, for all fish prey. Use extra lines if there are more than three measurable prey items in the category.

8. Repeat the above steps for each stomach scanned in the haul. Use the back of the form as well and complete one or more forms per haul, until you have reached your sampling goal.

- So that we can verify the validity of your scans, bring back several examples of fish prey found in pollock stomachs. We have provided you with 2 jars, and you can use formalin from your bucket. Place a label inside each jar to identify the contents and return them to the lab so that we can look at them. Larger specimens can be put into the bucket in a stomach bag.

Note: Follow the procedure on page 14-5 for fish which have regurgitated their stomach contents. "Naturally" empty stomachs are valid scans.

Prey codes:	**Season codes:**
pollock 8791030701	Winter: Jan/Feb/March = 1
Pacific cod 8791030401	Spring: April/May/June = 2
Pacific herring 87477010201	Summer: July/Aug/Sept = 3
myctophids 876214	Fall: Oct/Nov/Dec = 4
unidentified fish 8735	
miscellaneous/non fish 999999	

Debriefing Questionaire

Your Name

Vessel Name

1. Did you have any problems in carrying out this project (lack of sufficient equipment, lack of time, etc)?

2. How long did it take you to collect your samples from one haul?

3. Was it difficult to collect the expected number of samples from different size groups at different time periods?

4. Do you have any suggestions that would improve the sampling procedure for this project?

5. Do you have any suggestions that would make it easier for you to successfully complete this project?

STOMACH TALLY SHEET

TIME

SIZE	0101-0700	0701-1300	1301-1900	1901-0100	TOTAL
1_____	5	5	5	5	20
2_____	5	5	5	5	20
3_____	5	5	5	5	20
4_____	5	5	5	5	20
TOTAL	20	20	20	20	80

Figure 14-8: Stomach Tally Sheet

DP-004 83-01-15

SPECIMEN FORM

PAGE ____ OF ____

VESSEL 1 2 3 (1) CRUISE 5 6 7 HAUL (2) 9 10 11

STRATUM 13 14 15 SPECIES CODE 17 18 19 20 21 SPECIES NAME (4)

FREQUENCY 36 SUBSAMPLE TYPE 48 WEIGHT DETERMIN. 49 AGE STRUCTURE 50 AGE DETERMIN. 51

MATURITY TABLE 59 60 YOUR NAME (8) DATE (9)

23 SEX	25 MATUR	28 29 30 31 LENGTH IN ~~MM~~ CM	37 38 39 40 41 WEIGHT (GRAMS)	45 46 AGE	53 54 55 56 57 SPECIMEN NUMBER	62 63 64 65 66	68 69 70 71 72
(6)	(7)	(5) (0)			(3)		

Figure 14-9: Specimen Form

STOMACH COLLECTION LABEL

National Marine Fisheries Service, Trophic Interactions Lab
7600 Sand Point Way NE, Seattle, WA 98115-0070

VESSEL_____ CRUISE_____ HAUL_____

SPECIMEN NUMBER _____

LENGTH (CM)_____SEX: M F U MATURITY: SP NSP

SPECIES IDENTIFICATION _____

COMMENTS _____

_____

COLLECTOR'S INITIALS_____ PRESERVATIVE _____

Figure 14-10: Stomach Collection Label (not to scale, actual size 2.5 x 3.0 inches)

EXAMPLE

21

HAUL POSITION FORM

FILL OUT SEPARATE FORMS FOR STOMACHS & SCANS !

VESSEL (3 4) Kyowa Maru #2 CRUISE (5 6 7 8) YOUR NAME David Hope

Haul (10 11 12)	Yr (14 15)	Mo (16 17)	Day (18 19)	LATITUDE Degree (22 23)	LATITUDE Min. (24 25 26)	E/W (29)	LONGITUDE Degree (29 30 31 32)	LONGITUDE Min. (33 34 35)
001	85	07	15	52	15.4	E	1178	31.5

Round NOB time to nearest whole hour!

Average depth (fm) Gear (37 38 39 40)	Average depth (fm) Bottom (41 42 43 44)	Equil. hr. = NOB effort (46 47)	Haul duration (hrs.) (49 50 51)	Haul type (61)	Water temp. (°C) Surface (71 72 73)	Water temp. (°C) Gear (76 77 78)
75	75	12	3.5	0	8.0	2.5

Haul type (61): 0–Bottom, 1–Off bottom, 2–Other

Haul Type
0-Bottom
1-Off Bottom
2-Longliner
7-Pots

Haul (10 11 12)	Yr (14 15)	Mo (16 17)	Day (18 19)	LATITUDE Degree (22 23)	LATITUDE Min. (24 25 26)	E/W (29)	LONGITUDE Degree (29 30 31 32)	LONGITUDE Min. (33 34 35)

Average depth (fm) Gear (37 38 39 40)	Average depth (fm) Bottom (41 42 43 44)	Equil. hr. (GMT) (46 47)	Haul duration (hrs.) (49 50 51)	Haul type (61)	Water temp. (°C) Surface (71 72 73)	Water temp. (°C) Gear (76 77 78)

Haul type (61): 0–Bottom, 1–Off bottom, 2–Other

Haul (10 11 12)	Yr (14 15)	Mo (16 17)	Day (18 19)	LATITUDE Degree (22 23)	LATITUDE Min. (24 25 26)	E/W (29)	LONGITUDE Degree (29 30 31 32)	LONGITUDE Min. (33 34 35)

Average depth (fm) Gear (37 38 39 40)	Average depth (fm) Bottom (41 42 43 44)	Equil. hr. (GMT) (46 47)	Haul duration (hrs.) (49 50 51)	Haul type (61)	Water temp. (°C) Surface (71 72 73)	Water temp. (°C) Gear (76 77 78)

Haul type (61): 0–Bottom, 1–Off bottom, 2–Other

Haul (10 11 12)	Yr (14 15)	Mo (16 17)	Day (18 19)	LATITUDE Degree (22 23)	LATITUDE Min. (24 25 26)	E/W (29)	LONGITUDE Degree (29 30 31 32)	LONGITUDE Min. (33 34 35)

Average depth (fm) Gear (37 38 39 40)	Average depth (fm) Bottom (41 42 43 44)	Equil. hr. (GMT) (46 47)	Haul duration (hrs.) (49 50 51)	Haul type (61)	Water temp. (°C) Surface (71 72 73)	Water temp. (°C) Gear (76 77 78)

Haul type (61): 0–Bottom, 1–Off bottom, 2–Other

Figure 14-11: Haul Position Form

Your name Fred

Date 11/3/90

STOMACH SCAN FORM

Season	Year	Vessel	Cruise	Haul	Predator name / Code	Time (GMT)
3	90	37	2170	147	8791030701	2100
1	2 3	4 5	6 7 8 9	20 21 22	23 24 25 26 27 28 29 30 31 32	77 78 79 80

Codes – Sex: M F Juv (1 2 3) Maturity: NSp Sp (0 1) Fullness: E Tr 25% 50% 75% 100% (1 2 3 4 5 6) Digestion: E Tr WD PD FR (1 2 3 4 5)

Spec. no.	Fork length (cm)	Sex	Mat	Tot. content vol. (cc)	Fullness
1	57	2	0	270	4
33 34	35 36 37	38	39	40 41 42 43 44	47

Prey name	% vol.	Dig.	No.	Prey size (mm) 1	2	3	Prey sex	Prey code
Pollock	35	4	2	65	31			8791030701
OTHER	65	3						999999

48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73

Spec. no.	Fork length (cm)	Sex	Mat	Tot. content vol. (cc)	Fullness
2	60	1	0	150	3
33 34	35 36 37	38	39	40 41 42 43 44	47

Prey name	% vol.	Dig.	No.	Prey size (mm) 1	2	3	Prey sex	Prey code
Pollock	70	4	5	21	43	57		8791030701
Pollock		4		60	44			8791030701
OTHER	30	2						999999

48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73

Spec. no.	Fork length (cm)	Sex	Mat	Tot. content vol. (cc)	Fullness
3	36	2	0	0.0	1
33 34	35 36 37	38	39	40 41 42 43 44	47

Prey name	% vol.	Dig.	No.	Prey size (mm) 1	2	3	Prey sex	Prey code
Empty		1						

48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73

Spec. no.	Fork length (cm)	Sex	Mat	Tot. content vol. (cc)	Fullness
4	40	1	C	0.1	2
33 34	35 36 37	38	39	40 41 42 43 44	47

Prey name	% vol.	Dig.	No.	Prey size (mm) 1	2	3	Prey sex	Prey code
OTHER	100	2						999999

48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73

Figure 14-12: Pollock Scan Form

COMMISSIONERS

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INTERNATIONAL PACIFIC HALIBUT COMMISSION

ESTABLISHED BY A CONVENTION BETWEEN CANADA

AND THE UNITED STATES OF AMERICA

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January 16, 1996

Dr. Richard J. Marasco
National Marine Fisheries Service
7600 Sand Point Way NE
Seattle WA 98115

Dear Rich,

This letter authorizes the continued scientific collection of Pacific Halibut (Hippoglossus stenolepis) through the year 2000 by the National Marine Fisheries Service.

We are pleased to receive reports and publications derived from the halibut data.

Sincerely yours,

Donald A. McCaughran
Director

Figure 14-13: Halibut specimen collection letter

CATCH MESSAGE INSTRUCTIONS

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Introduction

Catch Messages are one of the most important aspects of an observer's work for several reasons. Primarily, Catch Messages contain information on fishing effort and species composition which are used for inseason management. The National Marine Fisheries Service, in conjunction with the North Pacific Fisheries Management Council, allocate a total allowable catch (TAC) for various groundfish species and areas. After the Observer Program completes preliminary quality control checks on the inseason data provided in the Catch Message, the information is made available to the Sustainable Fisheries Division in Juneau. This division of NMFS uses the information from observer Catch Messages to determine how much of the TAC has been caught and how long seasons or areas will remain open. If you do not submit Catch Messages on time and in the proper format, the Observer Program can not provide the information necessary for making sound management decisions. Finally, Catch Messages are used as a tracking tool so the Observer Program remains updated with where you are and which vessel(s) you are on.

In this chapter we will discuss Catch Messages and the protocol for submitting them properly. Plant observers should refer to "Weekly Plant Report Form" on page 8-18 for specific instructions on when to send messages.

What to Include in a Catch Message

- Vessel Observer faxing their catch messages should fax 1US or 2US information and the corresponding 3US information.
- Observers using ATLAS on vessels and at plants should refer to "Transmit Data" on page 16-33.

Sending Catch Messages

- A Report Week starts each Sunday at 00:00 hours and continues until Saturday at 23:59. At least one Catch Message should be submitted for each Report Week while you are deployed. Even if no fishing was done during the Report Week, you should submit a Catch Message if you are assigned to a vessel. When a vessel does not fish simply report your noon position(s) and indicate no fishing was done on the 1US or 2US.

- Observers faxing paper forms from catcher/processors and motherships should submit Catch Messages Forms once a week on either Sunday or Monday.

- ATLAS observers on trawler catcher/processors and motherships should submit electronic Catch Messages daily. ATLAS observers on pot and longline catcher/processors should submit Catch Messages at the end of the Report Week. Refer to the ATLAS chapter for instructions on how to send your data.

- Catcher boat observers who have ATLAS or are faxing should submit Catch Messages by trip. If trips are short (1 - 2 days) you can consolidate and submit two trips per Catch Message. If trips are long (> 10 - 12 days) call or send us a message indicating when we should expect your Catch Message. Catcher boat observers should also report noon positions for all non-fishing days they are on the vessel.

- Catch Messages Forms should be faxed to the Groundfish Observer Program in Seattle at: 206-526-4066 or 206-526-4207. If you can't get through the backup fax numbers are: 206-526-6723 and 206-526-4004. **Do not send Catch Messages via the fishing company's office.**

When to Start a New Catch Message

Start a new catch message for the following:

- you change vessels;
- the year changes;
- the report week changes or your trip ends;
- your vessel moves between the Bering Sea and Gulf of Alaska.

Questions and Communication Problems

If you have trouble sending a Catch Message don't give up. Try re-sending the message by using one of the alternate fax numbers listed above. If you can't get through call one of the numbers listed below, radio Dutch Harbor or Kodiak on the single side band radio to let us know the nature of your communication problem and when you think you will be able to send your Catch Message.

Remember, all radio transmissions are public and catch information should not be discussed over the radio. When you contact us please provide your name, cruise number, vessel name, ORC code and the reason why you can't send your catch message.

Questions or text messages can be included at the end of a Catch Message on a blank, unlined sheet of paper and may be hand written or typed. Please print or use a font large and dark enough so faxes can be easily read. If you have a communications related question call Glenn A. Campbell at 206-526-4240. If you are unable to send your Catch Message and need to report your situation, call the Observer Program collect at 206-526-4205. If no one is available to take your call leave a voice mail. When you leave a voice mail message give your name, cruise number, vessel name, ORC code, and the reason why you can't send your data.

Correcting and Resubmitting Catch Messages

If you have a correction to a Catch Message that you have already sent simply correct the information on your form(s) and circle any changes you have made. At the top of the form write "Resubmission of Catch Message" so we know you are sending a correction and not new data.

Some times the Observer Program does not receive your Catch Message due to a communications problem or we may only receive part of it. If this happens you may get a message from us instructing you to re-send your Catch Message. In this case simply fax your entire Catch Message again. Remember, there are several numbers to send information to, so if you are having trouble with the primary line try one of the alternate numbers. Remember, Catch Message information should not be sent via the fishing company office.

If you are on an ATLAS boat and you need to change your data, see "Editing in ATLAS" on page 16-9 for specific instructions. Any changed data will automatically be send to Seattle the next time you transmit data. If you are asked to resubmit you a catch message, select a haul or date range while "preparing" your data to be transmitted.

ATLAS INSTRUCTIONS

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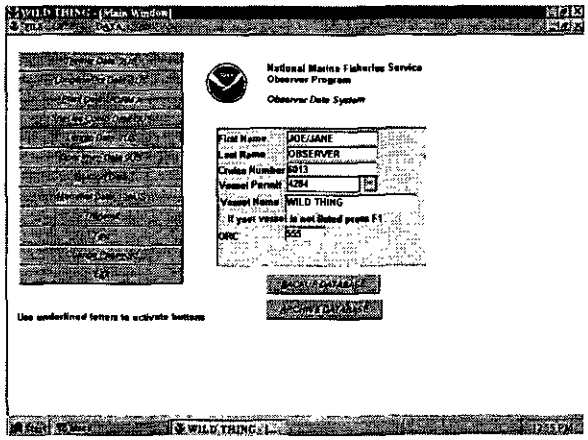
Introduction

The ATLAS AtSea Program was developed in order to allow groundfish Observers to send data from assignment stations, be that catcher/processor vessels in the Bering Sea or shore-side processing plants in Kodiak, Alaska, directly to NMFS Alaska Fisheries Science Center in Seattle. This program enables NMFS to receive, analyze, and distribute data to those who need it for the management of the fishery during the fishing season. The ATLAS AtSea program also allows Observers to obtain technical support while in the field via two way e-mail communications.

This chapter will provide a basic understanding of the features provided with the ATLAS AtSea program and how to use them. It will be assumed that a rudimentary understanding of Windows already exists, **if this does not apply to you, please inform an instructor prior to departing for your vessel and a tutorial will be given during your regular Observer briefing.**



ATLAS Basic Keystrokes

In order to learn how to use the ATLAS AtSea program you must first understand some rudimentary concepts. This section explains some basic terminology and techniques that are referred to throughout this chapter. Other terms are explained as they are introduced in the text.

Basic Terminology

Term	Meaning
Click	To quickly press and release the mouse button.
Double-click	To click the mouse button twice in rapid succession.
Point	To move the mouse until the mouse pointer on the screen rests on the item of choice.
< >ing	To use a specific key indicated by the < > marks i.e. <Enter>ing for pressing the <Enter> key.
⇦⇧⇩⇨	To use the arrow keys located at the right of the keyboard in a separate block from the other keys. [To use the arrow keys located on the number keypad you must first make sure that the numbers are not locked.]

Choosing and Selecting Items

In ATLAS, the terms **choose** and **select** have different, and specific, meanings. Selecting an item usually means marking it with the selection cursor, which can appear as a highlight, bold letters on a button, a dotted rectangle on a button, or all three. You choose an item to carry out an action. For example, choosing one of the command buttons on the Main Window will open a new window to one of the data entry forms. Choosing items in other areas may cause the program to enter data into the database or return you to other windows. You may use a combination of mouse and keyboard techniques to choose an item. For example, you could point and click on an item to select it, and then press <enter> to choose it. In some cases, by selecting an item you will be choosing it as well. When a procedure in this guide says to choose an item, generally, you can use whichever method you prefer. Alternative procedures are often provided.

Using the Mouse

A mouse is a piece of hardware that connects to your computer. While a mouse is not necessary to run the ATLAS AtSea program, it provides you with a good way to access features and options, and to manage the graphical environment. To select items on the screen place the mouse pointer (also known as a cursor) on the item and click the selector button on the mouse (on most mouses the selector button is the left button.) To choose an item using the mouse, place the mouse pointer on the item and double-click the mouse selector button. Many items in the ATLAS AtSea program will be selected and chosen at the same time by pointing and clicking on them. For example, on the Main Window one is able to choose the Specimen Data form by clicking on the "Specimen 9US" command button with the mouse. When it is necessary to double-click, it will be noted in this chapter.

What is a Menu?

On the top of every window and form there is a list of subjects in a row; these are called menu items. When you select a menu item, another list, called a menu list, will appear below the item. For example, in the Main window if you were to select DATA, by one of the methods described in the following sections, a menu list would appear with User Information and System Information (see Figure 16-1).

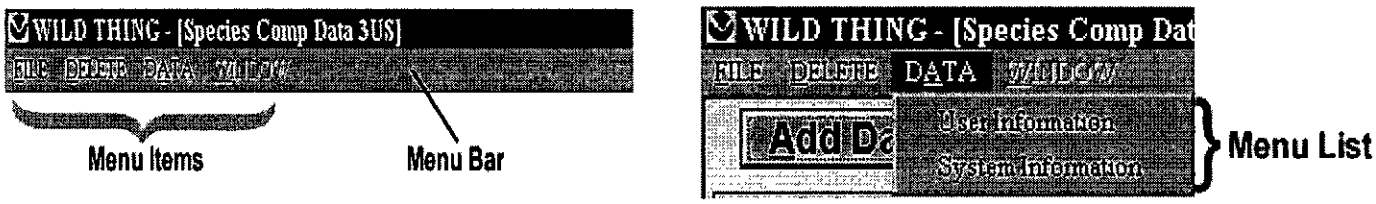


Figure 16-1: Menu items

Keyboard Alternatives to the Mouse

The ATLAS program is like most Windows applications in that one may use the <Tab> and <Enter> keys in order to select and choose items on the screen. Generally the <Tab> key moves the cursor left to right or top to bottom while the <Shift>+<Tab> key moves the cursor in the reverse. On the Main Window, for example, use the <Tab> key to select the "Specimen 9US" button and press the <Enter> key to choose it.

Keyboard Shortcuts

Shortcut-keys may be used to carry out some commands by selecting and choosing command buttons (see "Command Buttons" on page 16-8). The shortcut-keys on the Main Window buttons can be identified by the underlined letter on each button. To use a shortcut, you need only to press an underlined letter's key. For example; to choose the button "Longline/ Pot Data 1US" from the AtSea Main Window, one needs only to press the <L> key.

In other areas, such as the Menu, again you may identify shortcut-keys by the underlined letters. For menu shortcuts you must press the <Alt> key and the letter's key at the same time. This will select and choose the specified item. An example is the A in the DATA menu selection (see Figure 16-1).

ATLAS Basic Navigation

Finding Your Way Around in the ATLAS AtSea Program

Navigation within the AtSea program is very similar to almost all other window applications. To move into a form, select and choose the desired form on the Main Window by either;

a) moving the mouse pointer and clicking on the appropriate button,

b) <Tab>ing until the appropriate button is selected and hitting the <Enter> key,

or

c) using the shortcut keys.

The Haul/Set List Window

Navigation within forms on the AtSea program is very similar on most form types. Once you have chosen a form from the Main Window, the Haul/Set List Window will present you with a list of haul/set numbers that have been entered. Select and choose the haul/set you wish to add data to by either;

1. Pointing and clicking with the mouse on the appropriate haul/set in the list of haul/sets. Then pointing and clicking on the "Type in Haul Number and hit Enter" button.

2. Using the <Tab> key to select the list of hauls/sets. Using the ⇩ or ⇧ keys to select the haul/set number you wish to work with, then pressing <Enter> to choose it.

Data Fields

Data fields, or simply fields, are white boxes in which data may be entered (see Figure 16-3). When the cursor is in a data field, you may then enter data into the field. You may move between data fields by using the mouse and clicking on the data field you need, or by using the <Tab> key. You may move within a data field by using the left or right arrow keys. On many of the forms data must be entered into the field before you are able to leave the field. In general, it is best to proceed from field to field without skipping fields. This is due to the program's error checking and the depen-

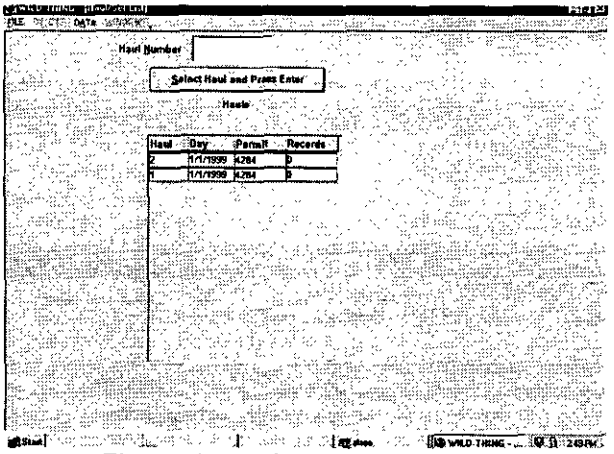


Figure 16-2: Hau/Set window list

dency of some fields on previous fields' values. In this chapter the names of the data fields will be written in italics, as in **First Name** field.

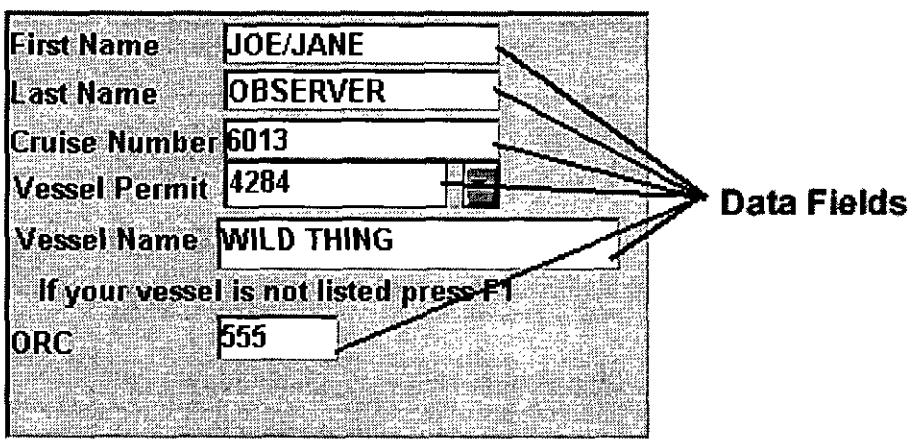


Figure 16-3: Data fields

Drop-down Lists

Many of the data fields will have drop-down lists. A drop-down list is a list of values which may be entered for the specific field. These fields may be identified by a down arrow located on the right side of the field (see Figure 16-4). To use the drop-down list; select a field with a down arrow and press the <Alt> and ⇩ key simultaneously, or point and click on the down arrow with the mouse cursor. This reveals a list which you will be able to scroll through by pressing the ⇩ or ⇧ keys, or by pointing and clicking on the scroll bar. A scroll bar is not always present, if it is it will be located on the far right of the list. Choosing the value may be accomplished by selecting the appropriate value, then pressing the <Enter> key, or by selecting the appropriate value with the mouse cursor and clicking.

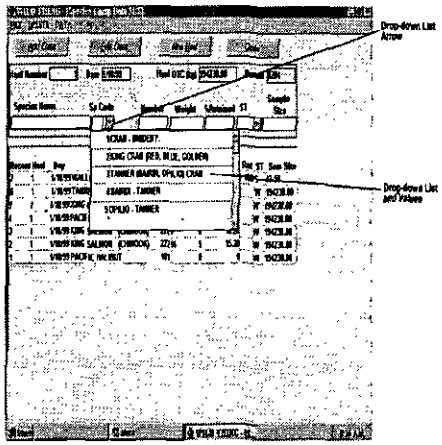


Figure 16-4: Drop down lists

Command Buttons

On each form there is a selection of command buttons on the top of the form. There are four command buttons that are common for most of the forms.

Choose this command button to continue adding data to a particular Set/ Haul.

Choose this command button if more data are to be entered, but on a different haul/set. Choosing it will send you to the Haul/Set List window to start again.

Choose this command button in order to edit previously entered data.

Choose this command button to exit the form and return to the Main Window.

Choosing any of the command buttons will save data from the entry windows to the database. In the case of Add Data, the program adds data to the database automatically. With the other command buttons, a window will appear asking whether you want to save the entered data or discard it. The program will then continue on with the function you have specified. These specifications hold true on all data entry forms; specific differences of each form will be discussed later in the chapter.

Editing in ATLAS

Editing Data

Editing data is simply changing data previously typed or entered. Every time you delete an entry in a data field or add a forgotten entry into a data field, you are editing data. The method you use to change data depends on if you have saved the data to the database or not.

a) Prior to saving (adding) data into the ATLAS database, you may change any entry in a data field by selecting the field you want to change and typing in the new entry.

b) After saving data to the database, you must use the editing function of the ATLAS program to edit data. Data saved to the database is listed in the Entered Data widow grid. This widow is located either to the right of or below the Data Fields (see Figure 16-5). You may start from either the main window or while you are working within a form:

- You may start from the Main Window by choosing the form type. On the next screen, choose the appropriate haul/set from the Hauls/ Set List window. On the data form, select the appropriate data line from the Entered Data window (of course you must have previously entered data), and choose the "Edit Data" command button.

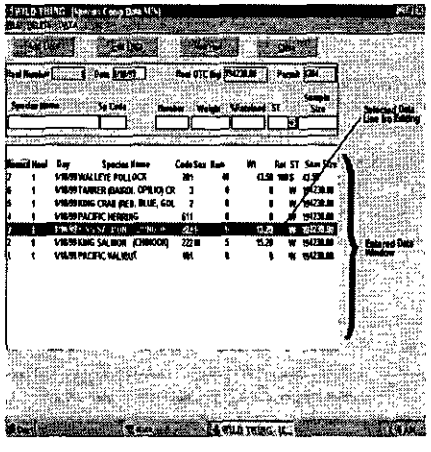


Figure 16-5: Data edit

- You may also start while working within a form. Select the appropriate data line from the Entered Data Window grid on the form, then select and choose the "Edit" data button.

You may now edit data by selecting the field you wish to change, deleting the existing data, and entering the correct data. Data are added to the ATLAS database as if you were adding new information, i.e., selecting and choosing one of the command buttons on the top of the form.

Deleting Data From the 2US or 1US or Form A

To delete an entry already in the ATLAS (Atsea) Database select the 2US or 1US or Form A buttons from the Main Window. In the grid on the right hand side of the screen select the haul/set/delivery number you want to delete. From the Menu at the top of the screen select DELETE then choose Delete Record. Answer yes to delete that record. **If you have entered data for that haul/set/delivery in other data forms you will get a message box telling you that all data for the haul/set/delivery will be deleted. Click on the OK button.**

Deleting Data From the 3US or 7US or 9US or Salmon or Mammal Forms

To delete an entry already in the ATLAS (Atsea) Database select the form type. On the next screen choose the appropriate haul/set form the Hauls/ Set List window. Now highlight select the line of Data in the Data window grid found at the bottom of the window. From the Menu at the top of the screen select DELETE then choose Delete Record. Answer yes to delete that record.

Windows 3.1 Starting the ATLAS AtSea Program

The computer on your vessel or plant will be set up in Windows 3.1, 95, 98 or NT. The first thing you must do is find the Program Manager window. If you are working with Windows 3.1 it will look like the window in Figure 16-6. Most vessels with Windows 3.1 will have this screen as their startup screen.

You must then choose the NOAA Observer Program icon

. This can be accomplished by placing the mouse pointer on the icon and double-clicking. After choosing the icon you should see a window like the screen in Figure 16-6. This is the Group Window.

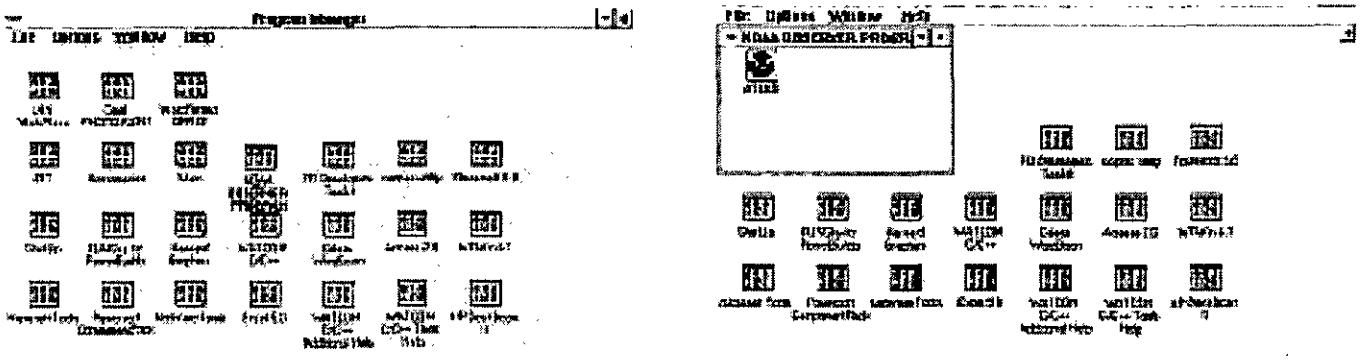


Figure 16-6: Group window for Windows 3.1

After the Group Window appears, point and double-click on the ATSEA Icon

. This will open the ATLAS AtSea program. The next screen will be the Observer Data System security screen asking for a password (see Figure 16-7). You will be given the password during your briefing or training. It is very important that you do not share this password with

anyone else. With the password anyone may change any data on your computer at will, without your knowledge. After typing in the password, point and double-click on the "Continue" button or hit the <Enter> key. You are now in the ATLAS AtSea Program.

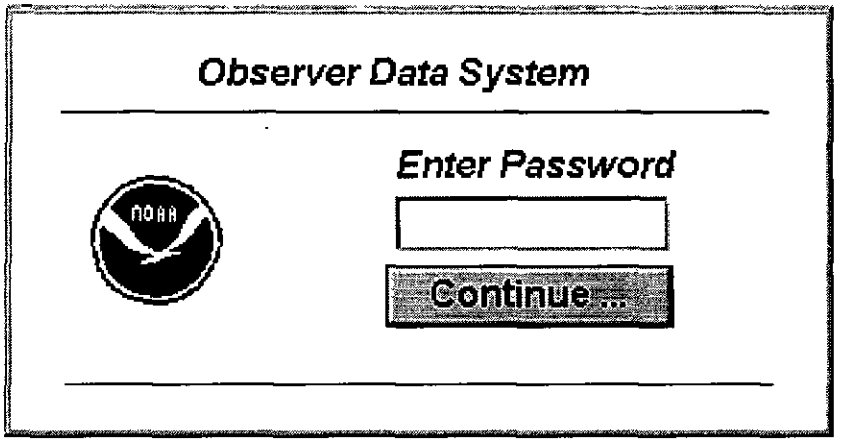


Figure 16-7: Observer data system security

Windows 95, 98, and NT Starting the ATLAS AtSea Program

The computer on your vessel or plant will be set up in Windows 3.1, 95, 98, or NT. If you are working with Windows 95, 98, or NT it will look like the window in Figure 16-8. All vessels with Windows 95, 98, or NT will have this screen as their startup screen. To Start the ATLAS AtSea Program you

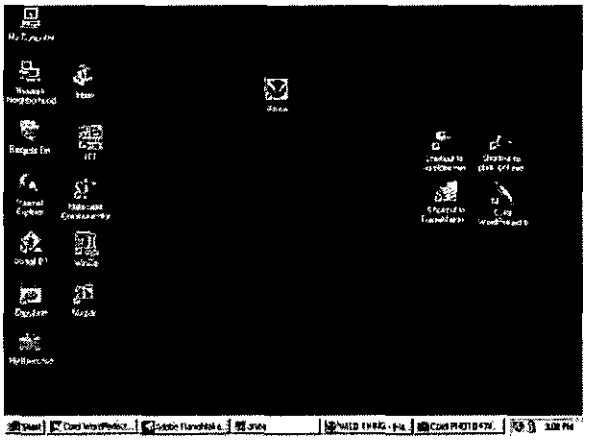


Figure 16-8: Group window for Windows 95,98 and NT

must choose the AtSea icon . This can be accomplished by placing the mouse pointer on the icon and double-clicking. This will open the ATLAS AtSea program. The next screen will be the Observer Data System security screen asking for a password (see Figure 16-9). You will be given the

password during your briefing or training. It is very important that you do not share this password with anyone else. With the password anyone may change any data on your computer at will, without your knowledge. After typing in the password, point and double-click on the "Continue" button or hit the <Enter> key. You are now in the ATLAS AtSea Program.

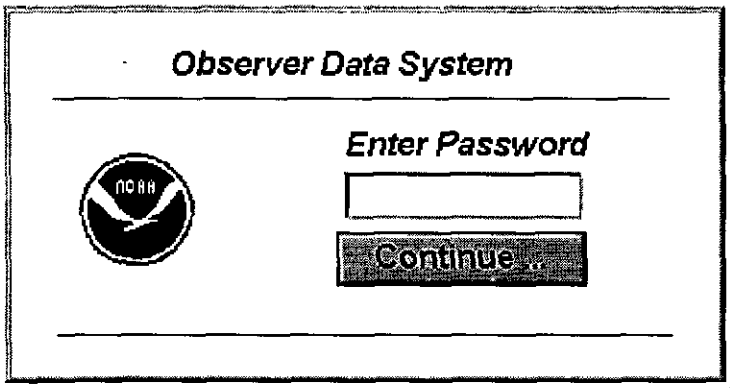


Figure 16-9: Observer data system security

Data Entry

Main Window

Entering Primary Information

The first window of the program is the Main Window (see Figure 16-10). Once you have entered the required data into the data fields, this window will be the starting point for the rest of the program. The information required includes your First Name, Last Name, Cruise Number, Vessel Permit Number, Vessel Name, and ORC. For all but the Permit Number and Vessel Name you may enter the data by selecting the appropriate field, and typing in the information. You may move to other data fields by pressing the <Tab> key or by pointing and clicking on another field with the mouse.

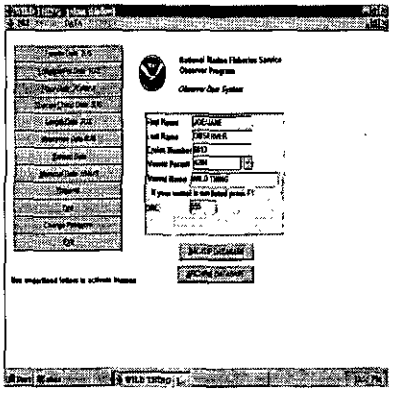


Figure 16-10: Main Window

You can find a drop-down list of vessel permit numbers and vessel names by choosing the drop-down list next to the **Vessel Permit** field. Select the name and permit number of your vessel from this list. If your vessel is not listed press the <F1> key on the top of the keyboard to enter "Unlisted Vessel," then contact NMFS in Seattle.

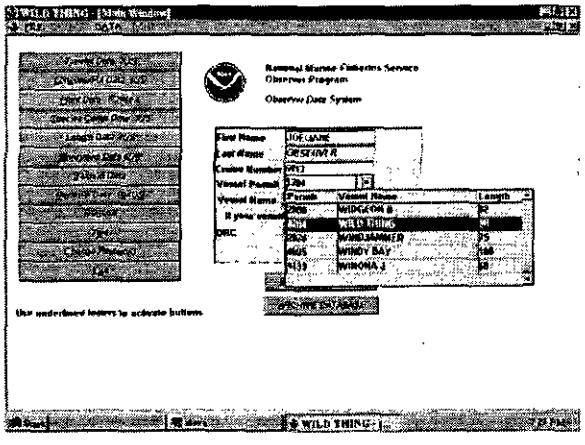


Figure 16-11: Vessel permit list

The Main Window Command Buttons: What They Mean

The buttons in the Main Window correlate with most of the paper forms that have been used in the past.

Choosing any of these Main Window command buttons will open the desired form. But data entry must start with the Trawler Data Form or the Longline/Pot Data Form; no other data may be entered until after either haul or set data has been entered.

Title	*Paper correlate*	*Data Subject*
Trawler Data 2US	*2US*	*Haul Information for Trawlers*
Longline/Pot Data 1US	*1US*	*Set Information For Longline and Pot Boats*
Plant Data FORM A	*Form A*	*Plant Delivery Information*
Species Composition Data 3US	*3US*	*Species Composition Data*
Length/Frequency 7US	*7US*	*Length/Frequency Data*
Specimen 9US	*9US*	*Length, Weight, and Sex Data for Age Structure and Salmon Scale Collections*
Salmon	*Inseason Salmon Retention Form*	*Salmon Count and Temperature Data*
Mammal Data 10US	*10US*	*Marine Mammal Interaction Data*
Transmit		*For Transmitting Data to NMFS or a Disk*
Text		*For Creating and Reading Text Messages*
Change Password		*For Changing the Original Entry Password*
Exit		*For Closing the AtSea Program and Exiting to Windows ProgramManager*

Trawler Haul Data Form

Entering Data

Choose the "Trawl Data 2US" button, and a screen, such as the one in, will appear. Choose the "Add Data" button, an empty Data Entry Window, such as the one in, will appear (see Figure 16-12). There are no differences between the data needed for this form and the data needed for the 2US, they should match.

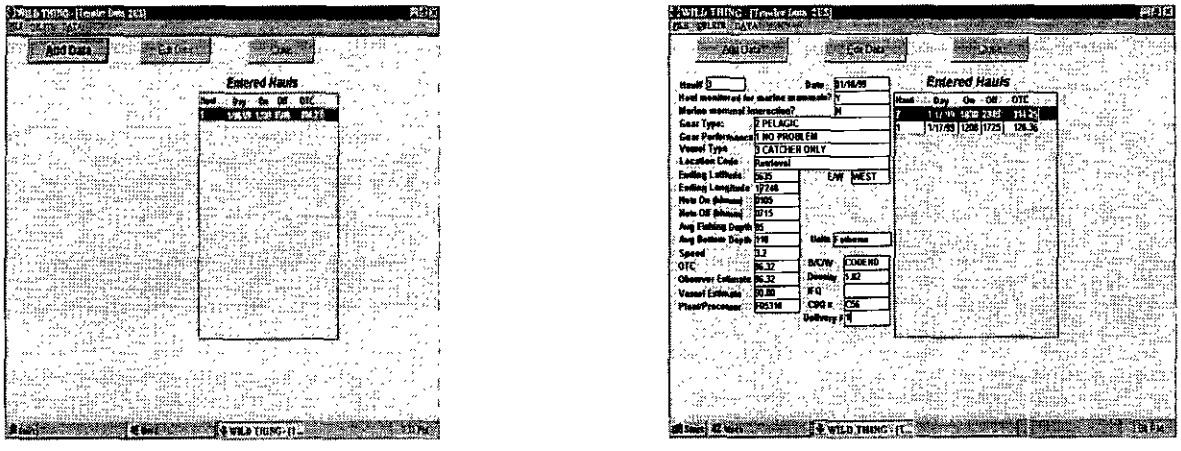


Figure 16-12: "Trawl Data 2US" and "Add Data" button

Specifics on the Haul Data Form

There are some data fields which will automatically be filled in with the same data as the previous haul. The number "1" is automatically added into the **Haul#** field the first time the program is run. Each time you choose the "Add Data" button, the resulting haul number is one number greater than the previous haul number. You may change the haul number simply by typing in a new number and moving to the next data field. The **Date** starts at 01/01/00, again you may change data in this field by typing the correct date in the mm/dd/yy format. You may, in a similar manner, change all other data added by the computer. You should enter the rest of the data in the same format as if you were entering it on the 2US (see "Form 2US - Haul Form for U.S. Trawlers Instructions" on page 3-19)

Hidden Fields

There are data fields which are only visible when other data are entered and meet specific criteria;

Bin/Codend field The **Bin/Codend** field is only visible if an Observer estimate greater than 0.0 is entered. If an Observer estimate was not made or is equal to 0.0, this field does not appear.

Density field The **Density** field is shown only if an Observer estimate greater than 0.0 is entered. If no Observer estimate was made or is equal to 0.0, this field does not appear.

ADFG field The **ADFG** field is only visible when a "2 Mothership" or "4 Mothership" is entered into the **Vessel Type** data field. Data may be entered into this field in two ways;

1. If you already know the ADF&G number of the catcher vessel, you may enter the number directly.

2. If you do not know the ADF&G number but do know the catcher vessel's name, you may use the drop-down list.

Plant/Processor field The **Plant/Processor** field only appears when "3 Catcher Only" is placed in the **Vessel Type** field. The easiest way to enter the correct code is to use the drop-down list. The codes are also listed in the Observer Manual. You may enter the codes found in the manual directly.

Delivery # field The **delivery** # field only appears when "3 Catcher Only" is placed in the **Vessel Type** field and a three character code is placed in the **CDQ** field.

Noon Positions

When a "0" is entered into the **Haul#** field, a screen will appear similar to the Trawler Haul Data form (see Figure 16-12). The difference being that the data fields **Date**, **Location Code**, **Ending Latitude**, **E/W**, and **Ending Longitude** will be the only data fields visible. The lattitude and longitude for the noon position should be entered in the **Ending Latitude** and **Ending Longitude** fields.

Longline/Pot Set Data Form

Entering Data

Choose the "Longline/Pot Data" button from the Main Window, a screen, such as the one in , will appear. Choose the "Add Data" button, a screen such as the one in Figure 16-13 will appear. **There are no differences between the data needed for this form and the data needed for the 1US, they should match.**

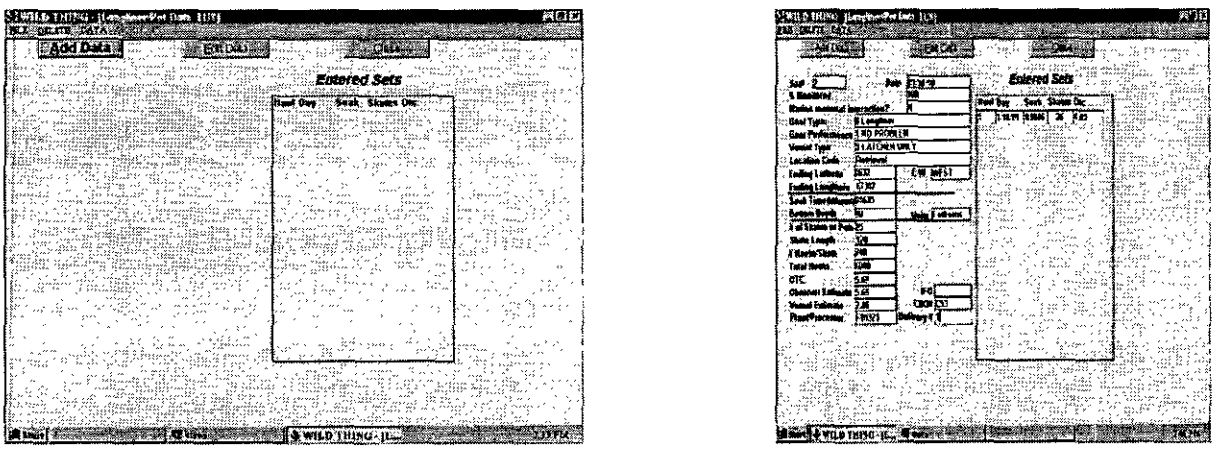


Figure 16-13: "Longline/Pot Data" and "Add Data" button

Specifics on the Set Data Form

There are some data fields which will automatically be filled in with the same data as the previous set. The number "1" is automatically added into the **Set#** field the first time the program is run. Each time you choose the "Add Data" button, the resulting set number is one number greater than the previous set number. You may change the set number simply by typing in a new number and moving to the next data field. The **Date** starts at 01/01/00, you may change data in this field by typing in the correct date in the mm/dd/yy format. You may, in a similar manner, change all other data added by the computer.

Hidden Fields

There are data fields which are only visible when other data are entered and meet specific criteria;

#Hooks/Skate and Total Hooks fields

The **#Hooks/Skate** and **Total Hooks** field only appear when "8 Longliner" is entered in the **Gear Type** field. After entering the **# of Skates or Pots** and **# Hooks/Skate**, the **Total Hooks** number is automatically generated by the computer by multiplying **# of Skate or pots** by the **#Hooks/Skate**. This number may be changed if you have a different method of determining total number of hooks, i.e., actual hook count.

Plant /Processor field

The **Plant/Processor** field only appears when "3 Catcher only" is replaced in the **Vessel Type** field.

Delivery # field

The **delivery** # field only appears when "3 Catcher Only" is placed in the **Vessel Type** field and a three character code is placed in the **CDQ** field.

Noon Positions

When a "0" is entered into the Set# field, a screen will appear similar to the Longliner/Pot Set Data form (see Figure 16-13). The difference being that the data fields Date, Location Code, Ending Latitude, E/W, and Ending Longitude will be the only data fields visible. The lattitude and longitude for the noon position should be entered in the Ending Latitude and Ending Longitude fields.

Species Composition Data Form

Entering Data

Before adding species composition data, you must have already entered haul or set data. Select the "Species Composition Data" button on the Main Window to begin adding composition data. You should now see the Haul/ Set List window (see Figure 16-2). Select and choose the haul/set you wish to add data to by either;

1. Pointing and clicking with the mouse on the appropriate haul/set in the list of haul/sets. Then pointing and clicking on the "Type in Haul Number and hit Enter" button.

2. Using the <Tab> key to select the list of hauls/sets. Using the⇩ or⇧ keys to select the haul/set number you wish to work with, then pressing <Enter> to choose it.

Choose the "Add Data" button to add data for the haul/set selected. The data fields will then appear, allowing you to enter species composition data (see Figure 16-14).

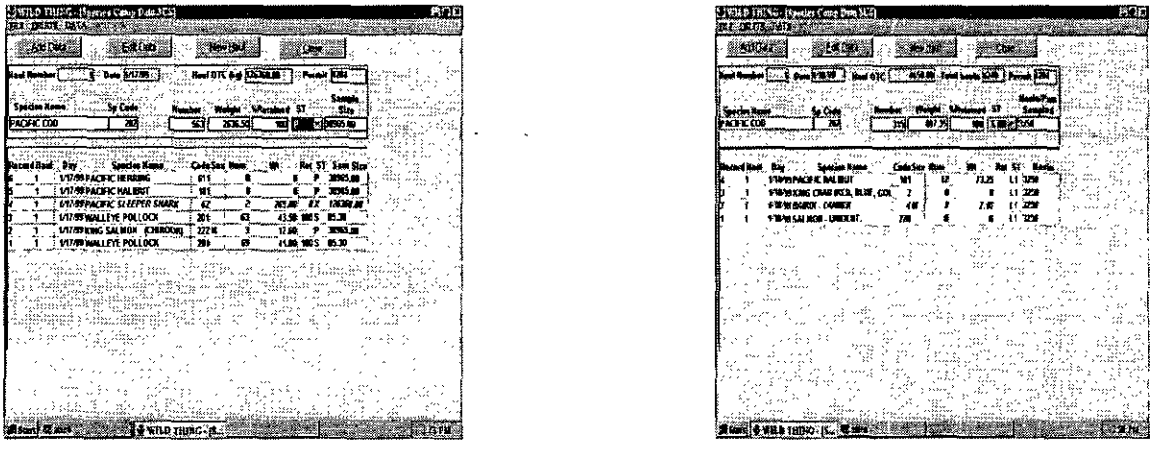


Figure 16-14: Add data for species composition

When entering data onto this form follow all the rules given for the 3US, except for the following difference:

Multiple entries Multiple entries for a single species are permitted. This will allow you to copy your data directly from the Deck Forms into the computer without having to summarize the data. This means, when you have more than one entry on the Deck Form for one species, you are allowed to add each entry separately on the Species Composition form without having to summarize your data.

Specifics on the Species Composition Form

There are certain areas in the program which deserve a more thorough explanation.

Species Name field

The **Species Name** may be entered in a myriad of ways:

1. Press the <Tab> key and skip the **Species Name** field, then enter the species code either directly or by the drop-down list. Once the code is entered, the species name will be entered automatically.

2. Type in part of the name, then select the drop-down list at the far right of the species name data field.

3. Type in the name of the species you wish to enter. (Note: You must enter the name exactly as it is on the species code list or it will not be accepted as a valid species name, i.e., Walleye Pollock, not simply, pollock)

Species Code field

The species **Code** field has a drop-down list or you may type in the species code directly.

Number field

The **Number** field must have an entry, and will only accept whole numbers.

Weight field

The **Weight** field must have an entry, and will only accept numbers to the nearest 0.01 kg.

Sample Type field

The **ST** field has a hidden drop-down list with different sample types, depending on the type of vessel you are on. For trawlers the choices given are W (for whole haul), P (for partial haul), S (for basket samples or subsamples), and X (for presorted species). For longliners and pot boats the L (longline) or T (trap) should be selected. The other selections for longline and pot vessels are for multiple sample sizes, which you should not be using.

Sample Size field

You may enter data into the **Sample Size** field only for partial haul samples. For whole haul samples, the OTC weight in kilograms is automatically entered into this field. Also, the weight of all the species with a sample type S is summed, and the summed total weight is placed in the sample size field. For Longliner/Pot sets the sample size is the number of skates or pots sampled and must be entered by the Observer.

Plant Data Form

Entering Data

Choose the "Plant Data Form A" button, a screen, such as the one in Figure 16-15, will appear. Choose the "Add Data" button, an empty Data Entry Window, such as the one in Figure 16-15, will appear. **There are no differences between the data needed for this form and the data needed for the paper Form A - Plant Delivery Form, they should match.**

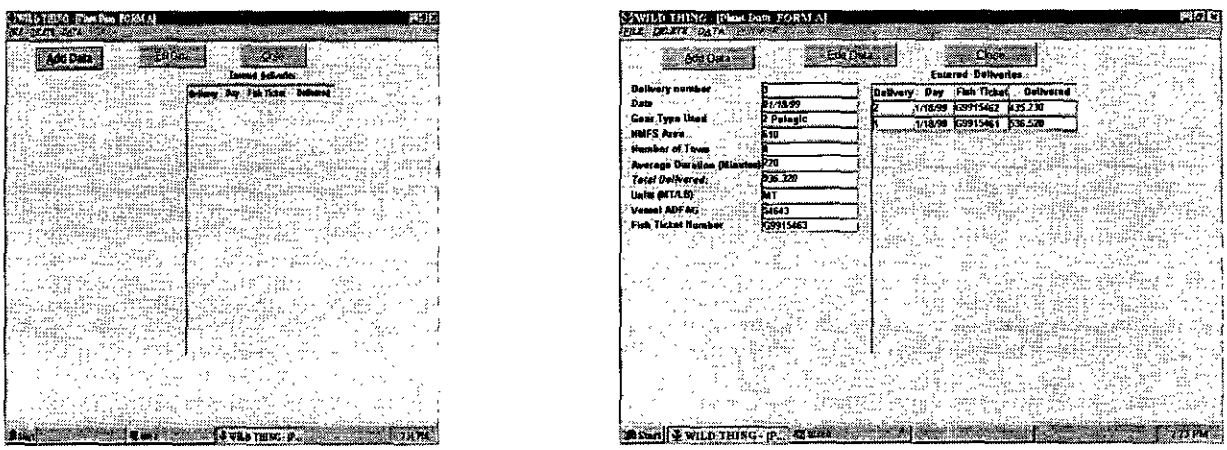


Figure 16-15: "Plant Data Form A" and "Add Data" button

Specifics on the Plant Data Form

You must enter the first delivery number. Each time you choose the "Add Data" button, the resulting delivery number is one number greater than the previous delivery number. You may change the delivery number simply by typing in a new number and moving to the next data field. The **Date, Gear Type Used**, and **Units (MT/LB)** data fields will automatically be filled in with the same data as the previous haul. The date starts at 01/01/00, again you may change data in this field by typing the correct date in the mm/dd/

yy format. You may, in a similar manner, change all other data added by the computer. You should enter the rest of the data exactly as if you were entering it on the Form A- Plant Delivery Form (see "Form A - Plant Delivery Form Instructions" on page 8-10).

Plant Observer Duties in Regards to ATLAS

The priority of plant Observer duties will not change from those listed on page 8-1. Plant Observers will continue to be responsible for transmitting data for vessel Observers on shoreside delivery boats. Since it is impossible to require shoreside delivery boats to have the satellite communications equipment necessary for ATLAS transmissions, it will still be necessary for some Observers to have their data transmitted once they reach port.

Length/Frequency Data Form

Entering Data

Before adding length/frequency data, you must have already entered haul/set data. To begin, select the "Length /Frequency" button on the Main Window. You should now see the Haul/Set List window (Figure 16-2). Select and choose the haul/set you wish to add data to by either;

1. Pointing and clicking with the mouse on the appropriate haul/set in the list of haul/sets. Then pointing and clicking on the "Type in Haul Number and hit Enter" button.

2. Using the <Tab> key to select the list of hauls/sets. Using the⇩ or⇧ keys to select the haul/set number you wish to work with, then pressing <Enter> to choose it.

Choose the "Add Data" button to add data for the haul/set selected. The data fields will then appear, allowing you to enter length/frequency data (see Figure 16-16). **Data needed for this form are the same as that needed for the 7US.**

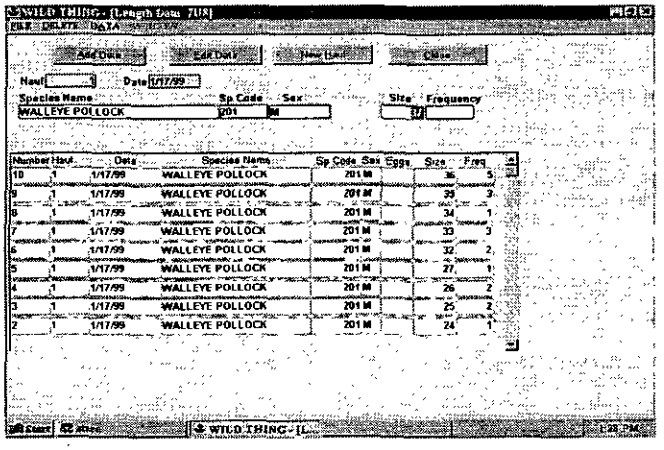


Figure 16-16: "Add Data" for length frequency data

Specifics on the Length/Frequency Form

There are certain areas in the program which deserve a more thorough explanation:

Species Name field — **Species Name** may be entered in the same manner as the Species Composition form

Species Code field — This field is exactly like the **Code** field for the Species Composition form. (see "Form 3US - Species Composition Instructions" on page 4-41)

Eggs? field — The **Eggs?** field is a hidden field and will only appear if a prohibited female crab, identified to species, is typed into the first three data fields.

Tips on Entering Data: Length/Frequency Form

Pressing the "Add Data" button will save data to the database and start a *new length/frequency entry with the same* **Species Name**, *the same* **Code**, the same **Sex**, and a length in the **Length** field one unit higher than the previous entry.

Tip:

If you have a number of lengths in consecutive order;

1. Type in the first length and frequency of the series.

2. Press the <Tab> key, the <Enter> key, and then the <Tab> key a second time.

3. Type in the frequency of the next entry.

This may be continued until your lengths are no longer in consecutive order. To change the length, type in the desired length. To change data in the **Species Name**, **Code**, and **Sex** data fields, point and click on the desired field, or use the <Shift> key and <Tab> key to move the cursor into the fields to the left. When in the desired field, simply type in the correct value. You should always double check your entries before moving on to another haul or form type.

Specimen Data Form

Entering Data

Before adding specimen data, you must have already entered haul or set data. To begin, select the "Specimen" button on the Main Window. You should now see the Haul/Set List window (see Figure 16-2). Select and choose the haul/set you wish to add data to by either;

1. Pointing and clicking with the mouse on the appropriate haul/set in the list of haul/sets. Then pointing and clicking on the "Type in Haul Number and hit Enter" button.

2. Using the <Tab> key to select the list of hauls/sets. Using the⇩ or⇧ keys to select the haul/set number you wish to work with, then pressing <Enter> to choose it.

Choose the "Add Data" button to add data for the haul/set selected. The data fields will then appear allowing you to enter specimen data (see Figure 16-17). **Data for this form is the same as that needed for the 9US.**

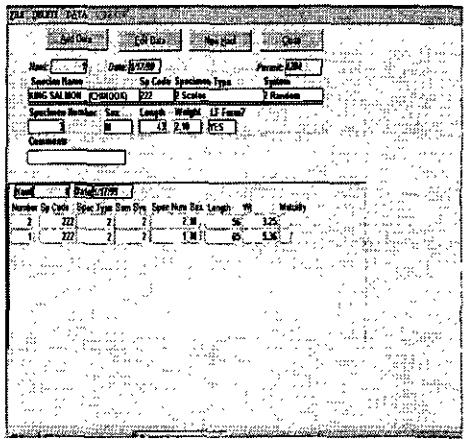


Figure 16-17: "Add Data" specimen data

Specifics on the Specimen Form

There are certain areas in the program which deserve a more thorough explanation:

Species Name field **Species Name** may be entered in the same manner as that on the Species composition form (see page 4-41)

Species Code field Species **Code** may be entered in the same manner as that on the Species composition form (see page 4-41)

Specimen Type field The **Specimen Type** field has a hidden drop-down list which may be viewed by pointing and clicking on this field

System field The **System** field has a hidden drop-down list which may be viewed by pointing and clicking on this field.

Tips on Entering Data: Specimen Form

Pressing the "Add Data" button will enter the data into the database and start a new specimen entry with the same **Species Name**, **Code**, **Specimen Type**, **System**, and **Sex** as the previous entry. It will also place a number in the **Specimen Number** field one digit higher than the previous specimen number. To change any of the values, choose the data field you want to change, point and click on the field with the mouse or use the <Tab> key to

navigate between fields, then type in the new data. As data are added to the database, they are listed in the Entered Data Window below the data fields. You should always double check your entries before moving on to another haul or form.

Salmon Retention Form

Entering Data

Before adding salmon retention data, you must have already entered haul, set, or delivery data. Select the "Salmon" button on the Main Window to begin adding data. You should now see the Haul/ Set List window (Figure 16-2) Select and choose the haul/set/delivery you wish to add data to by either;

1. Pointing and clicking with the mouse on the appropriate haul/set/ delivery in the list of haul/sets. Then pointing and clicking on the "Type in Haul Number and hit Enter" button.

2. Using the <Tab> key to select the list of hauls/sets. Using the⇩ or⇧ keys to select the haul/set/delivery number you wish to work with, then pressing <Enter> to choose it.

Choose the "Add Data" button to add data for the haul/set/delivery selected. One of two screens will appear, the screen on the left in Figure 16-18 will appear if you are working with plant data or the screen on the right in the same figure will appear if you are working with vessel data. **This form should follow the instructions for the In Season Salmon Retention Form.**

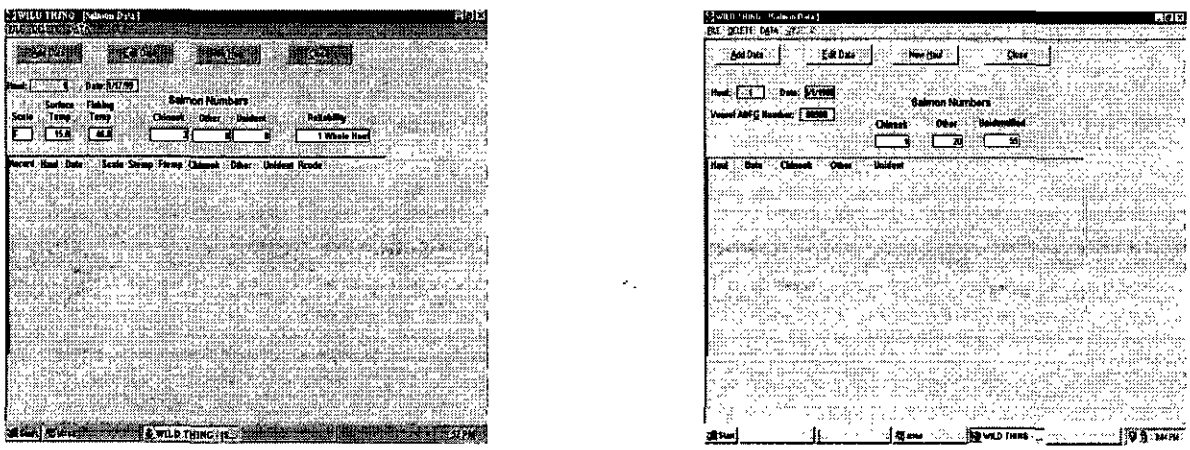


Figure 16-18: "Add Data" (salmon retention for vessels and plants)

Specifics on the Salmon Data Form

There are certain areas in the vessel salmon retention form which deserve a more thorough explanation:

Scale field The **Scale** field is for entering the temperature scale used either Fahrenheit or Celsius. This field contains a drop-down list which may be used.

Surface Temp. field Data entered into the **Surface Temp.** field should be to the nearest 0.1 degree. All obtained data should be entered.

Fishing Temp. field Data entered into the **Fishing Temp.** field should be to the nearest 0.1 degree. All obtained data should be entered.

Reliability field The **Reliability** field has a drop-down list

Tips on Entering Data: Salmon Data Form

Entering data on this form is very straight-forward, there can be only one entry per haul/set/delivery. For vessels any temperature data gathered should be entered, if you are only able to collect **Surface temperatures**, enter them. One small note, if you type faster than the computer can accept data, the computer will eventually catch up. Do not change forms before the computer is finished, always double-check your work.

Marine Mammal Data Form

Entering Data

Before adding marine mammal data, you must have already entered haul or set data. Select the "Mammal Data" button on the Main Window to begin adding data. You should now see the Haul/ Set List window (Figure 16-2). Select and choose the haul/set you wish to add data to by either;

1. Pointing and clicking with the mouse on the appropriate haul/set in the list of haul/sets. Then pointing and clicking on the "Type in Haul Number and hit Enter" button.

2. Using the <Tab> key to select the list of hauls/sets. Using the⇩ or⇧ keys to select the haul/set number you wish to work with, then pressing <Enter> to choose it.

Choose the "Add Data" button to add data for the haul/set selected. The data fields will then appear, allowing you to enter marine mammal data (see Figure 16-19). **The data needed for this form is exactly the same as that which is needed for the 10AUS.**

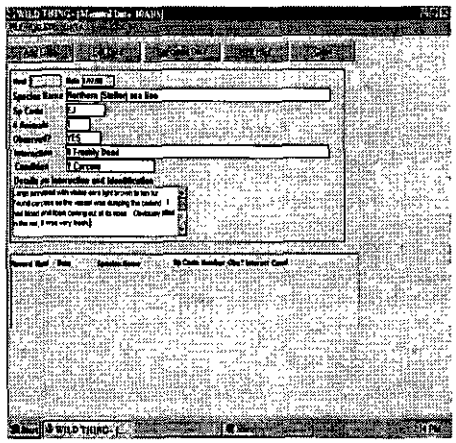


Figure 16-19: "Add Data" (marine mammals)

Specifics on the Marine Mammal Form

Sp. Name field — This field contains a drop-down list with both the species name and species code.

Code field — This field is automatically filled in when **Sp. Name** field is completed

Interaction field — This field contains a drop-down list which gives you the selection of different acceptable interactions and their codes.

Condition field — This field contains a drop-down list which gives you the selection of acceptable conditions and their codes.

Details on Interaction and Identification field — This field must be filled in for each entry or the data cannot be used. You should type in all the required information listed in "Form 10AUS - Marine Mammal Interaction Data Instructions" on page 12-7. In the **Details** field, use the key combination of the <Ctrl> key and <Enter> key to start a new line.

Tips on Entering Data: Marine Mammal Data Form

Entering data on the Marine Mammal Data form is very straight-forward. There should be no difficulty if you follow the rules for the paper 10AUS.

Marine Mammal Specimen Form

Specimen Data

To add data to the Marine Mammal Specimen form, you must first have entered data to the Marine Mammal Data form. Choose the "Add Specimen Data" button on the Marine Mammal Data form to change to the Marine Mammal Specimen form. On the Marine Mammal Specimen form, choose the "Add Data" button and you will see a screen which resembles the screen in Figure 16-20. **The data needed for this form is exactly the same as that which is needed for the 10BUS.**

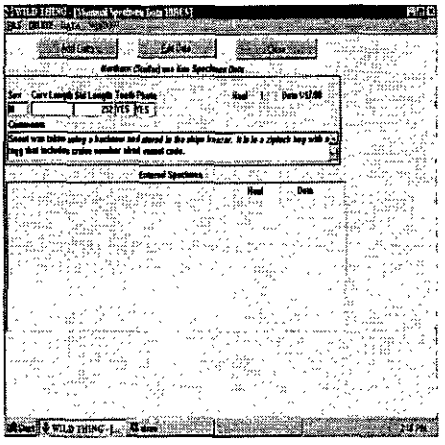


Figure 16-20: Specimen data field

Specifics on the Marine Mammal Specimen Form I

Comments field Comments should be entered in the as they are described in "Form 10BUS" on page 12-10. In the **Comments** field, use the key combination of <Ctrl> key and <Enter> key to start a new line.

Tips on Entering Data: Marine Mammal

Specimen Form

As data are entered to the Marine Mammal Specimen form, previously entered data are shown below the data fields. You should always double check your entries before moving on to another haul or form type.

Text Messages

Receiving Messages from NMFS

Any messages to you from NMFS will automatically be transmitted each time you connect with Seattle. Select the "Text" button in the main window to begin. If there are any incoming messages, the In Message List screen will appear. Follow the instructions given to you on the bottom of the screen (Figure 16-21).

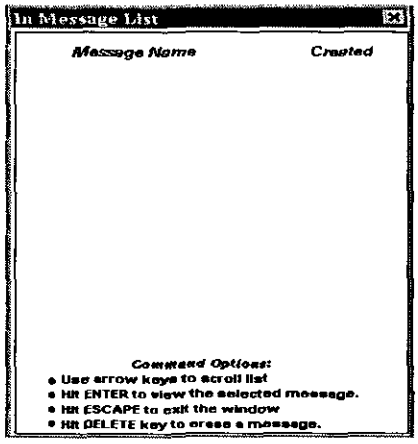


Figure 16-21: In Message List Screen

Recording Text Messages to Send

To record a text message, you must first exit the In Message List Window screen. A new screen will appear which will look like the screen in Figure 16-22.

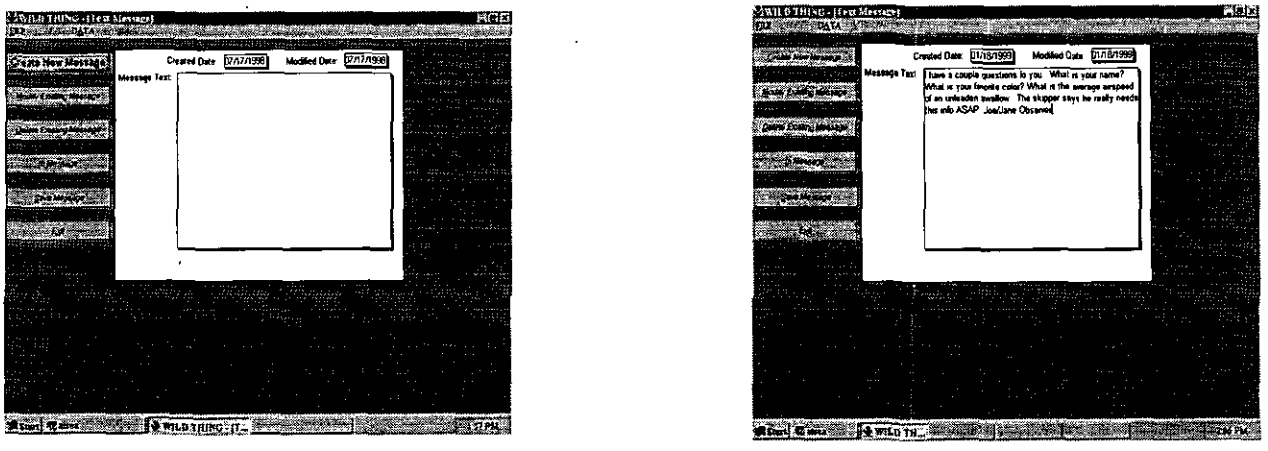


Figure 16-22: Recording text messages

List of Command Buttons and What They Do

Create New Message	Allows you to create a new message. Choose the "Create New Message" button, place the cursor in the message area, click, type in your text message, and choose the "Save Message" button. If you do not save a message it will be deleted when you exit the Text Message Form.
Modify Existing Messages	Allows you to view a list of saved and previously transmitted messages. This button will also allow you to modify messages which have not been transmitted. Previously transmitted messages may not be modified. To modify a message that has not been sent, choose the "Modify Existing Message" button, highlight the message you wish to modify in the List of Messages to Modify, and press the <Enter> key.
Delete Existing Message	Allows you to delete any message that has been saved, whether it has been sent or not.
In Message	Allows you to check your mail and view any messages that have been sent from NMFS to you.
Save Message	Allows you to save any message you have entered, whether it be new or changed, to the mailbox. These messages will be sent to NMFS in the next transmission.
Exit	Closes the Text Window and returns you to the Main Window.

Each screen in the Text Message Form will have a list of instructions at the bottom. Please read these and follow the directions given.

Printing Incoming Text Messages

To print incoming messages use the mouse to point and click on the "Print Message" button on the bottom of the In Message Selected for Display window. The message will print on the Window's default printer.

Saving Incoming Text Messages to Disk

To save incoming messages to a disk use the mouse and click in the lower right hand box of the displayed In Message and enter a: or b:. Then use the mouse to point and click on the "Copy Message to Disk" button on the bottom of the In Message Selected for Display window. The message will then be copied to a floppy disk.

Transmit Data

Transmit Data Command Buttons Page

Select the "Transmit" command button, a screen such as the one in Figure 16-23 will appear. The Transmit Menu form lists the options for transmitting data.

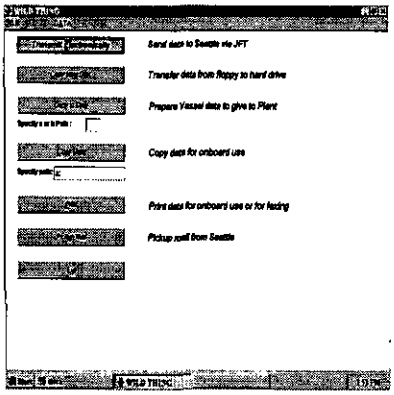


Figure 16-23: Transmit options

Transmit Electronically	Transmits prepared data from your vessel and receives messages from Seattle. This option is for vessels that have the satellite communications capabilities to use Just File Transfer (JFT) software.
Transmit Floppy	Copies prepared data off a floppy disk to the computer, then transmits the data to Seattle and receives messages from Seattle. This option is for plant Observers who must send data for Observers on vessels without the satellite communications capabilities to use JFT.
Copy to disk For Plants	Copies data to a floppy disk. This option will be used in combination with the Transmit Floppy option. On a vessel without the capabilities to send data from ATLAS (AtSea), you must first copy data to a disk, and then give the disk to the Observer at the plant you are delivering to. Before copying data to a disk, you must specify which drive (a or b) the floppy disk is in. [In most computers it will be drive A:\]. **This is not the button to use to backup your database, see page 16-38 on backing up data.**
Copy Data	Copies data to a specified path, this could be to either the hard drive or a directory. This option is for . You must first specify where you want the data to reside. Enter the pathway name into the data field located below the command button. For example, to specify a pathway to the "Observer" file on the C:\ drive, the pathway name would be C:\Observer.
Print	Prints a paper copy of the ATLAS data you have entered.
Pick Up Mail	Picks up mail sent to you from NMFS without transmitting anything to NMFS. **You must go to the Text window in order to view your mail.**
Exit	Sends you to the Main Window.

Figure 16-24: Data preparation and transmission

Data Preparation and Transmission Page

Before data can be sent to Seattle, to a hard drive, to a disk, or to a printer; you must first specify which data you wish to send. After selecting one of the options on the Transmit Menu form, you will see a window as in Figure 16-25. There are three windows and five command buttons.

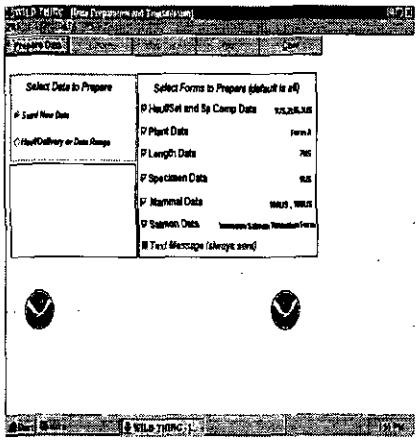


Figure 16-25: Data transmission

Windows:

Select Data to Prepare Window This window allows you to choose which data you wish to send:

1. Send New Data, the default option, will send all of the data you have entered onto the database and have not yet transmitted. It will also send any data you have edited since your last transmission.

2. Haul/Delivery or Date Range, allows you to resend any data you have already prepared and sent. When this option is chosen the Range Selection window will appear.

Range Selection Window This window allows you to select which date range or haul/set range you wish to send to NMFS for previously transmitted data. There are two ways of selecting data to be sent;

1. In the **Date Range** data fields, you may enter the range of dates, **Start** to **End**, you wish to send. To send a single date enter the same date in both fields. You must use a date range to send previously transmitted noon positions.

2. In the **Haul Range** data fields, you may enter the range of hauls/sets, **Start** to **End**, you wish to send. To send a single haul enter the same number in both fields.

Select Forms to Prepare Window

This window allows you to select the type of data you wish to send to NMFS. A check in the box means that these data forms are to be sent. A blank box means that these data forms will not be sent. Text data will always sent.

You may place or remove a check from the boxes by using either;

1. the mouse pointer to select the field, then click on it to add or remove a check, or

2. the <Tab> key or <Shift>+<Tab> key combination to select the field, and press the <space bar> key to add or remove a check.

Command Buttons:

Choose this button after selecting the appropriate data to be sent. This button prepares the data to be sent.

Choose this button to send data to NMFS, Seattle after it has been prepared.

Choose this button to copy prepared data to a disk or specified pathway.

Choose this button to send prepared data to the default printer.

Choose this button to close the application and send you to the Transmit Menu form.

How to Send Data

First you must decide what type of transmission you want to perform. The buttons on the Transmit Menu form list your options (see Figure 16-23).

After entering the pathway and/or selecting the transmission mode, there are a few steps which must be followed on all transmission types:

1. Select the data you wish to send in the windows of the Data Preparation and Transmission form. Unless informed otherwise by NMFS staff you should always **leave all the options in the default mode** which is "Send New Data" in the Select Data to Prepare

window and all of the forms checked in the Select Forms to Prepare window.

2. Before sending data, prepare the data to be sent. Preparing the data selects requested data from the database and compresses the specified files. Compressed files can be transmitted much faster. They also use less disc space when storing. Choose the "Prepare Data" command button to start compression. Wait for the program to inform you that the data has been prepared before continuing.

3. If you are sending the data to a disk, insert the blank floppy disk into the disk driver. If not, skip this step and go on to step 4.

4. Choose the appropriate command button, in the Data Preparation and Transmission window, to send the data.

5. Press the <Alt> key and the <Tab> key simultaneously **after** you see the JFT icon JFT flash on the screen. The JFT Communications Window will then appear. This window allows you to monitor the transmission process.

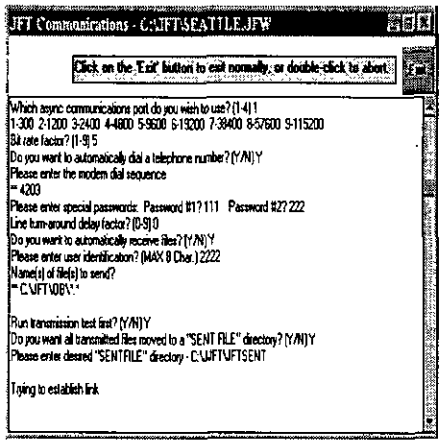


Figure 16-26: JFT communications

6. Wait for the transmission to be complete then press <Enter>. You will be informed if there are any incoming messages. When you are finished "Close" the Data Preparation and Transmission window. Choose "Exit" command button to navigate back to the Main window.

Tips on Transmitting Data

The program will not allow you to press an inappropriate button. For example, if you chose the "Print" command button in the Transmit Menu window, the "Transmit Data" button in the Data Preparation and Transmission window will be "greyed," and you will not be able to choose it. If you wanted to choose this option, you must first close the Prepare and Transmit Data window, then select the appropriate button from the Transmit Menu window.

After choosing the "Prepare Data" button the screen will blink, don't be alarmed this is normal operating procedure. Do not press anything until the program informs you that the data has been prepared.

Backing Up Data

What is Backing Up Data?

Backing up data is, simply, making a separate copy of your database so the database is not lost if there is a problem with the computer's hard drive. It's like insurance, you hope you will never need it, but sure are happy you have it when you do. If there was a problem with the hard drive, you could easily transfer the data from the 3.5" backup disks back onto the hard drive, once it is back in operation, or bring the disks directly to NMFS in Seattle.

When to Backup?

In an ideal world you would make backups after every data entry session. Knowing that making backups takes time and that time is one commodity that is at a premium at sea, we make it only a suggestion. **We do require that you make back ups at least every two days.** Just remember, **anything lost will need to be re-entered**. Data should also be backed up onto the 3.5" disks when you have finished entering data for the last time on the vessel. This will be the copy you return with to NMFS.

How to Backup?

To back up data;

1. Place a blank 3.5" disk into the floppy disk drive of the computer. The backup process will delete anything else you have on a disk.

2. Click on the "Backup Database" button in the Main Window (Figure 16-27).

Figure 16-27: Backup database

3. You must determine which drive your computer has specified as the 3.5" floppy disk drive. It will be either drive A or drive B. If you do not know, ask vessel personnel.

4. In most cases the 3.5" floppy disk drive will be drive A. If this is the case simply hit the Enter key or click on the "Yes" button when the screen below appears.

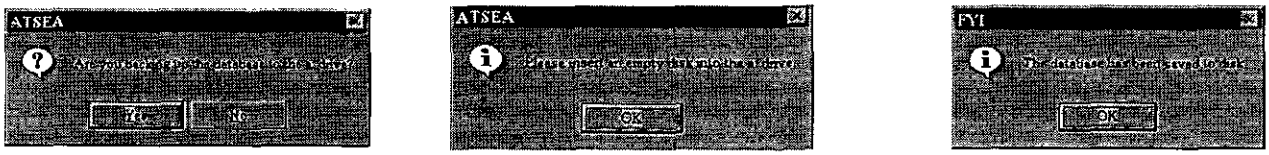


Figure 16-28: Steps for backing up database

5. If the 3.5" floppy drive is drive B, click on the "No" button. This automatically chooses the B drive.

6. The computer will "blink" and a black text screen will appear, be patient and wait until the entire process is over before attempting anything else. The computer will inform you when the backup is complete and will send you to the ATLAS Main Window.

For each different computer, not vessel, you work on, you should have a separate set of backup disks. Thus, if you work on a number of shoreside delivery vessels and only use one computer, only one set of backup disks are needed. If, on the other hand, you are on a number of catcher/processors, and use a different computer on each, a separate set of backup disks are needed for each computer.

Archiving Data

What is Archiving Data?

Archiving data is a final backup of the database and **the deletion of all data from the database**. This is necessary because a build up of data from multiple Observers will cause the computer to become slower as disc space becomes filled. To refresh the database after each Observer and speed the processing time, everything must be removed from the database after each cruise. We want to make sure that you do not lose any data, therefore a final copy of the database is made before the database is emptied.

When Should I Archive?

You should only attempt an archive **after** you have sent your final transmission to NMFS in Seattle and made a backup of the final data for each vessel. After an archive, **all of the data will be deleted**, none of your data will remain on the computer.

Do not archive until either;

1. NMFS staff inform you that you need to archive, or

2. You have made your final data transmission, have made a final backup, and either;

   a) you are on a catcher/processor or mothership with a desktop computer and are leaving the vessel for the final time, or

   b) you are on a catcher only vessel with a laptop and are returning the laptop to NMFS, **do not archive a laptop until you are absolutely sure you are finished with it.**

How to Archive?

To archive data;

1. Place a blank 3.5" disk into the floppy disk drive of the computer.

2. Click on the "Archive Database" button in the Main Window (Figure 16-29)..

Figure 16-29: Archive Database

3. Two cautionary windows will appear asking if you are sure you wish to archive the data. Click on the appropriate response, remember that all of your data will be deleted after the archive.

4. You must determine which drive your computer has specified as the 3.5" floppy disk drive. It will be either drive A or drive B. If you do not know, ask vessel personnel.

5. In most cases the 3.5" floppy disk drive will be drive A. If this is the case simply hit the Enter key or click on the "Yes" button when the screen below appears.

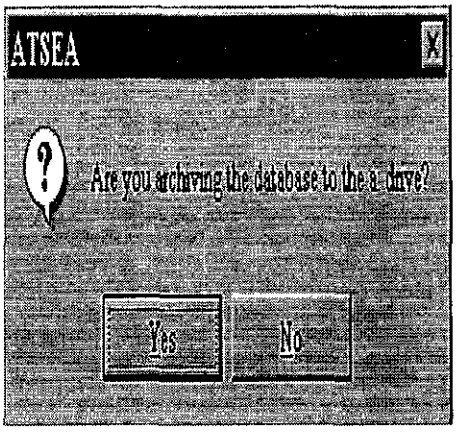


Figure 16-30: Archiving database to the A drive? "Yes" or "No"

6. If the 3.5" floppy drive is drive B, click on the "No" button. This automatically chooses the B drive.

7. The computer will "blink" and a black text screen will appear, be patient, and wait until the entire process is over before attempting anything else.

8. The computer will then inform you as to whether or not the database has been archived. If the archive has been successful then a box will appear asking you whether you wish to delete the data from the database. If you answer yes all data will be deleted from the computer. The program will then inform you when the archive is complete and the ATLAS Main Window will appear.

If the archive has been unsuccessful, it will inform you of this and the Main Window will appear, please send a message to NMFS Seattle informing them of your difficulty.

Updating ATLAS AtSea Program While At Sea

For Windows 3.1

On the Program Manager window for Windows 3.1 you may have noticed the icon . This icon is for programs designed to update the version of ATLAS AtSea to the most current version. This icon should only be activated if you are told to do so in a message received from NMFS Seattle. To

activate the program simply double-click on the icon. The screen will turn black for a few moments and then should return to the Program Manager window.

For Windows 95

To update the version of ATLAS AtSea in Widows 95 you must click on the Start button on the bottom left of the screen. A pop-up menu list will appear, select Programs. Another pop-up menu list will appear, select NOAA Observer Program. A third list will appear select the Update AtSea Icon and click (see Figure 16-31). This program should only be activated if you are told to do so in a message received from NMFS Seattle. The screen will turn black for a few moments and then should return to the Windows 95 startup window.

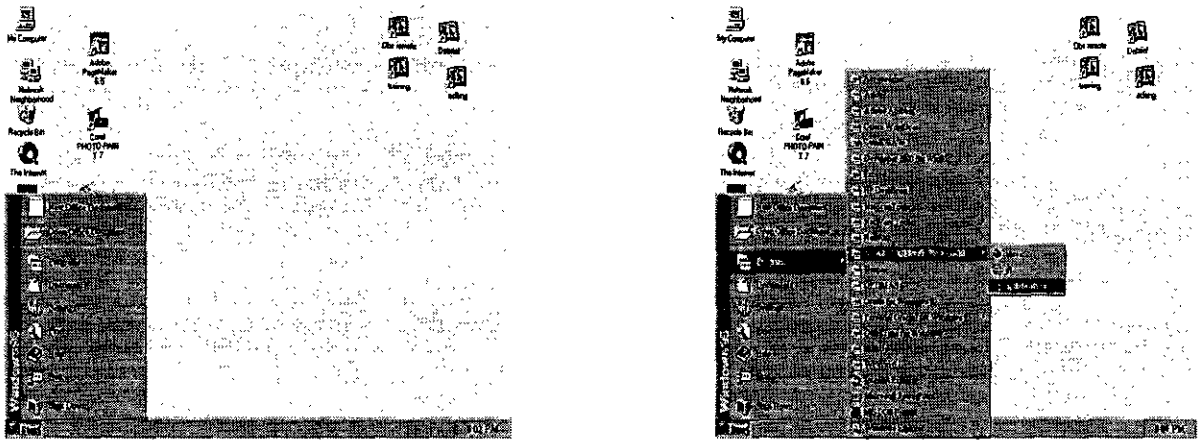


Figure 16-31: Updating ATLAS program at sea

What You Need to Bring Back

You should bring the following back to NMFS in Seattle:

- the backup and archive copies of the ATLAS database on the 3.5" disks.
- the paper haul forms (1US and 2US)
- the paper marine mammal sighting forms (11US),
- the deck forms,
- the Species Identification Forms,
- your logbook,
- and any biological samples, i.e., salmon scales, otolith samples, cod stomachs, or any special project material.

FIRST DAYS ON BOARD

By regulation Title 50 CFR§ 679.50:

Observers are to be notified at least 15 minutes before fish are brought onboard, unless the Observers specifically request not to be notified.

Observers are allowed to inspect and copy vessel logbook or documentation required by regulations.

Observers are allowed free and unobstructed access to navigation and communication equipment on request.

Upon boarding the vessel, introducing yourself to the captain should be a priority. It's important at this meeting to set the tone for a friendly but business-like working relationship. If the captain is receptive, take this opportunity to mention the following points:

- Tell the captain that it is important for you to routinely see the ship's fishing logs.
- On catcher/processor vessels, inquire as to how to send the weekly catch messages if the Observer At-Sea program is not installed, available, or is not functioning.
- Ask to be informed, in advance, of changes in the fishing schedule so that you may adjust your schedule accordingly.
- Ask to be notified if any marine mammals are found in the catches, regardless of time of day or whether you are sleeping; request that any marine mammal catch be held for your examination. Asked to be notified, if possible, of marine mammal sightings.
- Before leaving the dock you should be given a safety orientation and you need to go through your safety checklist (see "Checklist of safety equipment" on page 18-3). After this, if you have any questions or concerns that have not been addressed, ask the skipper. Notify your contractor and report in your log any safety problems not resolved.

Remember, while the vessel is in port, the captain is usually busy and may not be receptive at this time. Do not be discouraged. Ample opportunity should be available to discuss your issues and concerns with the vessel captain while steaming to the fishing grounds.

Vessels are required to provide Observers with accommodations equivalent to those provided for officers or other management level personnel of the vessel.

As quickly as possible, try adapting to the new surroundings by familiarizing yourself with the layout of the vessel and by meeting the people you will be working with. If the previous Observer is available, ask that person to give you a tour and orientation of the vessel. Note key areas such as Observer quarters, galley, wheel house, factory and sampling area. If the previous Observer is not available, vessel personnel are frequently assigned to assist new Observers with the familiarization process.

Before the vessel leaves port, make sure you have all of your personal

items and sampling equipment onboard. Check your equipment before leaving port for lost or forgotten items. Contact the field offices if you require additional sampling equipment and forms. If you are prone to sea sickness, get as much critical presampling work done before leaving port.

It is important that the Observer sampling station on board the vessel facilitates your objectives and goals. Criteria considered indetermining an adequate sampling station are as follows;

By regulation Title 50 CFR§ 679.50(f) a vessel is required to provide Observers with a *safe work area adjacent to* the sample collection site.

- Do you have access to unsorted catch?
- Is the collection site near the sampling station?
- Are there any tripping hazards?
- Do you have adequate room for storing your gear and samples?
- Is there a location in which you can secure a hanging scale; if not, do you need a flatbed scale from the field offices?
- Is there a work table or a comparable setup available for your use?
- Is there equipment nearby to adequately clean your gear and samples?

If you have the opportunity, you should view the vessel profile prior to deployment in Seattle or Anchorage, or visit the field offices.

On a Catcher/Processor Trawler

- In the first few days, familiarize yourself with life on board and initiate your work with the following:

By regulation Title 50 CFR § 600.72, §679.7, it is unlawful to physically or mechanically sort or discard the catch before sampling by an Observer.

- When the deck is inactive, perhaps when the vessel is in port or steaming to the fishing grounds, make measurements which will aid you in estimating codend dimensions and bin volumes.

- Watch the net retrieval and handling. At this time, you can easily decide when and where you will need to take additional measurements. Also, use this time to improve methods for obtaining dimension measurements for codends and bins. Determine whether you require assistance from vessel personnel and enlist their aid.

- Determine the best location for observing the codend retrieval. Remember that the location needs to be in a place that will ensure your safety and allow a full view of the deck activities. Speak with the deck boss for assistance in determining where the best area is with your objectives and goals in mind. 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.

- Observe the factory operations. Notice where the catch is being sorted, and what species and sizes are being retained. Follow the fish from the deck to the freezer. This is a good opportunity to determine what method would be suitable for obtaining information on the amount of catch that is discarded. Note what primary and ancillary products are being made. Be aware of all possible hazards.

- Get started with the most obvious methods for making catch weight estimations, for obtaining species composition data, and for collecting other biological samples. As time progresses, and you become comfortable with your duties, consider other methods or implement variations in your methods to improve your sampling and data quality.

On Board A Catcher-only Trawler

By regulation Title CFR§ 679.50, reasonable assistance should be provided to enable Observers to carry out their duties.

The operation is much simpler but an Observer has less opportunity to get oriented as only a few tows are made each trip.

- When the deck is inactive, perhaps when the vessel is in port or steaming to the fishing grounds, make measurements which will aid you in estimating codend dimensions.

- Watch the net retrieval and handling. At this time, you can easily decide when and where you will need to take additional deck measurements. Also, use this time to improve methods for obtaining dimension measurements for codends. Depending on the fishery, you may be using the trawl alley as a bin for volumetric estimates. This would be a good time to measure the trawl alley as well. Trawl alley measurements may also aid in obtaining codend dimensions. Determine whether you require assistance from vessel personnel and enlist their aid.

- Determine the best location for observing the codend retrieval. Remember that the location needs to be in a place that will ensure your safety and allow a full view of the deck activities. Take special note of hazardous or potentially hazardous areas. The captain or crew members may also have some advise on where possible hazardous situations exist.

- If you will be required to sample at the plant, you should locate the plant Observer before or immediately after your first deployment, so they can provide an overview on the plant sampling station and typical sampling protocol.

- Make a note of checker bins or other equipment that will be useful for collecting and storing samples. Space is limited on the smaller vessels so making use of all available resources is a necessity. You may realize at this point that you require an extra basket or two. You can obtain from the field offices extra baskets and portable totes.

- For the first retrieval, be prepared with sampling equipment ready and in hand. Use this time to observe the retrieval of the net and determine the most appropriate area and method for obtaining a catch estimate, depending on the fishery. Make the effort to measure the codend, or collect bin volumetric dimensions of the catch. Watch how and where the codend is opened and how thick and fast the fish are dumped. Look to see if the crew does any sorting on deck. Observe what is retained and discarded. Observe where and how sorting occurs. By being aware of these situations, you will be able to determine the best method for obtaining discard information and be able to avoid sample bias.

On a Longline Vessel

The fishing operations are different from a trawl vessel. There are other considerations that should be addressed.

- It is important to be familiar with the units of gear, gear handling, and average number of sets per day. This information will assist you in setting up a routine to complete your duties. Speak with the captain or deck boss to obtain this information. This is also an excellent time to determine the best method of verifying the number of hooks per skate and to apply that method.

- Sampling for species composition requires an area for observing the gear retrieval and everything that is caught on the gear. This could be in the factory or on deck, depending on the vessel setup. You will also need to locate an area where you can collect, store, and weigh bycatch and target species. This means that you may have more than one sampling station. Remember, working on a longliner imposes many hazards. You need to be aware of all possible dangers and work accordingly.

- During the first gear retrieval, locate an area where you can observe the retrieval of the line and all organisms coming up on the line. You should be near enough to identify most fish to species, family, or to special species groups. Determine what species are being retained and discarded, both at the roller and in the factory. This is

a good time to observe the rollerman and determine what type of control you will have over the collection of bycatch. Take into an account retrieval rate of the gear and the amount of gear set in order to conceive a sampling frame. Monitor the quality of gear reparation, as this affects overall gear performance.

On a Pot Vessel

The fishing operations are similar to that of longline vessels, with few minor differences.

- It's important to be familiar with the units of gear, gear handling, and average number of sets per day. This information will assist you in setting up a routine to complete your duties. Determine hazardous work areas. Speak with the captain or deck boss to obtain this information. Determine the best method to verify the number of pots set per string.

- Sampling for species composition can be quite arduous due to the many hazards you need to be aware of as you are working. Pot vessels are small vessels with a lot of constant activity. You will need to set up your sampling station away from the gear retrieval area and all of the potential hazards that may occur in that area. Ask the vessel personnel where Observers have historically sampled.

- Locate an area where you can observe the retrieval, yet remain safe of deck activity. Let the deck crew know what your objectives and goals are so they can work with you. Determine what species are being retained and discarded. Take into an account retrieval rate of the gear and the amount of gear set in order to conceive a sampling frame.

The first catch onboard is an excellent opportunity for you to work out a routine for collecting, sorting, weighing, and counting fish. This time allows you to determine what methods and techniques you will apply to collect species composition samples. Try to collect one or more baskets of fish. Practice collecting biological data from the target species and other species as required. Determine if and what extra assistance will be required to obtain biological data such as sexed length frequencies from the target species and halibut viability assessments. Familiarize yourself with the species caught by using the species identification keys and field guides. Begin writing species description forms.

These guidelines are general, and are written for Observers going to sea their very first time. These guidelines will also assist prior Observers who

are beginning a cruise onboard a vessel/fishery type with which they are not familiar. Remember that vessel and plant specific profiles are available. The profiles will facilitate and enhance your first days onboard your boat.

HEALTH AND SAFETY INFORMATION

From this section, you should learn:

- how to familiarize yourself with the safety equipment and procedures aboard your vessel,
- general safety precautions onboard and while performing your Observer duties
- how to deal with illness and sickness on board
- how to transfer between vessels safely
- how to respond to an emergency on board, and what procedures to follow in an abandon ship situation.

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Introduction

Commercial fishing in Alaska is a dangerous occupation. Slippery decks, heavy gear, and an inhospitable environment are inherent dangers on fishing vessels. The safety and survival material presented here and in Observer training is only an introduction to these topics. There are many pamphlets, books, and videos that provide more detailed information about sea safety and survival including the North Pacific Fishing Vessel Owners Association's Vessel Safety Manual, and the University of Alaska's Marine Advisory Bulletin Beating the Odds on the North Pacific. Both are available during training and on many vessels.

You must take responsibility for your own safety and learn as much as you can before an emergency happens that threatens your life. Most fishing vessels are operated by safety-minded skippers who realize the danger of their occupation and consider safety in all that they do. Use the knowledge and experience of the vessel's crew for guidance on safety on your vessel. They are certainly concerned about the safety of an Observer, a guest on their vessel, and will make sure that dangers for you are minimized.

Before You Board

The Commercial Fishing Vessel Safety Act of 1988 mandates certain safety equipment, instructions, and drills aboard vessels that operate beyond the boundary line (a federally designated line between points of land) or carry more than 16 individuals. Most vessels that need Observers fall under these regulation (see Figure 18-1).

In mid 1998, NMFS adopted regulations to ensure the adequacy and safety of fishing vessels carrying Observers. Under 50 CFR Part 600, owners and operators of fishing vessels that carry Observers are required to comply with US Coast Guard safety regulations. A vessel is considered inadequate or unsafe if it does not comply with the regulations regarding Observer accommodations or if it has not passed a USCG safety examination or inspection.

Checklist of Vessel Safety Equipment

1. Check for safety inspection documentation. Look for a current decal or ask for documentation.

2. Find the station bill, a posted placard describing the role of all hands on board (including the Observer) in an emergency.

3. Locate life rafts. Are you assigned to a particular one? Is there enough life raft capacity for everyone on board including you? Check the service dates displayed on the canister.

4. Immersion suits/life preservers - where are the survival suits and PFDs located? Are there enough for everyone on board? Are they accessible at all times? You will be issued an immersion suit and PFD as part of your NMFS sampling gear. Keep yours where you can get to it in a hurry. Your cabin is recommended, but may have limited space.

5. Life rings. Where are they? Are they accessible?

6. Flares–where are the flares located? Check the expiration date. Does this vessel also have approved smoke signals?

7. EPIRBS–Where is the Emergency Position Indicating Radio Beacon (EPIRB)? Is there more than one? Read the instructions.

8. Fire extinguishers–where are they? Are they accessible? Are they up to date, charged, and ready to use?

9. First aid materials–where are first aid materials kept? Is there a reference book on board? Who in the crew has had first aid and CPR training?

10. Radios–where are the radios? Are emergency call instructions posted nearby? Do you know how to operate the radio for an emergency call?

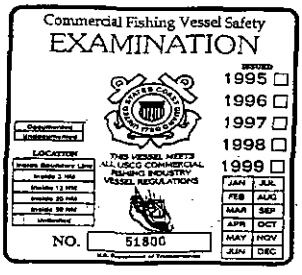
11. Are there emergency instructions for and did the skipper ensure that you were given a safety orientation explaining the following?

    - survival craft embarkation stations
    - survival craft assignments
    - fire/emergency/abandon ship signals
    - immersion (survival suit locations and donning instructions)
    - procedures for making a distress call
    - essential actions required of each person in an emergency
    - procedures for rough weather at sea
    - procedures for anchoring
    - procedures for recovering a person overboard
    - procedures for fighting a fire

12. As you walk through the vessel, make yourself aware of potentially hazardous areas. Identify the watertight doors, both on the interior and the outside–can they be secured in case of heavy weather or other emergencies? Are any hatches or passageways blocked or difficult to get to? Ask the skipper what the general alarm sounds like and if he will test it.

Figure 18-1: Checklist of safety equipment

This rule applies to all vessels designated to carry an Observer as part of any mandatory or voluntary Observer program under the MSFCMA (Magnuson-Stevens Fisheries Conservation and Management Act), the Marine Mammal Protection Act, or any other US law.



Prior to boarding a vessel for the first time, you are encouraged to spot check the vessel for compliance with Coast Guard regulations. Check the major safety items identified below. If you feel that you should not board the vessel because it is unsafe or inadequate for you to carry out your duties, contact your contractor immediately. NMFS may require the vessel owner or operator to either pass a USCG safety examination or inspection; or correct the deficiency that is causing the vessel to be unsafe. A vessel that would normally carry an Observer, but is deemed unsafe, is prohibited from fishing without an Observer.

This rule applies to you prior to boarding and at all times when you are on board.

Safety While Boarding, Transferring, or Disembarking Vessels

Wear a life jacket at all times on skiffs or other small vessels and while transferring between boats. When climbing, do not encumber yourself with heavy backpacks or baggage. Balance is important and both hands must be free during transfers. Use a day-pack and wear comfortable foot wear such as Xtra-Tuffs or athletic shoes that give sure footing. Time your actions with the movement of the boat; i.e. start your climb up a ladder from the top of the up-and-down cycle to avoid being pinched against the ladder from a moving boat

All baggage should 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.

If a cargo net, transfer basket, or cage is used to transfer you, make sure that a line is attached to the conveyance from both vessels for greater control and to reduce swinging. Maintain a crouched position (knees bent) to avoid back injury. Be sure to wear your hard hat in addition to your life vest when using this mode of transfer. Keep your arms, elbows, and fingers inside the conveyance when transferring.

You will normally board and disembark vessels at the dock, but transfers at sea sometimes may be necessary. Transfers between vessels are potentially hazardous, especially in rough weather. You must assume responsibility for deciding whether or not to transfer based upon your own evaluation of the sea conditions, transfer vessel, visibility, and distance to travel. An

ADF&G crab Observer and two crew members died when their small transport skiff overturned in rough water.

Never transfer via a small boat if you cannot see your destination. As a general guideline, do not transfer at dusk, in darkness, or in any other low visibility conditions. If boarding a small skiff or inflatable boat, make sure that the engine has been started and warmed up, and that there are oars stowed as a backup. Do not transfer when the sea state is two meters or more. Be cautious—not foolhardy. You cannot be forced into transferring against your better judgment by an anxious or impatient captain. Under "Vessel Responsibilities," 50 CFR §679.50(f), an operator of a vessel required to carry one or more Observers must:

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 Observers involved.

Notify Observers at least three hours before Observers are transferred, provide a safe pilot ladder and conduct the transfer to ensure the safety of Observers during transfers.

Provide an experienced crew member to assist Observers in the small boat or raft in which any transfer is made.

First Days on Board

When you board a vessel, regulations mandate that you receive a safety orientation. This may be as simple as crew members showing you around; but may include watching videos, donning immersion suits, or conducting drills. In addition to the required orientation, drills and instruction must be conducted involving each individual at least once a month. As a person aboard the vessel, you will participate in any drills and instruction.

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 to it in a hurry.

Personal Health and Safety Aboard Vessels

Fishing vessels have many potentially dangerous areas. Be aware of your surroundings at all times and keep your eyes and ears tuned to what is going on. The hours, the environment, the food, and the work may be quite different than your body is accustomed to. Drinking plenty of water and eating enough food are critically important in maintaining your health in this new environment.

General Safety Precautions on Board

- Apparel with loose strings or tabs and jewelry such as rings should be avoided, as these might become caught in the equipment or moving belts. Long hair should be tied back.

- Don't run aboard ships, particularly up stairwells. Always hold handrails in stairwells and on ladders. Slipping, tripping, and falling are the most common causes of Observer injury.

- Lift correctly! When lifting, get as close as possible to the object, keep your back straight, and use your legs. On a moving vessel, this is critical because unexpected movements can strain your back. Don't be afraid to ask for assistance in moving large weights.

- Fatigue and sleep deprivation suffered by the crew and yourself are threats to your safety. Be aware of the physical state of those around you—whether the person on watch or in control of the gear. Fatigued individuals make mistakes that could affect you. Monotonous work, such as longline tallies, is difficult to do accurately and safely when you are tired. Follow the example of the crew and "catch up" on sleep when there are breaks in fishing. Vegetarians (due to meat-and-potatoes menus) and diabetics (due to odd eating schedules) need to be especially concerned about getting a proper diet. Dietary supplements, vitamins, and extra medications should be considered.

- If you are not feeling well, use extra caution and reduce your time spent working.

Working on Decks

- Wear a hard hat, life vest or other flotation and boots when on deck.

- Do not stay outside on the deck during rough seas. One Observer was swept forward over a trawler's winches by waves sweeping up the stern ramp. When you are outside, remain in full view of a second party at all times.

- 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.

- Trawl cables that break under strain have maimed and killed fishermen. Whenever a cable is subjected to tension, stand where a backlash will not hit you. If your sampling station is on deck, interrupt your work and go to a safe place while a trawl is being set or retrieved.

- Explain to the deck boss that you need to watch the haul-back for marine mammals and will need to go out on deck for codend measurements once the winches have stopped. Ask for advice on a safe place to stand. When nets are being hoisted off the deck, stand clear. Heavy nets have fallen near Observers when the suspending cables parted.

- moving pots, if possible, and face the direction of the pot launcher while you work.

- On a longliner, if you are near the moving hooks during retrieval, wear eye protection and use a gaff, not your hands to collect fish.

Working in Factories

Do not pry loose any fish caught in the steel belts or rubber conveyors: a finger or hand may get mangled in the machinery.

Factory processing areas are crowded with machinery, electrical lines, and conveyor belts. It is often difficult to get to the area where you need to sample because of the maze of equipment. Climbing over, under and around machinery on oily and wet floors especially at sea in rough weather is extremely hazardous. Be careful where you step and where you grab for handholds.

factory offal wash out, be extremely cautious not to slip and fall into the wash of bilge water.

Seasickness

One of the least pleasant aspects of going to sea is the possibility of seasickness. An individual's susceptibility to seasickness is highly variable. If you've experienced motion sickness in cars, planes, or amusement park rides, you may experience seasickness during your cruise. Most people feel some level of discomfort when they first go to sea.

Seasickness is a result of a conflict in the inner ear (where the human balance mechanism resides) caused by the erratic motion of the ship through the water. Inside the cabin of a rocking boat, for example, the

inner ear detects changes in linear and angular acceleration as the body bobs with the boat. But since the cabin moves with the passenger, the eyes register a relatively stable scene. Agitated by this perceptual incongruity, the brain responds with stress-related hormones that can ultimately lead to nausea and vomiting. Its effect can be magnified by strong smells (like diesel fumes or fish, which are part of daily life at sea). Seasickness usually occurs in the first 12-24 hours after sailing. For most people, seasickness dissipates when the body becomes acclimated to the ship's motion (getting one's "sea-legs"). In rare cases, an individual may stay ill beyond the first couple of days at sea, regardless of sea state. If this occurs, dehydration may become life threatening if it leads to shock.

Take seasickness medication before you go to sea. There are several over-the-counter or prescription medications available to minimize seasickness. Antihistamines such as Dramamine (generic name is dimenhydrinate) or Bonine (generic name is meclizine) are effective. and are available over-the-counter. However these drugs cause drowsiness. A two part, prescription-only drug is promethazine, a seasick-preventing antihistamine coupled with ephedrine, which prevents drowsiness. Transderm Scop is another prescription-only motion sickness drug. It is a dime-sized adhesive patch that is worn behind the ear and delivers a continuous dose of scopolamine. Each patch lasts for 72 hours. The main side effects of the patch are dry mouth and occasionally blurry vision, but there is less drowsiness. Acupressure wristbands and eating crystallized ginger are other remedies used with varying success.

Seasick medications must be taken before the symptoms begin. Most take several hours to be absorbed in your system and may not work if you already can't keep anything in your stomach. Even if you doubt that you will get seasick, you might want to take the medication before you board as a precaution against rough weather.

If you should get seasick, take comfort in the fact that recovery is only a matter of time. All that is usually required for a complete recovery is some patience. Here are a few tips and considerations regarding seasickness:

- Continue eating items like crackers, dry toast, dry cereal, etc. (avoid anything greasy, sweet, or hard to digest). Keeping something in your stomach suppresses nausea, or, if vomiting, eliminates painful "dry heaves".

- Keep drinking fluids. Seasickness and related medications cause dehydration and headaches. Try to drink juices low in acidity, clear soups, or water, and stay away from milk or coffee.

- Focus on the horizon to eliminate the visual conflict in your brain.

Midship or aft in the vessel may have less motion.

- Keep working. Most people find that being busy on deck keeps their minds off their temporary discomfort. Also, the fresh air out on deck is often enough to speed recovery.

- Carry a plastic bag. This simple trick allows some peace of mind and eliminates some of the panic of getting sick. If you vomit over the side, be aware of which way the wind and waves are coming. Going to the lee will ensure that an unpleasant experience doesn't become any more unpleasant.

- Above all, don't be embarrassed or discouraged. If you get sick, chances are that others are sick too! No one is immune to seasickness.

Fish Poisoning

Fish poisoning is the common term for infections that develop in cuts, scrapes or punctures from bacteria found on fish. To prevent fish poisoning, wash your hands thoroughly after sampling in a solution of hot, soapy water and an antiseptic such as betadine. Change your gloves often to keep them dry and discard any torn gloves. Treat all minor cuts, especially those on your hands, with antiseptic to avoid infection from fish slime.

If a wound gets red or swollen, soak it for 1/2 hour in very hot, soapy water at least three times a day. Dry and bandage the wound. Antibiotics are commonly prescribed for fish poisoning. Your vessel will probably have some on board. Should an infection be left untreated, the threat to your health can become much more far-reaching than simply a pair of inoperative hands.

Take extra precautions against infection when collecting specimens from marine mammals. Because these mammals 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 by a scratch or bite.

Be cautious whenever wading through fish. Fish spines, especially rockfish, can penetrate rubber boots and cause painful wounds to the feet. Spines carry bacteria and can lead to fish poisoning.

Harassment

Providing a safe and hostility-free work environment is the responsibility of your contractor as your employer and the vessel's personnel, by regulation. It is of uppermost importance to the Groundfish Observer Program. However, verbal, physical or sexual harassment of Observers can occur at sea. While the crew of a fishing vessel have usually established a workable interaction among themselves, Observers who come on board for a single cruise are not part of that system and in fact, may be considered unwelcome government agents or even "fish cops." Observers therefore can be subject to negative attention, comment or actions.

Harassment of Observers by vessel personnel is strictly prohibited in 50 CFR 679.7 9(g). "It is illegal to(1) Forcibly assault, resist, oppose, impede, intimidate, or interfere with an observer."

Identifying Harassment

Harassment can take many forms such as:

- repeatedly waking an Observer during sleep periods,
- *providing substandard accommodations and food,*
- criticizing an Observer's sampling techniques or reporting practices,
- pressuring an Observer to ignore presorting of prohibited species.

In all cases, harassment is defined as when you, the Observer, feel threatened or that your work and living environment is being *compromised. You may feel embarrassed, or worry that you did something* to provoke the unwanted behavior, but you have a right to perform your job in an environment free from this type of interference.

Sexual Harassment

Sexual harassment is unwelcome behavior of a sexual nature. Privacy is greatly reduced onboard a vessel, and interactions can become intense more quickly. Sexual harassment may include sexist remarks or behavior, or sexual advances which result in a tense and unproductive work environment. Examples of sexual harassment might include: * suggestive sounds or gestures, sexual remarks about your clothing, body or sexual orientation, leering or ogling, persistent sexual comments and jokes, or constant brushing against or touching a person's body.

Sexual harassment is unwanted attention in a nonreciprocal relationship

(relationships with vessel and plant personnel are prohibited under Observer standards of conduct). In most normal interpersonal relationships, an individual can exercise free choice in deciding to develop a relationship based on mutual caring and respect. These elements are absent in sexual harassment.

Sexual assaults have occurred on fishing vessels at sea. If you feel harassed, report it before the problem escalates.

What to Do if You Experience Harassment

If you experience harassment in any form, confront it directly and document it completely. By reporting harassment, you are protecting the next Observer on board, as well as yourself.

Follow these steps:

1. Say no. Tell the harasser that his/her comments, actions or advances are unwanted and that you want them stopped. Remember that you are the judge of whether another person's actions negatively affect you.

2. Don't fight fire with fire. Keep your behavior professional and avoid being baited by the poor treatment of others. Make sure that your verbal and non-verbal messages to stop are clear.

3. Document the incidents from the very beginning. Even if you are unsure at first if you are experiencing harassment, record the details. They may provide you with the full story if the situation escalates. In your logbook, describe the situation, including who, what, where and when. Detail your attempts to end the harassment and the response you receive.

4. If the problem continues, report it to the skipper. Tell him the full story, explain that it is affecting your work, and request that he take steps to end the problem. Most skippers do not want trouble on the boat, and if you indicate to him that trouble is brewing, he should take appropriate action. Document any further incidents and the skipper's actions.

5. If the harassment is not taken care of by the skipper, or if your problem is with the skipper, report the offense to NMFS and your contractor at the first opportunity. If there is no resolution, your contractor will make arrangements for you to leave the vessel.

- If you are concerned for your immediate well being on board, use the ORC code given to you in training to contact NMFS via catch messages.

Illnesses and Accidents on Board

If you become ill on board, such as coming down with a severe cold or flu or seasickness that inhibits your work, you must inform your contractor and NMFS of your situation. If your illness gets worse or continues to affect your work for more than three days, your assignment may need to be changed.

By regulation, each vessel must have at least one person onboard certified in first aid and CPR. If you are hurt on board, contact your contractor and NMFS as with an illness. If the accident is serious, the captain will contact the USCG who will respond as necessary.

Emergencies on Board

Man Overboard

Everyone has an active role in a man overboard emergency. If you witness someone falling over, you must both notify the person at the vessel controls and keep the victim in sight. According to the station bill, crew members are assigned specific tasks; for example, donning an immersion suit to be the rescue swimmer, launching a life boat, or throwing a life ring. As an extra set of eyes, the best role for you is to keep your eyes on and your arm pointing to the victim so as to aid the person at the controls.

Cold-water Near Drowning

Cold-water near drowning is a phenomena that has been observed in cold waters such as the seas surrounding Alaska. Victims have been revived using CPR after being immersed in cold water for up to one hour. CPR is an exhaustive activity that requires more than one caregiver. The compression rate should be about 80 beats per minute in series of fifteen, followed by two breaths. You are not required to be certified to apply CPR to a victim. It has been said that bad CPR is better than no CPR. Keep in mind that although a victim looks dead, they may be revived by this technique (see CPR Chart, Appendix N).

A fire needs heat, fuel and oxygen. Remove any one of these components to stop a fire.

Fire

Ships carry large quantities of fuel and offer few places to go in the event of fire. Station bills give specific duties responding to a fire on board including who is in charge of the fire fighting team, and what equipment each person is responsible to gather. It is wise to know where fire extinguishers and exits are located in every area of the vessel—certainly those areas in which you spend time. Fire extinguishers only have short bursts of fire retardants; so back-up extinguishers should be located and brought to the fire as soon as the fire is discovered. To effectively use a fire extinguisher, fire in short bursts in a low, sweeping motion. Keep your body low so as to avoid smoke inhalation and heat. Do not attempt to fight anything but the smallest fire (a wastebasket, for example) on your own—sound the alarm immediately before you take action. After a fire, thorough inspection must be made of the area—including adjacent walls and rooms, to be sure the fire did not spread and will not flare up again.

Flooding

When a vessel is taking on water, usually the crew has time to try and solve the problem. Malfunctioning pumps or leaks in through-hull fittings are not uncommon, and can usually be fixed with equipment on board. If the flooding condition worsens, the Coast Guard can drop pumps to a vessel via aircraft. Observers have limited role in these types of vessel emergencies but should be prepared to assist if needed.

Abandon Ship

The worst possible emergency requires you to give up your shelter—the vessel. Never abandon the ship unless you are sure that being on board the vessel is more dangerous than being in the water. Lives have been lost because ships have been abandoned too soon during fires or flooding. Knowing the nearest exits, mustering areas, life raft locations, immersion suit locations, EPIRB locations, and the emergency equipment available become critical factors in helping you survive an abandon ship emergency.

Sending a May Day

A may day call is for a life threatening emergency. The emergency frequencies are Channel 16 on VHF radios and 2182.0 kHz or 4125.0 kHz on single side band radios (SSB). VHF radios are for short range and SSB radios are for long range communications (see Appendix M for more information on radios). Vessels are required to monitor the emergency frequencies at all times. Most radios have a red button that changes to the emergency frequency immediately. Near the radios, there will be a placard posted that describes MAYDAY calls. Be familiar with what constitutes a proper MAYDAY call:

MAYDAY MAYDAY. MAYDAY (said three times)

- Vessel name (said three times)
- Location
- Nature of emergency
- How many persons on board
- Vessel description
- What radio frequency is being used

ABANDON SHIP

Signal: Seven short blasts followed by one long blast

••••••

1. Prepare by including the following as time and circumstances permit:

   a. General Alarm & Mayday.
   b. All personnel don immersion suits/PFDS. Warm clothing if time permits.
   c. Prepare to launch life raft. Attach sea painter to vessel.
   d. Assemble signal devices-EPIRBS, flares, smokes, flashlights, handheld radios, etc..
   e. First Aid Kit
   f. Food

2. Muster at embarkation station

3. When sinking is imminent or remaining on board is inappropiate:

   a. Launch and board life raft.
   b. Keep sea painter attached to vessel. Be prepared to cut sea painter immediately if there is risk to life raft or vessel sinks
   c. Acvtivate EPIRB & commence 7 Steps to Survival

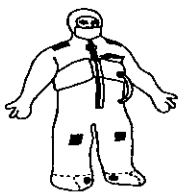
Figure 18-2: Abandon Ship Placard

Donning the Immersion Suit

An immersion suit is a shelter that is required by the safety regulations for everyone aboard a vessel that operates in cold water. Your assigned vessel will have enough aboard for the crew, and you will be issued one with your gear. You should know where they are stored and should try yours on (see Figure 18-3). Be sure that you can put the suit on in less than a minute—even in the dark!

1. Sit on deck and work your legs into the suit. You may have to remove your boots to do so. Putting plastic bags over them may help your legs slide easier.

2. Place your weak arm in first, then pull the hood over your head (or hood first, then weak arm). if you have long hair, make sure that it is safely tucked in the hood.



3. Holding your zipper below the slide with one hand, lean back to straighten the zipper and pull the lanyard with the other hand. Secure the face flap. Do not inflate the air bladder until you are in the water.

4. Jumping in the water is the last resort. Ease yourself into the water if possible. If jumping, protect your head and keep your feet together to protect from floating debris.

Figure 18-3: Donning the immersion suit

Life rafts

Your assigned vessel will have enough life rafts or life boat capacity for all aboard. Life rafts are stored in canisters that allow them to float free and automatically inflate if the vessel sinks. It is much better to manually launch and inflate the raft if there is time. Know where the rafts are stored, how to remove them from the cradle, where to launch them, and how to inflate them (see Figure 18-5).

Survival Kits

A personal survival kit can take up very little space in an immersion suit, yet greatly enhance your ability to survive. Think of the seven steps to survival and choose items that may help you. Items such as a knife, dental floss (a strong multi-purpose line), plastic garbage bags, matches, signal mirrors, a compass, hard candy, or bouillon cubes are small items that fit in a zip-lock bag and could save your life. Vessels may have an emergency bag stored and a person named in the station bill to bring it.

EPIRBS

The vessel will have at least one EPIRB (Emergency Position Indicating Radio Beacon) mounted in a float-free bracket that will be automatically activated in the event of sinking. The signal is received by satellite, and in new styles, will identify the sender. It is important to know where the EPIRB is mounted and how to activate it manually. In the event of an abandon ship emergency it is an item you want to take with you. Someone will be assigned that duty on the station bill. Be sure to locate the EPIRB(s) on your vessel and read the directions on how to activate them.

EMERGENCY ASSIGNMENTS

POSITION	ABANDON SHIP Go To & Bring	FIRE Go To & Bring	PERSON OVERBOARD Go To & Bring	FLOODING Go To & Bring
Captain	wheelhouse, radio maneuver vessel	wheelhouse, radio maneuver vessel	wheelhouse, radio maneuver vessel	wheelhouse, radio maneuver vessel
1st Mate	life raft, immersion suit	Fight fire	Throw ring, lookout	Plug hole, pump
Deckboss	life raft, immersion suit	Assist in fire fighting	wheelhouse, radio maneuver vessel	Assist plugging hole and pumping
Dechhand	Communicate, EPIRB, count crew	Communicate, boundary person, remove hazards, get survival gear	Communicate, assist where needed	Communicate, assist where needed, secure hatches
Observer	debarkation station, immersion suit	wheelhouse	Lookout, assist where needed	debarkation station, immersion suit

Figure 18-4: Station Bill. Everyone on board, including the Observer, has specific instructions in the event of an emergency.

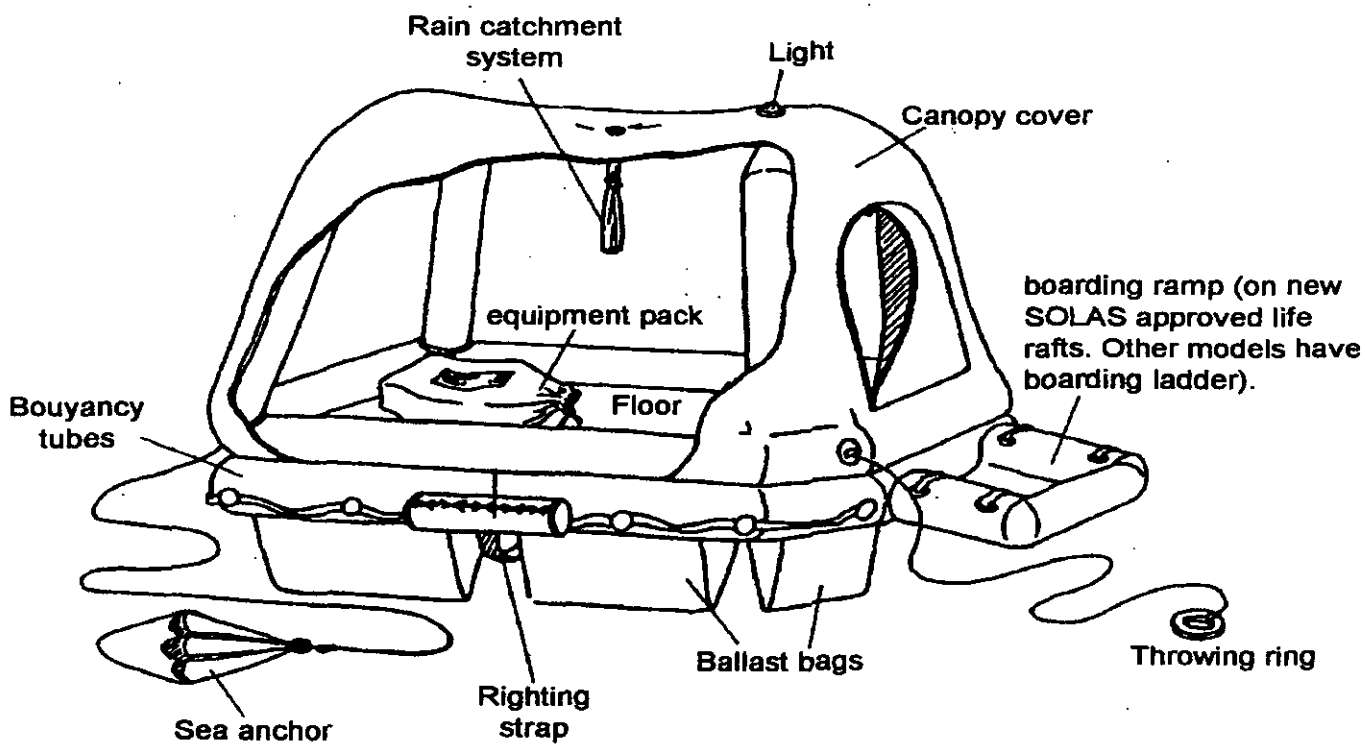


Figure 18-5: Life raft and equipment

The Seven Steps to Survival

The Seven Steps to Survival were assembled by the USCG from personal experiences of those who survived emergency situations. Committing the seven steps to survival to memory should be one of your goals in learning how to survive at sea. Every time your situation changes—boarding a raft, reaching land, etc,—the seven steps begin again.

Recognition

You must quickly recognize the seriousness of the situation and that your life is in danger. Hesitation or denial may cost your life, especially in the harsh environment of Alaska.

Inventory

Stop and assess the situation. Decide what you have that will help, and that which will not help you to survive. Inventory equipment, weather, your skills, injuries, and your mental condition. Doing so will help you to make good decisions that will help you survive.

Shelter

Your biggest enemy in Alaska is the cold. Shelter can be clothing, an immersion suit, a raft, or an overturned vessel—anything that protects you against the loss of your body heat. Water can take heat away from your body much quicker than air, so shelter also helps you keep as dry as possible. High heat loss areas, including the head and neck, need to be protected most. The added buoyancy of a PFD helps to keep your head and neck out of water, therefore conserving heat. In a shore survival situation, the seven steps to survival start over again and shelter is your first priority after you inventory the situation. It takes hours to construct adequate shelter on shore and you must do so as soon as possible.

Signals

Anything that attracts attention and conveys a message is a signal. Radios, EPIRBs, and flares are signals carried by vessels. Immersion suits have lights attached. You may have a signal mirror in your personal survival kit. If abandoning ship, anything that can be tossed overboard may help an aircraft spot your position. In a shore survival situation, three of anything (fires, buoys, immersions suits on the beach) is an internationally recognized distress signal.

Water

It is recommended that humans drink two liters of water per day to stay healthy. You can live without water for only a few days, and will suffer dehydration from the onset of any abandon ship emergency. Life rafts have limited rations of water, but it is advised to gather as much as possible before abandoning ship, if time permits. Have a strategy for gathering extra water in an emergency. Never drink sea water or urine.

Food

A person can go without food much longer than without water. Never eat food without water—your body requires water to digest food. Life rafts are supplied with limited food rations. In a shore survival situation, many types of edibles can be found near shore. Almost any animals or green plants in the inter-tidal zone are edible, but avoid mussels or clams—they may cause paralytic shellfish poisoning.

Play

Studies have shown that mental attitude makes a positive difference in a survival situation. Play is anything that keeps you occupied and prevents your mind from dwelling on the difficulties you are facing. Play could be

- reading, telling jokes or stories, completing a task, improving your shelter—anything that keeps your mind active and focused.

Summary

It is likely that you, if an Observer trainee, have never been to sea before. You will learn much about sea safety and survival from the vessel personnel, who probably have many years of sea experience between them. However, the ultimate responsibility is upon you to survive. It is easy to think "this will never happen to me" and "the skipper will know what to do," but those thoughts may cost you your life. Take the time to learn as much as you can, and consider what your actions will be in emergency situations. Visualize yourself and your actions in emergency scenarios in the factory, on deck, in your bunk, or anywhere you spend time. Having thought about an emergency will make your actions more automatic, and the time saved may save your life. Your life is worth far more than any data you could collect in the fishery.

Federal Requirements for Commercial Fishing Industry Vessels greater than 60 ft.	
General Requirements	
Documentation & Official Number **46 CFR 67-69**	• Must be measured and documented, documentation must be on board • Hailing/home port, and official number must be displayed in 4 inch letters on both bows. • Official number must be 3 inch letters and attached to integral interior structure member.
Operator License **46 U.S.C. 8304**	• The master, mate, and engineers on the vessel of 200 gross tons or more must have appropriate USCG license and operate within the limitations of the licenses.
Commercial Fishing Vessel *Safety Inspection* Requirements **50 CFR 679.50, 33 CPR Chapter I, 46 CFR Chapter I, 46 CFR 28.710, 46 CFR U.S.C. 3311**	• Must have a valid Commercial Fishing Vessel Safety Decal issued within the past 2 years that certifies compliance with regulations found in 33 CFR Chapter I and 46 CFR Chapter I. • Must have a valid certificate of compliance issued pursuant to 46 CFR 28.710 • Must have a valid certificate of inspection pursuant to 46 U.S.C. 3311.
Navigational Requirements	
Compass **46 CFR 28.230**	• Each vessel must be equipped with an operable magnetic steering compass with a compass deviation table at the operating station.
Electronic Position Fixing Devices **46 CFR 28.260**	• Vessels 79 feet or more in length must be equipped with an electronic positioning fixing device such as SAT NAV, GPS, LORAN, OMEGA, or RDF that is capable of providing accurate fixes for the area of operation.
Navigation and Anchor Lights	• Must be used from sunset to sunrise and when there is limited visibility.
Navigation Information **46 CFR 28.225**	• Current corrected charts of the appropriate areas and scale for safe navigation. • Current corrected copy (or applicable extract) of the U.S. Coast Pilot, USCG Light List, National Ocean Service Tide Tables and National Ocean Service Current Tables.

Anchor and Radar Reflectors **46 CFR 28.235**	• Vessels operating with more than 16 individuals on board: • Each vessel must be equipped with appropriate anchor(s) and chain(s), cable, or rope. • Nonmetallic hull vessels must be equipped with a radar reflector unless it is a vessel rigged with gear that can provide a radar signature at six miles.
Radar and Depth Sounding Devices **46 CFR 28.400**	• Vessels with 16 or more individuals that have had their keel laid or major conversion on or after September 15, 1991: • Each vessel must be fitted with a general marine radar system for surface navigation with a radar screen mounted at the operating station. • Each vessel must be fitted with a suitable echo depth sounding device.
Communications Requirements	
Communications Equipment **46 CFR 28.245,** **46 CFR 28.375,** **33 CFR 26.03,** **47 CFR 80**	• Each vessel must be equipped with VHF radiotelephone communication equipment operating within 156-162 Mhz band. • If a vessel is operating more than 20 miles from the coastline in waters near Alaska it must also be equipped with radiotelephone communication equipment operating within the 2-27.5 Mhz band. A cellular telephone or satellite communication system, servicing the area of vessel operation, is also acceptable to meet the requirements of this paragraph. • A radio transceiver installed on board before Sept. 15, 1991, operating on 4-20 Mhz band may continue to be used to meet the requirements for vessels operating more than 100 miles from the coastline in Alaskan waters. • All communications equipment must be operable from the vessel's operating station and must comply with FCC requirements including a Ship Radio Station License. • An emergency source of power, that is independent of the main power supply, outside of the main machinery space, and capable of providing power to communications equipment for at least 3 continuous hours.

Emergency Requirements	
Personal Flotation Devices (PFD) **46 CFR 28.105, 46 CFR 28.110,** **46 CFR 28.135, 46 CFR 28.140**	• CG approved immersion suit with 31 square inches of retroreflective tape on the front and back of each side. • Must have CG approved PFD light. • Must be marked with the name of the vessel, owner of device, or the individual to whom it is assigned.
Ring Buoy **46 CFR 28.115 & 46 CFR 28.135**	• Vessels less than 65 feet must have 1 orange Ring Life Buoy at least 24 inch in size, with 60 feet of line, and marked with name of vessel. • Vessels greater than 65 feet must have 3 orange Ring Life Buoys at least 24 inch size with 90 feet of line. Marked with the name of the vessel.
Safety Protection Device (SPD)	• Vessels less than 65 feet must have a whistle that is audible for 1/ 2 minute. • Vessels over than 65 feet must have a whistle that is audible for 1 minute.
Survival Craft **46 CFR Tables 28.120 (a)**	• Between shore & 12 miles off coastline - inflatable buoyant apparatus. • Between 12-20 miles off coastline - inflatable liferaft. • Between 20-50 miles off coast line - inflatable liferaft with SOLAS B pack. • Beyond 50 miles off coastline - inflatable liferaft with SOLAS A pack.
Stowage of Survival Craft **46 CFR 28.125**	• Each inflatable liferaft that is required to be equipped with a SOLAS A or B equipment pack automatically inflate if the vessel sinks. • Each inflatable liferaft must be kept readily accessible for launching or be stowed so they will float free if the vessel sinks. • Each hydrostatic release unit in a float free arrangement must have a CG approved number starting with 160.062.

Launching of Survival Craft **46 CFR 28.310**	• Vessels with 16 or more individuals that have had their keel laid or major conversion on or after September 15, 1991: • A gate or other opening must be provided in deck rails, lifelines, or bulwarks adjacent to the stowage location of each survival craft which weighs more than 110 pounds, to allow the survival craft to be manually launched.
Embark Stations **46 CFR 28.395**	• Vessels with 16 or more individuals that have had their keel laid or major conversion on or after September 15, 1991: • Each vessel must have at least one designated survival craft embark station (more if necessary) that is readily accessible from each accommodation space and work space. • Each embark station must be arranged to allow the safe boarding of survival craft.
Means of Escape **46 CFR 28.390**	• Vessels with 16 or more individuals that have had their keel laid or major conversion on or after September 15, 1991: • Each space used by an individual on a regular basis or which is generally accessible to an individual must have at least two widely separated means of escape. At least one of the means of escape must be independent of water tight doors. Means of escape include normal exits and emergency exits, passageways, stairways, ladders, deck scuttles and windows.
Visual Distress Signals **46 CFR 28.145**	• Vessels operating more than 3 miles from shoreline are required to carry 3 parachute flares, 6 hand flares, and 3 smoke signals. • Vessels operating within 3 miles of the coastline are required to carry night and day visual distress signals. Night signals can be one electric distress light or 3 CG approved flares. Day signals can be either one distress flag or 3 CG approved smoke signals.
EPIRB **46 CFR 28.150 & 46 CFR 25.26**	• Vessels operating beyond coastal waters are required to have an FCC type accepted category 1, float-free, automatically activated, 406 Mhz EPIRB. • Must be marked with vessel name and type II retroreflective material (46 CFR 28.135).

General Alarm **46 CFR 28.240**	• A general alarm system suitable for notifying individuals on board is required with a contact marker at the operating station. The general alarm must be capable of notifying individuals in any accommodation or work space. Under certain circumstances (defined at CFR 28.240) a public address system that is audible in all work spaces meets may meet regulatory requirements. • In noisy work spaces a flashing red light is required. • The general alarm system must be tested prior to getting underway and at least once each week while underway.
Emergency Instructions **46 CFR 28.265**	• As applicable, emergency instructions are required for: survival craft embarkation stations and personnel assignments; fire, emergency, and abandon ship signals; immersion suit location and donning information; procedures for making distress calls; list of each individual's emergency and specially established procedures. Specific details and posting requirements are found at 46 CFR 28.265.

Instruction, Drills, and Safety Orientation **46 CFR 28.270, 46 CFR 28.275**	• At least once a month the master must ensure that drills are conducted and instructions are given to each person on board. • No individual may conduct the drills or provide the instructions required by this section unless that individual has been trained in the proper procedures for conducting the activity. An individual licensed for operation of inspected vessels of 100 gross tons or more needs to comply with the requirements in 46 CFR 28.275. • Drills and instructions are to include: abandoning the vessel, fire fighting, man overboard recovery, stabilizing vessel after unintentional flooding, launching survival craft, and recovery of life and rescue boats, donning immersion suits, PFD's, fireman's outfits and breathing apparatus, radio and visual distress calls and signals, activating the general alarm and reporting of inoperative alarms and fire detection systems. • Viewing of videotapes followed by discussion led by a person familiar with the subjects can be used for instruction requirements but not as a substitution for drills. • The master must ensure that all individuals who have not received the above instruction or participated in the drills receive a safety orientation before the vessel may be operated. This safety orientation must explain the emergency instructions required by 46 CFR 28.265 and cover the specially established procedures. listed above.
High Water Alarms **46 CFR 28.250**	• Alarms are to be both visual and audible and installed at the operating station. • Alarms are to indicate high water in each of the following normally unmanned areas: a space with a through-hull fitting below the deepest load water line, a machinery space bilge, bilge well, shaft alley bilge, or other space subject to flooding from sea water piping within the space, a space with a non-watertight closure such as a space with a non-water tight hatch on the main deck.

Bilge Systems **46 CFR 28.255**	• All vessels must be equipped with a bilge pump capable of draining any watertight compartment, other than tanks and small buoyancy compartments, under all service conditions. • If portable bilge is used to meet this requirement, a suitable suction hose and discharge hose must be provided that will reach the bilges of all watertight compartments it must serve and ensure overboard discharge. The portable pump must be capable of dewatering each space at a rate of at least 2 inches of water depth per minute.
Casualties and Injuries **46 CFR 28.080, 46 CFR 28.090**	• If any of the following incidence occur, the master or other vessel representative must as soon as possible, contact the nearest USCG Marine Safety Office and submit written report CG-2692 within five days: • groundings, • loss of main propulsion or primary steering, • loss of life, • injury which requires professional medical treatment beyond first aid and render the victim unfit to perform vessel duties, • any damage over $25,000, any occurrence affecting the sea-worthiness of the vessel such as; fire, flooding, or the failure or damage to fixed fire extinguishing systems, lifesaving equip-ment, auxiliary power generating equipment or bilge pumping systems.
Injury Placard **46 CFR 28.165**	• A placard at least 5"x 7" stating the requirements of reporting injuries to vessel operator or agent as defined by US law, 46 U.S.C. 10603 must be posted in prominent place.

First aid Equipment and Training, **46 CFR 28.210**	• Each vessel must have on board a first aid manual and medicine chest of a suitable size in a readily accessible location. • Vessel with more than 2 individuals must have at least 1 individual certified in first aid and at least 1 individual certified in CPR or 1 individual certified in both. • Vessels with more than 16 individuals on board must have at least 2 individuals certified in first aid and at least 2 individuals certified in CPR. Individuals certified in both may be counted against both requirements. • Vessels with more than 49 individuals on board must have at least 4 individuals certified in first aid and at least 4 individuals certified in CPR. Individuals certified in both may be counted against both requirements.
Fire Control Requirements	
Fire extinguishers **46 CFR 28.155 & 46 CFR 28.160 & 46 CFR 25.30**	• Vessels over 65' are required to have approved USCG approved fire extinguishers in each of the following locations: Pilot house, service spaces, galleys, paint lockers, accessible baggage and storage rooms, workshops and similar spaces, engine room, auxiliary engine room, auxiliary spaces, and generator spaces. • **NOTE:** Specifics on the type of extinguishers, number per location, and legal description of spaces where extinguishers are required can be found at 46 CFR 28.155 & 46 CFR 28.160 & 46 CFR 25.30.

Fire Pumps, Fire Mains, Fire Hydrants, and Fire Hoses. **46 CFR 28.316**	• Vessels with 16 or more individuals that have had their keel laid or major conversion on or after September 15, 1991: • Vessels >36' must be equipped with a self-priming, power driven fire pump connected to a fixed piping system. • Specific requirements regarding locations and specifications for fire mains, fire hydrants, and fire hoses can be found at 46 CFR 28.316.
Fireman's Outfits and **Self-contained Breathing Apparatus** **46 CFR 28.205**	• Vessels equipped with refrigeration units using ammonia must be equipped with at least 2 self-contained breathing apparatus with spare air bottles for each. • If the vessel has more than 49 individuals on board, at least 2 firemen's outfits, stowed in widely separated locations, are required. A fireman's outfit consists of one pressure demand open circuit MSHA/NIOSH approved self-contained breathing apparatus with a 30 minute air supply and a full face piece, one lifeline with a belt or suitable harness, one flashlight, a rigid helmet, boots, gloves, protective clothing, one fire axe, and a spare air bottle.
Miscellaneous Requirements	
Guards for Exposed Hazards 46 CFR 28.215	• Suitable hand covers, guards,or railings must be installed in way of machinery that can cause injury to personnel, such as gearing, chain or belt drives, and rotating shafting. This is not meant to restrict necessary access to the fishing equipment such as winches, drums, or gurdies. • Internal combustion engine exhaust pipes within reach of personnel must be insulated or otherwise guarded to prevent burns.
Watertight and Weathertight integrity **46 CFR 28.560**	• Each opening in a deck or a bulkhead that is exposed to weather must be fitted with a weathertight or watertight closure devise.
Pollution Prevention **33 CFR 151, 33 CFR 155**	• Vessels are required to post oil pollution and garbage placards, and to have a written solid waste management plan that describes procedures for collecting, processing, storing, and discharging garbage, and designated person in charge of carrying out the plan. Restrictions on dumping can be found at 33 CFR 151, 33 CFR 155.

Sexual Abuse Act of 1986 **46 CFR U.S.C. 10104**	• It is then the responsibility of the master to report to the USCG any complaints of sexual offenses including aggravated sexual abuse, sexual abuse, sexual abuse of a minor or ward, and sexual contact per 46 CFR U.S.C. 10104.

THE OBSERVER ROLE IN REGULATORY COMPLIANCE

In this section, you should learn:

- how federal fisheries regulations are enacted,
- what to do if you suspect a violation,
- how to document compliance onboard your vessel, and
- what to do if the Coast Guard boards your vessel.

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Overview of Federal Groundfish Regulations

Federal fisheries regulations in the Bering Sea and Gulf of Alaska are developed by the North Pacific Fisheries Management Council (Council), approved by the U.S. Department of Commerce and administered by the National Marine Fisheries Service. The authority for the Council to develop fishing regulations comes from the Magnuson-Stevens Fishery Conservation and Management Act, originally passed in 1976 and reauthorized in 1996. The fishing industry is also required to meet regulations authorized by the Marine Mammal Protection Act and the Endangered Species Act.

Groundfish regulations in the Bering Sea and Gulf of Alaska are designed to conserve groundfish stocks and to protect established halibut, herring, crab and salmon fisheries. Regulatory tools used to manage the fisheries include: fishing area designations, fishing seasons, gear limits, catch quotas and bycatch quotas.

These regulations are enforced by the National Marine Fisheries Service Enforcement Division and the U.S. Coast Guard with assistance from cooperating state troopers and other federal agents. The NMFS Office of Enforcement is a unit of the Alaska Regional Office of NMFS, located in Juneau, Alaska.

Role of the Observer

The Observer 's role in monitoring the compliance of fisheries regulations is quite different from the role of a NMFS enforcement agent. Observers are not enforcement agents and are not empowered to issue citations or take any other enforcement action. It is not your job to advise the crew of regulations, interpret regulations or assure that the crew complies with regulations. As an Observer, you are only responsible for monitoring the activities aboard your assigned vessels and documenting all potential violations in your logbook.

The regulation summary, combined with your training, should give you enough information to identify potential violations, advise the skipper of a problem and adequately document the circumstances.

The following regulations are relevant to your work as an Observer:

Commercial fishing regulations for the Bering Sea/Aleutian Island area and the Gulf of Alaska (page 19-8).

These regulations include restrictions on seasons, areas, and gear; permit

and reporting requirements; regulations concerning special programs such a CDQ, IR/IU, VIP, salmon retention and prohibited species handling.

They also include requirements for the safety and accommodation of Observers. See "Federal Requirements for Commercial Fishing Industry Vessels greater than 60 ft." on page 18-20 for more information on safety regulations.

Observers must:

- be boarding a safe vessel,
- receive accommodations similar to the officers on board,
- receive assistance from crew members when necessary to complete duties,
- have unrestricted access to the catch and to all parts of the vessel,
- have unrestricted access to the vessel's logbooks,
- have unrestricted access to the vessel's communication equipment,
- not have their duties restricted or interfered with,
- must not be subject to assault or harassment.

Regulations concerning interactions between marine mammals and the groundfish fleet refer to "Marine Mammal Regulations" on page 19-30.

Marine pollution regulations refer to "Marine Pollution (Marpol) Regulations" on page 19-35.

Regulations related to protected and endangered species, refer to "BIRD SIGHTINGS AND INTERACTIONS," page 13-1 and "MARINE MAMMAL SIGHTINGS AND INTERACTIONS," page 12-1

Some Observers misinterpret their role in fisheries enforcement. Some exceed their assigned duties; others have a lackadaisical attitude about enforcement. Either of these patterns of behavior may place your certification in jeopardy.

Steps to Take if You Suspect a Violation

Common sense and good judgment should prevail if you suspect that a violation has occurred on your vessel or at your plant. Your role is straightforward: observe, advise and document. The actions you take depend upon the type of suspected violation, the circumstances under which it occurred, and the actions and attitudes of vessel or plant personnel. Investigation and documentation of a suspected violation should be done openly as part of your routine duties.

Observe
Observation is your first role in documenting possible compliance problems. There are obvious violations, such as crew members presorting halibut or discarding plastic bags overboard. Other suspected violations may not be so black and white. You may need to double check your measurements, calculations, and methods, check scale calibrations, logbook entries and production figures. Ask the skipper, plant manager, or other personnel to clarify any questions you have. By asking questions you may be able to determine that no violation has occurred. You can contact Observer Program staff or NMFS Enforcement personnel to see if a particular action would be considered a violation.

Advise
If you feel that a violation has occurred, bring it to the attention of the violator and notify the vessel's skipper or the plant manager. If you do not, preventable violations are likely to repeat themselves. Effective communication with the skipper/ plant manager requires a sound knowledge of the regulations and fair measure of good judgment and tact. Muster all the facts and approach the skipper or manager in a calm and reasonable manner.

The skipper/manager's response will shape how the violation eventually is handled. In many cases, the problem will be remedied immediately. If he or she ignores your statements and the violations continue, good documentation is required for NMFS Enforcement to deal with the problem. You are in the best position to advise NMFS on the circumstances of the violation and the apparent intent of the skipper/ manager.

If the problem continues, and interferes with your ability to do your job, contact the NMFS Observer Program in Seattle and your contractor either via phone or fax. They will contact the vessel and deal with the problem directly.

DocumentSuspected violations should be documented in your logbook under the Daily Notes section. Remember that your logbook may be used as evidence. Your documentation should be thorough and unemotional. All written comments should be in ink, and any events that are recorded should be in chronological order. Good documentation contributes to your credibility as a witness or author of an affidavit.

All logbook entries of suspected violations should contain the following basic elements:

Who: Identify the vessel or plant by name, permit number and vessel type.

- Identify the individuals involved by name, position (skipper, engineer, deckhand, etc.) and function or duties--especially if related to suspected violation.

- Identify who was notified and the nature of their reaction

What: Describe the events and circumstances in narrative form. Include:

- what made you suspicious,
- what you discovered in the investigative stage,
- what happened (or didn't happen) as a result of your talk.

- Use direct quotes whenever possible.

- Record each instance of a suspected violation.

When: Identify the exact or approximate time of the suspected violation - hour, day, month, year.

- Document the haul/set/delivery number where appropriate.

Where: Identify your vessel's position or the plant location at the time of the suspected violation, including: latitude/longitude and statistical reporting area.

If a vessel's exact position is not know, use the closest approximation from the last haul, noon position or compass direction and distance to the nearest point of land.

where on the vessel or at the plant the suspected violation occurred. Draw a diagram, where applicable identifying the area specifically.

Why: Try to determine why the suspected violation occurred. If you use your own conclusions or opinions, identify them as such. Try to be as objective as possible. Consider the following questions:

- Could it have been a careless mistake, such as a mathematical or transcription error in the logbook?

- Were there unusual circumstances beyond the control of vessel or plant personnel which may have played a factor? This might include severe weather conditions, mechanical breakdowns, or injuries.

If you feel the suspected violation was intentional, on whose orders or with whose knowledge do you feel it was done, and why? State why you feel it

was intentional, especially in cases of interference with Observers. Sometimes casual comments by crew members can give insight into the motive behind a suspected violation.

If the vessel or plant you are covering 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 important to make your entries factual and to avoid personal opinions. Do not use your logbook to "blow off steam". Statements such as "the skipper acts and dresses like a slob" are irrelevant as to whether a fisheries violation has been committed. If you are requested to write an affidavit your job will be much easier if you have taken the time to document as outlined above. If you have good documentation of a violation the case is more apt to be prosecuted.

In view of the importance of your logbook and other types of documentation, you should take special care to safeguard them against loss and tampering.

Observer Procedures During a Coast Guard Boarding

The Coast Guard makes periodic boardings of fishing vessels to inspect them for fisheries and safety violations. A NMFS Enforcement agent may also be present. If the Coast Guard boards your vessel, introduce yourself. After that, remain in the background and let the boarding party know where you can be found. Do not join in any discussions between boarding party members and vessel personnel. The Coast Guard or NMFS agent has certain objectives to accomplish in every boarding. If your assistance is needed, they will ask for it.

If the boarding party has questions or requests your assistance, be cooperative. Most Coast Guard officers are not biologists and you may be of assistance in identifying species of fish and invertebrates in bins, processing areas or freezer holds.

Make sure your logbook and paperwork are in order in case the boarding party wishes to inspect them. Avoid giving anyone your original forms or your logbook to keep if possible. Make copies as needed. If your vessel has no copy machine ask if copies can be made on board the Coast Guard vessel. If this is not a possibility, at least make handwritten copies.

If you have information on suspected or actual violations, or other problems, you may or may not wish to relay them to the boarding party. Use your judgement to decide if a potential violation would best be reported to the boarding party or saved for debriefing. If a vessel is issued a ticket immediately based on your report, you may be in an awkward

position after the Coast Guard leaves. The Coast Guard is aware that Observers may or may not choose to advise them of witnessed violations dependent on the situation.

If you have no information for the boarding party but someone in the boarding party wishes to question you, find a private location for your conversation. On occasion, an uninformed boarding party member may ask you questions in front of vessel personnel. Should this happen, defer the questions until you can speak in private. If that doesn't work, ask if they will accept a written statement from you. If you are questioned in private, answer all questions completely and honestly. Your testimony is one part of the whole investigation.

Your role in a Coast Guard boarding is as a source of objective information for the boarding party. The boarding party will conduct their own inspections and investigations, and they may or may not require your assistance. You should cooperate fully, and not hamper the investigation.

Debriefing

If you have witnessed and documented a suspected violation, point it out to the NPGOP staff during debriefing. You may be asked to clarify your notes in your logbook, or to write an affidavit, a formal legal statement describing what you saw. Details for your affidavit come from the Daily Notes section of your logbook.

If you submit an affidavit, it will be read by a NMFS Enforcement agent, who may contact you directly. Try and leave a the NPGOP staff with a good phone number to reach you. Your responsibility as a groundfish Observer regarding suspected violations may require a simple phone call with NMFS Enforcement, but could result in a court appearance, if a violation is prosecuted. You are required to cooperate with NMFS Enforcement while this process is underway.

Not all affidavits submitted by Observers result in prosecution of a fishing company. NMFS Enforcement is limited in it's resources. Often, NMFS Enforcement will send a certified letter to a fishing company informing them of the reported violation and that future problems may develop into an enforcement action. Minor violations are dealt with by a Summary Settlement System which can levy a fine of up to $5,000 on a vessel. This form of response to a violation does not have to go through the court system, it is similar to a traffic ticket. More serious violations can end up in court.

Federal Groundfish Observers themselves are not exempt from regulations.

Observers who falsify data or purposely overlook violations by the vessel can be charged both under civil and criminal law, as well as face decertification. Observer data is "front-line" information essential to conservation of the fisheries. False data reports is dealt with seriously by NMFS Enforcement and the NPGOP.

At the very least, your information about a potential fishing violation is read and added to a database that may establish a pattern of behavior and eventually result in prosecution. However, without complete, objective documentation of a suspected violation, NMFS enforcement has no background to pursue an investigation. Your detailed notes are the best source of the facts of the incident and the intent behind it.

Observer Program's Partial Summary Of Federal Groundfish Fishing Regulations For The U.S. EEZ Off Alaska.

Introduction

This summary of regulations is intended to provide Observers with a working knowledge of regulations as they apply to groundfish Observer duties. Regulations presented in the Code of Federal Regulations (50 CFR 600 and 679) which implement the Fisheries Management Plans (FMP) for the Gulf of Alaska, and the Bering Sea and Aleutian Islands areas have been simplified and reorganized for Observer convenience. This is not a complete summary, nor is it quoted verbatim from federal law. For additional information on these regulations and information of recent changes contact the National Marine Fisheries Service (NMFS) offices

In many cases, copies of the various CFR's are available in local libraries, and State or Federal Court Buildings. Supplementary changes to regulations will be available at offices of the National Marine Fisheries Service. Substantive supplementary changes to groundfish, marine mammal, safety, and marine pollution regulations will be published in the Federal Register. Current information on news releases, fishery closures, restricted area maps and regulations may also be obtained through the Alaska Regional Office. To aid the public in accessing this information, the Alaska Regional Office provides public access at the following INTERNET address, http://www.fakr.noaa.gov. To further assist fishermen, the National Marine Fisheries Service prints reference manuals on Recordkeeping and Reporting Requirements for Groundfish fisheries in Alaska.

This summary does not supersede, amend, or detract from federal regulations or law as printed in the Federal Register or the Code of Federal Regulations. This summary does not, nor is it intended to create any rights,

- substantive or procedural--enforceable at law by any party in any matter, civil or criminal -- and it may not be relied on for any such purpose.

This Summary Is For General Informational Purposes Only.

Scope of Regulations - §679.1

This summary contains fishing regulations implementing the FMP's for the federal groundfish fisheries of the Gulf of Alaska and Bering Sea and Aleutian Islands areas. These regulations are codified in Title 50 of the Code of Federal Regulations, Part 679 and in Title 16 of the United States Code Annotated, Chapter 38. This summary does not address U.S. commercial fishing for halibut, salmon, king and Tanner crab with the exception of incidental bycatch while fishing for groundfish. It also does not cover commercial fishing for scallops. Regulations governing halibut fishing are codified in 50 CFR, Part 301. Federal regulations governing salmon fishing are codified in 50 CFR, Parts 210 and 674. Commercial groundfish fishing within Alaska State waters (0-3 nautical miles offshore) and internal waters of the State of Alaska is managed by the Alaska Department of Fish and Game. Regulations governing such fisheries can be obtained from the Alaska Department of Fish and Game.

General Prohibitions - §600.725, §679.7

It is unlawful for any person to:

- Fail to submit to a USCG safety examination when required by NMFS pursuant to Sec. 600.746.
- Fail to display a Commercial Fishing Vessel Safety Examination decal or a valid certificate of compliance or inspection pursuant to Sec. 600.746.
- Fail to provide to an observer, a NMFS employee, or a designated observer provider information that has been requested pursuant to Sec. 600.746, or fail to allow an observer, a NMFS employee, or a designated observer provider to inspect any item described at Sec. 600.746.
- Forcibly assault, resist, impede, intimidate, or interfere with an observer.
- Interfere with or bias the sampling procedure employed by an observer, including physical, mechanical, or other sorting or discarding of catch before sampling.

- 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.

- 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.

- Harass an observer by conduct that 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.

- Require, pressure, coerce, or threaten an observer to perform duties normally performed by crew members, including but not limited to, cooking, washing dishes, standing watch, vessel maintenance, assisting with the setting or retrieval of gear, or any duties associated with the processing of fish, from sorting the catch to the storage of the finished product.

Conduct any fishing contrary to a notice of inseason adjustment. These include:

  - Closure, extension, or opening of a fishery
  - Closures of statistical areas or portions of statistical areas
  - Modification of allowable gear
  - Adjustment of Total Allowable Catch and Prohibited Species Limits (caps)
- Exceed the bycatch rate standard for red king crab or halibut as specified by the Program to Reduce Prohibited Species, also called the Vessel Incentive Program.

- Deploy trawl, longline, single pot and line, or jig gear where directed fishing for, or retention of groundfish by vessels using that gear is prohibited.

- Operate a vessel in more than one "inshore component" category. These categories include:

  - All shoreside processor operations
  - All processing vessels that average less than 18mt per week of processed GOA cod and pollock, and are less than 125 feet.
  - All processor vessels that process at a single geographic location during a year.
- Operate a vessel in both the "inshore " and "offshore component" of

a BSAI or GOA directed pollock fishery during the same fishing year.

- Operate a vessel in both he "inshore " and "offshore component" of a GOA directed Pacific cod fishery during the same fishing year.

- Use a vessel for which a BSAI or GOA groundfish permit was issued to catch, process, or possess fish that were caught in the Donut Hole during the fishing year for which the permit was issued.

- Use a vessel to fish with trawl gear in areas of BSAI Zone 1 that are closed to trawl gear unless NMFS authorizes this after consultation with the Council.

- Use a vessel to fish with trawl gear in areas of BSAI Zone 1 that are closed to trawl gear without fully complying with a scientific data collection and monitoring program.

- With respect to halibut caught while using hook-and-line gear to fish for groundfish, the following actions are prohibited:

  - Fail to release the halibut outboard a vessel's rails;
  - Release the halibut by any means other than one of the following careful release methods:
  - Cutting the gangion;
  - Positioning the gaff on the hook and twisting the hook from the halibut;
  - Straightening the hook by using the gaff to catch the bend of the hook and bracing the gaff against the vessel or any gear attached to the vessel;
  - Puncture the halibut with a gaff or other device; or
  - Allow the halibut to contact the vessel, if such contact causes, or is capable of causing, the halibut to be stripped from the hook.

- Have on board, at any particular time, 20 or more crab of any species which have a width of more than 1.5 inches (38 millimeters) at the widest dimension, caught with trawl gear during the following situations:

  - BSAI - When directed fishing for pollock with nonpelagic trawl gear is prohibited.
  - GOA - When directed fishing for groundfish, except by vessels using pelagic trawl gear for pollock, is prohibited.

- Discard any salmon taken incidental in a BSAI or GOA directed groundfish fishery by vessels using trawl gear until notified by a NMFS-certified observer that the number of salmon has been

determined and the collection of any scientific data or biological samples has been completed. This regulation is known as Salmon Retention.

Enforcement - §600.7 §600.8

Groundfish regulations may be enforced by authorized officers of the United States Coast Guard, Special Agents of the National Marine Fisheries Service, deputized officers of the Alaska Department of Public Safety, Fish & Wildlife Protection Division, or the Alaska Department of Fish & Game. The operator of, or any other person aboard a fishing vessel must comply with instructions and signals issued by an authorized officer to stop the vessel and to facilitate safe boarding and inspection of the vessel, its gear, equipment, fishing records, and catch. Please note that groundfish observers are not authorized enforcement officers.

Observer Health and Safety §600.746

An observer is not required to board, or stay aboard, a vessel that is unsafe or inadequate as described in this section.

- A vessel is inadequate or unsafe for purposes of carrying an observer and allowing operation of normal observer functions if it does not comply with the applicable regulations regarding observer accommodations or if it has not passed a USCG safety examination or inspection.

A vessel that has passed a USCG safety examination or inspection must display one of the following:

  - A current Commercial Fishing Vessel Safety Examination decal, issued within the last 2 years
  - A certificate of compliance issued pursuant to 46 CFR 28.710; or
  - A valid certificate of inspection pursuant to 46 U.S.C. 3311.

- Upon request by an observer, a NMFS employee, or a designated observer provider, a vessel owner/operator must provide correct information concerning any item relating to any safety or accommodation requirement prescribed by law or regulation. A vessel owner or operator must also allow an observer, a NMFS employee, or a designated observer provider to visually examine any such item.

Pre-trip safety check. Prior to each observed trip, the observer is

encouraged to briefly walk through the vessel's major spaces to ensure that no obviously hazardous conditions exist. In addition, the observer is encouraged to spot check the following major items for compliance with applicable USCG regulations: Personal flotation devices/immersion suits, ring buoys, distress signals, fire extinguishing equipment, emergency position indicating radio beacon (EPIRB), survival craft.

Corrective measures. If a vessel is inadequate or unsafe for purposes of carrying an observer and allowing operation of normal observer functions, NMFS may require the vessel owner or operator either to:

- Submit to and pass a USCG safety examination or inspection; or
- Correct the deficiency that is rendering the vessel inadequate or unsafe before the vessel is boarded by the observer.

The requirements of this section apply both at the time of the observer's boarding, at all times the observer is aboard, and at the time the observer is disembarking from the vessel.

- A vessel that would otherwise be required to carry an observer, but is inadequate or unsafe for purposes of carrying an observer and for allowing operation of normal observer functions, is prohibited from fishing without observer coverage.

Prohibited Species - §679.21

Retention of prohibited species is unlawful unless authorized by other applicable law, including the regulations of the International Pacific Halibut Commission.

Prohibited species include:

- Pacific salmon (All species.)
- steelhead trout
- halibut
- Pacific herring
- Tanner crab (All species)
- King crab (All species)
- 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 operator of each vessel must sort its catch as soon as possible after retrieval of the gear and return all prohibited species or part thereof to the sea immediately with a minimum of injury regardless of its condition, after

allowing sampling by an observer. Observer sampling includes when salmon are to be retained for counting and the collection of biological data. It shall be presumed that any prohibited species found on board a vessel subject to these regulations was caught and retained in violation of these regulations.

Salmon Retention Regulations - §679.21(C)

- The operator of a vessel and the manager of a shoreside processing operation in a directed BSAI groundfish fishery by vessels using trawl gear must not discard any incidentally taken salmon until the salmon has been enumerated by a NMFS-certified observer, and the collection of any scientific data or biological samples from the salmon has been completed. Exceptions to this regulation include mothership processing vessels and shoreside processing plants that are exempt from obtaining observer coverage.

- Operators of vessels carrying observers onboard and whose fishing operations allow for sorting of groundfish catch for salmon must retain all salmon bycatch from each haul in a separate bin or other location that allows an observer free and unobstructed physical access to the salmon to count each fish and collect any scientific data or biological samples. Salmon from different hauls must be retained separately in a manner that identifies the haul from which the salmon were taken.

- Operators of vessels not carrying observers onboard or whose fishing operations do not allow for sorting of groundfish catch for salmon must ice, freeze, or store in a refrigerated saltwater tank all salmon taken as bycatch in trawl operations for delivery to the processor receiving the vessel's groundfish catch.

- Processors receiving groundfish harvested in a directed fishery for groundfish using trawl gear must retain all salmon delivered by each trawl vessel during a weekly reporting period in separate bins marked with the vessel's name and ADF&G fish ticket number(s) for each delivery until a NMFS-certified observer has counted each salmon and collected any scientific data or biological samples from the salmon delivered to the processor by that vessel. Processors without an observer present must store whole salmon in an iced or frozen state until an observer is available to count each fish. Salmon must be stored at a location that allows an observer free and unobstructed physical access to each salmon.

Mothership processor vessels and shoreside processing facilities that are exempt from obtaining observer coverage during a month under § 679.50(c) are exempt from mandatory retention of salmon under this paragraph.

- Operators of vessels and managers of shoreside processing operations that are required to retain salmon must designate and identify to the NMFS-certified observer onboard the vessel or at the shoreside operation a crew person or employee to be responsible for sorting, retention, and storage of salmon consistent with this paragraph. Upon the request of the NMFS-certified observer, the designated crew person or employee also is responsible for counting salmon and taking biological samples from retained salmon under the direction of the observer.

- Salmon must be returned to Federal waters as soon as is practicable, with a minimum of injury, regardless of condition, following notice by a NMFS-certified observer that the number of salmon has been determined and the collection of any scientific data or biological samples has been completed.

Improved Retention/Improved Utilization §679.27

(a) The owner or operator of a vessel must comply with the IR/IU program set out in this section while fishing for groundfish in the GOA or BSAI, fishing for groundfish in waters of the State of Alaska that are shoreward of the GOA or BSAI, or when processing groundfish harvested in the GOA or BSAI.

(b) Pollock and Pacific cod are defined as "IR/IU species" for the purposes of this section. Other species are also defined: Rock sole and yellowfin sole in the BSAI (beginning January 1, 2003); Shallow-water flatfish species complex in the GOA (beginning January 1, 2003).

(c)Minimum retention requirements

To retain on board means to be in possession of on board a vessel.

(i) For catcher vessels (any gear type):

- If directed fishing for an IR/IU species is open, you must retain on board all fish of that species brought on board the vessel until lawful transfer.
- If directed fishing for an IR/IU species is prohibited, you must retain on board all fish of that species brought on board the ves-

sel up to the MRB (maximum retainable bycatch) amount for that species until lawful transfer
- If retention of an IR/IU species is prohibited you must retain on board no fish of that species until lawful transfer.

(ii) Catcher/processors and (iii) motherships

- If directed fishing for an IR/IU species is open, you must retain on board a primary product from all fish of that species brought on board the vessel until lawful transfer.
- If directed fishing for an IR/IU species is prohibited, you must retain on board a primary product from all fish of that species brought on board the vessel up to the point that the round-weight equivalent of primary products on board equals the MRB amount for that species until lawful transfer.
- If retention of an IR/IU species is prohibited, you must retain on board no fish or product of that species until lawful transfer.

(d) Any action intended to discard or release an IR/IU species prior to being brought on board the vessel is prohibited. This includes, but is not limited to bleeding codends and shaking or otherwise removing fish from longline gear.

(e) Any product from an IR/IU species may not be discarded at sea, unless such discarding is necessary to meet other requirements of this part.

(f) The retention requirements of this section apply to all IR/IU species brought on board a vessel, whether harvested by that vessel or transferred from another vessel. At-sea discard of IR/IU species or products that were transferred from another vessel is prohibited.

(g) IR/IU species may be used as bait provided that the deployed bait is physically secured to authorized fishing gear. Dumping of unsecured IR/IU species as bait (chumming) is prohibited.

(h) The retention and utilization requirements of this section do not apply to incidental catch of dead or decomposing fish or fish parts that were previously caught and discarded at sea.

(i) Minimum Utilization

If you own or operate a catcher/processor or mothership, the minimum utilization requirement for an IR/IU species harvested in the BSAI is determined by the directed fishing status for that species according to the following:

(1) If directed fishing for an IR/IU species is open, then your total weight of retained or lawfully transferred products produced from your catch or receipt of that IR/IU species during a fishing trip must equal or exceed 15 percent of the round-weight catch or round-weight delivery of that species during the fishing trip.

(2) If directed fishing for an IR/IU species is prohibited, then your total weight of retained or lawfully transferred products produced from your catch or receipt of that IR/IU species during a fishing trip must equal or exceed 15 percent of the round-weight catch or round-weight delivery of that species during the fishing trip or 15 percent of the MRB amount for that species, whichever is lower.

(3) If retention of an IR/IU species is prohibited, then your total weight of retained or lawfully transferred products produced from your catch or receipt of that IR/IU species during a fishing trip must equal zero.

Groundfish Observer Program - §679.50

Vessel Responsibilities

An operator of a vessel required to carry one or more observers must:

(i) Accommodations and food.

Provide at no cost to observers or the United States, accommodations and food on the vessel for the observer(s) that are equivalent to those provided for officers, engineers, foremen, deck-bosses or other management level personnel of the vessel.

(ii) Safe conditions.

Maintain safe conditions on the vessel for the protection of the observers including adherence to all U.S. Coast Guard and other applicable rules, regulations, or statutes pertaining to safe operation of the vessel.

Have on board:

(1) A valid Commercial Fishing Vessel Safety Decal issued within the past 2 years that certifies compliance with regulations found in 33 CFR Chapter I and 46 CFR Chapter I; or
(2) A certificate of compliance issued pursuant to 46 CFR 28.710; or
(3) A valid certificate of inspection pursuant to 46 U.S.C. 3311.

(iii) Transmission of data.

Facilitate transmission of observer data by:

- Allowing observers to use the vessel's communication equipment and personnel, on request for entry, transmission, and receipt of work-related messages, at no cost to the observers or the United States.

- Ensuring that each mothership that is required to have a second observer aboard, is equipped with INMARSAT Standard A satellite communication capabilities and cc:Mail remote. The operator of each mothership shall also make available for the observer's use the following equipment compatible therewith and having the ability to operate the NMFS-supplied data entry software program: A personal computer with 486 or greater capacity processing chip, a DOS 3.0, or a successor version of DOS with 10 megabytes free hard disk storage, and 8 megabytes RAM. The operator of the mothership is responsible for obtaining the NMFS-supplied data entry software and for ensuring that all software and hardware required for observers to enter and transmit data is fully functional and operational.

(iv) Vessel position.

- Allow observers access to, and the use of, the vessel's navigation equipment and personnel, on request, to determine the vessel's position.

(v) Access.

- Allow observers 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 that may be used to hold, process, weigh, or store fish or fish products at any time.

(vi) Prior notification.

- Notify observers at least 15 minutes before fish are brought on board, or fish and fish products are transferred from the vessel, to allow sampling the catch or observing the transfer, unless the observers specifically request not to be notified.

(vii) Records.

- Allow observers to inspect and copy the vessel's daily fishing logbook, daily cumulative production logbook, product transfer forms, and any other logbook or document required by regulations. Observers are also allowed to inspect and copy printouts or tallies of scale weights, scale calibration records, bin sensor readouts, and production records.

(viii) Assistance.

- Provide all other reasonable assistance to enable observers to carry out their duties, including, but not limited to, assisting observers in measuring decks, codends, and holding bins; providing the observers with a safe work area adjacent to the sampling collection site; when requested by observers, assisting in collecting bycatch, assisting in collecting and carrying baskets of fish; and allowing observers to determine the sex of fish when this procedure will not decrease the value of a significant portion of the catch.

(ix) Transfer at sea.

- 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 observers involved.

- Notify observers at least 3 hours before observers are transferred, such that the observer can collect personal belongings, equipment, and scientific papers.

- Provide a safe pilot ladder and conduct the transfer to ensure the safety of observers during transfers.

- Provide an experienced crew member to assist observers in the small boat or raft in which any transfer is made.

Shoreside Processor Responsibilities

The manager of the shoreside processor facility must:

(i) Safe conditions.

- Maintain safe conditions at the shoreside processing facility for the protection of observers by adhering to all applicable rules, regulations, or statutes pertaining to safe operation and maintenance of the processing facility.

(ii) Operations information.

- Notify the observers, as requested, of the planned facility operations and expected receipt of groundfish prior to the receipt of those fish.

(iii) Transmission of data.

- Allow observers to use the shoreside processor's communication equipment and personnel, on request, for the entry, transmission, and receipt of work-related messages, at no cost to the observers or the United States.

- Ensure that each shoreside processor that is required to have an additional observer, makes available to the observer the following equipment or equipment compatible therewith: A personal computer with a 486 or greater capacity processing chip with at least a 9600-baud modem and a telephone line. The personal computer must be equipped with a mouse, Windows version 3.1, or

a program having the ability to operate the NMFS-supplied data entry software program, 10 megabytes free hard disk storage, and 8 megabytes RAM. The manager of the shoreside processor is responsible for obtaining the NMFS-supplied data entry software and for ensuring that all software and hardware required for observers to enter and transmit data is fully functional and operational.

(iv) Access.

- Allow observers free and unobstructed access to the shoreside processor's holding bins, processing areas, freezer spaces, weight scales, warehouses, and any other space that may be used to hold, process, weigh, or store fish or fish products at any time.

(v) Document access.

- Allow observers to inspect and copy the shoreside processor's Daily Cumulative Production Logbook, transfer logbook, and any other logbook or document required by regulations; printouts or tallies of scale weights; scale calibration records; bin sensor readouts; and production records.

(vi) Assistance.

- Provide all other reasonable assistance to enable the observer to carry out his or her duties, including, but not limited to, assisting the observer in moving and weighing totes of fish, cooperating with product recovery tests, and providing a secure place to store baskets and sampling gear.

Contractor Responsibilities

Responsibilities and duties of observer contractors include but are not limited to the following:

(iv) Providing observer's salary, benefits and personnel services in a timely manner.

(v) Providing all logistics to place and maintain the observers aboard the fishing vessels or at the site of the processing facility. This includes all travel arrangements, lodging and per diem, and any other services required to place observers aboard vessels or at processing facilities.

Unless alternative arrangements are approved by the Observer Program Office:

- Observers must not be deployed on the same vessel or at the same shoreside processor for more than 90 days in a 12 month period.
- A deployment cannot exceed 90 days.
- A deployment cannot include assignments to more than four vessels and/or shoreside processors.

(vii) Maintaining communications with observers at sea and shoreside facilities. Each observer contractor must have an employee responsible for observer activities on call 24 hours a day to handle emergencies involving observers, or problems concerning observer logistics, whenever observers are at sea, stationed at shoreside facilities, in transit, or in port awaiting boarding.

(ix) Ensuring that observers complete mid-deployment data reviews when required.

(x) Ensuring that observers complete debriefing as soon as possible after the completion of their deployment and at locations specified by the Regional Director.

(xi) Ensuring all data, reports, and biological samples from observer deployments are complete and submitted to NMFS at the time of the debriefing interview.

(xii) Ensuring that all sampling and safety gear are returned to the Observer Program Office and that any gear and equipment lost or damaged by observers is replaced according to NMFS requirements.

(xiv) Providing the following to the Observer Program Office by electronic transmission (e-mail) or by fax.

- Copies of "certificates of insurance" that name the NMFS Observer Program Task Leader as a "certificate holder." The certificates of insurance shall verify the following coverage provisions and state that the insurance company will notify the certificate holder if insurance coverage is changed or cancelled:
- Maritime Liability to cover "seamen's" claims under the Merchant Marine Act (Jones Act) and General Maritime Law ($1 million minimum).

- Coverage under the U.S. Longshore and Harbor Worker's Compensation Act ($1 million minimum).

- States Workers' Compensation as required.

- Commercial General Liability with contractual endorsements optional.

Reports of observer harassment, concerns about vessel or processor safety, or observer performance problems must be submitted within 24 hours after the observer contractor becomes aware of the problem.

(ii) Observer contractors must assign observers without regard to any preference by representatives of vessels and shoreside facilities based on observer race, gender, age, religion, or sexual orientation.

General Prohibitions §679.7(G)

It is unlawful for any person to do any of the following:

- Forcibly assault, resist, oppose, impede, intimidate, sexually harass, bribe, or interfere with an observer.

- Interfere with or bias the sampling procedure employed by an observer, including physical, mechanical, or other sorting or discarding any catch before sampling.

- 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.

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

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

- Require, pressure, coerce, or threaten an observer to perform duties normally performed by crew members, including, but not limited to, cooking, washing dishes, standing watch, vessel maintenance, assisting with the setting or retrieval of gear, or any duties associated with the processing of fish, from sorting the catch to storage of the finished product.

- Fish for or process fish without observer coverage required under §679 Subpart E.

Gear Limitations - §679.24

Trawl Gear Definitions

NONPELAGIC TRAWL means a trawl other than a pelagic trawl.

PELAGIC TRAWL means a trawl that:

(1)Has no discs, bobbins, or rollers;

(2) Has no chafe protection gear attached to the foot rope or fishing line;

(3)Except for small mesh allowed under the following paragraphs of this definition;

(i) Has no mesh tied to the fishing line, headrope, and breast lines with less than 20 inches (50.8 cm) between knots, and has no stretched mesh size of less than 60 inches (152.4 cm) aft from all points on the fishing line, head rope, and breast lines and extending past the fishing circle for a distance equal to or greater than one-half the vessel's length overall (LOA); or

(ii) Has no parallel lines spaced closer than 64 inches (162.6 cm), from all points on the fishing line, headrope, and breast lines and extending aft to a section of mesh, with no stretched mesh size of less than 60 inches (152.4 cm), extending aft for a distance equal to or greater than one-half the vessel's LOA;

(4) Has no stretched mesh size less than 15 inches (38.1 cm) aft of the mesh described above for a distance equal to or greater than one-half the vessel's LOA;

(5) Contains no configuration intended to reduce the stretched mesh sizes described in paragraphs (3) and (4) of this definition;

(6) Has no flotation other than floats capable of providing up to 200 pounds (90.7 kg) of buoyancy to accommodate the use of a net-sounder

device; (note: floats on or in the codend are permitted.)

(7) Has no more than one fishing line and one foot rope for a total of no more than two weighted lines on the bottom of the trawl between the wing tip and the fishing circle;

(8) Has no metallic component except for connectors (e.g., hammerlocks or swivels) or a net-sounder device aft of the fishing circle and forward of any mesh greater than 5.5 inches (14.0 cm) stretched measure;

(9) May have small mesh within 32 feet (9.8 m) of the center of the headrope as needed for attaching instrumentation (e.g., net-sounder device); and

(10) May have weights on the wing tips.

BREAST LINE means the rope or wire running along the forward edges of the side panels of a net, or along the forward edge of the side rope in a rope trawl.

FISHING CIRCLE means the circumference of a trawl, intersecting the center point on the fishing line and perpendicular to the long axis of a trawl.

FISHING LINE means a length of chain or wire rope in the bottom front end of a trawl to which the webbing or lead ropes are attached .

FOOT ROPE means a chain or wire rope attached to the bottom front end of a trawl and attached to the fishing line.

HEADROPE means a rope bordering the top front end of a trawl.

Marking of Longline Gear

- All longline marker buoys carried aboard or used by any vessel regulated under this part shall be marked with the following:
- the vessel's name; and
- the vessel's Federal fisheries permit number; or
- the vessel's registration number.
- the required markings are to be in characters at least four inches high by one-half inch wide, in a contrasting color, and visible above the water line. These markings are to be maintained in good condition, so they are clearly visible.

Seabird Avoidance Gear and Methods For Longliners

Operators of hook-and-line vessels fishing for groundfish in the Bering Sea and Aleutian Islands management area (BSAI) and the Gulf of Alaska (GOA), and operators of hook-and-line vessels that are required to obtain a Federal permit and are fishing for groundfish in Alaskan waters adjacent to the BSAI and to the GOA, must comply with the following seabird avoidance measures. The operator of a vessel is not required to comply with the seabird avoidance measures whenever the round-weight equivalent of halibut retained on board exceeds the round-weight equivalent of groundfish retained on board.

Seabird Avoidance Measures:

(1) The operator of a vessel described above must conduct fishing operations in the following manner:

(i) Use hooks that when baited, sink as soon as they are put in the water.

(ii) Any discharge of offal from a vessel must occur in a manner that distracts seabirds, to the extent practicable, from baited hooks while gear is being set or hauled. The discharge site on board a vessel must either be aft of the hauling station or on the opposite side of the vessel from the hauling station.

(iii) Make every reasonable effort to ensure that birds brought on board alive are released alive and that wherever possible, hooks are removed without jeopardizing the life of the birds.

(iv) Employ one or more of the following seabird avoidance measures:

(A) Tow a streamer line or lines during deployment of gear to prevent birds from taking hooks;

(B) Tow a buoy, board, stick or other device during deployment of gear, at a distance appropriate to prevent birds from taking hooks. Multiple devices may be employed;

(C) Deploy hooks underwater through a lining tube at a depth sufficient to prevent birds from settling on hooks during deployment of gear; or

(D) Deploy gear only during the hours specified, using only the minimum vessel's lights necessary for safety. [note: table of hours omitted in this printing]

Groundfish Pots Requirements

- Each pot 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 of no larger size than No.30. Each pot used to fish for groundfish must also 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.

Program to Reduce Prohibited Species Bycatch Rates - §679.21

While participating in BSAI and GOA trawl fisheries, a vessel's bycatch rate at the end of a fishing month shall not exceed bycatch rate standards referenced in this section. This program which is also known as the Vessel Incentive Program is based on observed data. For the purposes of this program, observed data refers to data collected by observers who are certified under the NMFS Observer Program.

Bycatch rates for halibut and red King crab

- The bycatch rate for halibut is the ratio of the total round weight of halibut, in kilograms, to the total round weight, in metric tons, of allocated groundfish species.

- The bycatch rate for red king crab is the ratio of the number of red king crab to the total round weight, in metric tons, of allocated groundfish species.

Fishing Month

- Fishing month refers to a time period based on weekly reporting periods and is as follows: Each fishing month begins on the first day of the first weekly reporting period that has at least 4 days in the associated calendar month. Fishing month ends on the last day of the last weekly reporting period that has at least 4 days in that same calendar month. Dates of each fishing month are announced in the Federal Register.

Vessel Incentive Program Fisheries

Bycatch rate standards are set by fishery. Please note that these target

categories are unique to the Vessel Incentive Program. They are not necessarily consistent with targeting categories that are defined for directed fisheries or for prohibited species allocations.

Bering Sea and Aleutian Island Region

- Mid-water pollock
- Yellowfin sole
- Bottom pollock
- Other Trawl -- all other fishing with trawl gear that does not qualify as mid-water pollock, yellowfin sole, or bottom pollock.

Gulf of Alaska

- Mid-water pollock
- Other Trawl -- all other fishing with trawl gear that does not qualify as mid-water pollock.

Bycatch Rate Standards

Establishment of bycatch rate standards-- Prior to January 1 and July 1 of each year, the Regional Administrator will publish a notice in the Federal Register specifying bycatch rate standards for the fisheries identified above that will be in effect for specified seasons within the 6-month periods of January 1 through June 30 and July 1 through December 31, respectively. Bycatch rate standards will remain in effect until revised by a notice in the Federal Register. The Regional Administrator may adjust bycatch rate standards as frequently as he considers appropriate. Bycatch rate standards for a fishery and adjustments to such standards will be based on the following information and considerations:

- The previous year's average observed bycatch rates for that fishery;
- Immediately preceding season's average observed bycatch rates for that fishery;
- The bycatch allowances and associated fishery closures.
- Anticipated groundfish harvests for that fishery;
- Anticipated seasonal distribution of fishing effort for groundfish;

and

- Other information and criteria deemed relevant by the Regional Administrator.

Bycatch rate standards or adjustments to such standards specified under this section will not take effect until the Secretary has published the proposed bycatch rate standards or adjustments to such standards in the Federal Register for public comment for a period of 30 days unless the Secretary finds for good cause that such notice and public comment are impracticable, unnecessary, or contrary to the public interest.

Vessel Bycatch Rates

For the purposes of this program observed data collected for each haul sampled during a day will include the date, position (Federal reporting area) where trawl gear was retrieved, total round weight of groundfish (mt) sampled by species or species group, total round weight of halibut, in kilograms, and total numbers of red king crab that were in the portion of the haul that was sampled.

Observer Sampling Procedures

NMFS will randomly predetermine the hauls to be sampled by an observer during the time the observer is on a vessel.

An observer will:

- take samples at random from throughout the haul,
- take samples prior to sorting of the haul by crew for processing or discarding of the catch.
- sample a minimum of 100 kilograms of fish from each haul sampled.
- report to NMFS, on at least a weekly basis, the data for sampled hauls.
- allow the vessel operator to see all observed data that the observer submits to NMFS. Observed data was defined earlier for this section and is the CMA, CMB, 2US, and 3US data.

Bycatch Rate Calculations

At the end of each fishing month during which an observer sampled at least 50 percent of a vessel's total number of trawl hauls retrieved (as recorded in the vessel's daily logbook), the Regional Administrator will calculate the vessel's bycatch rate. This bycatch rate is based on observed data for each fishery (as described previously in this section) to which the vessel was assigned for any weekly reporting period during that fishing month. Only observed data that has been checked, verified, and analyzed by NMFS will be used to calculate vessel bycatch rates for purposes of this section.

The halibut bycatch rate of a vessel for a fishery during a fishing month is a ratio of halibut to groundfish that is calculated by using the total round weight of halibut, in kilograms (for red king crab or chinook salmon bycatch rate, the total number is used) in samples during all weekly reporting periods in which the vessel was assigned to that fishery and the total round weight of the groundfish in metric tons in samples taken during all such periods.

Compliance With Bycatch Rate Standards

- A vessel has exceeded a bycatch rate standard for a fishery if the vessel's bycatch rate for a fishing month exceeds the bycatch rate standard established for that fishery.

Marine Mammal Regulations

Prepared by Observer Program Staff, 1998

Regulations Concerning Taking of Marine Mammals (Excerpts taken from 50 CFR 216 and 229)

Definitions (§216.3)

Marine mammals means those specimens of the following orders, which are morphologically adapted to the marine environment, and whether alive or dead, and any parts thereof, including but not limited to, any raw dressed or dyed fur or skin: Cetacea (whales and porpoises), Pinnipedia (seals and sea lions), other than walrus.

Take means to harass, hunt, capture, collect, or kill, or attempt to harass, hunt, capture, collect, or kill, any marine mammal. This includes, without limitation, any of the following: The collection of dead animals, or parts thereof; the restraint or detention of a marine mammal, no matter how temporary; tagging a marine mammal; or the negligent or intentional operation of aircraft or vessel, feeding or attempting to feed a marine

mammal in the wild, or the doing of other negligent or intentional acts which result in the disturbing or molesting of a marine mammal.

Feeding is defined as "offering, giving, or attempting to give food or non-food items to marine mammals in the wild. It includes operating a vessel or providing other platforms from which feeding is conducted or supported. It does not include the routine discard of bycatch during fishing operations or the routine discharge of waste or fish byproducts from fish processing plants or other platforms if the discharge is otherwise legal and is incidental to operation of the activity."

Prohibited taking. (§216.11)

Except as noted below, it is unlawful for:

(1) Any person, vessel, or conveyance subject to the jurisdiction of United States to take any marine mammal on the high seas, and

(2) Any person, vessel, or conveyance to take any marine mammal in waters under the jurisdiction of United States.

Prohibited uses, possession, transportation, and sales (§216.13)

It is unlawful for:

(1) Any person to use any port, harbor, or other place under the jurisdiction of the United States for any purpose in any way connected with a prohibited taking or unlawful importation of any marine mammal or marine mammal product; or

(2) Any person subject to the jurisdiction of the United States to possess any marine mammal taken in violation of the Marine Mammal Act or these regulations, or to transport, sell, or offer for sale any such marine mammal or any marine mammal product made from any such mammal.

(3) Any person subject to the jurisdiction of the United States to use in a commercial fishery, any means or method of fishing in contravention of regulations and limitations issued by the Secretary of Commerce for that fishery to achieve the purposes of this Act.

Collection of certain marine mammal parts (§216.26)

(1) Any bones, teeth or ivory of any dead marine mammal may be collected from a beach or from land within _ of a mile of the ocean. The term ocean includes bays and estuaries. NOTE: walrus are managed by the State of Alaska and have management regulations that apply to the retention of their body parts. Observers often ask if they can keep walrus tusks that come up in the gear. Observers should not keep tusks or any other part of a walrus that are retrieved in commercial fishing gear.

(2) Marine mammal parts so collected may be retained if registered within 30 days with an agent of NMFS, or an agent of the Bureau of Sport Fisheries and Wildlife.

Prohibitions (§229.4)

Except as noted below, it is unlawful to take any marine mammal incidental to commercial fishing operations.

In addition, it is unlawful to (1) take any California sea otter; or (2) Intentionally lethally take any Steller sealion, any Alaskan sea otter, any cetacean, any depleted species (including the Pribilof Island population of Northern fur seal), or any endangered or threatened marine mammal. If the use of firearms or other means to deter marine mammals results in an injury or mortality of a marine mammal, the taking is presumed to be intentional lethal taking.

Marine Mammal Fishery Interaction Regulations

(§ 229 -This new regime replaces the Interim Exemption for Commercial Fisheries and is effective as of January 1, 1996. The following information is based on the proposed rule)

(1) Marine mammals killed during fishing operations which are readily accessible to crew members must be brought aboard the vessel for biological processing, if feasible and if requested by the observer. Marine mammals designated as biological specimens by the observer must be retained in cold storage aboard the vessel, if feasible, until retrieved by authorized personnel of NMFS.

(2) Any marine mammal incidentally taken must be immediately returned to the sea with a minimum of further injury and may only be retained if authorized by an observer, by condition of the Exemption Certificate, or by a scientific research permit that is in possession of the operator.

New Authorization Process:

Fishers participating in Category I fisheries would be required to register with NMFS and display a current decal. Annual registration fees may be charged for authorization issuance.

New Fishery Classification Criteria and Proposed List of Fisheries:

Commercial are classified according to their annual impact on marine mammal stocks, as defined by the number of serious injuries and mortalities relative to the stocks Potential Biological Removal (PBR). The status of all marine mammal stocks in U.S. waters, and each stock's serious injury and mortality rate relative to PBR, has been reviewed by NMFS biologists and other marine mammal scientists. A proposed list of fisheries has been developed, classifying fisheries according to the following criteria.

Category IA

commercial fishery that is, by itself, responsible for the annual removal of 50% or more of any stock's PBR (Potential Biological Removal).

Category IIA

commercial fishery that is, collectively with other fisheries, responsible for the annual removal of more than 10% of any marine mammal stock's PBR level and is by itself responsible for the annual removal of between 1% and 50% exclusively, of the PBR level for any stock.

Category IIIA

fishery that, collectively with other fisheries, is responsible for less than or equal to 10 percent of any marine mammal stock's PBR; or a fishery that, by itself, is responsible for less than or equal to 1 percent of that stock's PBR.

(Category II to Category III include Bering Sea and Aleutian Island groundfish trawl fisheries)

New Fishing Reporting Requirements:

- All fishers, regardless of category, would be required to submit a report to NMFS within 48 hours after the end of the fishing trip if they have incidentally injured or killed a marine mammal in the course of commercial fishing operations. Intentional lethal taking of marine mammals is prohibited, except if imminently necessary

in self defense or to save the life of another person in immediate danger. NMFS is developing easy-to-use computer scanning reports for use in reporting injuries and mortalities.

Regulations Concerning Steller Sea Lions(excerpts from §672.24 and §675.24)

New regulations now apply to all human activities, including commercial fishing, near Steller (northern) sea lions at-sea and near some of the islands where they breed.

(1)Shooting at or near any Steller sea lion for any reason is now prohibited in U.S. waters. Fishermen may still use other means which do not result in injury or death to the animal to deter sea lions from interfering with their gear.

(2)Fishing vessels are not permitted to enter within 3 nautical miles of Steller sealion rookery sites (locations where pups are born) west of 150° W longitude. Trawling cannot be conducted within 10 nautical miles of Steller sealion rookery sites during any part of the year. Trawling cannot be conducted with 20 nautical miles of the rookeries on Akun, Akutan, Sea Lion Rock, Ugamak Seguam, and Agligadak rookeries from January 20 to April 15.

This section does not prohibit a vessel in transit from passing through the following straits, narrows, or passageways, if the vessel proceeds in a continuous transit and maintains a minimum of 1 nautical mile from the rookery site. The listing of a strait, narrows or passageway does not indicate that the area is safe for navigation. The areas are as follows:

(2)Longline and pot vessels may fish within the 10 and 20 mile boundaries, but may not enter inside of three nautical miles. A table describing these rookeries is included on the next two pages. More detailed maps or additional clarification are available from the National Marine Fisheries Service in Juneau.

(3)The Secretary of Commerce is now empowered to place observers on any fishing vessel in order to monitor the accidental capture of sea lions in fishing gear. No more than 675 sea lions may be killed accidentally each year during fishing operations west of 141° W longitude.

(4)Violations of laws protecting Steller sea lions are subject to severe civil and criminal penalties including vessel forfeiture, fines of up to $25,000, and imprisonment for up to one year for

each violation.

These changes are due to the designation of the Steller sea lion as threatened throughout its range under the Endangered Species Act on April 5, 1990; and the designation of the western stock (west of 144°W) as endangered on June 4, 1997. These designations are based on declines of 63% since 1985 and 82% since 1960 in observed counts on certain Alaskan rookeries that are in the primary range of the species.

These closures are intended to further reduce any effects that groundfish trawling may have on the Steller sea lions, particularly to their foraging success. The 10 nautical mile closure is based on the average distance traveled by foraging female Steller sea lions during the summer reproductive period. Maintenance of the buffer zones in the non-breeding season is primarily intended to protect juvenile sea lions. Juvenile sea lions are likely to be the most susceptible to prey depletion, since they are less adept predators than adults. These young animals are also less likely to swim far from their rookery of birth, particularly during their first year. Thus, nearshore zones proximal to rookeries are likely to be important feeding areas throughout the year.

Marine Pollution (Marpol) Regulations

Prepared by Observer Program Staff 1995

The International Convention for the Prevention of Pollution From Ships (MARPOL) and five annexes are international agreements that were designed to halt at-sea disposal of wastes. MARPOL Annex V specifically prohibits the at-sea disposal of all plastics. It also eliminates the discharge of other types of vessel-generated garbage to specific distances from land. The at-sea disposal restrictions apply to commercial and publicly owned vessels of all sizes and classes.

Vessels complying with MARPOL Annex V have three options for dealing with wastes. 1) Non-plastics can be disposed of at sea within the legal restrictions, 2) they can incinerate wastes onboard the vessel, or 3) they can hold the wastes for shoreside disposal at port.

Plastic debris has been a concern of the NMFS since the early 1980's. Studies conducted in the North Pacific have linked debris generated by commercial ground fishing vessels with detrimental impacts to fish, seabirds, and marine mammals. Fur seals, and Steller sealions have been shown to be vulnerable to entanglement in netting, rope, and packing strap discards. Entanglement in debris is thought to contribute to mortality of individuals through starvation, suffocation, infection in resulting wounds,

exhaustion, bleeding, drowning, and possibly increased predation. Studies conducted by the NMFS, National Marine Mammal Laboratory indicate entanglement may be contributing to the decline in northern fur seal population. In addition to entanglement in netting and plastic wastes, other species are also affected by ingestion. Stomach analysis of some seabirds and fish have found undigestible plastics.

Vessel Operator Obligations

Placards

(1) The regulations require U.S. recreational and other U.S. vessel operators, if their vessel is 26 feet or more in length, to affix one or more placards to their vessel. These placards warn against the discharge of plastic and other forms of garbage within the navigable waters of the United States, and specify discharge restrictions beyond three miles from shore, as outlined later. The placard must also note that State and local regulations may further restrict the disposal of garbage.

(2) Operators shall ensure that one or more placards are displayed in prominent locations and in sufficient numbers so that they can be observed and read by the crew and passengers. These locations might include embarkations points, food service areas, galleys, garbage handling spaces, and common deck spaces frequented by passengers and crew.

(3) Each placard must be at least 9 inches wide and 4 inches high, made of durable material, and lettered with letters at least 1/8 inch high.

Waste Management Plans

(1) The regulations require U.S. recreational and other U.S. vessel operators, if their vessel is 40 feet or more in length and engaged in commerce or equipped with a galley and berthing, to carry a Waste Management Plan if the vessel operates, or is certified to operate, beyond three nautical miles from shore.

(2) The Waste Management Plan must be in writing and describe procedures for collecting, processing, storing, and properly disposing of garbage in a way that will not violate the requirements shown on the following table. It must also designate the person who is in charge of carrying out the plan.

Marina Obligations

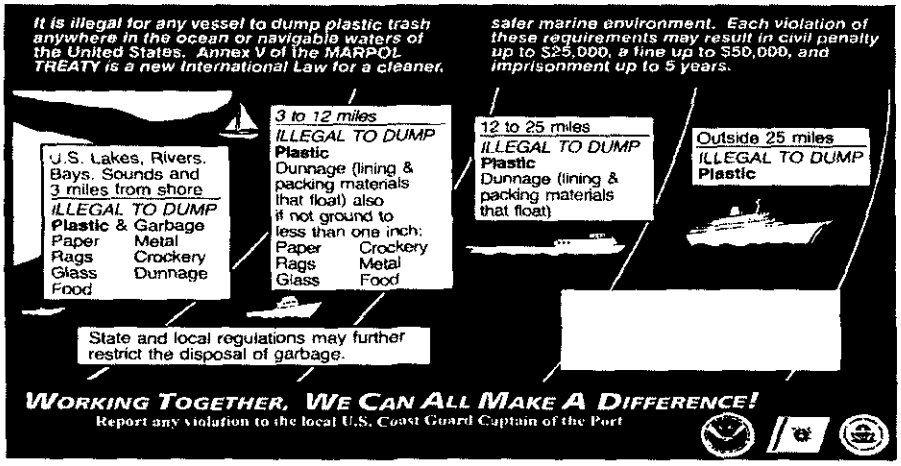
Ports and terminals that conduct business with a commercial vessel must be capable of receiving garbage from the vessel when it docks. Recreational boating facilities, capable of providing wharfage or other services for ten or more recreational vessels, must also provide adequate garbage reception facilities for any vessel that routinely calls. If a marina or terminal does not want to be directly involved in garbage collection and disposal, local firms may be retained to provided the service at the marina or terminal. Vessels must be conducting business with the facility or marina in order to qualify for the service. Terminals and marinas would not be expected to provide reception services to a vessel whose sole reason for docking was to offload its garbage. The marina or terminal can charge vessel operators reasonable fees for providing the reception service.

Enforcement

The U.S. Coast Guard is responsible for enforcement of Annex V.

Reporting Violations

Vessels denied the ability to offload their garbage wastes at marinas or other terminals should contact the closest U.S. Coast Guard Captain of The Port or Marine Safety Office. Any US citizen may report observations of dumping in violation of Annex V at these same offices. NOTE: Observers wishing to report a potential MARPOL V violation can complete a questionnaire during the debriefing process.



THE MID-CRUISE AND FINAL DEBRIEFING

List of Duties

- Schedule and attend, with all your data, a mid-cruise debriefing with NMFS staff.
- Near the end of your cruise, complete, organize and prepare all your data and specimens for final debriefing.
- Schedule a final debriefing through your contractor.
- Complete a vessel survey for each vessel of your deployment.
- Participate in a final debriefing interview with NMFS staff.
- Make any needed corrections and resubmit your data.

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Introduction

The success of the North Pacific Groundfish Observer Program depends on the quality of data collected by Observers. The data submitted both in electronic and paper format serves as the backbone of fisheries management in the North Pacific as well as insight into the entire ecosystem. The importance of these data requires that Observers consistently follow program guidelines and employ scientifically valid methods to collect the data. In order to ensure these methods are consistent and the data collected are sound, NMFS requires that Observers participate in both an mid-cruise and final debriefing. The mid-cruise debriefing will assess your work while in the field. Following your cruise, you will participate in a "final debriefing" with a NMFS staff member and prepare a final report for each vessel assignment. A conscientious attitude in collecting the data as well as at sea completion and checking will improve the quality of the data and expedite this process.

Mid-cruise

Much of the inseason management of commercial fisheries in Alaska relies on data collected by at sea Observers. Fisheries managers use these data to assess catch rates, determine when quotas have been reached, and announce the closure of each season. Observer data collected and submitted during each fishing season is essential in supporting these actions. Given the importance of these data, NMFS has established a mid-cruise debriefing process. This debriefing, occurring early on in your deployment, provides the opportunity for both the Observer and NMFS staff to assess the data collected up to that time, the methods employed, and any difficulties that you have encountered in your assignments. This is also an opportunity to discuss future vessel assignments and answer any questions that have come up since your last training or briefing.

Where Do I Go for my Mid-cruise Debriefing?

If you are in Kodiak or Dutch Harbor during working hours, it is not necessary to call. The offices are staffed Monday through Friday from 9:00 a.m. to 5:00 p.m. with variable hours on Saturday and Sunday. Stop by the field office and let a staff member know that you are there for a mid-cruise debriefing. You are to bring your logbook, all data collected up to that point, as well as completed species id forms. In addition, prepare a list of questions that have come up during any of your assignments. This is the greatest opportunity during the season for you to discuss these issues and obtain answers.

What Do I Do if the Office Is Closed?

If your vessel is in town after working hours or on weekends, the field office should be contacted by phone. Both offices have answering machines. Leave a message stating your name, vessel, estimated duration in port, how you can be contacted and the estimated date that you will return to port for the next delivery.

Am I Required To Have a Mid-cruise Debriefing?

All Observers on their first or second contract are required to have a mid-cruise debriefing. In addition, those Observers who have demonstrated conceptual errors on their previous contract or have limited experience on some vessel types are required. If you fall into one of these categories, then this debriefing is not an option and must be completed in order to fulfill your responsibilities as an Observer. If you are unsure if it is necessary, ask your contractor or stop in to the field station anyway and a NMFS staff member will still be able to review your data with you at that time or schedule a future appointment. This debriefing is helpful for all Observers and for a short time spent in the field office, it could save you much more time when you return to Seattle.

When Do I Have a Mid-cruise Debriefing?

Observers are to report for their mid-cruise debriefing early on in their assignment. Observers on catcher only vessels (trawl, longline and pot) are to schedule this debriefing after the first couple of deliveries while those on catcher processors should report during their first off-load.

What Do I Do If I Can't Get To a NMFS Field Office?

On rare occasions, Observers are unable to arrange a meeting time. In this case, and only as last resort, the following questions are to be answered and faxed to one of the field offices or the main office in Seattle (see "Appendix R. Contact Addresses and Numbers" on page A-39):

Please describe how the Official Total Catch (OTC) was determined. If the Observer estimate was used, how was the OTC determined when no estimate was made? How often are you making Observer estimates (i.e., two of every four hauls... etc.)?

Describe in detail how the Observer estimate was made. Trawler Observers: describe the collection technique you used to get fish for density. What was the average density value and predominant species in the catch? If certified bins were used, were there any difficulties? If no Observer estimates were made, explain why.

Explain in detail the sampling methods(s) you used on this vessel. Describe your sampling area, how you collected samples, and if there were any difficulties. What methods did you employ to ensure the least amount of sample bias using random sampling techniques?

Did you obtain sexed length frequencies? Please describe methods used and any difficulties you encountered sexing fishes. Also describe how halibut viabilities and lengths were collected. If none were collected, please explain why.

Please describe anything that has affected your ability to effectively conduct your work. Have you been able to complete any special projects or other assignments?

Final Debriefing

At Sea Preparation

While the final debriefing does not take place until the end of your last assignment, there are many things you can do to prepare for this process. This section provides many suggestions on how to check and organize your data. Reading and following this section while at sea will simplify and expedite your debriefing.

Data check: While you are at sea, check your work on a regular basis. The more accurate your work upon returning, the faster you will be finished with debriefing. Consult your manual continuously while doing paperwork and be sure the forms are filled in properly. The examples in the manual are a complete "set" of data and show how forms are interlinked as well as the correct format for each

Logbook: Filling out your logbook at sea is a requirement. Inside the front cover (in ink) you need to put your name, cruise number and contractor. Then list your ship's and/or plant names (for each assignment) and respective vessel or plant code. Complete factory/deck and plant diagrams for all assignments. Clearly label all calculations throughout the logbook including all mathematical formulas. Keep daily notes of sampling activities for each vessel. This will be especially helpful in recalling details if your cruise involves multiple vessel assignments.

Observers who have witnessed fisheries violations may be instructed during debriefing to write an affidavit, a formal legal statement describing what you saw. If you encounter violations they must be documented in your logbook with references to any data that supports these violations. Refer to "Steps to Take if You Suspect a Violation" on page 19-3 for more information.

Reports: Prior to the debriefing interview, you will be completing an electronic report for each vessel that you were assigned. Completing the report in the back of the logbook for each vessel while on board will help you complete the electronic report when you return.

Be sure that all your catch messages are complete and have been sent. Failure to do this could delay your debriefing.

Forms: The following are all the forms needed by vessel type

Trawler Observers

- Catch data (2US)
- Species composition (3US)
- Length data (7US)
- Specimen collection (9US)
- Species I.D.
- Special project, tagged fish data
- Marine mammal (10US and/or 11US)

Longline Observers

- Catch data (1US)
- Species composition (3US)
- Length data (7US)
- Specimen data (9US)
- Species I.D.
- Special project, tagged fish
- Marine mammal (10US and/or 11US)

Atlas Vessel Observers

- Catch data (1US or 2US)
- Deck (species composition)
- Species I.D.
- Special project, tagged fish
- Marine mammal (11Us)

Atlas Plant Observers

- Plant delivery (Form A)
- Plant and mothership Observers
- Plant delivery (Form A)
- Weekly work report
- *Length data (7US)*
- Specimen data (9US)

All of these forms are to be filled out at sea and completed prior to your debriefing interview. Keeping up with your work becomes especially important if you are deployed on more than one vessel or plant. Keep in mind that some corrections will affect data on other forms and those too, need to be corrected. Conduct cross referencing of all forms to be sure that the precise data is recorded on each form type. Also, if you were on more than one ship and/or plant, the data from each will need to be kept separately. Do not mix the data together; number the pages for each vessel/ plant and form type. 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.

The following is a list of common mistakes to remind you of possible errors. This list is not all inclusive. Refer to the respective section of each form type for more instructions. Correcting mistakes before the debriefing improves data quality, demonstrates professionalism and speeds the debriefing process.

All Forms

- Your name and ship's name on the first page of each type of form for each ship or plant.
- Number the pages properly with no skipped or duplicate numbers. Blank pages may be numbered or not.
- Every page needs to have your cruise number and vessel code. Cruise numbers should be adjusted to *the right with no leading zero.*
- Leading zeros are present only for dates, times, and haul weights of zero weight (0.00 on 1US and 2US form).
- All decimals already printed on the forms are to have numbers listed to two decimal places except for speed on the 2US.
- All repeat fields (arrows and brackets) are to be complete and have the same number at the top and bottom.

- Your handwriting is to be clear and legible. Data entry personnel have no idea how the data is used and cannot interpret your data.

Form 1US and 2US

- Every day on the vessel must have an entry. This includes the day you boarded and disembarked as well as everyday in between.
- All non- fishing days must have a noon position with a haul number of zero. Note the reason the vessel was not fishing.
- Plant name, date and delivery number must be recorded for all catcher vessel deliveries.
- No duplicate haul/set numbers.
- All haul/set numbers in consecutive order.
- A position must be recorded for all hauls/sets. If unavailable, interpolate from the previous position.
- No missing data in a line, except possibly duration, speed, or Observer estimate.
- No decimals other than those already printed on the page.
- No minutes greater than 59.
- For trawlers, no overlapping of on and off bottom times between hauls (except on motherships).
- Retrievals times of 0000 are attributed to the next day. Do not use a 2400 hr. notation.
- Depths must be rounded to whole numbers. No fishing depths deeper than bottom depths.
- An "F" or "M" for every depth recorded.
- Official total catch recorded to two decimal places for every haul.
- On the 1US, number of skates and hook counts must be whole numbers.
- Mothership Observers, complete "Name and ADFG #" for vessels that delivered catch.
- Catcher vessels, complete plant name and processor code for every haul.
- A "Y" or "N" must be recorded in the IFQ column.
- Catcher vessels, the vessels delivery number must be recorded.
- All CDQ numbers must be recorded to four digits with the first two digits, the year.

Plants

- Make sure that all mandatory information is on the forms. If information is missing, explain the circumstances on the form.
- Weights of the target species must be converted to round weight if fish were processed at sea.
- ADF&G numbers must be listed for each of the delivering catcher vessels.
- For date of delivery, record the date the delivery was completed.
- Every day at the plant must be recorded with the date and any sampling activity.
- The entire fish ticket number must be listed for each delivery including the year in two digits and any letter.

Form 3US

- Haul numbers are to correspond with dates and hauls listed on the 1US or 2US.
- Species names are to match species codes.
- No species code can be listed twice except for different sexes of prohibited species.
- No species code listed without corresponding data.
- Sex codes included only for salmon, tanner and king crab, if found in the sample.
- If sex is unknown, the sex field is left blank.
- Entries for each of the prohibited species groups: tanner crab, king crab, Pacific halibut, salmon and herring. This is required whether they were found in the sample or not.
- A weight for every number and a number for every weight listed. Zeros are recorded only for a prohibited species group not found in your sample.
- A "1" in the number column for species code 900 (Miscellaneous) and species code 899 (decomposed fish), no matter what the true number.
- Sample types in descending order of sample weight. Please skip a line between sample types.
- Sample weight indicated for each line of entry.
- Whole haul sample weights that match or round to the OTC recorded on the 2US form.
- Make decimal points distinct, use only one or no more than two decimal places.

- All weights must be in kilograms.
- Accurate sum of numbers, weights, and species codes on the top line.
- Percent retained is entered for all non prohibited species listed in whole numbers.

Form 7US

- Hauls listed in ascending order.
- Species codes match species names.
- Species name, species code, and haul number for every line of data.
- Any whole hauled species, the number of species listed is not more than the number of the same species listed on the 3US.
- No decimal places for length.
- No size group reversed with the frequency.
- Lengths recorded in ascending order. No lengths with a frequency of zero.
- Correct keypunch check sum of the numbers on each line. Double check your math.
- All crab unit measurements ending in "3" or an "8".
- Sex codes recorded for each species, every line. Halibut have condition codes of "E", "P", "D", or "U". All other species with a sex code of "F", "M", or "U".
- Date listed for haul must match corresponding date on 1US or 2US. Dates match delivery dates for all plant Observer data.

Form 9US

- Specimen type and sampling system are entered.
- Only one NMFS area per page.
- Each species must be on a separate set of pages with separate page numbering.
- No comments or numbers in "total no. of specimens" or "catalogue date or "remarks" section opposite the data. These are for otolith or scale readers only.
- All specimens have a haul number, a specimen number, a sex, a length, and a weight.

- No duplicate specimen numbers for the same species.
- Skipped otolith or scale numbers are to be noted with an explanation.
- Lengths must be recorded on the 7US if you indicated a "Y" in the "Form 7?" column.

Form 10US

- If a marine mammal interacted with the vessel, crew or gear (including preying on catch or being fed) or was caught, killed, harassed or deterred, there must be an entry on the 10AUS.
- If you are turning in a photo or have specimen data, there must an entry on the 10BUS.
  - In the "Remarks" block include:
  - features used in identifications
  - details of the incident
  - for specimen data, methods of measuring or sexing
  - for an animal or specimen, its condition

Form 11US

- Make sure all the non-shaded boxes are complete, including cruise # and vessel code.
- The identifying characteristics are to be described in detail. This is needed for the first sighting of each species for each Observer contract.
- For repeated sightings on the same day, you need at least one sighting form per day.

Debriefing

The final debriefing occurs at the completion of your last vessel assignment. Most likely, this will take place in the Seattle NMFS office, though field debriefings are sometimes possible. The debriefing process consists of the following parts: completion of electronic vessel report for each vessel, debriefing interview, gear check-in, the pre-key punch check, correction of errors, and final check out. The time to complete this process is variable. Do not make plane reservations until you are sure that your data has been finalized.

At the end of the debriefing, your work and performance will be evaluated. This evaluation will include a description of your sampling methods,

comments on overall effort in completing duties, level of documentation of activities, and any issues of note that you encountered during your debriefing. The evaluation will also include a recommendation for a future briefing.

Scheduling

The appointment for the final debriefing is made through your contractor once you have disembarked from your vessel. Your contractor will contact the Observer program office and schedule and appointment for two events. The first part is the vessel survey which is scheduled for 9:00 A.M. The second is for the actual interview, which normally takes place the following day at 9:30 A.M. Please keep in mind that Observers cannot be scheduled until they have disembarked the vessel and are awaiting a flight or already in Seattle. Remember, the scheduling is done on a first come first serve basis and can be affected by the number of staff available and how many Observers are already scheduled. The Observer program will do its part to make sure your debriefing is as thorough as necessary and completed in a reasonable amount of time. Remember, providing quality data is the main purpose of debriefing and is to be maintained as a priority throughout the process.

Vessel Survey

The electronic vessel survey is to be completed before the scheduled interview. This survey is done for each vessel and the will serve as the most detailed and accurate description of your cruise. The survey is in multiple choice format with some of the questions requesting further comment. Detailed answers to these questions are important. These data are used by many different groups including future Observers, Fishery managers, your debriefer and other NMFS staff (enforcement, data editing, etc.). Any comments unclear or incomplete will be reviewed and corrected during the interview. Once again, thoroughness in this step will expedite debriefing! After completion of the vessel survey, you must leave all your data, your printed vessel surveys, and logbook in the debriefing office.

Interview

The interview usually takes place at 9:30 A.M. on the day following your completion of the vessel survey. During the interview, your debriefer (who has already reviewed your survey) will ask you to clarify or elaborate on any issues not fully addressed in the vessel survey. In addition, each set of data forms will be reviewed in terms of completeness, accuracy, and format.

At this time, both you and the debriefer have the greatest opportunity to discuss your time at sea, your sampling methods, and the resulting data. The most important aspect of the interview are honesty and willingness to discuss problem and difficulties. NMFS needs to know the feasibility of sampling on various vessels and plants, and Observers are a valuable source of this information. If you feel you could not sample adequately, tell us so we can help the next Observer. In the end, responses in the vessel survey will explain and support the respective data collected as well as provide a detailed and accurate description of each vessel assignment. Remember, the interview is designed to be a productive process beneficial for both the Observer and the debriefer. Professional conduct through cooperation, candor and effort is expected from all debriefing Observers.

For Observers on Atlas and Non-Atlas vessels, the procedure for debriefing differs slightly. For Atlas Observers, all data is submitted with the logbook and vessel survey. An error report of the electronic data is produced and spot checks of the data are performed by the debriefer. The main purpose of the computer error check is to compare data between form types, search for missing data, and flag questionable entries. This report will be reviewed during the interview and all corrections will be made at that time. In addition, deck forms and catch data (2US or 1US) forms will be checked and compared with the electronic data.

Observers on Non-Atlas vessels also submit their data, logbook, and completed vessel surveys the day before the interview. The debriefer then retrieves the data and reports for review before the interview. Since you have been sending data in on a weekly basis, most of your data has already been edited in the Seattle office. However, calculations and some of the forms will still need to be checked by the editing and debriefing staff. The 7us and 9us data will be sent to an outside company to be entered into electronic format. Please keep in mind that these people who perform this job have no idea what these data are or how they are used. This dictates that each form be completed following the given format and without missing data. Failure to do this will result in lost time to correct the errors or even worse, loss of the data.

Any specimens collected during the cruise must also be prepared and submitted during the debriefing process. Salmon scales are to be mounted for confirmation of species. For each species, five scales from five specimens are to be placed in a zip lock bag. Otolith vials are to be filled with appropriate solution and each box set labeled (see figure). All tagged salmon snouts are to be salted (if not already) and placed in the wet lab adjacent to the debriefing office. Any halibut, sablefish or other tags are to be submitted with the corresponding tagged fish form.

Special project data are also submitted at this time. Observers with stomach collections are to report to the stomach laboratory with their data and specimens. Fish collections are stored in the Observer Program's freezer. Fish are to be labeled with the species name, haul or set number, date captured, Observer's name, cruise number, and vessel code.

Evaluations

Observer's work and performance are evaluated at the completion of each cruise. This evaluation serves two purposes. First, it provides a summary of the worked performed as well as Observer effort and quality of the data collected. Second, it serves as a tool for future deployments giving recommendations, suggestions and identifying areas of needed improvement. Areas of greatest importance are the compliance with established protocols throughout the contract and an understanding of sampling concepts.

The evaluation is based on many factors.

- sampling methods employed
- documentation and communication.
- preparedness for debriefing
- problem solving skills
- overall effort

Based on this evaluation, each vessel is assigned a rating score (see criteria). A score of 0 on any vessel signifies, for that vessel, the expectations of the Observer program have not been met. Based on the severity of the problems, there are several different courses of action. Along with a 0 score, Observers may receive a letter of notice. This letter will detail the area(s) of your work or performance that were unacceptable. The purpose of this letter is to provide the Observer with a tool to improve both performance and the subsequent data.

If the debriefing staff agrees that severe deficiencies in the work or lack of understanding of concepts is great, the Observer will be suspended and recommended for decertification. This process is governed by the Code of Federal Regulation (CFR's) which dictates that in order to preserve the integrity of the data collected, NMFS must certify only responsible and qualified Observers. Any action taken such as suspension or decertification is necessary in order to adhere to this policy. The regulations also states the following: "The serious nature of suspension and decertification requires that these actions be taken only in the public interest for the promotion of fishery conservation and management and not for purposes of punishment."

Observers who make an honest effort, follow instructions from training and briefing, and show a willingness to fulfill their responsibilities do not have to be concerned about this procedure. Most cases involve severe conceptual errors, poor conduct, or falsification of data. A copy of the CFR's which include all Observer program regulations and procedure can be obtained from any NMFS staff member.

Observers who receive a score of 1 have met the expectations of the Observer Program. Proper sampling method were applied and all protocols in terms of collection of data were followed.

A score of 2 is assigned to those who have exceeded the expectations of the Observer program. These Observers have demonstrated their ability to perform at levels above average. All areas of the Observer's work are exemplary. They can be relied on in any situation to solve problems, make independent decisions, and collect data of high quality.

Briefings

Observers who have successfully completed their first contract (priors) must attend a briefing before each subsequent deployment. Depending on the work and performance the previous contract, briefings are assigned either 1 or 4 days in length Each Observer must attend at least (one) 4- day annual briefing per year. This must occur previous to the first contract in each calendar year regardless of performance or briefing recommendations. In addition, Observers who have demonstrated conceptual errors and/or difficulty in fish identification will be required to attend a four day briefing. This briefing covers changes in sampling protocol, regulations, data forms, etc. Time will be spent reviewing fish identification and Observers must successfully pass a species identification test in order to be recertified. Other topics include bird identification, enforcement and random sampling techniques. This briefing is also the opportunity to ask questions, familiarize yourself once again with the manual, and review recommendations from your last evaluation.

One day briefings are designed for Observers in good standing who have shown no conceptual errors or difficulties in species identification. This one day briefing covers recent changes in sampling protocol and regulations, reviews sampling priorities and provides the opportunity for Observers to ask vessel and/or fishery specific questions.

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Appendix A. Species Code List - Fishes, Crabs, and Invertebrates.

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
43	Ascidians, Sea Squirt, Tunicate	Urochordata
204	Atka Mackerel	*Pleurogrammus monopterygius*
48	Barnacles	Cirripedia
770	Barracudina - unident.	Paralepididae
	Birds - Refer to Appendix B.	
203	Black Cod (Sablefish)	*Anoplopoma fimbria*
302	Bocaccio Rockfish	*Sebastes paucispinis*
27	Brachiopod, Lampshell - unident.	Brachyopoda
54	Bristleworm (Polychaete - unident.)	Annelida
32	Bryozoans	
604	Capelin	*Mallotus villosus*
44	Chiton - unident.	Amphineura
199	Chub (Pacific) 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*
209	Cod, Pacific Tom-	*Microgadus proximus*
208	Cod, Saffron	*Eleginus gracilis*
214	Codling - unident. (See also Flatnose, Pacific)	Moridae
32	Corals	
1	Crab - unident. (Family unknown)	
6	Crab, Blue King	*Paralithodes platypus*
11	Crab, Box	*Lopholithodes foraminatus*
8	Crab, Brown (Golden) King	*Lithodes aequispina*
49	Crab, Cancer	*Cancer pregonensis*
16	Crab, Couesi King	*Lithodes couesi*
39	Crab, Decorator	*Oregonia gracilis*
12	Crab, Dungeness	*Cancer magister*
841	Crab, Fuzzy	*Acantholithodes hispidus*
15	Crab, Hermit - unident.	Paguridae
2	Crab, King Crab - unident.	Lithodes & Paralithodes
7	Crab, Korean Horsehair	*Erimacrus isenbeckii*
14	Crab, Lithodid (Brown, Couesi, or Golden)	*Lithodes* spp.
37	Crab, Lyre -- Rounded Spined	*Hyas coarctatus*
9	Crab, Lyre -- Sharp Spined	*Hyas lyratus*
840	Crab, Lyre - unident.	*Hyas* spp.

Appendix A. Species Code List-Fishes, Crabs and Invertebrates

Code	Common Name	Scientific Name
17	Crab, Paralomis Multispina	*Paralomis multispina*
38	Crab, Paralomis Verilli	*Paralomis verilli*
13	Crab, Red King	*Paralithodes camtschaticus*
842	Crab, Rhinoceros	*Rhinolithodes wosnessenski*
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* spp.
23	Crab, Telmessus	*Telmessus cheirgonus*
53	Crinoids - unident.	Crinoidea
144	Dab, Longhead (Sanddab)	*Limanda proboscidea*
679	Daggertooth	*Anotopterus pharao*
899	Decomposed Fish	
690	Dreamer - unident.	Oneirodidae
250	Eelpout - unident.	Zoarcidae
253	Eelpout, Twoline	*Bothrocara brunneum*
251	Eelpout, Wattled	*Lycodes palearis*
91	Egg Case, Skate - unident.	
34	Eggs, Snail	Gastropoda
601	Eulachon, (Candlefish)	*Thaleichthys pacificus*
901	Fish - unident.	Osteichthyes
100	Flatfish - unident.	Pleuronectiformes
210	Flatnose, Pacific (Codling)	*Antimora microlepis*
146	Flounder, Arctic	*Liopsetta glacialis*
141	Flounder, Arrowtooth	*Atheresthes stomias*
145	Flounder, Bering	*Hippoglossoides robustus*
149	Flounder, Kam/ Arrow - unident.	
147	Flounder, Kamchatka	*Atheresthes evermanni*
142	Flounder, Starry	*Platichthys stellatus*
390	Greenling - unident.	*Hexagrammos* spp.
392	Greenling, Kelp	*Hexagrammos decagrammus*
393	Greenling, Rock	*Hexagrammos lagocephalus*
80	Grenadier, (Rattail) - unident.	Macrouridae
82	Grenadier (Rattail), Giant	*Albatrossia pectoralis*
430	Gunnel - unident.	Pholidae
77	Hagfish - unident.	Myxinidae
206	Hake, Pacific	*Merluccius productus*
102	Halibut, Greenland (Turbot)	*Reinhardtius hippoglossoides*

Appendix A. Species Code List-Fishes, Crabs and Invertebrates

Code	Common Name	Scientific Name
101	Halibut, Pacific	*Hippoglossus stenolepis*
611	Herring, Pacific	*Clupea harengus pallasi*
350	Idiotfish (Shortspine Thornyhead)	*Sebastolobus alascanus*
902	Invertebrate - unident.	
33	Isopod - unident.	Isopoda
207	Jack Mackerel	*Trachurus symmetricus*
35	Jellyfish - unident.	Scyphozoa
900	Kelp - misc.	Misc. items
608	King-of-the-salmon, (Ribbonfish)	*Trachipterus altivelis*
75	Lamprey - unident.	Petromyzontidae
785	Lancetfish, Longnose	*Alepisaurus ferox*
700	Lanternfish - unident.	Myctophidae
52	Leech - unident.	Hirudinea
45	Limpet - unident.	
603	Lingcod	*Ophiodon elongatus*
525	Lumpsucker - unident.	Cyclopteridae
531	Lumpsucker, Smooth	*Aptocyclus ventricosus*
530	Lumpsucker, Pacific Spiny	*Eumicrotremus orbis*
204	Mackerel, Atka	*Pleurogrammus monopterygius*
207	Mackerel, Jack	*Trachurus symmetricus*
199	Mackerel, Pacific (Chub)	*Scomber japonicus*
774	Manefish	*Caristius macropus*
903	Marine Mammal (Or Parts Of) unident.	
289	Melamphid - unident.	Melamphaeidae
900	Misc. - unident.	(Rocks, Mud, Garbage, Etc)
29	Mussels, Clams, Oysters, Scallops	Pelecypoda
25	Nudibranch (Sea slug)	Nudibranchiata
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, Scaly - unident.	Notosudidae
452	Poacher, Sturgeon	Agonus acipenserinus
450	Poacher - unident.	Agonidae
201	Pollock, Walleye	*Theragra chalcogramma*
54	Polychaete - unident. (Bristleworm, Leech)	Annelida
765	Pomfret - unident.	Bramidae
750	Prickleback - unident.	Stichaeidae

Appendix A. Species Code List-Fishes, Crabs and Invertebrates

Code	Common Name	Scientific Name
205	Prowfish	*Zaprora silenus*
280	Ragfish	*Icosteus aenigmaticus*
99	Ratfish, Spotted	*Hydrolagus colliei*
80	Rattail, (Grenadier) - unident.	Macrouridae
82	Rattail (Grenadier), Giant	*Albatrossia pectoralis*
90	Ray, (Skate) - unident.	Rajiformes
563	Ribbonfish - unident.	Trachipteridae
300	Rockfish - unident.	Scorpaenidae
347	Rockfish - Dark unident.	(Species code 306, 316, 345, etc.)
348	Rockfish - Small Red unident.	(Species code 301, 303, 304, 323)
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*
351	Rockfish, Broad Banded Thornyhead	*Sebastes macrochir*
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, Light Dusky	*Sebastes ciliatus*
345	Rockfish, Dark Dusky	*Sebastes sp. cf. 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*

Code	Common Name	Scientific Name
326	Rockfish, Shortraker	*Sebastes borealis*
354	Rockfish, Shortraker/rougheye	*S. borealis* or *aleutianus*
350	Rockfish, Shortspine Thornyhead	*Sebastolobus alascanus*
310	Rockfish, Silvergray	*Sebastes brevispinis*
315	Rockfish, Splitnose	*Sebastes diploproa*
328	Rockfish, Stripetail	*Sebastes saxicola*
349	Rockfish, Thornyhead unident.	*S. alascanus* or *altivelis*
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*, spp.
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, Sea Urchins	Echinoidea
670	Sand Lance, Pacific	*Ammodytes hexapterus*
136	Sanddab - unident.	Bothidae
144	Sanddab, Longhead	*Limanda proboscidea*
137	Sanddab, Pacific	*Citharichthys sordidus*
239	Sandfish, Pacific	*Trichodon trichodon*
614	Sardine, Pacific	*Sardinops sagax caerulens*
607	Saury, Pacific	*Cololabis saira*
29	Scallops, Clams, Mussels, Oysters	Pelecypoda
353	Scorpionfish, Aleutian	*Adelosebastes latens*
400	Sculpin - unident.	Cottidae
409	Sculpin, Crested	*Blepsias bilobus*
405	Sculpin, Great	*Myoxocephalus polyacanthocephalus*
418	Sculpin, Irish Lord - unident.	*Hemilepidotus* spp.
407	Sculpin, Red Irish Lord	*Hemilepidotus hemilepidotus*
414	Sculpin, Yellow Irish Lord	*Hemilepidotus hemilepidotus*
55	Sea Anemone - unident.	Actiniaria
41	Sea Cucumber - unident.	Holothurioidea

Appendix A. Species Code List-Fishes, Crabs and Invertebrates

Code	Common Name	Scientific Name
689	Sea Devil - unident.	Ceratiidae
59	Sea Mouse	*Aphrodite aculeata*
42	Sea Onions - unident.	*Boltenia* spp.
58	Sea Pen, Sea Whip - unident.	Pennatula
57	Sea Potato - unident.	*Halocynthia* spp.
25	Sea Slug - unident.	Nudibranchiata
56	Sea Spider - unident.	Pycnoganida
43	Sea Squirts, Onions, Potatoes, Tunicates	Urochordata
40	Sea Urchins, Sand Dollars	Echinoidea
58	Sea Whip, Sea Pen - unident.	Pennatula
54	Sea Worms (Polychaetes) - unident.	Annelida
	Seabirds - Refer to Appendix B.	
242	Searcher	*Bathymaster signatus*
900	Seaweed - misc.	Misc. items
606	Shad, American	*Alosa sapidissima*
65	Shark - unident.	Squaliformes
69	Shark, Blue	*Prionace glauca*
68	Shark, Brown Cat	*Apristurus brunneus*
62	Shark, Pacific Sleeper (Mud)	*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.	Arthropoda
90	Skate - unident.	Rajiformes
212	Skilfish	*Erilepis zonifer*
602	Smelt - unident.	Osmeridae
604	Smelt, Capelin	*Mallotus villosus*
601	Smelt, Eulachon (Candlefish)	*Thaleichthys pacificus*
605	Smelt, Rainbow	*Osmerus mordax dentex*
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*

Appendix A. Species Code List-Fishes, Crabs and Invertebrates

Code	Common Name	Scientific Name
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 Sole unident.	
120	Sole, Northern Rock Sole	
121	Sole, Southern Rock Sole	*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
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* spp.
226	Steelhead	*Salmo gairdneri*
230	Sturgeon - unident.	*Acipenser* spp.
810	Sunfish, Ocean	*Mola mola*
113	Tonguefish, California	*Symphurus atricauda*
807	Tubeshoulder - unident.	Searsiidae
43	Tunicates, Ascidians, Sea Squirts	Urochordata
102	Turbot, Greenland (Halibut)	*Reinhardtius hippoglossoides*
143	Turbot/ Kam/ Arrow - unident.	
805	Viperfish - unident.	Chauliodontidae
757	Warbonnet, Decorated	*Chirolophis decoratus*
899	Waste Fish	
762	Wearyfish, (Paperbones) - unident.	Notosudidae
779	Wolffish, Wolf-eel - unident.	Anarhichadidae
780	Wolf-eel	*Anarrhichthys ocellatus*
781	Wolffish, Bering	*Anarhichas orientalis*
760	Wrymouth, Giant	*Delolepis gigantea*
783	Wrymouth, Dwarf	*Lyconectes aleutensis*

Appendix B. Species Code List - Seabirds.

Code	Common Name	Scientific Name
852	Albatross, Black-footed	*Diomedea nigripes*
851	Albatross, Laysan	*Diomedea immutabilis*
850	Albatross, Short-tailed *	*Diomedea albatrus*
849	Albatross - Unident	*Diomedeidae* spp.
883	Alcid - unident.	*Alcidae* spp.
893	Auklet/Murrelet - Unident	Auklet/murrelet spp.
895	Auklet, Rhinocerous	*Cerorhinca moncerata*
998	Bird - unident.	Aves
861	Cormorant - unident.	*Phalacrocoracidae* spp.
866	Eider, Common	*Somateria mollissima*
863	Eider, King	*Somateria spectabilis*
864	Eider, Spectacled **	*Somateria fischeri*
865	Eider, Steller's **	*Polysticta stelleri*
854	Fulmar, Northern	*Fulmarus glacialis*
846	Grebe - unident.	Podicipedidae
884	Guillemot - unident.	*Cepphus* spp.
878	Gull, Glaucus	*Larus hyuperboreus*
879	Gull, Glaucus-winged	*Larus glaucescens*
877	Gull, Herring	*Larus argentatus*
874	Gull - unident.	*Larinae* spp.
871	Jaeger/Skua - unident.	*Stercorariidae* spp.
876	Kittiwake, Black-legged *	*Rissa tridactyla*
875	Kittiwake, Red-legged *	*Rissa brevirostris*
898	Land Bird - unident.	
844	Loon - unident.	Gaviidae
889	Murre, Common	*Uria aalge*
888	Murre, Thick-billed	*Uria lomvia*
887	Murre - unident.	*Uria* spp.
893	Murrelet/Auklet - unident.	Murrelet/auklet spp.
896	Murrelet, Kittlitz's	*Brachyramphus brevirostris*
894	Murrelet, Marbled	*Brachyramphus marmoratus*
854	Northern Fulmar	*Fulmarus glacialis*
853	Petrel/Shearwater - unident.	*Procellariidae* spp.
858	Petrel, Storm - unident.	*Hydrobatidae* spp.
868	Phalarope - unident.	*Phalaropodidae* spp.
891	Puffin, Horned	*Fratercula corniculata*
892	Puffin, Tufted	*Fratercula cirrhata*
890	Puffin - unident.	*Fratercula* spp.
897	Seabird - unident.	
855	Shearwater, Dark unident.	*Puffinus* spp.
853	Shearwater/Petrel - unident.	*Procellariidae* spp.

Appendix B. Species Code List- Seabirds

Code	Common Name	Scientific Name
857	Shearwater, Short-tailed	*Puffinus tenuirostris*
856	Shearwater, Sooty	*Puffinus griseus*
867	Shorebird - unident.	Charadriiformes
871	Skua/Jaeger - unident.	Stercorariidae
858	Storm-Petrel - unident.	Hydrobatidae
880	Tern - unident.	*Sterninae* spp.
848	Tubenoses - unident.	Procellariiformes
862	Waterfowl - unident.	Anseriformes

Seabirds - Please also note occurances in Observer Logbook, Seabird Sightings section. * Note in log whether: adult (A), sub-adult (S), immature (I), or unknown (U). ** Note in log whether: male (M), female (F), or unknown (U). For more information see bird key in Species I.D. Manual.

Appendix C. Species Code List - Marine Mammals.

Code	Common Name	Scientific Name
NU	None	(NE indicates no equivalent)
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*
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 (NE indicates no equivalent)
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*
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*

Appendix C. Species Code List- Marine Mammals

Code	Common Name	Scientific Name
BB	Sei whale	*Balaenoptera boreali*
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*
UX	Unidentified small whale	NE
UZ	Unidentified large whale	NE
UW	Unidentified whale	NE
UC	Unidentified cetacean: whale or porpoise or dolphin, definitely not a pinniped (Form 10AUS only)	NE
ZZ	Unidentified marine mammal	NE
UM	Polar bear	*Ursus maritimus*

Appendix D. Weights, Measures, and Conversions

Weights and Measures

Abbreviations

inch (in)	millimeter (mm)	kilograms (kg)	minute (min)
foot (ft)	centimeter (cm)	metric ton (mt)	
pounds (lbs)	meter (m)	liter (L)	
ton (t)	kilometer (km)	quart (qt)	
mile (mi)	celcius (C)	latitude (lat)	
farenheit (F)	grams (g)	longitude (lon)	

1 in = 2.540cm 1cm = 10 mm = 0.3937 in

1 ft = 0.3048 m = 0.1667 fathoms 1m = 100 cm = 3.2808 ft = 0.5468 fathoms

1 fathom = 6 ft = 1.829m 1000 m = 1 km = 0.6214 statute mi

1 L = 1.0567 U.S. qt

F° = (1.8 x C°) + 32C° = 5/9(F° - 32)

1 statute m = 5,280 ft = 1.609 km = 0.86899 nautical mi = 880 fathoms

1 nautical mi = 1.15078 statute mi = 1 min lat = 1.852 km = 1,012.6859 fathoms = 1,852 m

1 *fathom = 0.0009875 nautical mi = 0.0011364 statute mi*

1 lb = 0.4536 kg

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

1 mt = 1,000 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 mt

1 long ton = 1,016.0469 kg = 2240 lbs = 1.1060 mt = 1.12 short tons

Converting Pounds to Metric Tons

LBS	MT	LBS	MT
1,000	0.4536	14,000	6.3504
2,000	0.9072	15,000	6.8040
3,000	1.3608	16,000	7.2576
4,000	1.8144	17,000	7.7111
5,000	2.2680	18,000	8.1647
6,000	2.7216	19,000	8.6183
7,000	3.1752	20,000	9.0719
8,000	3.6288	21,000	9.5255
9,000	4.0824	22,000	9.9791
10,000	4.5360	23,000	10.4327
11,000	4.9896	24,000	10.8863
12,000	5.4432	25,000	11.3399
13,000	5.8968	26,000	11.7935

Volume and Product Formulas

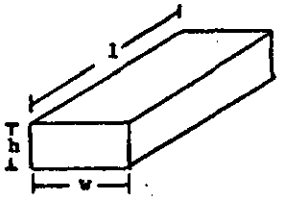
Number of Product Units x Average Unit Weight = Total Weight of Product
Product Weight ÷ Recovery Rate = Whole Weight of fish used to make the product
Product Weight x Conversion Factor = Whole or Fresh Weight of fish used for product

Area of a circle = πr^2 Circumference = $2\pi r^2$ ($\pi = 3.1416$)
Area of a square or rectangle = length × width
Area of a triangle = $1/2 \times$ base × height

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

Volume of a sphere= $(4\pi r^2) \div 3$
Length of the triangle hypotenuse "c" where a and b equal the length of the opposite two sides

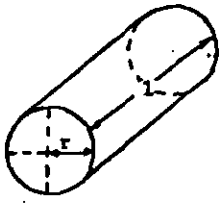
$$a^2 + b^2 = c^2 \quad \sqrt{c^2} = c$$



Rectangle solid

Volume= height × width × length

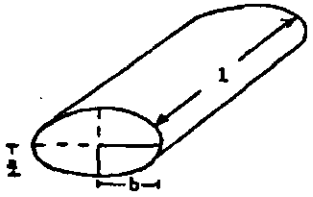
V = hwl



Cylinder

Volume = $\pi \times$ radius$^2 \times$ length

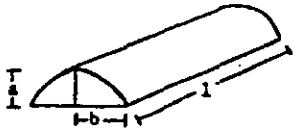
$V = \pi r^2 l$



Ellipsoidal solid

Volume = $\pi \times$ short radius × long radius × length

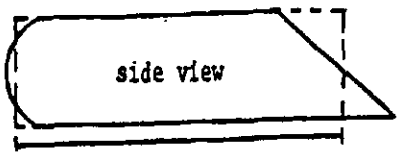
V = πabl



Semi -ellipsoidal solid

Volume= $1/2 \times \pi \times$ short radius × long radius × length

V = $1/2 \times \pi abl$



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

Appendix E. Random Number Table A

	col. 1 to 5	col. 6 to 10	col. 11 to 15	col. 16 to 20	col. 21 to 25	col. 26 to 30	col. 31 to 35	col. 36 to 40	col. 41 to 45	col. 45 to 50
1	5 6 7 2 4	0 5 8 7 5	1 1 9 6 7	9 7 4 8 2	6 6 4 1 2	8 7 2 1 0	1 0 5 1 1	6 5 3 8 8	2 5 6 3 4	9 4 5 7 6
2	0 8 3 5 4	9 6 2 0 8	2 5 9 9 4	9 6 2 6 8	2 5 0 9 5	6 3 9 5 2	4 5 4 3 9	3 5 6 8 9	0 6 2 8 0	3 8 8 2 4
3	8 4 8 8 4	4 1 4 0 3	7 8 4 6 8	3 4 3 9 4	2 9 3 2 8	3 6 8 5 5	3 2 2 0 1	7 1 0 2 1	9 5 2 4 0	7 5 0 2 6
4	1 0 4 3 7	1 6 3 1 5	2 8 7 6 8	2 2 8 5 2	7 6 0 4 5	0 2 9 1 0	8 5 7 0 8	7 5 5 7 9	2 8 7 3 3	2 9 3 5 7
5	6 4 5 9 2	5 4 8 9 6	4 2 3 2 1	2 6 5 5 3	4 0 2 0 1	1 1 6 1 6	1 0 8 2 5	2 5 8 7 0	7 9 7 8 5	5 9 9 9 8
6	3 0 3 5 0	8 5 1 0 5	3 7 3 2 1	7 1 7 9 9	9 9 1 3 6	8 3 4 5 5	1 9 9 4 7	9 3 9 9 5	8 9 9 0 1	1 2 9 2 5
7	1 8 2 6 0	5 7 7 4 2	9 6 2 2 3	1 9 6 7 5	5 8 7 1 3	4 9 5 1 1	8 2 6 1 9	3 6 3 5 2	4 5 3 1 2	6 3 9 6 0
8	2 5 9 2 5	5 7 1 4 5	4 6 7 6 5	1 3 2 3 7	3 6 2 2 5	4 0 8 6 0	7 1 4 8 8	3 8 2 3 1	2 7 6 0 1	6 3 8 5 4
9	9 8 5 8 5	6 7 5 3 5	3 8 9 4 6	7 4 0 4 6	1 4 3 6 2	9 1 6 8 8	4 4 7 3 2	2 0 9 0 9	5 8 8 4 8	2 4 7 9 4
10	2 4 4 8 8	0 6 0 2 6	4 8 8 3 4	3 7 1 7 7	0 4 1 2 4	0 6 0 8 7	1 0 1 7 7	9 0 1 7 1	5 0 9 9 5	4 0 6 0 6
11	6 9 9 8 2	8 8 6 6 6	5 3 2 9 3	4 0 2 7 2	7 0 3 2 0	7 1 5 3 1	8 5 3 9 3	7 1 0 0 6	7 7 8 4 5	1 5 5 6 7
12	6 6 6 3 6	9 2 7 7 5	0 7 5 4 9	7 7 9 7 8	7 5 7 3 5	7 8 4 6 8	6 8 7 4 7	7 2 9 6 7	3 0 7 9 5	7 2 3 1 7
13	8 4 0 2 1	1 9 5 0 1	5 0 3 6 0	6 2 0 1 2	2 9 7 4 4	0 7 2 5 0	5 8 1 1 0	5 7 5 8 5	9 3 9 2 2	5 1 3 7 7
14	5 6 1 4 3	4 6 2 0 6	5 8 9 0 5	3 2 6 7 9	4 7 9 9 1	2 6 8 9 2	3 2 1 5 6	3 5 6 0 6	6 5 8 9 4	3 3 3 5 4
15	9 6 0 4 9	0 0 3 7 7	3 2 2 9 7	8 8 9 0 6	6 3 5 6 2	2 8 9 1 6	7 3 2 6 7	7 5 0 2 6	2 8 0 1 7	0 6 2 6 4
16	7 7 2 2 2	1 2 9 0 4	5 1 4 5 3	9 4 6 5 9	6 6 1 1 7	7 9 0 6 2	5 7 5 4 4	7 0 9 6 8	5 1 8 9 6	6 5 9 6 4
17	3 3 0 5 2	5 0 6 3 7	4 7 5 9 3	8 7 7 4 1	4 1 8 3 6	7 6 6 3 8	9 3 1 4 0	0 2 7 2 3	5 7 8 2 8	8 9 5 7 0
18	4 7 3 3 7	0 3 2 0 8	8 6 3 0 0	7 4 6 3 1	8 5 5 6 5	0 2 8 1 2	3 3 0 5 9	7 7 7 8 4	6 8 0 2 2	7 5 3 1 6
19	8 1 2 4 4	4 6 8 2 3	2 2 4 8 4	3 5 3 0 0	7 5 2 3 3	7 5 2 4 5	8 5 4 9 1	3 5 7 2 4	3 0 5 7 9	5 5 8 0 4
20	8 2 6 0 2	8 5 9 6 4	6 3 3 6 4	8 3 5 4 6	6 6 4 8 9	5 2 6 5 6	1 0 3 0 1	5 5 4 4 6	8 8 8 4 5	8 9 8 3 6
21	1 4 7 8 5	0 5 3 4 5	9 5 6 3 4	6 7 9 0 3	0 6 2 6 2	9 6 5 6 3	4 7 9 7 0	9 5 5 7 3	6 1 1 1 9	3 3 7 4 9
22	5 0 9 5 8	2 3 9 1 8	4 8 1 1 6	9 0 4 3 3	0 7 7 1 2	4 2 7 8 7	9 7 0 5 7	0 1 7 1 8	7 3 8 4 7	4 0 5 8 4
23	4 5 2 2 8	1 0 9 9 8	3 4 9 3 5	2 8 0 0 4	7 2 1 8 1	8 8 9 3 6	0 0 1 1 0	4 5 4 2 2	9 3 5 3 8	3 8 6 1 0
24	0 5 7 7 6	6 7 6 4 8	3 8 6 1 5	0 4 7 4 8	1 5 2 4 0	3 8 3 4 7	2 1 8 7 9	9 0 1 2 4	2 8 6 6 6	3 6 4 3 4
25	2 2 3 1 6	2 7 5 6 9	1 3 9 5 9	3 8 4 7 7	8 5 8 9 8	9 6 3 5 4	1 5 7 2 7	8 1 8 1 1	5 6 2 9 1	3 9 3 8 1
26	1 5 4 7 3	7 8 7 7 1	5 1 4 3 0	6 3 7 4 7	6 0 0 7 7	1 8 2 8 5	5 4 2 3 0	8 8 0 0 5	6 6 8 4 7	0 0 1 0 7
27	2 2 8 4 7	0 5 0 0 0	6 9 8 2 6	3 0 5 9 0	6 6 1 3 7	8 9 4 9 4	3 8 0 3 3	5 1 4 0 7	0 4 0 1 6	5 1 8 9 6
28	9 1 4 0 2	7 5 5 0 4	2 7 6 1 8	7 5 8 2 6	5 9 3 8 2	5 3 6 8 1	5 9 6 9 3	0 8 9 2 2	3 6 1 0 2	3 1 8 1 4
29	8 0 0 1 6	1 4 2 8 0	0 9 5 2 6	3 3 5 3 2	0 0 8 4 2	7 7 7 7 4	1 7 3 0 6	3 0 7 7 6	6 3 0 1 7	0 0 9 3 1
30	3 6 2 8 4	6 9 6 6 8	6 6 1 8 3	8 7 9 0 5	9 3 1 8 1	6 0 1 5 9	7 3 9 9 7	3 0 3 5 4	5 5 6 3 6	0 6 7 6 6
31	0 7 9 2 8	1 0 3 4 7	9 2 9 0 3	6 8 7 2 6	0 8 1 4 6	1 6 0 0 0	3 0 1 7 6	0 2 4 5 7	0 3 1 7 4	0 4 7 4 0
32	5 0 8 3 3	1 6 4 1 5	7 6 5 4 4	4 5 3 6 3	4 9 7 6 0	6 7 6 0 9	3 1 9 7 5	9 2 5 2 6	1 1 2 1 7	5 7 7 3 6
33	1 9 2 7 9	8 1 4 8 8	4 0 1 6 1	4 7 2 5 8	6 9 9 5 9	7 4 6 3 5	2 7 0 4 5	5 7 5 8 1	1 2 1 7 3	6 3 5 8 4
34	1 7 7 3 8	1 4 0 4 9	6 2 1 0 9	4 7 4 4 0	3 9 5 1 1	7 3 7 8 3	6 1 8 8 5	4 8 1 0 4	6 0 6 2 4	6 8 5 8 0
35	7 9 3 4 8	3 6 2 4 9	8 3 0 2 2	9 4 1 9 8	0 0 2 3 4	7 0 0 4 6	2 0 6 1 9	9 1 8 5 9	7 4 9 6 7	2 2 5 2 4
36	0 7 5 7 9	4 3 8 7 1	6 2 4 6 4	6 5 1 2 0	4 0 7 9 1	7 5 9 9 7	6 9 4 4 4	7 0 6 1 4	1 9 5 3 3	4 2 0 2 9
37	5 1 4 2 1	8 8 1 7 9	5 5 0 8 6	9 1 9 6 4	5 0 2 8 9	2 0 6 9 5	6 1 6 9 6	3 9 3 7 9	5 9 4 9 7	2 5 5 5 0
38	5 3 5 8 9	6 1 8 2 1	9 7 6 3 4	2 2 3 1 1	3 8 6 2 8	7 5 2 4 8	5 4 4 8 5	1 3 1 1 4	0 4 9 1 4	7 9 0 2 3
39	2 0 6 5 5	1 8 9 1 1	6 7 9 7 7	6 1 3 0 5	0 6 9 0 7	8 8 3 3 8	4 8 1 7 7	1 9 2 1 5	3 8 7 4 5	1 7 1 6 3
40	6 9 7 2 0	7 9 0 3 7	2 4 5 6 1	3 7 4 2 6	8 0 6 9 2	9 3 0 2 3	9 9 5 8 4	8 7 4 4 5	1 0 0 3 5	0 9 2 9 0
41	8 8 7 6 8	5 4 9 9 6	0 8 6 7 0	7 5 3 0 4	0 1 0 3 0	2 4 9 4 5	6 7 4 4 0	5 6 7 7 3	5 6 4 0 2	1 7 5 1 8
42	9 2 8 8 6	0 5 6 4 0	5 7 9 3 7	8 8 7 5 5	2 8 1 4 0	3 0 7 8 9	9 8 0 1 2	2 3 1 4 2	1 0 9 0 0	7 7 9 0 2
43	9 9 1 6 9	2 8 2 3 9	2 6 8 0 1	7 1 4 6 9	0 5 5 5 0	1 8 3 5 4	8 7 0 5 8	8 5 8 4 1	2 5 0 1 4	0 2 0 6 9
44	7 5 4 9 5	6 7 1 5 0	5 1 5 0 9	1 8 2 3 6	1 1 1 7 9	5 5 2 8 5	4 2 4 2 3	0 1 9 1 3	1 6 4 2 2	8 5 9 4 2
45	4 5 0 7 8	0 5 4 0 3	4 4 8 8 3	1 3 6 2 4	4 6 6 1 6	5 5 2 0 2	0 5 7 1 7	5 7 7 2 0	9 9 1 9 1	3 4 1 3 0
46	7 6 0 8 8	6 8 7 3 6	5 3 7 7 5	9 9 6 6 2	3 6 1 9 2	8 5 2 8 1	6 8 2 3 0	2 9 5 4 6	7 2 9 6 0	6 5 0 0 5
47	6 1 3 5 8	8 1 5 6 7	9 5 7 7 2	2 8 9 4 5	1 9 6 9 5	2 0 6 9 1	6 2 6 1 4	0 6 0 7 9	7 6 4 0 2	9 9 5 2 3
48	7 9 0 8 0	7 4 0 3 0	6 6 5 1 7	2 5 4 0 5	2 8 0 1 5	3 9 9 9 2	2 1 8 7 1	5 8 1 9 5	7 6 9 1 6	2 1 9 8 8
49	2 4 3 6 4	5 6 5 3 2	2 0 9 1 7	9 8 5 8 3	5 5 4 9 4	1 2 1 9 2	9 5 5 1 9	7 4 8 5 5	7 1 3 3 0	7 6 2 7 9
50	7 4 6 5 4	1 5 7 4 8	0 0 8 3 1	3 0 2 2 4	0 9 9 6 2	6 7 1 7 7	5 4 2 4 2	5 6 1 6 6	1 6 6 9 0	1 4 2 0 3

Appendix E. Random Number Table B

	col. 1 to 5	col. 6 to 10	col. 11 to 15	col. 16 to 20	col. 21 to 25	col. 26 to 30	col. 31 to 35	col. 36 to 40	col. 41 to 45	col. 45 to 50
1	88960	10117	44462	63500	36675	14482	78214	97365	54581	74267
2	95307	40097	64366	10959	60213	47582	13181	13080	66468	53592
3	24660	11388	32168	23966	32463	07629	56119	12432	04524	97665
4	56227	47413	77246	46908	55490	63364	99473	02203	94413	93510
5	26530	15489	45432	17695	37595	46755	94908	43077	88169	22695
6	00203	56563	40377	88892	27408	26279	07131	83200	84188	61635
7	28536	67455	84352	93530	55615	94149	38983	28293	54317	48784
8	90289	38157	83251	96751	75490	52651	50304	80953	85564	60649
9	74301	13787	58676	87644	53776	33672	47720	82843	16057	10007
10	59182	42122	30713	56474	66318	45485	48369	66461	03765	87854
11	15142	54296	67379	63046	78729	04565	21587	03018	43397	34232
12	39430	53966	31916	27910	30547	67657	96015	33745	79621	26224
13	84384	16145	57193	37341	34719	67607	86305	01906	04347	22374
14	13574	16223	60898	44686	59310	30529	90103	68293	57867	49884
15	47309	78548	67104	40245	44123	69189	17768	87560	68847	72097
16	34808	36021	02018	68152	51634	44267	73305	80296	80952	32747
17	85542	76466	80226	85870	57534	22545	31514	99638	26017	00975
18	67027	51719	14122	68472	76695	46239	36444	43831	60253	30860
19	64592	38872	32847	51369	34125	13788	06298	24004	88797	76653
20	72097	64662	58668	85222	80788	32148	63062	01170	82124	19383
21	12799	89632	73397	44037	03489	83300	72199	47688	20771	72047
22	10420	82233	07329	88727	61450	22969	11594	64508	52285	05497
23	85843	28695	34833	49415	44285	21974	05956	32410	41816	32784
24	84658	86447	64057	29048	87869	90999	48263	16681	91490	09406
25	90308	97880	68850	17587	29760	00354	26855	32201	37513	10797
26	88177	42883	76741	74932	66465	03705	87417	23645	99266	40925
27	68940	36554	34620	62050	20660	81870	46936	23783	43709	77252
28	15982	60768	81522	83390	33106	83626	24826	54736	47105	87512
29	88564	70509	81572	11241	49313	83783	40233	35492	82865	61690
30	40504	99798	67641	28711	56405	93018	88111	43122	25846	43624
31	13029	84450	84455	48623	21475	44292	80638	45603	87005	59780
32	22379	92680	36356	29029	49563	43717	21277	63078	02007	79451
33	50570	82458	39897	63621	08196	28199	64811	17723	50913	62956
34	10672	33849	41932	67527	01221	01168	55732	17609	74680	47067
35	49676	08092	35388	00234	06914	38125	75432	59374	80707	53342
36	92617	46120	52765	51090	46022	00752	61788	24645	91687	44673
37	23696	34476	83976	51627	37219	14985	29896	54251	06614	24956
38	07876	75395	18657	98315	90947	07678	47000	17685	56035	07031
39	81159	69284	51046	84033	21515	81994	41200	52248	16807	10454
40	26390	18760	34739	54109	19528	11105	37526	01787	80020	99975
41	60818	98167	67790	61136	52648	72941	49729	20902	49606	33924
42	08835	03083	32565	72992	80453	41247	06638	28742	61968	00278
43	06051	59273	23360	69376	86920	21362	84485	05978	01337	67231
44	12048	77112	25745	06121	89753	48229	98503	22527	55802	45331
45	66991	28302	95555	90527	13424	69889	42278	63901	22869	66924
46	53810	47096	88344	47249	91450	96550	58321	92183	25735	36844
47	85519	37912	60155	63825	18429	23156	75059	15513	69437	77448
48	29860	01907	66257	28650	91419	35628	16910	41814	23373	99807
49	54239	65994	64595	48563	53485	29131	80170	61439	80271	16863
50	16278	20100	51076	10266	07539	78292	88649	26090	57349	19584

Appendix F. Product Recovery Rate (PRR) - Summary of PRR

Product recovery rate (PRR) represents that proportion of an organism that is used for product. The PRR is also referred to as the recovery ratio. Recovery rates can be used for estimating the fresh weight of a catch from the tonnage of product produced. The following equation can be used for estimating round weight from product weight. Remember to add in discards.

(product weight ÷ recovery rate)= round 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. The weight of product divided by the weight of the fish before processing is the recovery ratio. *The fish weighed before processing should be sorted to species and be of the size and condition needed* for the product.

(product weight ÷ round weight)= product recovery rate

The product weight as defined here assumes 100% efficiency in production. If fifty fish are weighed before processing, the product weight should represent the product from all fifty fish. If the product weight is less, because of loss along the production line, the result should be called an efficiency ratio rather than a product recovery ratio.

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 all have a bearing on the recovery rate of a particular species.

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 6.67). To convert a conversion factor to a recovery rate, take the reciprocal of the conversion factor, i.e., divide the number 1 by the conversion factor.

Appendix F. Product Recovery Rate (continued)

NMFS Report Group Code (from Appendix H)

Product Code (from Appendix G)	3	4	6	7	8	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	30	31	32	33	36	37
110	.98	.85	.63	.57	.47	.44	–	.45	–	.05	.05	–	.05	–	.01	.45	.35	.25	.25	–	.15	.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	–	.11	–	.17	–	–	–
122	.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	–	–	–
125	.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	–	.18	–	.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	–	.60	.50	–	–	–	–	–	–	.15	.05	.05	.10	.40	.30	.35	.25	–	–	–	.17	–	–	–
143	.98	.88	.55	.60	.50	–	–	–	–	–	–	.20	.05	.05	.05	.40	.30	.35	.25	–	–	–	.17	–	–	–
144	.98	.88	–	.60	.50	–	–	–	–	–	–	.15	.05	.05	.10	.40	.30	.35	.25	–	–	–	.17	–	–	–
160	.98	.88	–	.50	.40	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.17	–	–	–
168	.98	.88	–	.60	.50	–	–	–	–	–	–	.15	.05	.05	.10	.40	.30	.35	.25	–	–	–	.17	–	–	–
169	.98	.88	–	.60	.50	–	–	–	–	–	–	.15	.05	.05	.10	.40	.30	.35	.25	–	–	–	.17	–	–	–
172	.98	.88	–	.60	.50	–	–	–	–	–	–	.15	.05	.05	.10	.40	.30	.35	.25	–	–	–	.17	–	–	–
173	.98	.88	–	.60	.50	–	–	–	–	–	–	.15	.05	.05	.10	.40	.30	.35	.25	–	–	–	.17	–	–	–
193	.98	.87	.67	.64	.61	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.15	–	.17	–	–	–
270A	.98	.80	.70	.65	.56	.50	–	–	–	.04	–	.15	–	–	–	.35	.30	.30	.21	.13	.16	.22	.17	–	–	.43
270B	.98	.80	.70	.65	.56	.50	–	–	–	.04	–	.15	–	–	–	.35	.30	.30	.21	.13	.17	.22	.17	–	–	.43
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	–	–	.32	–	–	–	.32	–	–	–	–	–	–	–	–	–	–	–	–	–	.17	–	–	–
710	.98	.89	–	.68	.63	.50	–	–	–	–	–	–	.05	–	–	.35	.30	.30	.25	–	–	–	.22	–	–	–
875	.98	.69	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.17	–	.75	–

Appendix G. Product Codes and Description

Code	Description
1	Whole fish/food fish (PRR = 1.00)
2	Whole bait fish (PRR = 1.00)
3	Bled only (throat, or isthmus, slit to allow blood to drain)
4	Gutted only
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)
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, skinless/boneless
24	Deep skin fillets
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	Butterfly (split, no backbone, head removed, fillets still attached)
95	Discards at plant. Floaters/shoreside in plant discard of whole fish and prohib.'s
96	Decomposed fish, previously caught fish which is caught again and discarded. (PRR 0.0)
97	Food bank fish
98	Discards, at sea. Groundfish and prohibited sp. discarded by catcher vessels, c/p, and ms.
99	Dockside discard; discard after delivery and before processing.

Appendix H. NMFS Report Group Codes from Vessel Logs

Code	Areas	Common name
110	All	Pacific cod
118	GOA	Deep water flatfish (rex sole, Dover sole, Greenland turbot)
119	GOA	Shallow water flatfish (all flatfish **except** deepwater flatfish, flathead sole and arrowtooth flounder) Includes yellowfin and rock sole
120	BSAI	Other flatfish (all flatfish except yellowfin, rock sole, arrowtooth flounder, & Greenland turbot). Includes flathead sole.
121	BSAI	Arrowtooth flounder and/or Kamchatka flounder
121	GOA	Arrowtooth flounder
122	GOA	Flathead sole
123	BSAI	Rock sole
125	GOA	Rex sole
127	All	Yellowfin sole
130	All	Ling cod (non-allocated)
134	BSAI	Greenland turbot
136	GOA	Northern rockfish
139	BSAI	Other rockfish (all rockfish and thornyheads except POP, sharpchin, northern, shortraker, and rougheye)
141	All	Pacific Ocean Perch
143	GOA	Thornyhead rockfish (all Sebastolobus species)
144	GOA	Slope rockfish (aurora, blackgill, chilipepper, darkblotch, greenstriped, harlequin, pygmy, shortbelly, splitnose, stripetail, vermillion, yellowmouth, bocaccio, silvergrey, and redstripe.
160	All	Sculpins
166	GOA	Sharpchin rockfish
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, AI	Shortraker and/or rougheye rockfish
172	AI	Sharpchin and/or northern rockfish
173	BS	Other red rockfish (shortraker, rougheye, sharpchin, and northern)
193	All	Atka mackerel
213	All	Grenadier (non-allocated)
270	All	Pollock, 270A = Jan. - Jun, 270B = Jul. - Dec.
510, 511, 516	All	Smelt, eulachon, capelin
689	All	Sharks
700	All	Skates
710	All	Sablefish
875	All	Squid

Appendix I. Processor Code List

Processor Code	Processor	Location
F05470	10th & M Seafoods	Anchorage
F05388	Alaska General Processors	Ketchikan
F05429	Alaska Seafood Co. Inc.	Juneau
F05342	Alaska Pacific Seafood	Kodiak
M03230	Alaska Packer	
F05504	Alaska Custom Seafoods Inc.	Homer
M04285	Alaska Challenge	
F05945	Alaska Glacier Seafood Co.	Juneau
F05343	Alaska Fresh Seafoods Inc.	Kodiak
M03794	Alaska Ocean	
F05797	Alaskan Premier Seafoods	Anchorage
F05528	Alaskan Leader Fisheries	Kodiak
M04598	Alaskan Leader	
M02018	Alaskan Rose	
F05334	Aleutian Dragon Fisheries	Chignik
M02924	Alliance	
F05320	Alyeska Seafoods Inc.	Unalaska
M01879	American No. 1	
M03408	American Empress	
M03681	American Dynasty	
M02760	American Enterprise	
M04055	American Triumph	
F05394	Annette Island Packing Co. Cold Storage	Metlakatla
F05397	Aquatech	Anchorage
M02943	Arctic Storm	
M03381	Arctic Sea	
F06247	Arctic Salmon Inc.	Bethel
M03396	Arctic Fjord	
M03694	Arica	
F06229	Arrowac Fisheries Inc.	Homer
F05424	Arrowac Fisheries Inc.	Bellingham
F05303	Atka Pride Seafoods Inc.	Juneau
F05309	Barge Unisea	St. Paul Island
M00528	Beagle	
F05482	Bell's Seafood	Haines
F05415	Big Dipper Seafoods Inc.	Valdez
M05361	Blue Wave	
F05380	Bornstein Seafoods Inc.	Bellingham
M02726	Browns Point	
F05935	Buy N Pack Seafoods	Hoonah
M02110	Cape Horn	
F05444	Carlson Seafoods	Anchorage
F05327	Chignik Pride Fisheries	Chignik
M02850	Christina Ann	
M02718	Clipper Surprise	
F05463	Cannery Rowinc	Cordova
M03242	Clipper Endeavor	
M04463	Clipper Epic	
M05319	Clipperton	
F05520	Coal Point Trading Co.	Homer
F05435	Coastal Cold Storage	Petersburg
M04092	Constellation	
F06009	Cook Inlet Processing	Seward
F05321	Cook Inlet Processing	Kodiak
F06117	Cook Inlet Processing	Nikiski
F05364	Cook Inlet Processing	Nikiski
M02695	Crest	
F05298	Deep Creek Custom Packing Inc.	Ninilchik
M02815	Deep Sea Harvester	
M04635	Defender	
F05542	Dejon Delights	Haines
F05318	Dragnet Fisheries Co. Inc.	Kenai
F06178	Eat Me Seafoods	Craig
M02722	Elizabeth Ann	
F05312	Emerald Is. Gourmet Seafoods	Anchorage
M03360	Endurance	
M05822	Enterprise	
M04111	Excellence	
F05383	Favcoinc.	Anchorage
F05386	Fishhawk Fisheries Inc.	Astoria
F06067	Flopping Fresh	Homer
F06152	Fresh and Frozen Seafoods	Ketchikan
F05372	Glacier Village Supermarket Inc. -Super Bear	Juneau
F05373	Glacier Village Supermarket Inc. Jerry's Meats	Juneau
M01607	Golden Alaska	
M00367	Golden Fleece	
F05484	Great Pacific Seafoods Inc.	Anchorage
F06224	Haines Fisheries Inc.	Haines
M03348	Highland Light	
F06003	His Catch Value Added Seafood	Homer
F05335	Hoonah Cold Storage	Hoonah

Processor Code	Processor	Location
F05638	Horst Seafood Inc.	Juneau
F05565	Howsers Supermarket Ltd.	Haines
F05407	Icicle Seafoodsinc.	Bellingham
F05332	Icicle Seafoodsinc	Homer
F05490	Icy Straits Seafoods Inc.	Juneau
M03259	Independence	
F05419	Inlet Salmon	Kenai
F05466	Inlet Fish Producers Inc.	Kenai
F05405	Int'l Seafoods of Alaska Inc.	Kodiak
F05392	International Seafoods Of Alaska Inc.	Kodiak
M03870	Island Enterprise	
F05631	Island Seafoods	Kodiak
F05602	J.r. Fish Co Inc.	Wrangell
F05462	J&r Fisheries	Seward
F05476	Jon-k Seafoods Inc.	Juneau
F05398	Kachemak Fish Packers	Homer
F05302	Kachemak Bay Seafood	Homer
F05521	Kake Fisheries Inc.	Kake
F05439	Katch Seafoods Inc.	Homer
M01996	Katie Ann	
F05421	Kell-nor Fisheries	Everett
F05494	Kenai Custom Seafoods	Kenai
F05645	Kingfisher Seafoods Co	Unalaska
F05535	Kodiak Smoking & Processing	Kodiak
M03671	Kodiak Enterprise	
M03367	Legacy	
M05167	Miss Kimberly	
F05546	Nautilus Foods	Valdez
M03475	Neptune	
F05400	New West Fisheries Inc.	Bellingham
F05365	Nor-freeze Inc.	Seattle
F05353	Norquest Seafoods Inc.	Craig
F06238	Norquest Seafoods Inc.	Chignik
F05338	Norquest Seafoods Inc.	Cordova
F05336	Norquest Seafoods Inc.	Ketchikan
F05337	Norquest Seafoods Inc.	Petersburg
F05662	North Alaska Fisheries Inc.	Anchorage
F05341	North Pacific Processors	Cordova
M03261	Northern Eagle	
M04063	Northern Hawk	
M00661	Northern Glacier	
M03896	Northern Jaeger	
F05420	Northport Fisheries Inc.	Everett
M05294	Norton Sound	
F05370	Ocean Beauty Seafoods Inc.	Kodiak

Processor Code	Processor	Location
F05518	Ocean Beauty Seafoods Inc.	Seattle
F05369	Ocean Beauty Seafoods Inc.	Cordova
F05431	Ocean Beauty Seafoods Inc.	Petersburg
M03703	Ocean Phoenix	
M02134	Ocean Peace	
F05443	Ocean Beauty Seafoods Inc.	Naknek
M03442	Ocean Rover	
M05119	Omnisea	
F05349	Osterman Fish	Dutch Harbor
F05442	Pacific Star Seafoods Inc.	Kenai
M02799	Pacific Navigator	
M03357	Pacific Glacier	
F05543	Pacific Choice Seafoods Co.	Charleston
M03416	Pacific Explorer	
F05344	Pacific Salmon Company Inc.	Seattle
M03383	Pacific Scout	
F05921	Pelican Seafoods	Pelican
F05357	Peter Pan Seafoods Inc.	Valdez
F05358	Peter Pan Seafoods Inc.	King Cove
F05300	Petersburg Fisheries	Petersburg
F05339	Pioneer Food Corp.	Unalaska
F05301	Point Adolphus Seafoods	Gustavus
F06109	Port Graham Seafoods Inc.	Port Graham
F05423	Prime Select Seafood Inc.	Cordova
F05333	Prime Alaska Seafoods Inc.	Unalaska
F05827	Pristine Seafood Co.	Sitka
M03629	Provider	
M01190	Pursuit	
F05925	R & J Seafoods	Kasilof
M02838	Rebecca Ann	
F05438	Resurrection Bay Seafoods L.l.c.	Seward
F05313	Royal Aleutian Seafoods Inc.	Seattle
F05403	S.e. Ak. Smoked Salmon Co. Inc. - Taku Fisheries	Juneau
F05304	Sahalee of Alaska Inc.	Anchorage
F05460	Salamatof Seafoods Inc.	Kenai
F05465	Samer-i Seafoods	Anchor Point
F06232	Sea Catch Inc.	Seattle
M03231	Sea Alaska	
M02757	Sea Legend	
F05523	Sea Level Seafoods Inc.	Wrangell
F05955	Sea World Fisheries Ltd.	Ketchikan
F05950	Sea Hawk Seafoods Inc.	Valdez
F05432	Seafood Producers Cooperative	Sitka

Appendix I.. Processor Code List

Processor Code	Processor	Location
F05371	Seafood Producer Cold Storage Inc.	Sitka
F06233	Seafreeze Ltd. Partnership	Seattle
M03245	Seattle Enterprise	
F05299	Seward Fisheries	Anchorage
F05359	Sitka Sound Seafoods	Yakutat
F05346	Sitka Sound Seafoods	Sitka
F06244	Smoki Foods Inc.	Seattle
F06163	Sound Seafood	Girdwood
F05354	Specialty Fish Products	Anchorage
F05367	Star of Kodiak	Kodiak
M03414	Starbound	
M05362	Stellar Sea	
F05952	T & L Specialty Meats And Seafood Inc.	Sitka
M04616	T-mike	
M03229	Tempest	
M04650	Tenacity	
F05436	The Salmon River Smokehouse	Gustavus
F06053	The Auction Block	Homer
F05464	Toksook Bay Fishermen's Bldg.	Toksook Bay
F05350	Trans-aqua International Inc.	Kasilof
F05305	Trident Seafoods Corp.	Sand Point
F05306	Trident Seafoods Corp.	Akutan
F05307	Trident Seafoods Corp.	St. Paul Island
M03004	U.S. Enterprise	
M02800	U.S. Intrepid	
F05696	Unalaska Seafood Co.	Unalaska
F05310	Unisea Inc. - Dutch Harbor	Dutch Harbor
M02839	Victoria Ann	
M03796	Vin Ce	
F05376	Wards Cove Packing Co. Dba E.c. Phillips & Son	Ketchikan
F05348	Wards Cove Packing Company - Alitak	Kodiak
F05414	Wards Cove Packing Co.	Kodiak Island
F05560	Wards Cove Packing Company	Elfin Cove
F05409	Wards Cove Packing Co.	Excursion Inlet
F05375	Wards Cove Packing Company Kenai Operation	Kenai
F05488	Washington Crab Producers Inc.	Westport
F05347	Western Alaska Fisheries Inc.	Kodiak
M03590	Western Sea	
F05323	Westward Seafoods Inc.	Dutch Harbor
F05956	Wild Fish	Juneau
F05308	Wrangell Fisheries Inc.	Wrangell
F06258	Wrangell Seafoods Inc.	Wrangell
F05315	Yamaya Seafoods	Anchorage
M03116	Yardarm Knot	
F05891	Yki Fisheries Inc.	Yakutat

Appendix J. List of Vessel Code, Vessel Plant Name, Length, Coast Guard Number

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
P044	10TH & M SFDS			5470
A586	A J	150	599164	3405
A559	AIREDALE	130	521431	3374
A573	ALASKA BEAUTY	98	544967	2046
A442	ALASKA CHALLENGE	98	615085	4285
A416	ALASKA CHALLENGER	105	597377	3387
A366	ALASKA DAWN	90	978517	4615
A030	ALASKA DESTINY	245	556069	3258
P021	ALASKA FRESH SFDS			5343
A068	ALASKA JURIS	238	569276	2443
A222	ALASKA MIST	174	586179	2833
A115	ALASKA OCEAN	376	637856	3794
P016	ALASKA PACIFIC SFDS			5342
A298	ALASKA PATRIOT	185	513392	3816
A088	ALASKA PIONEER	196	555645	3308
A072	ALASKA RANGER	200	550138	3400
A238	ALASKA ROSE	111	610984	516
A117	ALASKA SPIRIT (Trawl)	221	554913	3819
A585	ALASKA SPIRIT (Longline/ Pot)	98	605674	4105
A499	ALASKA TRADER	132	567664	3693
A286	ALASKA TROJAN	124	609369	1089
A264	ALASKA VICTORY	227	569752	4093
A009	ALASKA VOYAGER	220	536484	1311
A108	ALASKA WARRIOR	215	590350	3423
A155	ALASKAN	73	510811	2010
A431	ALASKAN BEAUTY	105	590340	5133
A033	ALASKAN COMMAND	184	599383	3391
A306	ALASKAN ENTERPRISE	151	595760	3006
P063	ALASKAN I	246	605691	3532
A309	ALASKAN LEADER	150	971836	4598
A564	ALASKAN PRIDE	120	566399	2036
A031	ALASKAN ROSE	124	529154	2018
A475	ALASKAN SHORES	124	603879	4583
A065	ALDEBARAN	132	664363	901
A181	ALEUTIAN	68	227566	2256
A488	ALEUTIAN BALLAD	97	656806	4458
P003	ALEUTIAN DRAGON FISHERIES			5334
A076	ALEUTIAN ENTERPRISE	142	664123	1016
A287	ALEUTIAN LADY	165	504762	4102
A546	ALEUTIAN MARINER	118	602229	495
A391	ALEUTIAN ROVER	128	517272	5282
A627	ALEUTIAN SPRAY	98	522870	427

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
A025	ALEUTIAN TRAWLER			776
A381	ALICIA JEAN	101	967014	5571
P030	ALITAK			
P020	ALKOD			
P005	ALL ALASKAN			
P064	ALL ALASKAN-FLOATER	340	248773	3677
A449	ALLIANCE (LL)	100	623876	2956
A563	ALLIANCE (Trawl)	107	622750	2924
A182	ALLSTAR	62	578815	2111
A323	ALMIGHTY	99	558548	2804
A302	ALOMA	67	623611	2802
A199	ALRITA	73	248401	52
A300	ALSEA	124	626517	2811
A377	ALSKA	63	553667	1562
A038	ALYESKA	122	560237	395
P010	ALYESKA SEAFOODS			5320
A424	AMATULI	110	511315	3227
A224	AMBER DAWN	97	529425	980
A487	AMBITION	95	618713	466
A376	AMERICAN BEAUTY	123	613847	1688
A587	AMERICAN CHALLENGER	106	633219	4120
A478	AMERICAN CHAMPION	183	527411	2974
A074	AMERICAN DYNASTY	272	951307	3681
A292	AMERICAN EAGLE	120	558605	434
A064	AMERICAN EMPRESS	306	942347	3408
A056	AMERICAN ENTERPRISE	210	594803	2760
A032	AMERICAN NO. 1	160	610654	1879
A622	AMERICAN STAR	154	959935	4586
A262	AMERICAN TRIUMPH	285	646737	4055
A436	AMERICAN VIKING	126	550276	2309
A422	AMERICAN WAY	100	662562	2099
P049	ANDERSON SFDS			
A386	ANDRONICA	99	622780	4560
A148	ANITA J	130	560532	1913
A534	ANNA MARIE	86	524384	1627
A126	ANNETTE	68	562157	1430
A505	ARCTIC DAWN	96	634806	4676
A303	ARCTIC EAGLE	126	967106	4555
P060	ARCTIC ENTERPRISE	339	248169	5314
A069	ARCTIC FJORD	275	940866	3396
A003	ARCTIC I	115	678234	3009
A002	ARCTIC II	115	678235	3008
A006	ARCTIC III	180	647985	3007
A055	ARCTIC IV	155	936302	3388

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
A477	ARCTIC V I	124	988598	4993
A633	ARCTIC LADY	122	604215	2841
A447	ARCTIC MARINER	125	618374	4582
A555	ARCTIC ORION	155	596653	3686
A569	ARCTIC SEA	135	596137	3381
A054	ARCTIC STORM	334	903511	2943
A050	ARCTIC TRAWLER	297	517242	2733
A439	ARCTIC WIND	123	608216	5137
A013	ARCTURUS	132	655328	533
A317	ARGOSY	124	611365	2810
A103	ARICA	186	550139	3694
A204	ARROW	70	223621	97
P054	ARROWAC FISHERIES			5424
A523	ATKA ENTERPRISE	190	555416	4629
A517	ATLANTIC HARVESTER	81	298089	4739
A294	ATLANTICO	98	524452	625
A305	ATLAS	350	282733	4009
A467	AUGUSTINE	90	635397	3093
A044	AURIGA (Trawler)	193	639547	2889
A630	AURIGA (Pot)	156	298691	4585
A048	AURORA	193	636919	2888
A492	BAGATELL	136	515712	4165
A165	BALLAD	67	590537	2017
A457	BALLYHOO	167	501812	1921
A127	BALTIC SEA	61	564342	2913
A562	BARANOF	180	598508	1248
A448	BARBARA J	110	648690	4979
A638	BAY ISLANDER	86	521200	1193
A049	BEAGLE	107	623210	528
A307	BEAUTY BAY	127	959086	4533
A454	BELAIR	91	221429	1904
A180	BERING EMPIRE	150	636416	3858
A005	BERING ENTERPRISE	183	610869	3003
A285	BERING ROSE	111	624325	515
A502	BERING SEA	114	554126	3380
A437	BERING STAR (Pot)	108	593310	4658
P065	BERING STAR (Plant)	199	597734	3531
A530	BETTY LEE	65	595427	2336
A515	BIG BLUE	77	601825	1907
A518	BIG VALLEY	92	515719	2412
A548	BILLIKIN	135	550190	277
A528	BLAZER	73	973389	4486
A464	BLUE FIN	120	546234	5040
A356	BLUE FOX	85	979437	4611
A120	BLUE ICE	82	600875	2402
A104	BLUE NORTH	167	604676	3339
A355	BLUE PACIFIC	168	569927	4618

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
P066	BLUE WAVE	200	509280	5361
A463	BOLD CONTENDER	66	620497	617
A432	BOUNTIFUL	165	593404	278
A484	BOUNTY HUNTER	113	982587	4961
A651	BRISTOL MARINER	125	608397	5448
P067	BRISTOL MONARCH	121	255409	1237
A374	BRISTOL STORM	126	270392	3726
A620	BRITTANY	106	600856	5127
P057	BROOKS ALASKAN			5360
A073	BROWNS POINT	190	587440	2726
A535	BUCCANEER	76	558467	1106
A289	BULLDOG	141	583974	4106
A395	C-LADY	65	509980	1185
A327	CAITLIN ANN	103	960836	3800
A472	CALIFORNIA HORIZON	90	590758	412
A393	CAPE CROSS (LL)	46	257536	4690
A228	CAPE CROSS (LL)	64	622186	662
A198	CAPE FLATTERY	71	241146	589
A077	CAPE HORN	158	653806	2110
A326	CAPE KIWANDA	76	618158	1235
A398	CAPE OMMANEY	85	246336	3770
A339	CAPRICE	86	565511	1912
A271	CAPT'N ART	83	544628	1945
A322	CARAVELLE	86	583916	3402
A192	CAROL M	61	225374	2259
A404	CASCADE	101	557441	3699
A369	CENTAURUS	149	530652	5780
A231	CHANDALAR	70	632162	5747
A200	CHELSEA	70	224464	2187
A359	CHELSEA K	150	976753	4620
P004	CHIGNIK PRIDE FISHERIES			5327
A028	CHRISTINA	58	262160	2284
A046	CHRISTINA ANN	204	653045	2850
A036	CLAYMORE SEA	227	935475	3362
A057	CLIPPER ENDEAVOR	124	633593	3242
A580	CLIPPER EPIC	172	619796	4463
A153	CLIPPER SURPRISE	124	628555	2718
P068	COASTAL STAR	311	594619	5293
A101	COHO	71	622773	1230
A125	COLLIER BROTHERS	89	593809	2791
A279	COLUMBIA (Trawl)	123	615729	1228
A168	COLUMBIA (LL/Pot)	81	223578	2741
A150	COMMODORE	133	914214	2657
A371	CONFIDENCE	49	623838	1990
A283	CONSTELLATION (Trawler)	150	640364	4092
A616	CONSTELLATION (Pot)	127	604998	5781
A269	CONSTITUTION	73	211928	302

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
A641	CONTROLLER BAY	88	942350	5530
P062	COOK INLET -SEWARD			
P028	COOK INLET PROC.-KODIAK			5321
P032	COOK INLET-KENAI			5364
A179	COOLIDGE	62	227211	1119
A623	CORNELIA MARIE	136	957458	5178
A280	COURAGEOUS	180	606117	1276
A157	CREST	134	238060	2695
A163	DAILY	54	219557	256
A267	DAWN	86	532081	5
P006	DEEP CREEK CUSTOM PAC			5298
A067	DEEP PACIFIC	124	640128	2872
A304	DEEP SEA HARVESTER	168	627840	2815
A358	DEFENDER (Trawl)	200	554030	3257
A486	DEFENDER (Trawl)	120	665983	4635
A270	DEFIANT	66	619236	2198
P043	DELIVERY: UNKN OR BAIT			
A363	DENALI	80	506043	5418
A288	DESTINATION (Trawler)	180	571879	3988
A408	DESTINATION (Pot)	109	632374	5329
A647	DESTINY	100	590962	4177
A421	DETERMINED	111	600071	1114
P069	DISCOVERY STAR	160		3877
A295	DISTANT WATER	119		2087
A578	DOLPHIN	86	249021	3424
A082	DOMINATOR	124	602309	411
A017	DOMINION	66	620062	642
P070	DONA KAREN MARIE	369	681105	4107
A145	DONA LILIANA	152	651752	2770
A254	DONA MARTITA	152	651751	2047
A133	DONA PAULITA	152	637744	2769
P058	DORY SFDS			5517
P031	DRAGNET FISHERIES CO.			5318
A250	DUSK	86	550418	4
A558	EAGLE (Longline)	77	917711	4013
A189	EAGLE (Pot)	83	508600	1174
P019	EAGLE FISHERIES L.P.			
A584	EASTBOUND ONE	144	299124	4183
A241	ECHO BELLE	84	617234	1974
A185	ECLIPSE	72	226744	878
A027	EL DAN	72	626786	915
A052	ELIZABETH ANN	220	534721	2722
A014	ELIZABETH F	90	526037	823
A147	EMERALD QUEEN	140	648911	3787
A084	ENDURANCE (Trawler)	278	592206	3360
A619	ENDURANCE (Trawler)	98		1594
A220	ENTERPRISE (LL/Pot/Trawl)	78	557952	2579
A639	ENTERPRISE (Trawler)	120	657383	5822
P071	EVENING STAR (Plant)	166	570891	3530
A217	EVENING STAR (Longline)	65	248539	200
A567	EXCALIBUR I I	76	636602	410
A291	EXCELLENCE	367	967502	4111
A388	EXITO	126	273458	5091
A160	EXODUS	94	598666	1249
P027	FAROS SFDS			5459
A423	FARRAR SEA	100	973143	5478
A443	FARWEST LEADER	101	606083	3226
A503	FIERCE ALLEGIANCE	166	588849	4133
A588	FIERCE CONTENDER	166	589883	4110
A331	FIERCE SEA	166	642407	4119
A083	FLYING CLOUD	124	598380	1318
P072	FORT YUKON			368
A334	FORUM STAR	97	925863	4245
A100	FRONTIER MARINER	135	951440	3672
A107	FRONTIER SPIRIT	135	951441	3673
A656	GALAXY	188	576981	5118
A508	GEORGE ALLEN	78	528842	4764
A260	GINNY C	65	251357	3088
A640	GOD'S WILL	85	513397	2808
A070	GOLD RUSH	93	521106	1868
A255	GOLDEN ALASKA	305	651041	1607
A297	GOLDEN DAWN	149	604315	1292
A343	GOLDEN FLEECE	104	609951	367
A149	GOLDEN PISCES	98	599585	586
A557	GRAND DUCHESS	114	625876	2228
A259	GRANT	68	225264	289
A382	GREAT PACIFIC	124	608458	511
P050	GREAT PACIFIC SFDS			5483
A139	GREEN HOPE	88	609993	685
A466	GRIZZLY	123	664175	4178
A433	GRUMPY J	82	514665	1232
A453	GUARDIAN	99	972714	4627
A206	GULF MAIDEN	72	514505	1591
A102	GUN-MAR	172	640130	425
A037	HALF MOON BAY	122	615796	249
A372	HANDLER	126	970937	5480
A314	HARMONY I	82	604477	638
A019	HARVESTER ENTERPRISE	188	584902	2732
A333	HAZEL LORRAINE	89	592211	523
A058	HEATHER SEA	270	946773	3664
A444	HERITAGE	68	582098	5744
A227	HESSAFJORD	142	236979	3385
A552	HI SEAS I	84	599405	3891
A040	HICKORY WIND	81	594154	993

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
A389	HIGH SPIRIT	95	982610	4803
A316	HIGHLAND LIGHT	270	577044	3348
A347	HOLY CROSS	79	515144	1203
P087	HOONAH COLD STORAGE			5335
A171	HOOVER	62	228381	1969
A308	HUSKY	132	586918	3375
A529	HUSTLER	72	606821	4238
A542	ICELANDER	100	563421	2730
P014	ICICLE SFDS -HOMER			5332
P034	ICICLE SFDS-PBURG			5300
A451	ICY POINT	105	554355	4996
A320	ILSE	58	298563	3415
A242	IMMIGRANT	61	509415	3541
A221	INDEPENDENCE (Longline/ Pot)	78	552513	792
P073	INDEPENDENCE (Floater)	356	237743	3259
P025	INT'L SFDS OF ALASKA, INC.			5392
P017	INT'L SFDS-MARINE WAY(CLOSED)			5405
A143	IRENE H	82	520337	2899
A194	IRENE'S WAY	83	629033	2827
A225	ISLAND ENTERPRISE	304	610290	3870
P056	ISLAND SFDS			5631
A252	JADE ALASKA	115	553592	1139
A473	JAMIE MARIE	90	932586	4999
A645	JEANINE KATHLEEN	58	972086	4195
A243	JEANOAH	82	530164	1497
A113	JESSICA B	78	675561	3398
A257	JOANN MARIE	60	533613	1285
A142	JUDI B	92	562772	1695
A481	JUDY MAE	34	281526	4677
A483	JUNO	116	260614	3691
A561	KAARE	75	236664	4456
P053	KAKE FISHERIES			5521
A195	KAMILAR	66	629244	362
A536	KAMISHAK QUEEN	76	611551	1528
P048	KANAWAY SFDS			
A232	KARIEL	66	626555	3759
A311	KARLA FAYE	163	960004	4520
A173	KATHERINE	86	599072	3583
A078	KATIE ANN	296	518441	1996
A653	KATIE K	108	552364	3354
A460	KATRINA EM	101	607434	1980
A164	KEMA SUE	80	589000	1701
A226	KESIA DAWN	66	629009	274
A414	KETA	97	576029	5330
A549	KEVLEEN-K	104	517481	4769

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
A201	KILKENNY	75	510076	3248
A266	KING AND WINGE	96	212014	1850
P088	KINGFISHER SEAFOODS CO.			5645
A516	KISKA ENTERPRISE	180	642653	3376
A402	KISKA SEA	124	965726	4179
A130	KJEVOLJA	110	612616	1632
A410	KODIAK	111	600072	1109
A105	KODIAK ENTERPRISE	275	579450	3671
A385	KODIAK QUEEN	145	507891	603
A566	KONA WIND	81	934764	4373
A379	KONA-KAI	108	669025	2342
A646	KRISTEN GAIL	114	618791	1686
A514	KRISTIANA	69	247187	576
A210	KRISTINE	61	248470	806
A468	LABRADOR	133	284504	4589
A526	LADY GRACE	78	227284	4271
A407	LADY KODIAK	112	972646	4893
A513	LADY L	80	511617	4190
A336	LADY OF GOOD VOYAGE	78	597603	2074
A537	LADY SELKET	87	959092	4680
A490	LAST FRONTIER	99	667407	4962
A202	LAURA	93	508622	1571
A035	LEGACY	117	664882	3367
A493	LESLIE LEE	91	584873	1234
A330	LET'S GO	71	609344	476
A175	LEVIATHAN	62	224443	1991
A351	LILLI ANN	141	976538	4569
A582	LILLIAN S	90	210075	2671
A397	LIN-J	80	538018	1705
A632	LINDY	77	227167	357
A140	LISA JO	82	511692	1565
A650	LISA MARIE	78	1038717	6172
A313	LISA-MELINDA	81	584360	4506
A116	LONE STAR	86	520494	213
A174	LORELEI II	63	251968	1257
A253	LUALDA	63	259740	1665
A485	MAGNUM	118	529675	4113
A299	MAHALO	83	598642	1817
A170	MAJESTIC	60	223177	38
A315	MAJESTY	106	962718	3996
A015	MAR DEL NORTE	86	523219	435
A625	MAR DEL SUD	110	524524	1287
A079	MAR PACIFICO	96	524001	1674
A637	MAR-GUN	113	525608	524
A476	MARATHON	87	596156	1191
A158	MARCY J	97	517024	2142

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
A010	MARGARET LYN	123	615563	723
A132	MARIA N	123	950038	3692
A636	MARK I	98	509552	1242
A176	MASONIC	70	228492	1279
A624	MELANIE	102	512191	1934
A114	MELISSA BETH	77	677261	3397
A216	MEMORIES	65	251934	2264
A489	MESSIAH	79	610150	6081
A346	MICHELLE RENE	98	966996	4131
A272	MIDDLEPOINT	83	661543	3427
A470	MIDNITE SUN	85	548491	3060
A122	MILKY WAY	72	599711	3038
A551	MISS ANNGEL	72	607807	2860
A219	MISS BERDIE	80	913277	3679
A406	MISS BLU	68	538250	708
A236	MISS CONCEPTION	69	533411	171
A029	MISS CORINNE	58	607659	1314
A205	MISS JANE	84	543021	2603
A325	MISS LEONA	86	522643	1482
A244	MISS LINDA	59	559778	507
A479	MISS SARAH	103	921578	4989
A141	MISS TIFFANIE	70	646374	2265
A649	MISTY DAWN	107	926647	5946
A321	MONRAD FARSTAD	80	550564	4161
A137	MORIAH	75	556529	1489
A053	MORNING STAR	148	610393	208
A659	MR B	154	600325	5325
A568	MS. JULIET	75	550828	1698
A112	MS. AMY	90	920936	2904
A631	MUIR MILACH	86	611524	480
A230	NANCY H	85	268442	2998
A425	NEAHKAHNIE	109	599534	424
A387	NEPTUNE	203	604812	3475
A213	NETTIE H	58	553680	2202
A648	NEW LIFE	79	504299	6182
A106	NEW STAR	188	285304	3491
A440	NEW VENTURE	100	565816	1137
P074	NEW WEST FISHERIES			5400
A215	NIGHTWATCH	74	575942	854
A539	NIP 'N TUCK	66	611459	2340
A579	NO QUARTER	51	681410	4948
A415	NOR' QUEST	110	609064	3425
A245	NORCOASTER	62	563617	181
A455	NORDIC FURY	110	542651	1094
A655	NORDIC MARINER	106	591077	6191
A087	NORDIC STAR	123	584684	428
P061	NORQUEST (SILVER LINING)			5336
P090	NORQUEST SEAFOODS INC.			5338
A533	NORSKA	70	629262	1734
A209	NORTH	62	223635	68
A427	NORTH AMERICAN	110	566067	4091
A368	NORTH COMMAND	174	500871	5675
A507	NORTH PACIFIC	96	511698	4851
P007	NORTH PACIFIC PROCESS			5341
A412	NORTH POINT	85	296653	5389
A498	NORTH SEA	126	606565	3382
A572	NORTH STAR	112	512076	948
A521	NORTHERN	69	226833	307
P075	NORTHERN ALASKAN			864
A062	NORTHERN AURORA	155	596308	1613
A532	NORTHERN BELLE	85	615387	4639
A413	NORTHERN CASCADE	110	556251	4543
A041	NORTHERN EAGLE	341	506694	3261
A352	NORTHERN EMPIRE	194	?566573	4587
A275	NORTHERN ENTERPRISE	166	629978	3005
A001	NORTHERN GLACIER	201	663457	661
A282	NORTHERN HAWK	341	643771	4063
A080	NORTHERN JAEGER	336	521069	3896
A357	NORTHERN LADY	138	930157	3363
A405	NORTHERN MARINER	73	958549	3741
A634	NORTHERN PRINCE	53	563437	5912
A329	NORTHERN SPIRIT	90	613825	3736
P059	NORTHERN VICTOR	379	248959	4078
A007	NORTHWEST ENTERPRISE	162	609384	3002
A524	NORTHWEST MARINER	106	625268	4580
A426	NORTHWESTERN	126	587816	4973
A583	NORTHWYN	80	250121	4336
A312	NORTON SOUND	136	936017	5294
A390	NOWITNA	135	608699	2222
A635	NUKA ISLAND	105	604208	1959
A491	NUNIVAK	86	264094	506
A403	OBSESSION	107	603285	2212
A522	OCEAN BALLARD	114	974507	4573
P023	OCEAN BEAUTY SFDS-KODIAK			5370
P055	OCEAN BEAUTY-CORDOVA			5369
A233	OCEAN CAPE	98	583721	1615
A183	OCEAN DAWN	80	550890	1936
A004	OCEAN ENTERPRISE	155	678236	3011
A417	OCEAN FURY	124	586441	5368
A240	OCEAN (Pot/Trawl) HARVESTER	108	549892	5130
A629	OCEAN (Longline) HARVESTER	72	524908	649

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
A152	OCEAN HOPE I	92	652395	1640
A020	OCEAN HOPE I I I	96	652397	1623
A154	OCEAN HUNTER	88	622324	1964
A373	OCEAN LEADER	120	561518	1229
A501	OCEAN OLYMPIC	156	592441	4940
A110	OCEAN PEACE	219	677399	2134
A090	OCEAN PHOENIX	688	296779	3703
P076	OCEAN PRIDE			4319
A237	OCEAN PROWLER	155	632751	3336
A136	OCEAN ROVER	256	552100	3442
A340	OCEAN SPRAY	80	517100	815
A550	OCEAN STORM?	166	602654	3355
A497	OCEAN TEMPEST	156	509743	3723
A081	OCEANIC	122	602279	1667
A268	OLYMPIC	168	599434	2834
A364	OLYMPIC MONARCH	124	973006	4540
P077	OMNISEA	323	247493	5119
A129	ONE OCEAN	74	926699	3097
A296	ORION	80	530292	1769
P089	OSTERMAN FISH			5349
A281	PACESETTER	114	576391	3750
A161	PACIFIC	74	226539	3758
A310	PACIFIC ALLIANCE	105	612084	2816
A156	PACIFIC BREEZE	90	591887	3700
A474	PACIFIC CHALLENGER	104	518937	657
A063	PACIFIC ENTERPRISE	155	678237	3010
A071	PACIFIC EXPLORER	236	942592	3416
A456	PACIFIC FURY	110	561934	421
A039	PACIFIC GLACIER	276	933627	3357
P078	PACIFIC HARVESTER			
A109	PACIFIC KNIGHT	185	561771	2783
A642	PACIFIC LADY	137	624429	4377
A465	PACIFIC MARINER	126	560501	4581
A519	PACIFIC MIST	87	293053	1923
A097	PACIFIC MONARCH	166	557467	2785
A085	PACIFIC NAVIGATOR	195	592204	2799
A509	PACIFIC PEARL	162	614930	276
A574	PACIFIC PRINCE	149	697280	4194
P079	PACIFIC PRODUCERS			
A554	PACIFIC RAM	77	589115	4305
A119	PACIFIC SCOUT	236	934772	3383
A026	PACIFIC STAR	79	633001	2781
A462	PACIFIC SUN	121	604581	3648
A096	PACIFIC TRAWLER	132	664799	3349
A441	PACIFIC VENTURE	102	523423	3238
A169	PACIFIC VIKING	127	555058	422
P080	PALISADES	155	536355	3852

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
A419	PANDAD	70	512414	270
A235	PARAGON I I	110		371
A576	PATHFINDER	180	591678	4306
A570	PAUL M	69	598959	1520
A277	PAVLOF	166	597532	3406
A191	PEGASUS(Trawler)	96	565120	1265
A399	PEGASUS (LL/Pot)	72	567048	952
A011	PEGGY JO	99	502779	979
A435	PEGGY ROSE	68	614537	304
P035	PELICAN SEAFOODS, INC.			5385
A544	PENGWIN	148	586183	1301
A335	PERSEVERANCE	87	536873	2837
A434	PERSISTENCE	76	581823	5381
P015	PETER PAN SFDS-KING COVE			5358
P046	PETER PAN SFDS-VALDEZ			5357
A471	PHOENIX (Longline)	104	250687	2855
A162	PHOENIX (Longline)	75	507268	2469
A144	PISCES	33	AK4033	378
A420	POINT OMEGA	72	525825	1937
P081	POLAR QUEEN	151	523613	4104
A626	POLAR SEA	104	589317	4590
A207	POLARIS	76	210966	51
A396	POLESTAR	103	960839	5390
A094	POSEIDON	117	610436	1164
A249	PREDATOR (LL/Pot)	63	589907	2844
A337	PREDATOR (Trawl)	90	547390	1275
P040	PRIBOLOF ISLAND PROC.			
A541	PRO VISION	92	552625	2905
A342	PROGRESS	114	565349	512
A075	PROSPERITY	137	615485	3361
A328	PROVIDENCE	70	682689	2420
A016	PROWLER	115	623837	1622
P024	QUEEN - EAST PT KODIAK			5326
A273	QUEST	65	604314	438
A186	RACHEL K	63	575123	3735
A571	RANGER	86	249514	3895
A042	REBECCA ANN	217	592205	2838
A089	REBECCA B	77	677263	2817
A034	REBECCA IRENE	140	697637	1610
A652	REBEL	98		3689
A392	RED BARON	73	262690	373
A265	REPUBLIC	86	211802	221
A098	RESOLUTE (Trawl)	240	553631	3702
A208	RESOLUTE (LL)	72	223688	46
A560	RESPONSE	125	561289	4209
P051	RESURRECTION BAY SFDS			5438

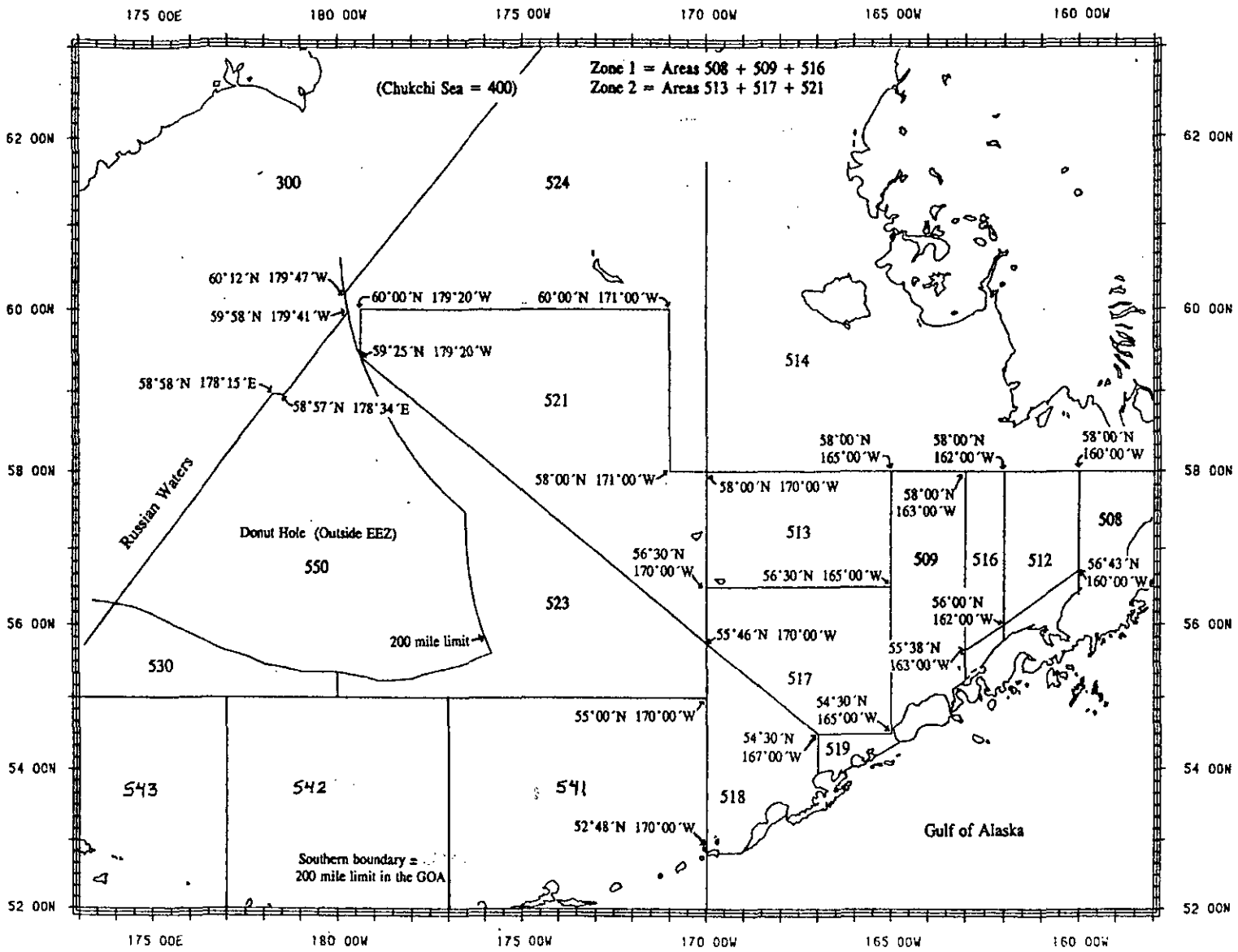
Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
A469	RETRIEVER	133	598975	4588
A187	ROCKY B	66	614651	1042
A338	ROGUE	86	944290	4138
A654	ROLLO	107		5449
A319	ROSELLA	90	509579	2861
P047	ROYAL ALEUTIAN SFDS			5313
A134	ROYAL AMERICAN	105	624371	543
A188	ROYAL ATLANTIC	124	559271	236
A021	ROYAL BARON	97	260803	540
A301	ROYAL ENTERPRISE	203	615663	4134
A480	ROYAL QUARRY	82	520953	626
A430	ROYAL VIKING	108	542375	5455
A159	RUFF & REDDY	90	514964	651
A621	SAGA	107	606800	5792
A293	SAGA SEA	302	965039	4056
P052	SAHALEE OF AK			5304
A229	SAN PEDRO PRIDE	80	549506	4205
A384	SAVAGE	71	648797	4100
A380	SCANDIES ROSE	130	602351	5456
A500	SEA PRODUCER	167	284437	1922
A658	SEA DANCER	72	664245	751
A370	SEA ERN	112	504144	4652
A131	SEA MAC	87	525516	1043
A458	SEA QUAIL	82	248228	2734
A482	SEA STAR	104	521201	439
A123	SEA STORM	123	628959	420
A166	SEA VALLEY I I	66	625137	2853
A556	SEA VENTURE (Trawler)	65	531117	4539
A628	SEA VENTURE (Pot)	104	525572	2122
A643	SEA WARRIOR	99	563829	3072
A061	SEA WOLF	143	609823	1652
P082	SEABOARD BARGE			
A290	SEABROOKE	109	614410	3035
A121	SEADAWN	124	548685	2059
A276	SEAFISHER	230	575587	3835
P091	SEAFOOD PRODUCERS COOPERATIVE			
A045	SEATTLE ENTERPRISE	270	904767	3245
A258	SEATTLE STAR	138	250464	2008
A495	SEAWIND	166	610220	3704
A318	SEEKER	98	924585	2849
A218	SEMIDI	65	214876	724
A172	SEYMOUR	82	210939	283
A644	SHAMAN	110	558637	602
A496	SHELIKOF	150	597967	3705
A429	SHELLFISH	94	506986	290

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
SSDR	SHORESIDE DELIVERY ROTATION			
A617	SIBERIAN SEA	137	975853	4578
A345	SIERRA SEAS	65	249822	3029
A367	SILENT LADY	150	529872	5328
A246	SILVER CHALICE	72	598904	328
A256	SILVER ICE	117	270744	3585
A504	SILVER SPRAY	116	964016	4101
A111	SISU	83	585708	2731
P026	SITKA SOUND-SITKA			5346
P037	SITKA SOUND-YAKUTAT			5359
A511	SJOVIND	180	587409	3990
A411	SNUG HARBOR	78	948313	3940
A203	SOJOURN	67	626614	1157
A284	SONNY BOY	79	546375	2537
A531	SOUND PACER	80	948793	4664
A197	SOUTHEAST	66	694038	1798
A365	SOUTHERN SEAS	66	950624	4333
A512	SOUTHERN WIND	141	625927	1696
A024	SPEEDWELL	167	594754	2329
P036	ST. ELIAS OCEAN PRODUCTS			
A135	ST. JANET	73	516881	2104
A211	ST. JOHN I I	65	245779	485
A581	ST. JUDE	86	917554	4210
A394	STAR OF THE SEA	65	633592	3337
A091	STARBOUND	240	944658	3414
A022	STARFISH	123	561651	1167
A151	STARLITE	123	597065	1998
A138	STARWARD	123	617807	417
P039	STELLAR SEA			5362
A459	STORFJORD	131	569573	4529
A060	STORM PETREL	123	620769	1641
A184	STORMBIRD	90	656842	1751
A494	SUNDANCER	64	634057	4659
A452	SUNRISE	89	238918	5759
A543	SUNSET	65	223408	333
A092	SUNSET BAY	122	598484	251
A401	SUNWARD	65	251957	2075
A577	SYLVIA	60	226282	3107
A018	TAASINGE	73	547210	912
P012	TAKU SMOKERIES			
A540	TAMAR	80	617170	4665
A400	TANI RAE	90	542076	5158
A251	TARKA I I	60	557686	444
A506	TENACITY	103	931446	4650
A461	TERRIER	78	667475	4827

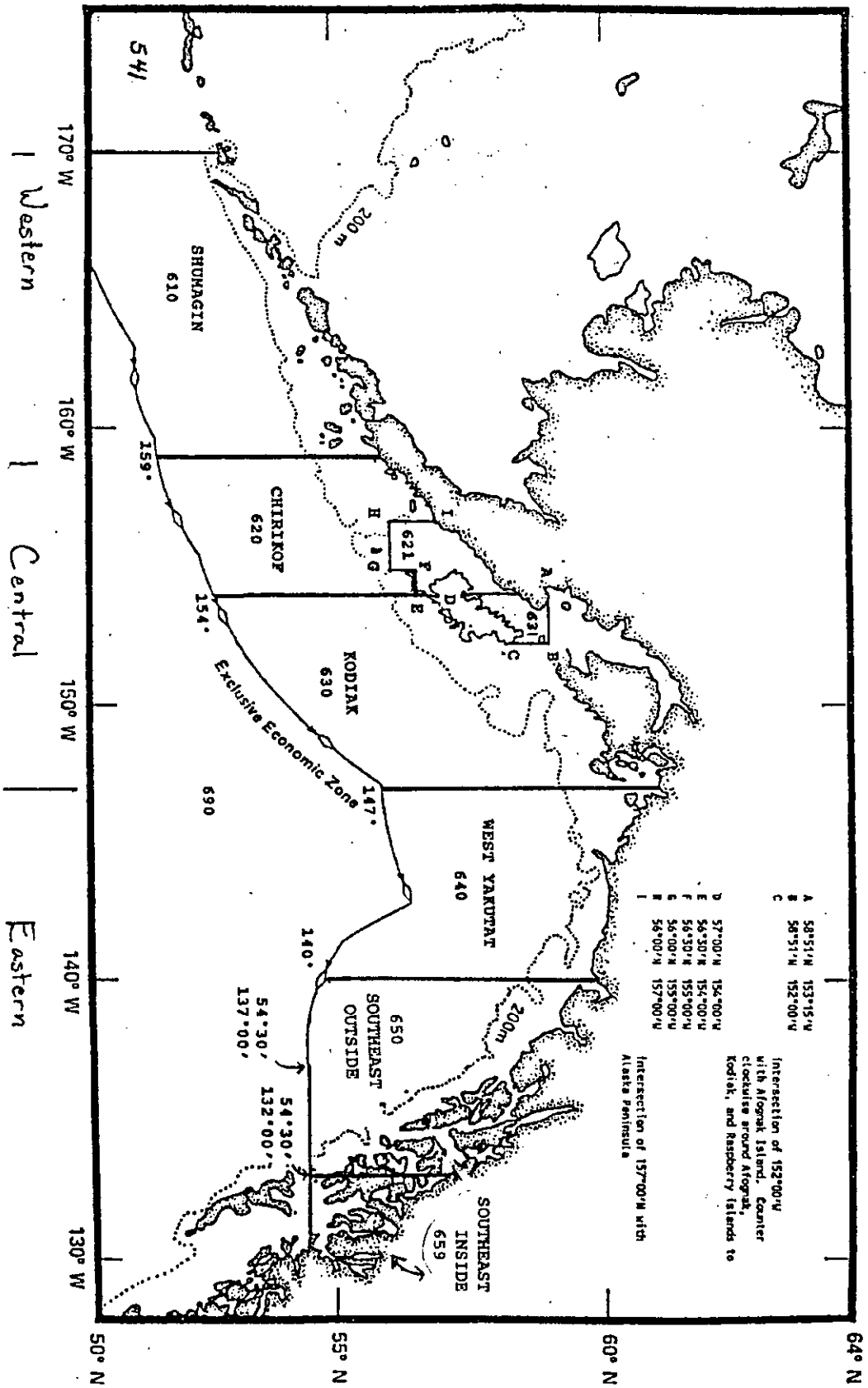
Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
A263	THOR	68	224713	1628
A418	TIME BANDIT	114	973238	4984
A051	TONQUIN	105	258868	2570
A234	TOPAZ	80	575428	405
A178	TORDENSKJOLD	75	209487	592
A378	TOTEM	79	542086	3330
A247	TRACY ANNE	95	904859	2823
A428	TRAILBLAZER	133	596514	3343
A239	TRASK	73	246520	1909
A124	TRAVELER	109	929356	3404
P001	TRIDENT SFDS-AKUTAN			5306
P038	TRIDENT SFDS-SAND POINT			5305
A332	TRIONFO	64	625449	2988
A565	TUCANA	85	622875	4374
A362	TUXEDNI	109	513354	3589
P018	TYSON SFDS-STAR OF KODIAK			5367
A043	U.S. ENTERPRISE	224	921112	3004
A066	U.S. INTREPID	185	604439	2800
A023	U.S. LIBERATOR	161	611520	372
UNAS	UNASSIGNED			
A047	UNIMAK ENTERPRISE	185	637693	3369
P041	UNIPAC			5311
P008	UNISEA BARGE			5309
P009	UNISEA: G1 & G2			5310
A575	URSA MINOR	88	590767	1948
P029	URSIN SFDS 511 SHEL.			
A118	VAERDAL	124	611225	2123
A618	VALIANT	111	522574	5717
A438	VAN ELLIOTT	76	524557	1575
A012	VANGUARD	94	617802	519
A177	VANSEE	87	210906	61
A446	VEGA	90	516479	332
A261	VERNON	50	220310	3646
A510	VESTERAALEN	124	611642	517
A059	VICTORIA ANN	217	592207	2839
A409	VIEKODA BAY	102	939078	4593
A212	VIGOROUS	67	250226	937
A341	VIKING	93	606625	3665
A093	VIKING	144	565017	1222
A167	VIKING EXPLORER	124	605228	1116
A525	VIN CE	82	679775	3796
A657	VIXEN	98	1063312	6210
A086	WALTER N	95	257365	825
P042	WARDS COVE-ALITAK			5348
P033	WARDS COVE-KODIAK			5414

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
A196	WESTERLY	72	507754	1286
P022	WESTERN AK FISHERIES			5347
A128	WESTERN DAWN	113	524423	134
A274	WESTERN ENTERPRISE	166	629826	3268
P084	WESTERN SEA			3590
A214	WESTERN STAR	80	612319	2511
A383	WESTERN VIKING	101	507161	5131
A445	WESTLING	108	633577	2150
A095	WESTWARD I	135	615165	1650
P013	WESTWARD SFDS-DUTCH HARBOR			5323
A278	WESTWARD WIND	160	595289	3274
A545	WILD THING	98	620343	4284
A248	WINDJAMMER	75	515274	2076
A538	WINONA J	69	645410	1433
A547	WIZARD	156	594470	4532
A190	WONIYA	72	636605	1979
P085	WOODBINE			4152
A520	YAKUTAT	78	211859	3930
P086	YARDARM KNOT	323	250424	3116
A099	YUKON QUEEN	166	509115	3616
A527	ZACHERY R	66	532084	1981
A146	ZENITH	124	628313	440
A450	ZOLOTOI	98	625095	3016

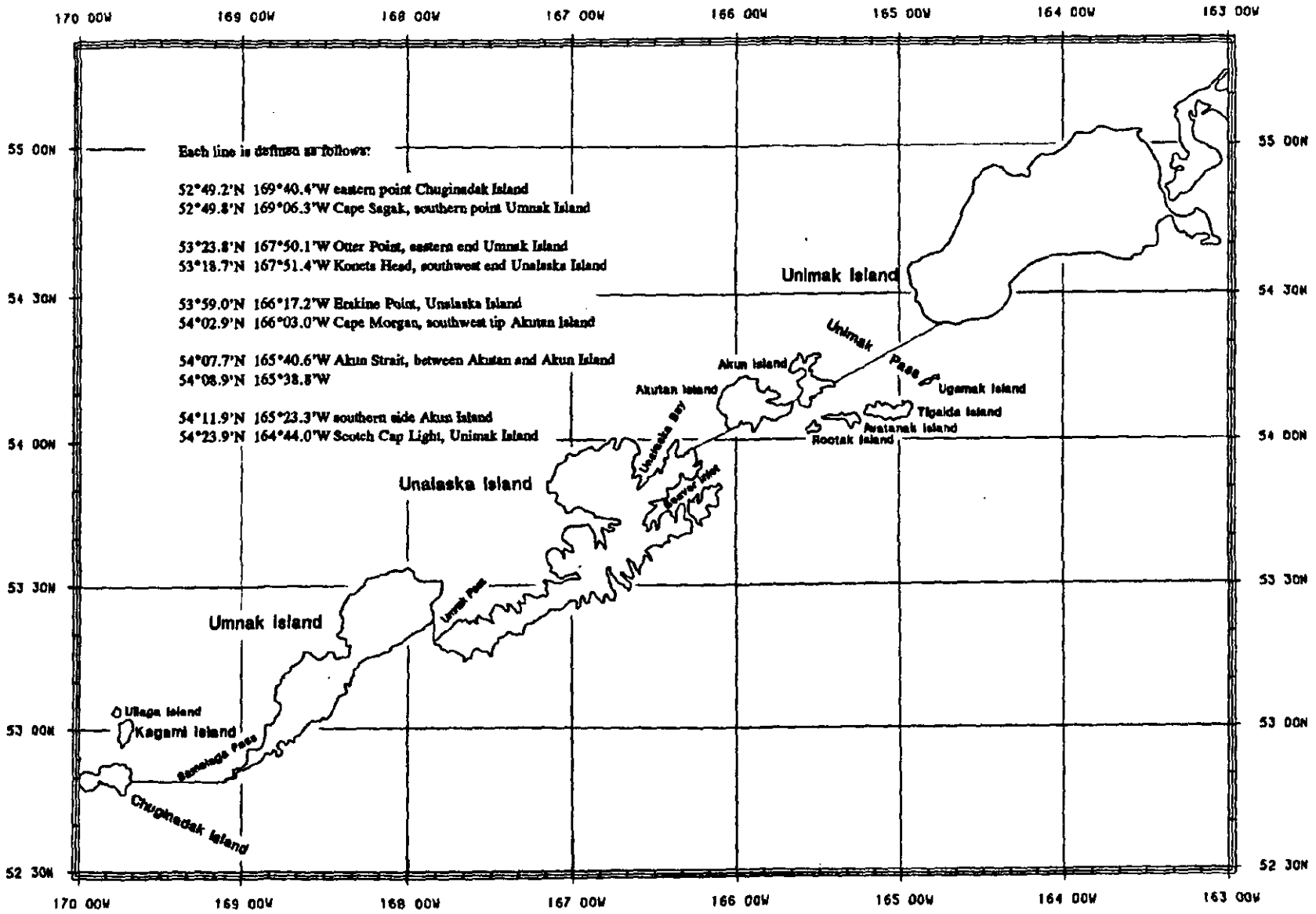
Appendix K. Regulatory and Reporting Areas of the Bering Sea



Appendix L. Regulatory and Reporting Areas of the Gulf of Alaska



Appendix M. Boundary between Bering Sea/Aleutian Islands and Gulf of Alaska



Appendix N. Halibut Length/Weight Table

(cm)	Kilograms	(cm)	Kilograms	(cm)	Kilograms
10	.01	55	1.82	100	12.64
11	.01	56	1.93	101	13.05
12	.01	57	2.05	102	13.47
13	.02	58	2.16	103	13.91
14	.02	59	2.29	104	14.35
15	.03	60	2.41	105	14.80
16	.03	61	2.55	106	15.26
17	.04	62	2.69	107	15.73
18	.05	63	2.83	108	16.21
19	.06	64	2.98	109	16.71
20	.07	65	3.13	110	17.21
21	.08	66	3.29	111	17.72
22	.09	67	3.45	112	18.24
23	.11	68	3.62	113	18.77
24	.12	69	3.80	114	19.32
25	.14	70	3.98	115	19.87
26	.16	71	4.17	116	20.44
27	.18	72	4.36	117	21.01
28	.21	73	4.56	118	21.60
29	.23	74	4.76	119	22.20
30	.26	75	4.98	120	22.81
31	.28	76	5.19	121	23.43
32	.32	77	5.42	122	24.07
33	.35	78	5.65	123	24.71
34	.38	79	5.89	124	25.37
35	.42	80	6.13	125	26.04
36	.46	81	6.38	126	26.72
37	.50	82	6.64	127	27.41
38	.55	83	6.91	128	28.12
39	.60	84	7.18	129	28.83
40	.65	85	7.46	130	29.56
41	.72	86	7.75	131	30.31
42	.76	87	8.05	132	31.06
43	.82	88	8.35	133	31.83
44	.88	89	8.66	134	32.61
45	.95	90	8.98	135	33.41
46	1.02	91	9.31	136	34.22
47	1.10	92	9.64	137	35.04
48	1.17	93	9.99	138	35.87
49	1.25	94	10.34	139	36.72
50	1.34	95	10.70	140	37.59
51	1.43	96	11.07	141	38.46
52	1.52	97	11.45	142	39.35
53	1.62	98	11.83	143	40.26
54	1.72	99	12.23	144	41.18

Appendix N. Halibut Length/ Weight Table (continued)

(cm)	Kilograms	(cm)	Kilograms	(cm)	Kilograms
145	42.11				
146	43.06	188	97.39	230	187.75
147	44.02	189	99.11	231	190.40
148	45.00	190	101.10	232	193.09
149	45.99	191	102.83	233	195.80
150	47.00	192	104.58	234	198.53
151	48.02	193	106.36	235	201.29
152	49.06	194	108.16	236	204.08
153	50.12	195	109.97	237	206.90
154	51.18	196	111.81	238	209.74
155	52.27	197	113.67	239	212.61
156	53.37	198	116.00	240	215.50
157	54.49	199	117.45	241	218.43
158	55.62	200	119.37	242	221.38
159	56.77	201	121.32	243	224.35
160	57.93	202	123.28	244	227.36
161	59.11	203	125.27	245	230.39
162	60.31	204	127.28	246	233.45
163	61.53	205	129.32	247	236.54
164	62.76	206	131.37	248	239.66
165	64.01	207	133.45	249	242.80
166	65.27	208	135.55	250	245.98
167	66.55	209	137.67		
168	67.83	210	139.82		
169	69.17	211	141.99		
170	70.51	212	144.18		
171	71.86	213	146.39		
172	73.23	214	148.63		
173	74.62	215	150.89		
174	76.02	216	153.18		
175	77.45	217	155.49		
176	78.89	218	157.82		
177	80.35	219	160.18		
178	81.83	220	162.56		
179	83.33	221	164.97		
180	84.85	222	167.40		
181	86.39	223	169.85		
182	87.94	224	172.33		
183	89.52	225	174.84		
184	91.11	226	177.37		
185	92.73	227	179.93		
186	94.36	228	182.51		
187	96.01	229	185.11		

Appendix O. Pacific Halibut Discard Condition Criteria - Trawl Gear

NOTE: Fish are initially assumed to be in **EXCELLENT** condition. If any criteria is true for a lesser condition, fish is then considered to be no better than that lesser condition.

CRITERIA CATEGORY		EXCELLENT No sign of stress	POOR Alive, but showing signs of stress	DEAD No sign of life or, if alive, likely to die from severe injuries or suffocation
Capture injuries	General	Injuries, if any, are minor.	Moderate injuries.	Major injuries.
	Fin fraying	Minor.	Severe.	Severe.
	White Side Hemorrhaging	Limited to 10% or less of surface area on white side of fish.	From 10 to 25% of surface area on white side shows hemorrhaging.	More than 25% of surface area on white side of fish shows hemorrhaging.
	BodyDamage	Limited to superficial nicks or cuts on body.	Moderate severity of any abrasions or cuts that may be present.	Vital internal organs may be damaged. Body or body cavity may be ripped open. Severe skin lacerations.
Jaw and mouth		Jaw is tightly clenched.	Jaw is weakly clenched.	Jaw may hang open. Sediment in mouth.
Operculum pressure		Fish closes operculum tightly for at least 5-10 seconds. Very difficult to force open.	Fish closes operculum weakly and not sustained.	Fish does not close operculum.
Bleeding		No bleeding observed.	Bleeding from gill area may occur, but not profusely. Slight bleeding from fin edges.	Severe bleeding may be occurring from gill area.
Muscle tone and physical activity		Muscle tone or physical activity is strong.	Muscle tone or physical activity is weak. Intermittent movement. May respond if stimulated. Body appears limp.	No sign of muscle tone. Physical activity absent or limited to fin ripples or twitches. Little, if any, response to stimuli.
Gill color		Gills are deep red in color, indicating no loss of blood.	Gills are deep to bright red, indicating some loss of blood.	Gills appear washed out, e.g., dull red, pink, or white in color, indicating a substantial loss of blood.

Appendix P. Pacific Halibut Discard Condition Criteria - Hook And Line Gear

ANOTE: Fish are initially assumed to be in EXCELLENT condition. If any criteria is true for a lesser condition, fish is then considered to be no better than that lesser condition.

CRITERIA CATEGORY		EXCELLENT No sign of stress	POOR Alive, but showing signs of stress	DEAD No sign of life or, if alive, likely to die from severe injuries or suffocation
Hooking & hook removal injuries	General	Hook injuries are minor, limited to hook entrance/ exit hole, torn lip.	Hook injuries are moderate.	Hook injuries are severe.
	Jaw	Jaw in one piece, not split or separated from head.	Upper or lower jaw bone may be torn through, hanging from fish, or torn away on either side of the head. Tear may or may not include tearing through the cheek area. Lower or upper jaw may be split laterally, tearing through either snout or lower mouth.	Removal of hook has torn large flap from side of head. Tear usually originating in cheek area. Flap, usually including part of jaw, is either hanging loosely or missing.
	Eyeball/ Eye socket	Eye socket may be torn, but eyeball is undamaged.	Eyeball punctured.	Eyeball punctured.
Internal organs		Internal organs undamaged.	Internal organs undamaged.	Internal organs are damaged.
Bleeding		Minor and limited to jaw area.	Light to moderate, but not from gills.	Fish is bleeding severely, especially from gills.
Muscle tone		Muscle tone or physical activity is strong.	Weak or intermittent; little or any response to stimuli.	No sign of muscle tone. Physical activity absent or limited to fin ripples or twitches.
Gill color		Deep red, indicating no loss of blood.	Deep to bright red, indicating some loss of blood.	Gills appear washed out, e.g., dull red, pink, or white in color, indicating a substantial loss of blood.
Jig-hook wounds		Limited to minor scratches on, or shallow punctures of, head or body.	Limited to minor scratches on, or shallow punctures of, head or body.	Jig-hook injury has penetrated viscera.
Gaff hook wounds		Limited to minor scratches on, or shallow punctures of, head or body.	Limited to minor scratches on, or shallow punctures of, head or body.	Gaff wound penetrates viscera or cranial area.
Sand fleas		Sand fleas may be present on the body, but no penetration of the eyes, fins, anus is noticed. Any damage is limited to small marks on skin or near fins.	Sand fleas may be present on the body, but no penetration of the eyes, fins, anus is noticed. Any damage is limited to small marks on skin or near fins.	Sand fleas have penetrated body. This may be very noticeable, but closely examine the fish. Initial penetration is usually through membrane around eye, near anus, or at base of fins.
Other predators		None.	None.	Sea lions or orca whales may have taken obvious bite out of fish. Sea lamprey may have left hole into viscera or body.

Q. Pacific Halibut Discard Condition Criteria - Groundfish Pot Gear

NOTE: Fish are initially assumed to be in EXCELLENT condition. If any criteria is true for a lesser condition, fish is then considered to be no better than that lesser condition.

CRITERIA CATEGORY		EXCELLENT No sign of stress	POOR Alive, but showing signs of stress	DEAD No sign of life or, if alive, likely to die from severe injuries or suffocation
Capture injuries	*General*	*Injuries, if any, are minor.*	Moderate injuries or damage to fish.	Severe injuries or damage to fish.
	Fin fraying	Minor.	Moderate.	Severe.
	White Side Hemorrhaging	Limited to 10 % or less of surface area on white side of fish.	From 10 to 25 % of surface area on white side shows hemorrhaging.	More than 25% of surface area on white side of fish shows hemorrhaging.
	Body Damage	Limited to superficial nicks or cuts on body.	*Moderate severity of any abrasions or cuts* that may be present.	Vital internal organs may be damaged. Body or body cavity may be ripped open. Severe skin lacerations or cuts.
Jaw and mouth		Jaw is tightly clenched.	Jaw is weakly clenched.	Jaw may hang open. Sediment in mouth.
Operculum *pressure*		Fish closes operculum tightly for at least 5-10 *seconds. Very difficult to force open.*	Fish closes operculum weakly and not sustained.	Fish cannot close operculum, especially when disturbed.
Internal organs		Internal organs undamaged.	Internal organs undamaged.	Internal organs are damaged.
Bleeding		None from fins or gills.	Bleeding only slightly from fin edges or body.	Severe bleeding from fin edges, body, or snout.
Muscle tone		Muscle tone or physical activity is strong.	Muscle tone or physical activity is weak. Intermittent movement. May respond if stimulated. Body appears limp.	No sign of muscle tone. Physical activity absent or limited to fin ripples or twitches. Little, if any, response to stimuli.
Gill color		Gills are deep red in color, indicating no loss of blood.	Gills are deep to bright red, indicating some loss of blood.	Gills appear washed out, e.g., dull red, pink, or white in color, indicating a substantial loss of blood.
Sand fleas		*Sand fleas may be present on the body, but no* penetration of the eyes, fins, anus is noticed. Any damage is limited to small marks on skin or near fins.	*Sand fleas may be present on the body, but no* penetration of the eyes, fins, anus is noticed. Any damage is limited to small marks on skin or near fins.	Sand fleas have penetrated body. This may be very noticeable, but closely examine the fish. Initial penetration is usually through membrane around eye, near anus, or at base of fins
Other predators		No damage from crabs.	No damage from crabs.	Crabs in the pot may have attacked and/or eaten the "dead" fish

Appendix R. Contact Addresses and Numbers

North Pacific Groundfish Observer Program, Seattle

Address	Contact
NMFS Observer Program, F/AKC2 , 7600 Sand Point Way NE BIN C15700 Seattle, WA 98115-0070	Fax: (206) 526-4066 or 526-4207 Backup fax: (206) 526-6723 or 526-4004 Standard A, B or mini-M for Atlas (206) 526-4203 Standard C: country code 582, mobile no. 430349910 Atlas software or communication questions; Glenn Campbell (206) 526-4240 Training & Debriefing (206) 526-4192 Gear Room Bldg. 33 (206) 526-6827

During working hours, program staff members will accept collect calls. After-hours, voice mail is available on (206) 526-4205. Leave a message even if only to tell us you are trying to reach us. The voice mail message tells the operator that you can leave collect calls.

Alaska Regional Office

Address	Contact
National Marine Fisheries Service, F/AKR P.O Box 21668 Juneau, AK 99802 - 1668	Phone (907) 586-7229 Fax (907) 586-7131 (This office will accept collect calls from observers on matters directly related to observer work, (i.e., CDQ daily reports, not "quota remaining" or "fishery closure" questions.

If you need to contact any of these offices, you may leave a message on the answering machine stating your name, reason for calling and how you can be reached for further communication.

Kodiak Field Office

Address	Contact: Allison Barns
NMFS Observer Program 301 Research Court Kodiak, AK 99615	Phone: (907) 481-1770 Fax: (907) 481-1771 SSB Call Sign: WYH (Whiskey, Yankee, Hotel) 4125.0 KHz: M - F, 0800 - 1630

Dutch Harbor Field Office

Address	Contact: Chris Bill
FTS Office Complex, Suite 104 Dutch Harbor, AK 99692	Phone: (907) 581-2060 or (907) 581-2063 Fax: (907) 581-2066 VHF Channel 9, M - F, 0830 - 1600 SSB Call Sign: WYI (Whiskey, Yankee, India) 4146.0 KHz from 10-11 AM, M - F 6227.0 KHz from 2-3 PM, M - F

Anchorage Field Office

Address	Contact: Todd Loomis, Troy Martin
Groundfish Observer Program 222 West 7th Ave, Box 7 Anchorage, AK 99531	Phone (907) 271-1313 Todd Loomis (907) 271-1314 Troy Martin Fax (907) 271- 1315 NMFS Enforcement Office (907) 271-3031 Todd Dubois

Observer Training Center (OTC), Anchorage

Address	Contact
UAA North Pacific Fisheries Observer Training Center 707 A St. Suite 207 Anchorage, AK 99501	Phone (907) 257-2770 Fax (907) 257-2774

Enforcement

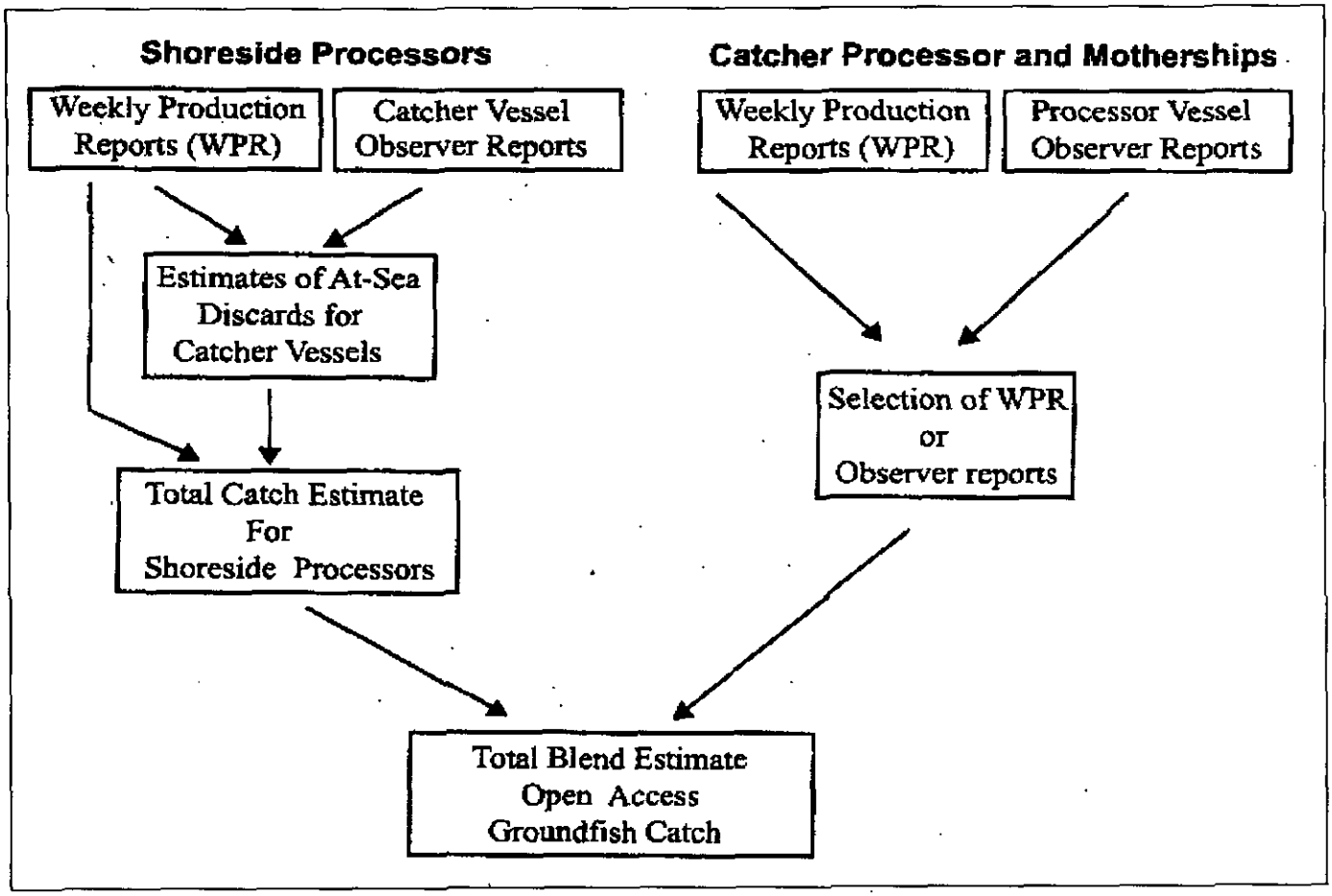
Observers who have enforcement issues to discuss are to call Todd Dubois with NMFS Enforcement in Anchorage at (907) 581-271-3031 He is the primary enforcement officer for Observer reported issues.

There is also a Kodiak Enforcement Office which can be reached at (907) 486-3298.

Sometime in 1999, the Dutch Harbor Enforcement Office will be staffed and can be reached at (907) 581-2061

Appendix S. The NMFS 'Blend' System

The 'Blend' system combines data from industry and observer reports to estimate groundfish in North Pacific groundfish fisheries. Groundfish harvest is estimated weekly for each processor. Why use both industry and observer data?



Shoreside Processors

Weekly Production Reports for Shoreside Processors Weekly Production Reports (WPR) for Shoreside Processors report landed weight of catch, which is used to account for the retained portion of the groundfish catch. Landings on a WPR are reported separately for each week, reporting area, gear type, and State/Federal waters designation. Catch under a Community Development Program or Research Fishery is reported separately.

The total retained groundfish for each processor is also used, in conjunction with observed discard rates, to estimate at-sea discards of groundfish.

Catcher Vessel Observer Reports

Observers on catcher vessels report groundfish species composition, total catch, and estimates ofretention and discard on a weekly basis. The information on groundfish discards is used in conjunction with total retained groundfish catch from shoreside weekly production reports toestimate total at-sea discards from all catcher vessels, including observed and unobserved vessels.

Estimates for Catcher Vessels delivering to shoreside processors Observers on shore-delivering catcher vessels collect data on at-sea discards of groundfish. All observer data for a month, gear, and target fishery are combined to compute discard rates for each groundfish species observed to be discarded.
The discard rates are expressed as a ratio of the weight of the discarded species to the total retained groundfish weight.

The discard rates are multiplied by the retained landings for each shoreside processor to estimate total at-sea discards of groundfish associated with the groundfish landed to the processor.

Total Catch Estimate for Shoreside Processors Total catch for shoreside processors is obtained by adding the landed catch weights reported on shoreside processor weekly production reports to the estimates of at-sea discards.

Catcher/Processors and Motherships

Weekly Production Reports for catcher processors and motherships Weekly Production Reports for Catcher Processors and Motherships report weights of processed products and round weights of discards. Product weights are converted to equivalent round weights using Product Recovery Rates (PRR).

Processor Vessel Observer Reports Observers on processor vessels report groundfish species composition, total catch, and estimates of retention and discards on a weekly basis for each separate reporting area and gear type. Total catch may be estimated using cod-end or bin volumetrics, scales, or conversion from production data. -Species composition of the catch is obtained by sampling the catch, and the total catch is apportioned by species based on that sampling.

Selection of WPR or Observer Reports

Total groundfish catch for all species combined is computed each week for each processor vesselfrom the weekly production report and from the observer report.

- If either report is missing, the report present is selected. If both reports are present, the blend compares the two numbers:

- If the WPR and observer total catch numbers are within 5 percent, the WPR is selected as the source.

- If the WPR is more than 30 percent higher than the observer total catch (for pollock target fisheries)** or more than 20 percent higher (all other targets), the WPR is selected as the source.

- In all other cases, the observer report is selected as the source.

The blend program then returns to the source data (WPR or observer) and copies the detailed records, showing gear type, area and species, to the blend. Records from WPR are identified in the blend by a Source field value of 'W',observer records are identified by a Source field value of 'O.'

** Pollock is processed into several products with highly variable recovery rates, including surimi and deep-skin fillets. The wider selection range is needed to ensure that WPR records are not inappropriately selected in cases where a processor achieves high recovery rates.

Total Blend Estimate of Groundfish Catch Summary: The blend process combines data from industry production reports and observer reports to make the best, comprehensive accounting of groundfish catch. These data are used to manage quotas for groundfish in the Gulf of Alaska, Bering Sea, and Aleutian Islands . The blend data are also used as the basis for computing estimates of prohibited species bycatch. Prohibited species include Pacific halibut, salmon, herring, and crabs. Blend data are used for numerous regional and national reports, fishery stock assessments, and analysis of fishery management plans.

Why use both industry and observer data to estimate total groundfish catch? For shoreside processors, Weekly Production Reports (WPR) submitted by industry are the best source of data for retained groundfish landings. All fish delivered to shoreside processors are weighed on scales, and these weights are used to account for retained catch.

Observer data from catcher vessels provide the best data on at-sea discards of groundfish by vessels delivering to shoreside processors. Discard rates from these observer data are applied to the shoreside groundfish landings to estimate total at-sea discards from both observed and unobserved catcher vessels.

For observed catcher/processors and motherships, the WPR and the Observer Reports record estimates of total catch (retained catch plus discards). If both reports are available, the blend selects one of them for incorporation into the catch database. If the vessel is unobserved, only the WPR is available.

Appendix T. 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.

The use of radio communication equipment requires a licensed operator. If your vessel has **given you** permission to use the radio, you must follow the FCC rules for calling and speaking on the type of radio (VHF or SSB) you use. Ask first how to operate the radio and use these pages as a guide for calling. Be aware that obstructing others' transmissions with your call (by conversing for too long), using profanities or making false distress calls can cost the permit holder and/or you a heavy fine and/or prison sentence.

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-andrescue (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 Shipto-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-tocoast). 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

To communicate over distances of beyond twenty miles, you will need to use satellite communication or a medium to high frequency radiotelephone referred to as Single Side Band (SSB) radio. The signal is poorer in quality than VHF and susceptible to slight atmospheric shifts. Lower frequencies are used for medium distances and higher frequencies for greater distances. The general rule for single sideband frequency selection is: multiply the frequency in MHz by 100 to obtain the approximate coverage distance in miles. At night however, the ranges of SSB radiowave travel are from 2-3 times greater. Therefore, use a lower frequency at night to cover the same distance.

All ship SSB radiotelephones must be capable of operating on 2182 kHz, the international distress and calling frequency, and at least 2 other frequencies. Numerous channels are available for your use; which ones are available varies from place to place. However, channel 2670 kHz is only used for communicating with the Coast Guard and should not be used for other purposes.

When using SSB radiotelephone, you must observe radio silence on channel 2182 kHz, the emergency channel, for 3 minutes immediately after the hour and the half hour. The purpose of radio silence on the emergency hailing channel is to clear the airwave for weak or distant distress signals. No radio silence is used on the VHF emergency channel: channel 16.

Radio Procedure

In as much 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").

- 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.

- 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	J - Juliet	S - Sierra
B - bravo	K - kilo (keeloes)	T - tango
C - Charlie	L - Lima (Leema)	U - uniform
D - delta	M - mike	V - victor
E - echo	N - November	W - whiskey
F - foxtrot	O - Oscar	X - x-ray
G - gulf	P - papa	Y- Yankee
H - hotel	Q - Quebec	Z- Zulu
I - India	R - Romeo	

- 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.)

- 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.

- Speak in normal tones, using normal conversational pauses and emphasis.

- Ensure that your messages are brief and businesslike. No chatter.

- 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 four, one, nine, zero; this is the fishing vessel Starry Flounder, Whiskey Tango Zulu four, one, nine, zero on channel sixteen, over.

  C.G.: *Fishing vessel Starry Flounder this is Coast Guard Station Kodiak shift and answer on channel eleven, out.*

  You: Coast Guard Station Kodiak Coast Guard Station Kodiak this is the Starry Flounder on channel eleven, over.

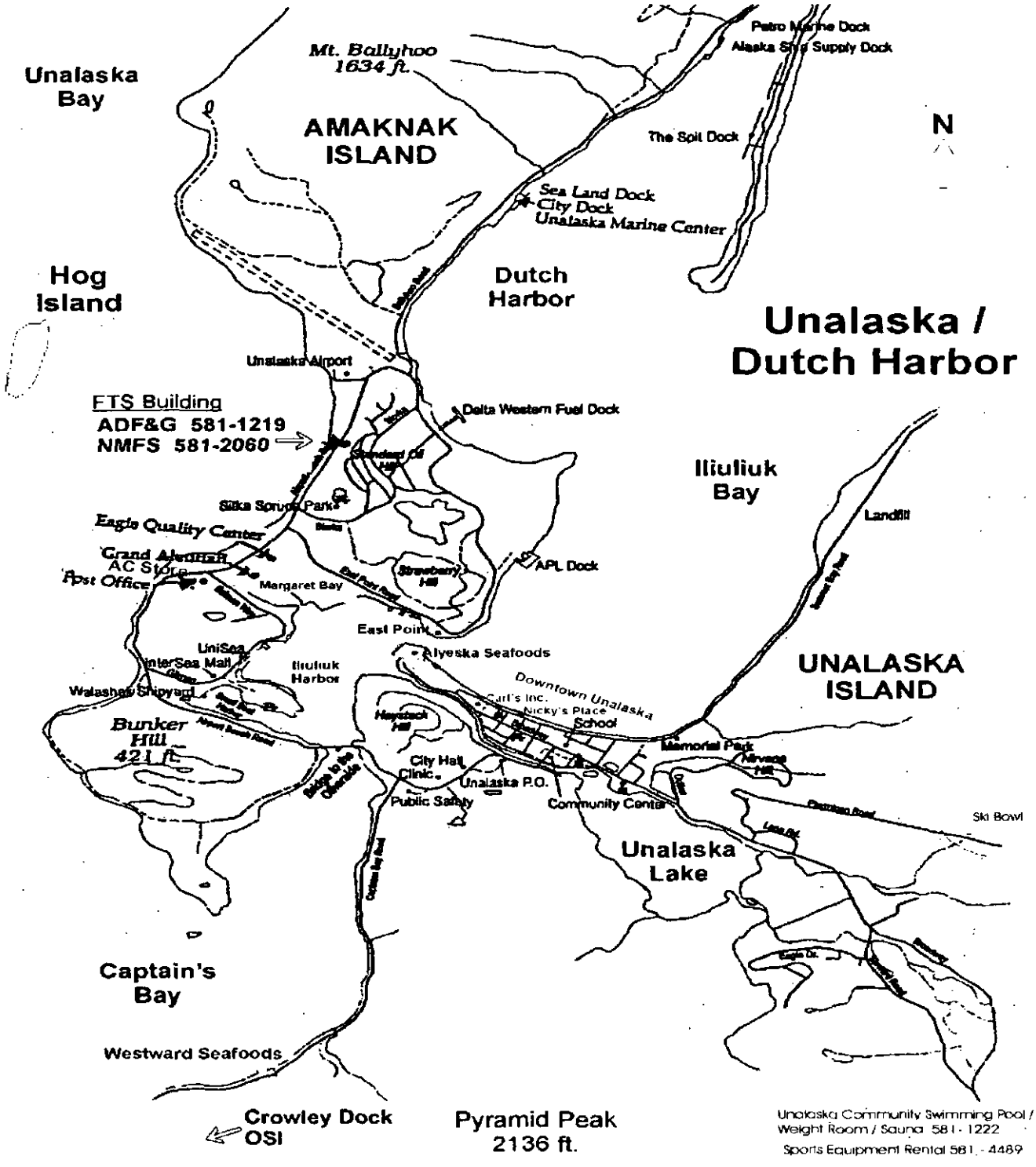
  C.G.: *Fishing vessel Starry Flounder, this is Coast Guard Station Kodiak send your traffic, over.*

  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. "

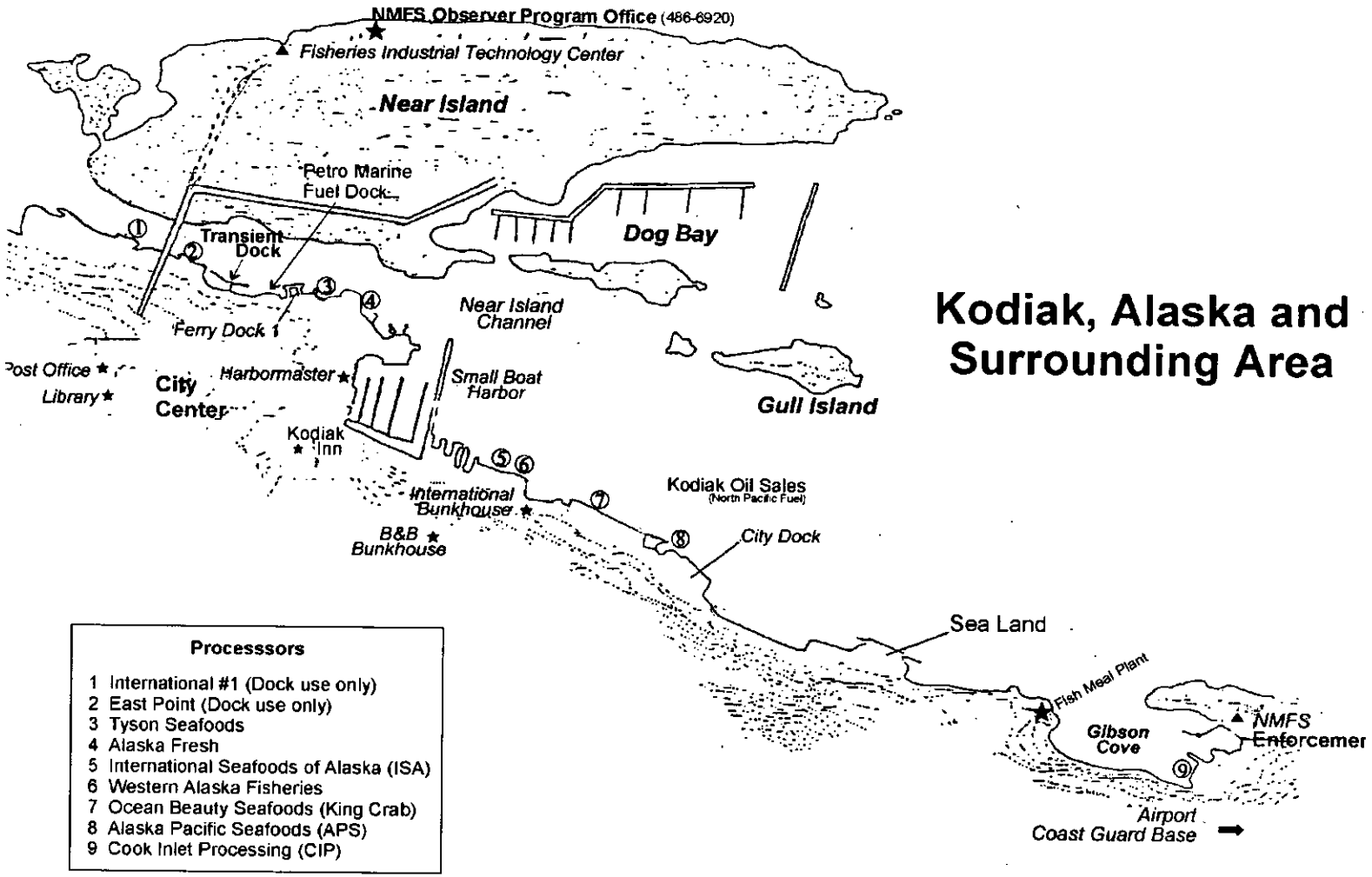
  C.G.: *Vessel Starry Flounder, this is Kodiak. AffirmativeG What is your current position? Over. "*

  You: Kodiak this is the Starry Flounder. Position ffty-five degreesfifty minutes north, 157 degrees, twenty-four minutes west, over.

Appendix U. Map of Unalaska and Dutch Harbor



Appendix V. Map of Kodiak and Surrounding Area



Appendix W. Use of Flow Scales

If the vessel has a flow scale, and it is functioning properly according to daily testing, use flow scale weight as OTC, and continue to do the best volumetric estimate for that vessel as the Observer estimate. If the scale fails the daily test, use the best volumetric estimate as OTC until the scale is repaired and passes the next test. A passing test is good for 24 hours.

It is important to remember that vessels are not currently required to use flow scales, unless they are involved in a multi-species community development quota fishery. A vessel may be using a flow scale for its own purposes and the observer will not be able to use it for OTC or partial haul sample size if the following conditions cannot be met.

The vessel responsibilities, if the observer is to use the flow scale include:

1. The scale has been certified by the Alaska Regional Office.
2. Hauls cannot be mixed.
3. A daily 400 kg materials test of the flow scale is conducted by vessel personnel to verify flow scale accuracy.
4. Flow scale tests should be conducted when the observer is present to verify the test was conducted in accordance with regulations.
5. The vessel must record the flow scale test on the proper form (OMB No. 0648-0330).
6. The vessel must produce a printout of the total catch. The printout must have haul number, date of haul, and the weight of all the catch as weighed by the flow scale.

The observers' responsibilities, if the observer is to use the flow scale include:

1. Verify accuracy of the electronic motion compensating platform scale using certified test weights. Test the scale at 10 kg, 25 kg, and 50 kg. The display must be accurate to +/- .5 percent. Record information in your logbook in a table set up like the example below.

Date	Time	Display wt. 10 kg (9.95 to 10.05 kg)	Display wt. 25 kg (24.88 to 25.13 kg)	Display wt. 50 kg (49.75 to 50.25 kg)	Pass/Fail	Observer Initials

2. If the platform scale fails a test it can be retested. A passing test is good for 24 hours.

3. The platform scale cannot be used to determine any part of an observer's sample if it does not pass. The flow scale cannot be used to determine a partial haul sample size or OTC if the platform scale does not pass. This is because the accuracy of the weight used to test the flow scale is dependent on the platform scale being accurate.

4. Contact the Observer Program if you intend to use the platform or flow scale for any reason. Please address any question or problems that arise with use of the scales and inform us of the responsibilities being accomplished by both you and the vessel.

FLATFISH SPECIES DESCRIPTION FORM

SPECIES COMMON NAME: _____

DATE: _____

HAUL NUMBER: _____

STANDARD LENGTH: _____

A SPECIMEN COLLECTED? Yes No

THE FISH HAS (CIRCLE ONE) - eyes on the right side eyes on the left side

ARE EITHER OF THE PELVIC FINS DIRECTLY ON THE VENTRAL RIDGE?

Yes No

ACCESSORY DORSAL BRANCH (ADB) OF THE LATERAL LINE PRESENT?

Yes No

RELATIVE TO THE THE STANDARD LENGTH, THE ADB LENGTH IS -

less than half greater than half

CAN THE EYE BE SEEN FROM THE BLIND SIDE (TOP EYE SOCKET IS EMBEDDED IN THE DORSAL RIDGE)?

Yes No

WHAT IS THE BLIND SIDE COLOR? _____

RELATIVE TO THE LOWER EYE, THE MAXILLARY ENDS -

_____ forward of orbit _____ below mid-eye

_____ below anterior part of orbit _____ below posterior part of orbit

_____ beyond the orbit

THE PREOPERCULUM SHAPE IS -

rounded angled

ANAL SPINE PRESENT? Yes No

THE SHAPE OF THE LATERAL LINE OVER THE PECTORAL FIN IS -

_____ flat _____ curved slightly

_____ arched _____ highly arched

IF THE FLATFISH IS A - BERING FLOUNDER, FLATHEAD SOLE, NORTHERN OR SOUTHERN ROCK SOLE, ARROWTOOTH OR KAMCHATKA FLOUNDER, OR A SANDDAB, THEN MAKE THE FOLLOWING GILL RAKER COUNTS:

GILL RAKERS ON THE 1ST ARCH:

Total: _____

Upper arm: _____

Lower arm: _____

GILL RAKERS ON THE 2ND ARCH:

Upper arm: _____

In the diagram below, draw in the characters of your fish. DRAW:

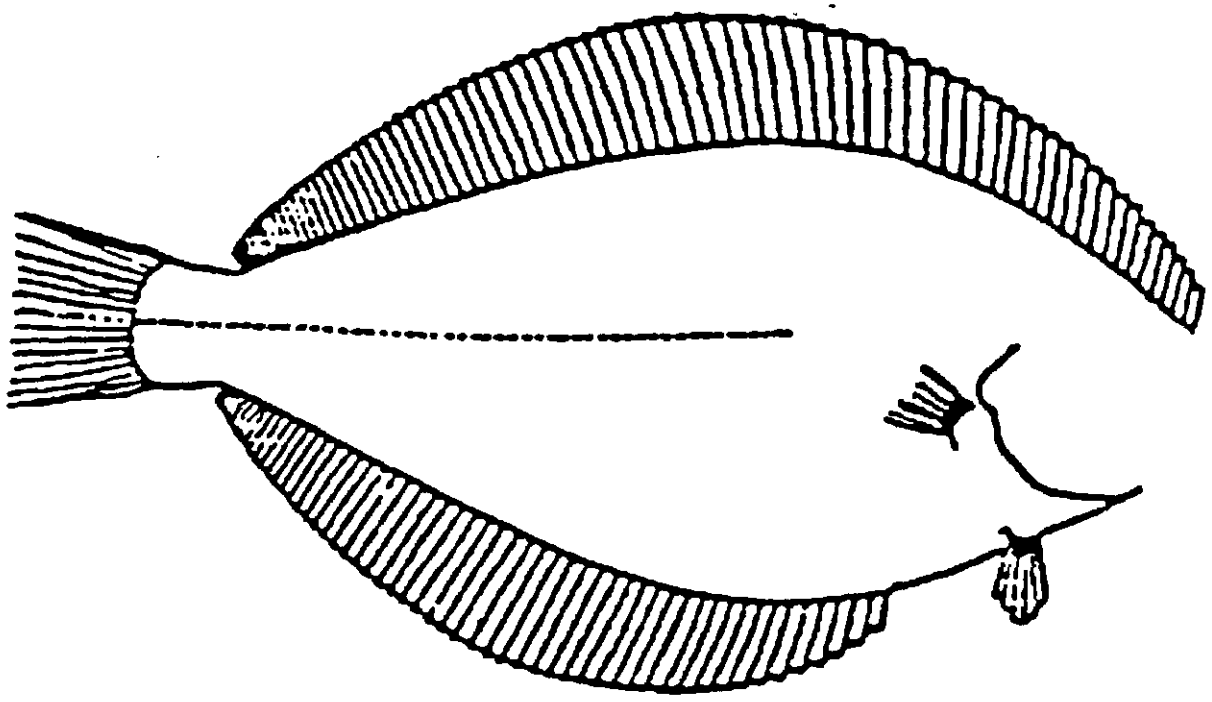
7) the mouth, showing the size

8) preoperculum and tail shape

9) lateral line curve

10) ADB size

11) any markings



ROCKFISH SPECIES DESCRIPTION FORM

SPECIES COMMON NAME:_____

DATE:_____

HAUL NUMBER:_____

STANDARD LENGTH:_____

A SPECIMEN COLLECTED? Yes No

WHAT COLOR CATEGORY IS THIS ROCKFISH (circle one)?

Red Banded

Red/black White-spotted red

Black

DOES THIS FISH HAVE A SYMPHYSEAL KNOB?

___None ____Yes, small and rounded ____Yes, long and prominent

DARK BLOTCHES ON THE BODY? - *Draw these (on back of form)*

____ None ____ Yes, bars extending below the lateral line

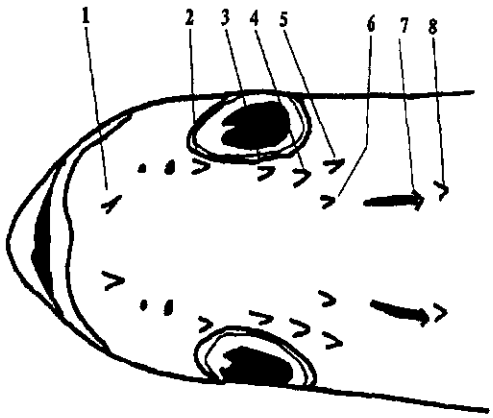
____ Yes, above lateral line only ____ Yes, dispersed all over body

OPERCULUM MARKINGS? - *Draw these markings (on back of form)*

____ None ____ Diffuse opercular blotch or smudge

____ Bars radiating from the eye ____ Very distinct opercular blotch

PERITONEUM COLOR = _____



HEAD SPINES ARE (circle one) -

weak strong

HEAD SPINES PRESENT (circle those found) -

1 2 3 4 5 6 7 8

ANAL FIN SLANT, AS COMPARED TO THE BODY AXIS-

___ Perpendicular

___ Anterior slant (angle is toward the head)

___ Posterior slant (angle is toward the tail)

___ Rounded anteriorly

ANAL FIN SPINES - Compare the second anal spine length to the third anal spine

____Equal in length

____Second anal spine <u>longer</u> than third

____Second anal spine <u>shorter</u> than third

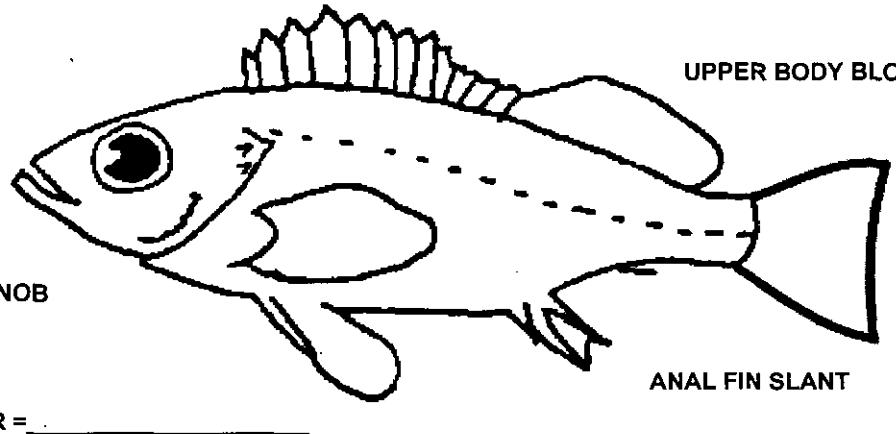
NUMBER OF SPINES UNDER THE EYE - 0 1-2 >2

DRAW THE FISH CHARACTERISTICS ON THIS DIAGRAM -

BODY BACKGROUND COLOR =_____

MAXILLA SIZE

UPPER BODY BLOTCHES/SPOTS/BARS



SYMPHYSEAL KNOB

ANAL FIN SLANT

VENTRAL COLOR =_____

NOTE: IF A KEY CHARACTERISTIC THAT DISTINGUISHES ONE SIMILAR ROCKFISH FROM ANOTHER IS GILL RAKER COUNT OR FIN RAY COUNT, THEN YOU MUST MAKE THOSE COUNTS AND RECORD HERE.

FIN RAY COUNTS

Which fin was counted? - _____

What was the count? - _____

GILL RAKER COUNT

Number of total rakers - _____

MISCELLANEOUS SPECIES DESCRIPTION FORM

SPECIES COMMON NAME:_____

DATE:_____

HAUL NUMBER:_____

FISH LENGTH:_____

A SPECIMEN COLLECTED? Yes No

CRAB - HOW MANY PAIRS OF WALKING LEGS DOES THE CRAB HAVE?

_____ Three

_____ Four

HOW MANY DORSAL FINS DOES THE FISH HAVE?

_____ One

_____ One dorsal and an adipose fin

_____ Two

_____Three

PELVIC FINS ARE - present absent modified into a sucker disc

CAUDAL FIN DESCRIPTION -

_____ A caudal peduncle and a regular tail

_____ Caudal fin meets the anal fin and there is no caudal peduncle (an eel-like tail)

CHECK OFF THE SPECIAL FEATURES OF YOUR FISH SPECIMEN -

_____ Photophores

_____ Adhesive disc on bottom

_____ Large white pores on head

_____ Multiple lateral lines

_____ No lateral line

_____ Scaleless

_____ Spines on head

_____ Red dorsal fin

_____ Pelvic axillary process on pelvic fin

_____ Scutes on bottom

_____ Barbel present

_____ Body encased in bony plates

_____ Blue eyes

Describe the color and markings of the fish, or the characters of the crab you have keyed here.

_____

_____

_____

_____

_____

_____

_____

_____

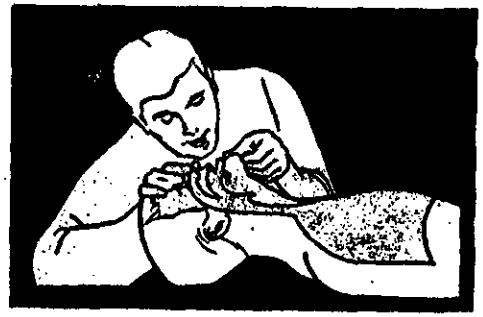
Draw your fish or crab here. Indicate on the drawing the mouth size, body shape, fin locations, color and markings, and any specific characters that helped in keying the specimen.

Please do not copy the drawing from the identification manual! If your identification is incorrect, your drawing could help NMFS staff determine the correct identification.

Cardiopulmonary Resuscitation (CPR)

SHAKE OR SHOUT TO DETERMINE UNCONSCIOUSNESS

Airway



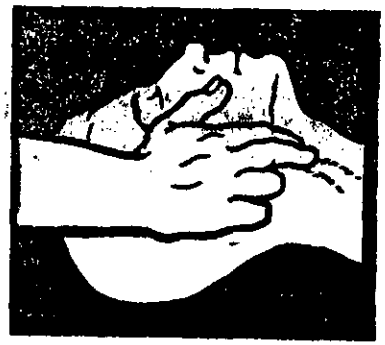
If no response:

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.

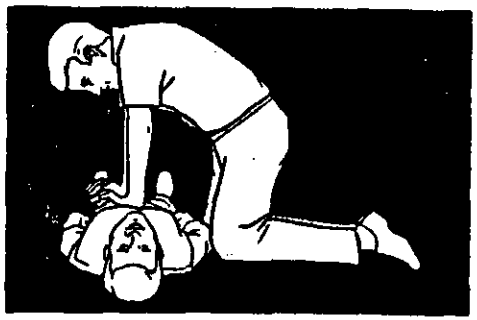
Breathing

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)

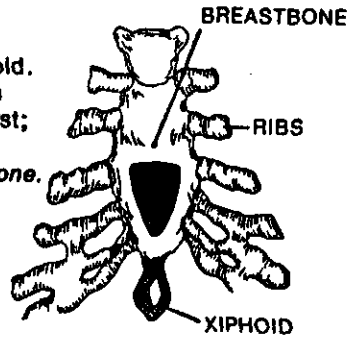


Circulation



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 1 ½ 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.

Appendix BB. Material Safety Data Sheet for DMSO

MALLINCKRODT SCIENCE PRODUCTS DIV -- DIMETHYL SULFOXIDE METHYLSULFOXIDE, DMSO
MATERIAL SAFETY DATA SHEET
FSC: 6810
NIIN: 00N008642
Manufacturer's CAGE: 62910
Part No. Indicator: A
Part Number/Trade Name: DIMETHYL SULFOXIDE METHYLSULFOXIDE, DMSO

General Information

Company's Name: MALLINCKRODT INC. SCIENCE PRODUCTS DIVISION.
Company's Street: PARIS BYPASS
Company's P. O. Box: M
Company's City: PARIS
Company's State: KY
Company's Zip Code: 40361
Company's Emerg Ph #: 314-982-5000
Company's Info Ph #: 314-982-5000
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Date MSDS Prepared: 13NOV85
Safety Data Review Date: 31JAN89
MSDS Serial Number: BHHLH
Unit Of Issue: NK

Ingredients/Identity Information

Proprietary: NO
Ingredient: METHYL SULFOXIDE (DMSO)
Ingredient Sequence Number: 01
NIOSH (RTECS) Number: PV6210000
CAS Number: 67-68-5
OSHA PEL: N/K (FP N/ORNL)
ACGIH TLV: N/K (FP N/ORNL)
Other Recommended Limit: N/K (FP N/ORNL)

Physical/Chemical Characteristics

Appearance And Odor: CLEAR.COLORLESS ODORLESS LIQUID;HYGROSCOPIC.
Boiling Point: 372,189C
Melting Point: 65.3F,18.5C
Vapor Pressure (MM Hg/70 F): SEE SUPP
Vapor Density (Air=1): 2.7(AIR=1)
Specific Gravity: 1.10 (WATER=1)
Decomposition Temperature: N/K (FP N)
Evaporation Rate And Ref: 4.3 (CCL*4=1)
Solubility In Water: MISCIBLE WITH WATER

Fire and Explosion Hazard Data

Flash Point: 203F,95C
Flash Point Method: OC
Lower Explosive Limit: 2.6%
Upper Explosive Limit: 28.5%
Extinguishing Media: DRY CHEMICAL,FOAM OR CARBON DIOXIDE.
Special Fire Fighting Proc: USE NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: COMBUST.MOD FIRE HAZ WHEN EXPOS TO HEAT/FLAME.ABOVE FL PT,VAP-AIR MIXT IS EXPLOW/IN FLAM LIM NOTED ABOVE.HAZ DECOMP PROD:SO*3,FORMALDEHYDE & METHYL MERCAPTAN.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): STABLE UNDER ORDINARY CONDITIONS OF USE AND

STORAGE,HYGROSCOPIC LIQUID.
Materials To Avoid: STRONG OXIDANTS,ACYLHALIDES,ARYLHALIDES,BROMOBENZOYYL ACETANILIDE,MAGNESIUM PERCHLORATE,PERCHLORIC ACID,SODIUM HYDROXIDE
Hazardous Decomp Products: SO*2 AT TEMP ABOVE 213F,100C.HAZ THERMO-OXIDATIVE DEGRADATION PROD FROM DMOS INCL FORMALDEHYDE,METHYL MERCAPTAN & SO*2.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): WILL NOT OCCUR.

Health Hazard Data

LD50-LC50 Mixture: LD50 RAT ORAL 17500 MG/KG.
Health Haz Acute And Chronic: ABSORPTION MAY AFFECT BLOOD.REPEATED SKIN APPLICATION MAY CAUSE SCALING DERMATITIES.REPEATED ORAL DOSES MAY AFFECT THE LIVER AND KIDNEYS.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: METHYL SULFOXIDE (DMSO):CARCIN IN HUM NOT DETERMINED.INADEQUATE NEGATIVE EVIDENCE FOR CARCIN IN ANIMALS (GENE-TOX 1987).
Signs/Symptoms Of Overexp: EYES:REDNESS,PAIN,BLURRED VISION.SKIN:AN IRRITANT CAUSING REDNESS,ITCHING & SCALING.READILY ABSORBED THROUGH SKIN. GARLIC-LIKE TASTE & ODOR MAY DEVELOP ON BRTH & SKIN.TRANSIENT DISTURBANCES OF COLOR VISION,PHOTOPHOBIA,HEADACHE,DIARRHEA & DERMATITIS MAY RESULT FROM SKIN APPLICATIONS.INGESTION:ABDOMINAL PAIN (SEE SUP DAT)
Med Cond Aggravated By Exp: PERSON W/PRE-EXISTING SKIN OR EYES DISORDERS OR IMPAIRED LIVER OR KIDNEY FUNC MAY BE MORE SUSCEPTIBLE TO EFTS OF THIS PROD.TROPICAL APPLICATION ENHANCES DERMAL ABSORPTION OF MANY OTHER (SEE SUPP DATA)
Emergency/First Aid Proc: EYES:WASH W/PLENTY OF H*2O FOR AT LEAST 15 MIN.CALL MD.SKIN:FLUSH W/PLENTY OF H*20 FOR AT LEAST 15 MIN WHILE REMOVING CONTAM CLTHG & SHOES.WASH CLTHG BEFORE REUSE.CALL MD IMMED.INGEST:INDUCE VOMITING IMMED BY GIVING 2 GLASSES H*20 (MILK IF AVAIL) & STICKING FINGER DOWN THROAT.CALL MD IMMED.NEVER GIVE ANYTHING BY MOUTH TO UNCON PERSON. INHAL:MOVE TO FRESH AIR.GET MED ATTN FOR ANY BRTHG DIFFICULTY.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: VENT & EVACUATE AREA.CLEAN-UP PERS MAY REQ PROT CLTHG & RESP PROT FROM VAP.ALLOW ONLY QUALIFIED TO HNDL SPILL.CONTAIN & REMOVER SPILLS WHEN POSS.COVER LARGE SPILLS W/EARTH,SAND/INERT SOLID, SCOOP UP W/NON-SPARKING TOOLS & PLACE IN APPROPRIATE CNTNR.
Neutralizing Agent: N/K (FP N/ORNL)
Waste Disposal Method: DISPOSAL MUST BE IN ACCORDANCE WITH FEDERAL,STATE AND LOCAL REGULATIONS (FP N).WASTE MAY BE DISPOSED IN A RCRA APPROVED FACILITY OR BURNED IN A RCRA APPROVED INCINERATOR.
Precautions-Handling/Storing: KEEP IN TIGHTLY CLSD CNTNR.STORE IN COOL, DRY,VENTILATED AREA AWAY FROM SOURCES OF HEAT,MOISTURE AND INCOMPATIBILITIES.PROTECT FROM PHYSICAL DAMAGE.
Other Precautions: AVOID BRTHG MIST.KEEP CNTNR CLOSED.USE WITH ADEQUATE VENTILATION>AVOID CONTACT W/EYES,SKIN & CLTHG.WARNING:COMBUSTIBLE.HARMFUL IF SWALLOWED,INHALED OR ABSORBED THROUGH SKIN.CAUSES IRRIT.CONTACT LENSES SHOULD NOT BE WORN AROUND THIS PRODUCT.

Control Measures

Respiratory Protection: NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
Ventilation: LOCAL AND GENERAL VENTILATION NECESSARY TO KEEP AIR CINCENTRATION BELOW LEVELS OF CONCERN (FP N/ORNL).
Protective Gloves: RECOMMENDED
Eye Protection: CHEM WORK GOGG (FP N).FULL FACESHIELD.
Other Protective Equipment: IMPERVIOUS PROT CLOTHING INCLUDING BOOTS.LAB COAT,APRON OR COVERALLS.MAINTAIN EYEWASH FOUNTAIN & QUICK DRENCH FACILITY.

Appendix BB. Material Safety Data Sheet for DMSO (continued)

Work Hygienic Practices: WASH THOROUGHLY AFTER HANDLING.
Suppl. Safety & Health Data: VP:0.37 MMHG @ 68,20C.FL PT:192F,89C (CC).
CHEMICAL INCLUDING DRUGS & ALLERGENS OF MODERATE MOLECULAR WEIGHT.
IRRITATION DATA:SKIN RABBIT 10 MG/24 (MILD):EYE RABBITS 100 MG.

Transportation Data

Trans Data Review Date: 89083
DOT PSN Code: ZZZ
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
IMO PSN Code: ZZZ
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION
IATA PSN Code: ZZZ
IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
AFI PSN Code: ZZZ
AFI Prop. Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
Additional Trans Data: NOT REGULATED FOR SHIPMENT

Disposal Data

Label Data

Label Required: YES
Label Status: G
Common Name: DIMETHYL SULFOXIDE METHYLSULFOXIDE, DMSO
Special Hazard Precautions: ABSORPTION MAY AFFECT BLOOD.REPEATED SKIN APPLICATION MAY CAUSE SCALING DERMATITIES.REPEATED ORAL DOSES MAY AFFECT THE LIVER AND KIDNEYS. EYES:REDNESS,PAIN, BLURRED VISION.SKIN:AN IRRITANT CAUSING REDNESS,ITCHING & SCALING.READILY ABSORBED THROUGH SKIN.GARLIC-LIKE TASTE & ODOR MAY DEVELOP ON BRTH & SKIN. TRANSIENT DISTURBANCES OF COLOR VISION,PHOTOPHOBIA,HEADACHE,DIARRHEA & DERMATITIS MAY RESULT FROM SKIN APPLICATIONS.INGESTION:ABDOMINAL PAIN (SEE SUP DAT)
Label Name: MALLINCKRODT INC. SCIENCE PRODUCTS DIVISION.
Label Street: PARIS BYPASS
Label P.O. Box: M
Label City: PARIS
Label State: KY
Label Zip Code: 40361
Label Emergency Number: 314-982-5000

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GLOSSARY

A - B

ABC - Acceptable Biological Catch is an annual harvest level for each species based only on biological considerations.

Aft - towards the stern of a vessel

Amidships - midway between the bow and stern of a ship, or on the centerline.

Athwart ships - side-to-side across a ship, perpendicular to the centerline.

Bag - the codend.

Basket sample - when the amount of catch which was sampled by the observer is actually weighed. Basket sample weight may be as small as 100 kg or less, or as large as the OTC weight.

Beam - width of a ship.

Benthic - living in direct relation with the bottom

Bight - a loop or turn in a line.

Bin - a large compartment built into a ship for holding fish. Also called live tank, refrigerated seawater tank (RSW tank), lobby.

Block - a pulley or system of pulleys in a frame, with a hook.

Boat Share - The percentage of the gross which goes to the vessel owner.

Bobbin - a round, rubber or steel roller used in the footrope of a bottom net to protect the net from damage.

Bosun - person in charge of a ship's rigging, anchors, cables, and deck crew.

Bottom - (1) ocean floor, (2) fishing depth, or (3) a ship hull. Which meaning to apply must be taken from context.

Bow - the front section of a boat or ship.

Bow line - a mooring line attached to the bow of a ship.

Bowline - a type of knot used to form an eye in the end of a rope.

Breech - a behavioral characteristic of some marine mammals such as humpback whales, where they rise vertically out of the water, and then with most of their body above the surface, they fall to their back or side.

Bridge - the control center of a ship.

Bridle - Wire attached to the headrope, footrope or side panel of a net, by which the net is towed.

Bulkhead - a wall separating compartments of a ship.

Bulwarks - the upper section of the side plating of a ship, which extends above and around the upper deck.

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

C

Capstan (gypsy) - an upright, spool-shaped, power rotational cylinder around which cables or hawsers are wound for

Catcher boat - vessel that is used for catching fish and that does not process (freeze) fish on board.

Catcher/processor - vessel that is used for, or equipped to be used for, catching fish and processing (freezing) fish.

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, responsible for care of engines and deck machinery.

Choker, choke strap - a loop of wire or rope used to cinch off the net or codend.

Cleat - a heavy piece of wood or metal having two horns around which ropes may be made fast or belayed, usually secured to a fixed object such as the dock or deck.

Coded wire tag - small tag (3mm) etched with binary code that are inserted into fishes for later identification.

Codend - the end "bag" of a trawl net where the majority of the fish are collected and held.

Combing - a low partition that separates the trawl deck from the side pockets.

Companionway - Entrance/stairway from deck to fo'c'sle and engine room.

Compliance - in accordance with the fishing regulations.

Cookie (disc) - a flat, round piece of rubber with a hole in the center strung on a wire rope or chain to protect it from abrasion and to stir up a mud cloud.

D - E

Demersal - dwelling at or near the bottom.

Directed fishing - targeting or fishing for a species quota.

Disembark - to get off a vessel.

Door - a large steel or alloy structure attached to each main wire (in front of the net) to spread the net horizontally by means of hydrodynamic and friction forces.

Draft - vertical distance from keel to waterline of a ship.

Drum - a metal spool or cylinder around which cable, etc. is wound.

Drumhead - the top of a capstan, into which bars are inserted for leverage in turning it.

Ebb tide - outgoing tide.

EEZ - Exclusive Economic Zone. This is the term for the 200 mile jurisdiction zone formerly called the FCZ.

Embarkation - to board a vessel.

EPIRB - Emergency Position Indicator Radio Beacon.

Expansion straps (container lines) - A series of lines running around the circumference of a codend to provide strength and help maintain the shape of the bag.

Expenses - All costs of making the trip: fuel, groceries, ice, bait, lost gear. Some expenses may be gross-stock expenses, that is, costs levied against the gross stock before any shares are deducted. Crew expenses are those trip costs levied against the crew's share, which is the amount left after deduction of boat share and gross-stock expense.

F

Fathom - a measure of length or depth equal to six feet.

Fishfinder - an electronic device for locating schools of fish under a vessel.

Fishing line - a length of chain or wire in the bottom, front end of a net between the footrope and the bolsh line.

Flatfish - fish which are laterally compressed and who orient themselves in the water with their lateral surfaces or sides towards the surface and bottom.

Flatlink - a piece of cut or cast hardware, generally oblong in shape, with leg diameter smaller in certain areas to allow attachment of a G-hook; used where wires must be connected and disconnected frequently.

Flood tide - incoming tide.

Fo'c'sle (from: forecastle) - the forward part of a ship where sailor's quarters are located.

Footrope - a series of bobbins, tires or discs strung on chain or wire rope attached to the bottom front of a bottom net to protect the net from damage. On a midwater net, the rope or wire running along the front, bottom edge of the net.

Forward - towards the bow of a vessel.

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.

G

G-hook - a piece of cut or cast iron hardware in the shape of a "G", used with a flatlink where wires must be connected and disconnected frequently.

Galley - Ship's kitchen and/or mess hall.

Gallows - structure from which trawl blocks are hung; separate units port and starboard.

Gangen - the leader line, about a meter in length, tied into a longline with a hook tied to it's free end.

Gantry - a continuous structure athwart ship used for towing and gear handling.

Gas bladder - a sac filled with air or similar gases in the body cavity. May or may not be attached to the throat by a duct.

Gill rakers - bony tooth like structures on the anterior edges of the gill arches. For protection or straining out food.

Gilson - a single hookline (as distinguished from a multiple block) used to assist in setting, hauling and moving gear on deck.

Gunnel or Gunwale - the upper edge of the side of a boat.

Gurdy - Special winch for hauling of longlines or trolling lines.

Gypsyhead - A metal drum with a smooth concave surface, usually mounted on a winch. Several wraps of line around the gypsy provide enough friction while it is turning to raise heavy loads smoothly because the line slips and is easily controlled, like the friction on a clutch plate.

H - K

Hatch - an opening in a deck or bulkhead of a ship.

Haul - a catch of fish from one tow of a net

Hawser - any large rope (generally five inches or more in circumference) used primarily for towing, mooring or hauling.

High grading - when a vessel puts up product but later discards it overboard in favor of a more valuable product.

I-beam - a steel beam shaped like an "I" in cross section.

Incidental catch or species - catch taken while fishing for the primary purpose of catching a different species.

Intermediate - a gradually tapered section, generally of small mesh, between the back body of a trawl and the codend.

Joint Venture - a cooperative fishing/processing effort between vessels of different nationalities.

Knot - A measure of time multiplied by distance, equaling speed. One knot equals one nautical mile (6080 feet) in one hour.

L - O

Lay - the direction in which the strands of a rope are twisted (right or left) or the degree of tightness with which they are twisted (soft, medium, hard, etc.)

Lazaret - a storage place between the decks of a ship.

Lee, Leeward - the side protected from the wind, opposite the "windward" side

Lobby - another name for a fish bin on a catcher/processor.

Master - fishing master and/or captain.

Mothership - a processing vessel at-sea (under way) whose fish come from catcher boat's deliveries.

MSY - Maximum Sustainable Yield is an estimate of the largest average annual catch or yield that can be taken over a significant period of time from each stock under prevailing ecological and environmental conditions. Since MSY is a long term average, it need not be specified annually.

Net reel - a hydraulic drum on the deck on which the net and most of the rigging are wound.

Otter trawl - The type of net gear used on stern trawlers; Refer to net diagram.

Otterboard - Another name for a trawl door; Refer to net diagram.

OY - a range within which summed Total Allowable Catches must fall.

P

Partial haul sampling - When less than the Official Total Catch (OTC) weight was sampled (sorted) by the observer. The sample weight is estimated by volume, tally, or proportioning delivery weight.

Pelagic - midwater.

Peritoneum - the lining of the gut cavity.

Pew, Pew stick, Pewing - a sharp-ended pole which is used to skewer fish and toss them to another location.

Pod - a school of marine mammals, such as seals, whales or dolphins.

Porthole - a window in the hull or the outside bulkhead of a ship.

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

Presorting - The segregation and/or removal of any item(s) or organism(s) from the catch prior to the point where you are collecting your sample.

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

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

PSC - Prohibited Species Catch is a harvest limit usually placed on halibut, salmon and crabs or other species which must be discarded in the groundfish fisheries.

R

R.D.F. - Radio direction finder.

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.

Regenerated scale - a fish scale which has grown in to replace one that was lost. Regenerated scales are useless for aging the fish.

Reserve - a portion of quota set aside at the beginning of the fishing year to allow for uncertainties in preseason estimates of DAP catch.

Riblines - heavy lines or chains that run down the length of the trawl net to strengthen it.

Rostrum - a pointed, calcareous, median extension on the anterior end of crab carapaces.

Round weight - the weight of the whole fish (or animal) as it was when alive, synonymous with fresh weight.

Roundfish - fish that orient themselves in the water with the dorsal side towards the surface and ventral side towards the bottom.

RSW - Refrigerated sea water, usually referring to a tank for holding fish.

S

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

Scupper - a hole in the bulwarks which allows water to drain from the deck.

Sheave - a wheel with a grooved rim, such as is mounted in a pulley block to guide the rope or cable.

Skate - a length of longline gear, usually 100 fathoms or 600 feet long.

Skate bottom - a white fabric square with lines on the corners to tie it into a bundle once a longline "skate" has been coiled onto it.

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

Spring line - a mooring line attached amidships.

SSB - Single Side Band radio used for long distance contact.

Starboard - the right side of a ship (when one is looking forward).

Stern - the aft or back end of a vessel.

Stern ramp (slip) - a sloping ramp in the stern of a trawler between the deck and the water line, through which the net is set and hauled.

Stern trawler - any of various sized fishing vessels which trawl a conical shaped mesh net through the water, haul it up a ramp through the stern of the ship, empty, and process the catch to make a wholesale fish product. These vessels may fish for a month or more at sea without support.

Sub-sample - the weight of catch designated by the observer which weighs less than the sample weight and is processed for a supplemental task to determining the composition of a haul, such as sampling for average weight.

Surimi - minced fish meat paste usually produced from pollock.

T - Z

TAC - Total Allowable Catches are annual harvest levels based on biological, economic and social factors

Taper - to cut webbing according to a given formula for fitting into a trawl.

Tare - a deduction from gross weight to obtain net weight. Usually made to allow for the weight of a container.

Target species - the species the vessel was fishing for, not neccessarily the most abundant species.

Trawl - A cone shaped net, towed through the water to catch fish.

Under way - Vessel in forward motion, running. According to Coast Guard regulation, a vessel is under way if it is not at anchor or at dock, so a vessel adrift is technically under way.

Vessel Code - A code used only by the observer program to identify a ship.

Warp (main wire) - the cables on a trawler which run from the main winches to the trawl doors on the net.

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

Whole haul sample - The entire catch was sorted, or the sorting was supervised, by the observer.

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 easily washed out from these than from shirt sleeves. Most fishermen cut off work shirt sleeves, generally about halfway between elbow and wrist.

ACRONYM GUIDE			
ABC	Acceptable Biological Catch	GOA	Gulf of Alaska
ADFG	Alaska Department of Fish and Game	IFQ	Individual Fishing Quota
AI	Aleutian Island (subarea)	mt	metric ton (1000 kg or 2204.6 lb)
BS	Bering Sea	NPFMC	North Pacific Fishery Management Council
BSAI	Bering Sea and Aleutian Islands	NMFS	National Marine Fisheries Service
C/P	Catcher/Processor	NPFOTC	North Pacific Fisheries Observer Training Center
CDQ	Community Development Quota	OTC	Official Total Catch
EEZ	Exclusive Economic Zone	TAC	Total Allowable Catch
FMP	Fishery Management Plan		

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