North Pacific Groundfish Observer Manual

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INTRODUCTION

The North Pacific Groundfish Observer Program (NPGOP) collects, maintains, and distributes data for scientific, management, and regulation compliance purposes in the Gulf of Alaska and the Eastern Bering sea. The NPGOP is a component of the Alaska Fisheries Science Center (AFSC) of the National Marine Fisheries Service (NMFS). The program deploys nearly 400 certified groundfish Observers each year on a variety of commercial fishing vessels. These Observers, in turn, provide the program with nearly 35,000 data collection days annually.

An Observer's job is unique, challenging, and constantly changing. This Observer Manual is an indispensable tool both for trainees and experienced Observers. It should be used as both a text book for trainees, and a field reference manual for Observers at sea. It contains the background, procedures, and protocols on how to collect the wide variety of information requested, and some ideas on how to cope with specific situations. The methods described in this manual have been tested and modified throughout the eleven years of the domestic Groundfish Observer Program, and will continue to be refined with Observer feedback and suggestions.

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Commonly Used Abbreviations

ABC- Acceptable Biological Catch	MARPOL- Marine Pollution
ADF&G- Alaska Department of Fish and Game	MSCDQ- Multi-Species Community Development Quota
AFA- American Fisheries Act	M-SFCMA- Magnuson-Stevens Fishery Conservation and Management Act
AFSC- Alaska Fisheries Science Center	MSY- Maximum Sustainable Yield
ALT- Alaska Local Time	NMFS- National Marine Fisheries Service
BBL- The Bird Banding Laboratory of the U.S. Geological Survey	NMML- National Marine Mammal Laboratory
BSAI- Bering Sea Aleutian Islands	NORPAC- North Pacific database
C/P- Catcher/Processor	NPFMC- North Pacific Fishery Management Council
CFR- Code of Federal Regulations	NPFOTC- North Pacific Fisheries Observer Training Center
CPR- Cardiopulmonary Resuscitation	NPGOP- North Pacific Groundfish Observer Program
CPUE- Catch Per Unit Effort	ORC- Observer Routing Code
DCPL- Daily Cumulative Production Log	OTC- Official Total Catch
DMSO- Dimethyl Sulfoxide	OY- Optimum Yield
EEZ- Exclusive Economic Zone	PFD- Personal Floatation Device
EPIRB- Emergency Position Indicating Radio Beacon	PLT- Pacific Local Time
FCC- Federal Communications Commission	PRR- Product Recovery Rate
FMP- Fishery Management Plan	PSC- Prohibited Species Cap
FUS- Fully Utilized Species	RBT- Random Break Table
GOA- Gulf of Alaska	RKCSA- Red King Crab Savings Area
GPS- Global Positioning System	RST- Random Sample Table
IFQ- Individual Fishing Quota	RSW- Refrigerated Sea Water
IPHC- International Pacific Halibut Commission	SSB- Single Side Ban radio
IR/IU- Improved Retention/Improved Utilization	TAC- Total Allowable Catch
IRCS- International Radio Call Sign	USCG- United States Coast Guard
LOA - Length overall	

History of the Fishery

Commercial fishing has occurred in the eastern Bering Sea since the early 1930s. Over time, the countries harvesting this resource have changed, as have the target fisheries. Prior to the 1960s, Japan and Russia dominated this industry, focusing predominantly on yellowfin sole. In the mid- 1960s a decline in the flatfish stocks caused the Russians and Japanese to move toward walleye pollock as their main target species. During the 1960s and 1970s other countries, including Taiwan, the Republic of Korea, and Poland, began fishing in these profitable waters.

foreign vessel

In 1973 the NMFS began placing Observers on foreign vessels operating off the northwest and Alaskan coasts, creating the North Pacific Foreign Fisheries Observer Program. The primary goals of these Observers were to determine bycatch rates of Pacific halibut in groundfish catches and to verify catch statistics in the Japanese crab fishery. Later, Observers collected data on bycatch of other commercially important species including king crab, Tanner (snow) crab, and salmonids.

sampling on deck in foreign fishery

The flatfish and pollock fisheries remained largely foreign off-shore fisheries until passage of the Magnuson Fishery Conservation and Management Act in 1976. This act was re-authorized in 1996 as the Magnuson-Stevens Fishery Conservation and Management Act. With this Act, the U.S. declared management authority over fish resources within 200 nautical miles from their shores- the Exclusive Economic Zone (EEZ). The goals of the Magnuson Act were to Americanize the fishery and to implement a fishery management plan to maintain optimum yield (OY) of the resource while rebuilding depleted groundfish stocks. Additionally, the Magnuson Act established eight regional councils to manage the nation's fisheries. The North Pacific Fisheries Management Council (Council) has jurisdiction over the 900,000 square mile EEZ off the coast of Alaska.

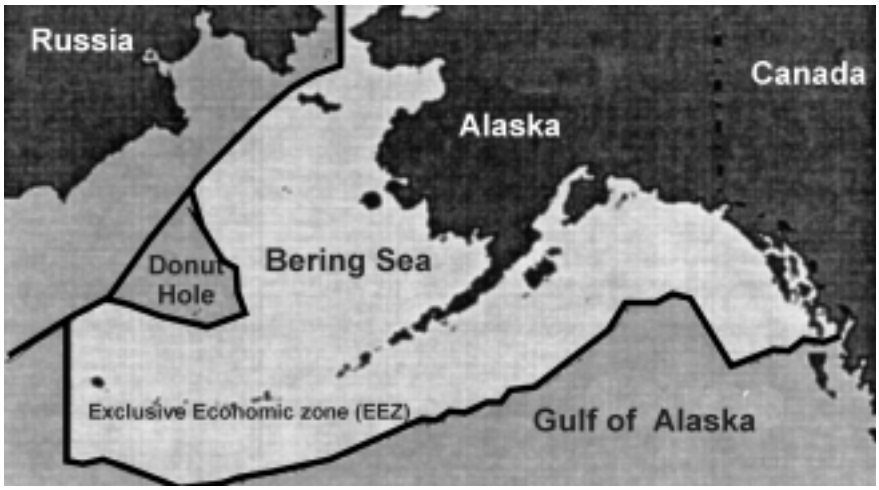


Figure 1-1: Exclusive Economic Zone (EEZ)

American catcher vessel delivering catch to foreign mothership

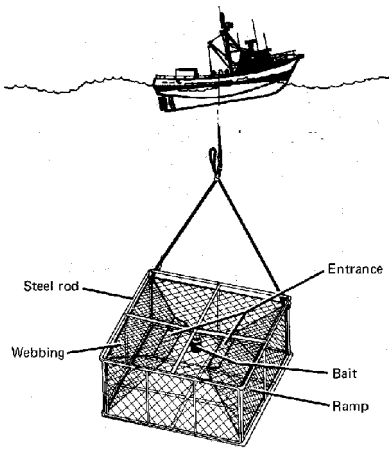
When the Magnuson Act was passed, American fishers had little knowledge on how to harvest or process the groundfish species found in the North Pacific. To encourage investment in this resource, the American Fisheries Promotion Act required that fish quotas be given preferentially to nations which contributed heavily to the development of the U.S. fishing industry. Instituting joint-venture fisheries, with American catcher vessels delivering their catch to large foreign floating processors, allowed foreign countries to continue receiving their quota, while developing the domestic fleet. By 1991 all foreign commercial fishing within the 200 mile EEZ was terminated, leaving an entirely domestic fishery.

The Fishery Today

As the fisheries changed, so did the Observer Program. The Council implemented the domestic NPGOP to gather the data they needed to manage the wide variety of fisheries off the coast of Alaska. Observer coverage is required on some vessels and shoreside fish processing plants. Coverage requirements for vessels are now based on gear size and type, and Observer coverage at plants is based on the amount of groundfish delivered each month. Vessels and plants arrange for Observer coverage through a NMFS-certified contractor, and the vessel or plant pays for the cost of the Observer. The Federal Government covers the costs associated with the operation of the program, Observer certification training and briefing, Observer debriefing, and management of the data.

Vessel and Plant Descriptions

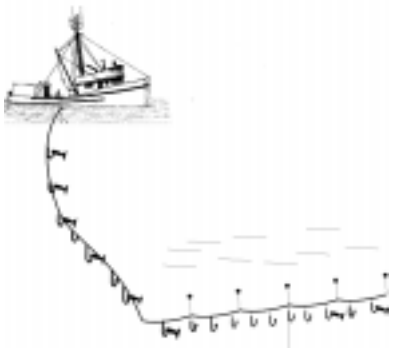
The fishery today is harvested by a variety of vessel types, but most Observer trips occur on one of three types: pot, longline, or trawl. Within these three vessel types, there are catcher vessels and catcher processors (C/Ps). Catcher vessels are generally small boats that do not process their catch. Fish are caught, brought aboard, and stored in tanks until the vessel delivers to a processing plant. The majority of catcher boats use refrigerated sea water (RSW) to keep their catch fresh until delivery, but a few use ice. Catcher processors have factories and freezers aboard. They make a preliminary or finished product, and store it in large freezer holds. It is the ability to freeze fish that differentiates C/Ps from catcher boats, and a vessel which freezes whole fish is still considered a C/P.



pot vessel and gear

Pot Vessels

Pot vessels fish with fixed steel traps, or “pots.” The pots work much the same way as a lobster pot. The fish enter the pot in search of bait, and become trapped inside. Most pot vessels are catcher boats, but there are a few C/Ps, producing mainly “head and gut” product. Pot boats are used to harvest Pacific cod and, to a much lesser extent, sablefish (black cod). Pot vessels must carry an Observer for 30% of their fishing days in each calender quarter in which they fish for more than three days.



longline vessel and gear

Longline Vessels

Longline vessels fish with fixed hooks strung along a ground line. The longline can be several miles long, and can have thousands of baited hooks attached. The longline fleet is made up of both catcher boats and C/Ps. Longliners target Pacific cod, Pacific halibut, sablefish, and some rockfish species. Longline vessels greater than or equal to 125' in length overall (LOA) are required to carry an Observer whenever they are harvesting groundfish in the EEZ off Alaska. Longliners between 60-124' LOA have the same coverage requirement as pot vessels.

trawl vessel and gear

Trawl Vessels

Trawlers fish with a net towed behind the boat. The net is shaped like a large funnel. At the end of this funnel is a bag, called the codend, which collects fish caught by the net. Trawlers make up the largest component of vessels which carry Observers, and include both C/Ps and catcher vessels. They participate in all groundfish fisheries and have the same Observer coverage requirements as longline vessels.

Processing Plants

Processing plants accept fish from catcher vessels, and make preliminary or final products. Catch is transferred from the boat to the plant using a large pump, or Trans-Vac. There are two types of processing plants, shoreside and floating. Shoreside processors are on land and floating processors, or “floaters,” are anchored vessels which do not fish for themselves, but rather accept deliveries of pumped fish. Processing plants that process 1,000 metric tons or more of groundfish per month must have an Observer present each day they process fish. Plants that process 500-1,000 metric tons each month must arrange for Observer coverage for 30% of those days.

Management Plans

Observer data are used, in part, for determining the age composition of a stock, fishing mortality and location, and catch per unit effort. This information is used by the Council to write fishery management plans (FMPs) for each of the commercially important species it manages. FMPs must comply with standards laid out in the Magnuson Act in that they must:

- prevent overfishing,
- achieve optimum yield,
- achieve efficiency and utilization of the resource,
- base management on the best scientific data available,
- manage the fishery throughout it's range, and
- be fair to all fishers.

Time-Area Closures

Time and area closures are used in all groundfish FMPs. These are closures which pertain to specific management areas over specific dates. A time and area closure may be used to protect a different resource, or to stop directed fishing in an area. FMPs call for an annual total allowable catch (TAC) to be set for each species, and parts of the TAC are often allocated to particular management areas or user groups. Once an allocation is reached, the area or a specific group's access to this area closes, while the fishery may remain open in other areas. Once the entire TAC has been harvested, the fishery closes. Removal amounts for each statistical area are calculated using a blend of industry Weekly Production Reports (WPRs) and Observer data (see“The NMFS ‘Blend’ System” on page A-48).

Area closures can be mandated by other management measures, such as the Marine Mammal Protection Act (MMPA), which closes areas surrounding critical sea lion and walrus habitat at certain times of the year, and the Red King Crab Savings Area (RKCSA), which closes this area to bottom trawling when female red king crab are gravid. Other FMPs, such as the Vessel Incentive Program (VIP), encourage trawl fishers to reduce their catch of Pacific halibut and red king crab (see page 4-36). Observer data is used to determine the catch rates for each vessel. Each vessel's bycatch affects the fishery, so those with bycatch rates beyond established limits risk prosecution for exceeding them.

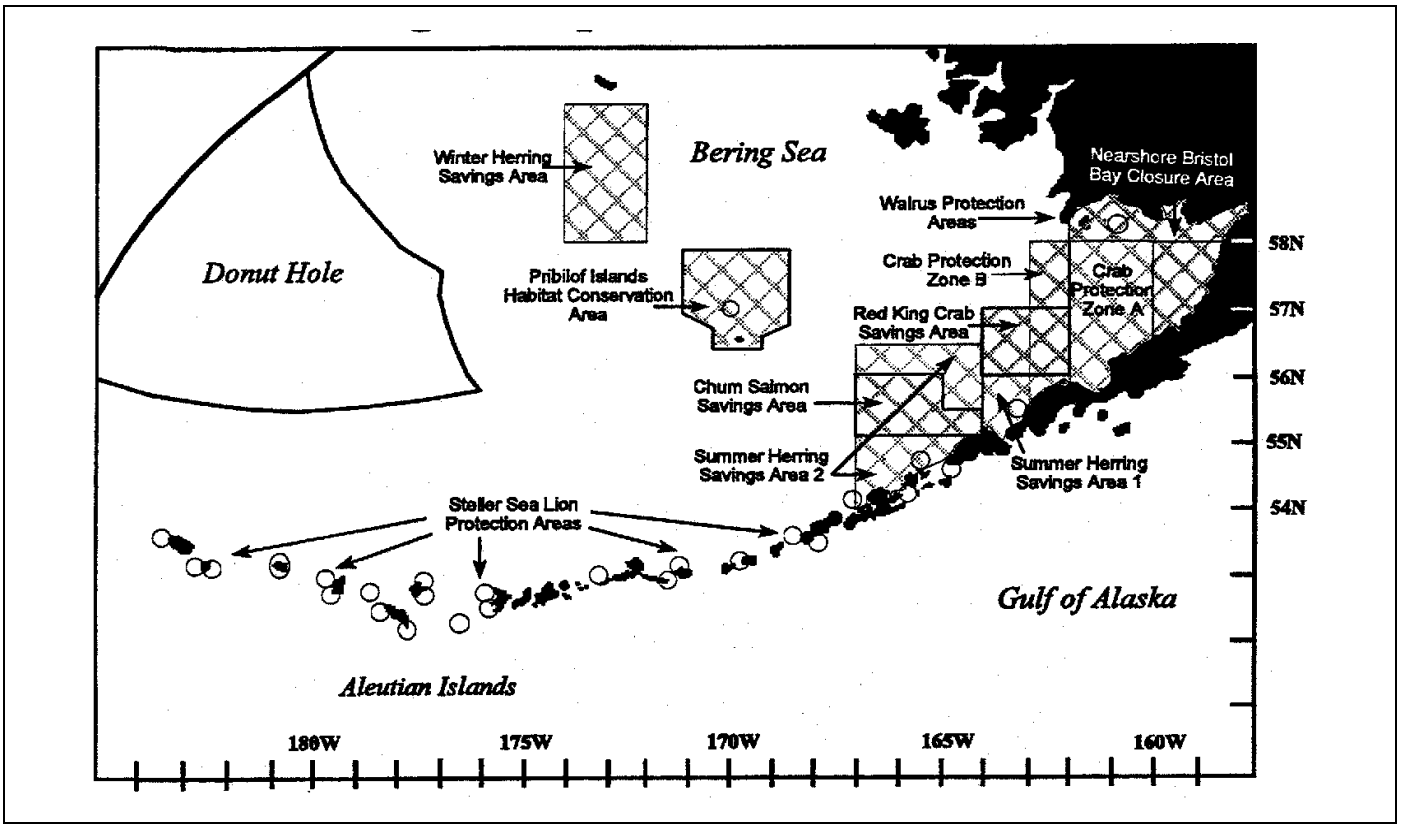


Figure 1-2: Example of Bering Sea Time-Area Closures

Restricted Access Fisheries

Most groundfish in the North Pacific is harvested in open-access fisheries. These are fisheries in which anyone can participate, and which can be targeted until the entire quota is caught. License Limitation Programs restrict the number of participants in some fisheries. The Individual Fishing Quota (IFQ) program gave permits to fish sablefish and Pacific halibut to longline fisherman and vessels which had historically harvested these species at certain levels. This reduced the number of vessels targeting these species, and lengthened the amount of time over which they are harvested. The Multi-Species Community Development Quota (MSCDQ) Program encourages Western Alaskan communities to become involved with the fishing industry by giving them a percentage of the TAC of all groundfish species. Most of these communities do not have the equipment to harvest and process groundfish yet, so they sell their quota to vessels and processors already involved in open-access fisheries. This arrangement has allowed some communities to purchase fishing vessels, or shares in fishing companies. Vessels which participate in the MSCDQ program have to follow strict regulations and be part of a NMFS approved Community Development Plan (CDP). Catch estimates on MSCDQ vessels are based primarily on Observer data, and additional training is needed to observe during these fisheries.

Recent legislation has also initiated programs which limit the number of vessels targeting a species. The American Fisheries Act of 1998 (AFA) limited the number of C/Ps targeting Bering Sea pollock, and created an opportunity for vessels targeting these fish to form a cooperative (co-op) agreement. Catcher processors joined a co-op in 1999, and motherships and some catcher vessels joined co-ops in 2000. A co-op assigns each vessel part of the pollock TAC, much like the IFQ system. Catcher processor vessels and motherships regulated by the AFA carry two Observers, one of whom must have additional training to observe aboard these vessels.

Other Management Agencies

The FMPs for some species delegate the management to other agencies. The commercial king and Tanner crab fisheries are managed by the Alaska Department of Fish and Game (ADF&G), with Federal oversight. The ADF&G has a Shellfish Observer Program, which collects catch and bycatch data from these fisheries. The fishery for Pacific halibut is managed by the International Pacific Halibut Commission (IPHC), although the Council can also develop regulations to manage this fishery. Groundfish Observers are occasionally deployed on halibut IFQ vessels.

Certification

Certification as a groundfish Observer is granted and maintained by successful completion of four steps: 1) training, 2) demonstrating proficiency during each cruise, 3) receiving satisfactory performance evaluations (see page 19-14), and 4) briefing and being deployed at least once every 18 months.

Training

A three-week training course is required of all new Observers, and for prior Observers who have not been to sea in more than 18 months. Training can take place at either the NPGOP in Seattle, or at the North Pacific Observer Fisheries Training Center (NPFOTC) in Anchorage. The NPOTC is part of the University of Alaska-Anchorage and is funded by the Alaska SeaGrant program. The NPFOTC works closely with Observer Program staff to provide consistent training at both locations.

The purpose of the course for trainees is to gain an understanding of how to collect unbiased data which can be used to manage the groundfish stocks. Trainees learn and demonstrate the proper techniques of data collection and recording through a variety of in-class and take home practices. Most importantly, trainees learn how to work efficiently under the strenuous conditions of commercial fishing vessels.

Training consists of an intensive overview of commercial fishing, sampling protocols, fish, invertebrates, birds, and mammals of the North Pacific, and safety at sea. Trainees must pass a series of tests and homework to demonstrate their understanding of:

- Observer priorities and duties,
- methods of independent catch estimation,
- proper recording of catch data,
- methods of sampling and recording species composition data,
- fish identification and use of dichotomous keys,
- gender determination and measurements of fish and crab,
- procedures for collection of age structures,
- applications of volume, weight, density, proportioning, and extrapolation calculations, and
- safety and survival skills.

In order to receive certification, trainees must attend and participate in every class, pass the cumulative exams, complete all the homework, and make any corrections requested. Trainees must also pass a safety test including an on-land and in-water test of survival suit and life raft use. Additionally, trainees must be able to demonstrate to the instructor that they have the attitude and ability required to perform a difficult job independently, and to act professionally in stressful situations.

Deployment

The logistical arrangements of your travel, assignments, and debriefing appointments are made by your contractor. Often, you will receive your assignment prior to leaving your training location, and you may be deployed directly after passing the training class. During one of your last days of training, you will be issued some of the equipment needed to complete your sampling tasks. You are responsible for providing your personal gear, and NMFS will supply your sampling gear.

Personal Equipment

Observer in rain gear

Observers are responsible for providing their own raingear. This is your first and most important protection from wind, spray, inclement weather, and fish slime. Your raingear should be heavy, brightly colored PVC, lined with cotton for strength and warmth. Grundens, Cofish International, Helly-Hanson, and Eriksens are brands which are frequently used by fisherman and Observers. You will need a hooded jacket and "bibs." Dark colors should be avoided, since they are difficult to see on deck, especially at night. You will also need several pairs of gloves and glove liners. Fishing supply stores stock a variety of gloves of different weights and materials. You should choose a pair that are heavy enough to withstand harsh conditions, but flexible enough to allow you to write. Waterproof boots should be warm and sturdy, with a non-slip sole. The Xtra-tuff brand is the standard boot for Alaskan fisherman, processors, and Observers.

A list of clothes and belongings you may want to bring to sea is provided in Figure 1-3. If you have questions on what to bring to sea, ask prior Observers, or NMFS and NPFOTC staff. Generally, first time Observers bring too much with them. In one contract you are likely to be on four airplanes, four vessels, and in any number of cabs and hotel rooms. Throughout this you will need to carry both your personal and sampling gear! Rather than taking a lot of clothes, focus on bringing items which can be layered. Working out on the deck of a vessel in Alaska is cold and wet, and layering will help protect you from the elements. Synthetic or wool materials are recommended and will keep you warmer than cotton. Inexpensive clothes are also recommended, since the smell of fish is difficult to remove from fabric. While you are at sea, you may store extra belongings at the NMFS in Seattle, or at the NPFOTC in Anchorage. Please note that this service is only for Observers while they are at sea, and cannot be used between contracts.

This list of items is approximately what you will need for a 60-90 day contract. The amount and type of heavy clothing will depend on your personal preferences, the vessel type you are assigned to, and time of year you are working. Items you bring should be old, or inexpensive, since the smell of diesel and fish is difficult to remove. Items which **can** be hand washed are recommended, but items which are so delicate that they **must** be hand washed should be avoided.

Work Clothes

Raingear- bib overalls and jacket with hood (1 set)
Boots- Xtra-tuff brand highly recommended (1 pair)
Boot insoles- wool or felt insoles made for Xtra-tuffs (2 pairs)
Gloves- heavy rubber gloves- strong enough for work, but flexible enough to write (6-8 pairs)
Glove liners- polypropylene, wool, or poly/cotton blend (3-5 pairs)

T-shirts- cotton, polypropylene, or light wool (3 shirts)
Sweatshirts- cotton or polypropylene fleece (3- two for work, one for inside)
Pants- cotton or polypropylene sweat pants, or wool work pants (2 pairs)
Shorts- to sleep in (1 pair)
Jeans- a pair of pants for wearing in town (1 pair)
Sandals- flip-flops for shower use (1 pair)
Hiking boots- lightweight but waterproof boots for town (1 pair)
Teva or Birkenstock type sandals- for wearing inside on the vessel (1 pair)
Long underwear- polypropylene or other thermal (2 pairs)
Socks- wool, polypropylene, or blend (5 pairs)
Hat- wool or polypropylene cap that will fit under a hood (2 hats)
Gloves and hat for town, also fleece ear and neck bands are useful (1 each)
Jacket- any warm jacket for town that will resist rain and heavy winds (1 jacket)
* If you are purchasing a jacket to wear at sea, Stormy Seas or any brand of float coat is suggested. This will allow you to wear a PFD while maintaining your range of motion.

Other Items

Sleeping bag- lightweight, but warm
Pillowcase- some Observers carry a flat sheet with them as well
Towel- medium sized terry towel (1-2 towels)
Toiletry articles
Seabag- an old or inexpensive duffel bag, many observers use Army surplus duffles
Padlock- for your duffel, also useful if there is a locker on the vessel
Backpack- suitable as an airline carry-on bag for fragile items and useful as a day-pack in town
Glasses or contacts- bring an extra pair
Cash or traveler's checks- contractors provide cash advances, many ports do not have an ATM
Credit card and/or pre-paid calling card
Camera and film
Sewing kit- needle, thread, and safety pins. Duct tape is also useful, and common on vessels.
Watch and /or travel alarm clock
Seasickness medication- Bonine and Dramamine are commonly used by Observers
First Aid kit- small, you may want some cold medicine, pain reliever, etc...
Vitamins and/or nutritional supplements- especially if you have a restricted diet (i.e.: vegetarian)
Stationary, envelopes, stamps, and a small address book
Books and/or a journal
Walkman/Discman and music
Water Bottle- for keeping water near your bunk

Figure 1-3: List of Personal Gear

Sampling Gear

Sampling and safety equipment is supplied by NMFS. The gear you receive may not be new, but it will be in good working order. It is your responsibility to maintain your gear and return it in the best condition possible. You may be charged for misuse or neglect of sampling gear. It is best to make cleaning and caring for your gear part of your everyday routine, since you will rely on this equipment to do all of your work. Some suggestions on how to care for your gear are:

1. Keep your gear in a secure place aboard the vessel. Avoid leaving gear on the vessel's deck. If there is no alternative to leaving it out on deck, be sure that it is well secured.

2. Keep forms, books, pencils, pens, and unused equipment in a dry safe place, such as your room or a secure lazarette. Leave only what you regularly use in the factory or on deck.

3. Keep all gear as clean as possible. This will make it much easier for you to clean your gear when returning it. Use deck hoses to rinse slime, scales, and blood off your baskets, deck sheets, length boards, clipboards, scalpel, and knife after each use. Most C/Ps and shoreside plants have high pressure hoses which are excellent for cleaning gear.

4. Keep metal parts clean and well oiled. The lubricant oil issued is food-grade and can be kept in the factory or out on deck. Do not put weighing scales, scalpels, knives, thumb counters, measuring tapes, or other metal objects in plastic bags or boxes when they are wet, or they will rust quickly.

5. If something does happen to your issued gear, document what happened. You will not be charged for gear damage or loss due to documented circumstances that were out of your control.

6. Keep your gear centralized; you will be less likely to forget something when disembarking.

NMFS will also issue you some safety equipment, including an immersion suit, a life vest and whistle, a hard hat, and ear plugs. These are provided in order to reduce your reliance on vessel equipment. Keep your immersion suit in a safe place, such as your bunk. It is not a good idea to keep your suit with the crew's, since it may not be easily accessible, and may be forgotten when you are disembarking. Both your immersion suit and life vest have zippers on them, which need to be kept waxed to prevent sticking.

The majority of your gear will be issued to you at your training or briefing location. However, additional gear may be obtained from the NMFS field offices in Dutch Harbor and Kodiak. Even if you are deployed out of these ports, you may be in town for a very short period of time, so it is best to take all the gear you will need from Seattle or Anchorage. If your vessel assignment changes at the last minute, you may need to pick up additional thumb counters, baskets, a Mustang suit, or a flatbed scale from the field offices. Let your contractor know your needs, so they can arrange the logistics with the vessel.

Assignments

VESSEL PROFILE

Vessel: **A222** **ALASKA MIST**
Length: **174** **ADFG NO: 54851**

Target Species: **Pacific Cod**

Topic: Recommended method for obtaining observer estimates
Longline sampling, Extrapolation of sampled to total gear.

Topic: Other Concerns
It would be advisabel to speak withthe crew and skipper to have them call out gear knots and may be advisahld to bring some brite tubing or other such devise to mark the knots since they are extremely difficult to see.

Topic: Special Projects previously completed on this vessel
None

Topic: Equipment
Take at least two length frequency strips and 4-6 counters Mustang suit - especially if tallying on deck.

Topic: Methods for applying a Random sampling frame on this vessel
This vessel hauls the gear at a fairly consistent speed. Determine the approximate time it takes to haul one skate. Divide the gear into sections and chose 1/3 of the sections randomly. Estimate the start time of each section by applying the skates/hour retrieval speed to the elapsed time of the set retrieval. Spatial sampling frame is also possible on this vessel, work closely with deckhands to keep track of the skates coming on board. (Request deckhands mark the first skate of set currently being retrieved. Also have them keep track of where they are placing current set's racks)

Topic: Recommended method for obtaining composition samples.
There are two tally locations on this vessel. One is on the upper deck above the rollerman and the other is opposite the rollerman. The limiting factors on the upper deck include decreased visibility and little access to the catch during the tally period. The area to the right of the rollerman is limited in size and when the pole gaffer is present, there is not enough room for the Observer. Bycatch is collected by the crew immediately after the rollerman and placed in large black totes provided by the vessel.

Topic: Recommended method for obtaining prohibited species samples
The observer can stand near the roller man and ask for the next 'n' halibut. Lengths and viability can be taken at this location or a small number can be collected and taken back to the station for viability assessment (very narrow area to walk while carrying large fish).

Topic: Description of Sampling Area
The vessel was certified for CDQ in February 1999 and the sample station is available for use during open access. Station includes grating, adequate light ,one water hoses (seawater)as well as a small sink with hot running water, sample table, and motion compensated platform scale. There is grating over by the collection bin where the observer stands to collect target and bycatch. Sample station is about 2.8 m from collection point. Station is out of the weather for the most part.

The tally point is not particulary good in that you have to look through the rollermans back to the line. So when the line is comming up directly under the boat you can not see the fish unleas/until they are landed. An experienced observer may be able to tally from the wheel house, but this needs further investigation. Some species ID such as flatfish may not be possible from this location and the halibut lengths would also not be good, but another method needs to be devised for tallying on this boat.

example of a vessel profile

If you know your assignment prior to leaving your training location, you may get specific information about the vessel or plant from a Vessel or Plant Profile, or training report. These reports are created by NMFS staff and recommend specific sampling types for each vessel and fishery. They will also contain information about lodging, gear requirements, and past problems and how to solve them. If you only know what vessel type you are getting on, it may be a good idea to read several pertinent profiles to get an idea of general sampling situations.

The NMFS has a 90-day limit for each Observer contract. Additionally, Observers may not be assigned to more than four vessels and/or plants during one contract. These limitations were created in order to protect Observers from "burn-out," and to allow us to finalize your data in a timely manner. Your vessel assignments and the particulars of your contract are dependent on your contractor. Contracts are generally written for 90 days, however many Observers work less than this because of fishery closures, weather, and erratic vessel schedules. If you need to complete a contract by a specific date, tell your contractor, and get this date written into your contract. You should also have a written understanding of payment and reimbursement agreements prior to leaving, since traveling in Alaska can be unpredictable and expensive.

When beginning a new assignment, take time to adjust to your surroundings before the vessel leaves the dock. Familiarize yourself with the safety equipment prior to sailing, using the check list on page 17-3. Consider your data collection needs, and ask questions about how the catch is handled, and what has worked in the past for Observers. Read the "First Days on Board," section beginning on page 16-1 to get an idea of what to look for in a sample station. Ask the captain how many hauls are expected each day to determine your sampling schedule.

Communications

You will be communicating with NMFS daily, weekly, or on a trip by trip basis depending on your vessel type. Most C/Ps have the ATLAS communications system (see page 15-1). This computer software was designed to allow you to enter your data on the vessel's computer, and transmit it to NMFS. It also allows you to send e-mail messages to NMFS staff. The e-mail you send is read, and responded to, by a member of the NPGOP debriefing staff who is knowledgeable about the boat. They will also be able to look at your data and troubleshoot problems while you are still at sea. If you are on a catcher vessel that does not have ATLAS, you will fax in your data after each trip. For more details on communicating with NMFS, refer to the Catch Message section beginning on page 2-26. Regardless of your vessel type, you must contact NMFS and your contractor if you are ill or injured and cannot work for more than one day. You also must inform your captain of this impediment.

You must contact NMFS each day an illness or injury entirely prevents you from sampling.

Vessel operators are required by law to allow Observers free access to communication systems for work purposes. Their communication systems are not usually for personal use. If they allow you to use the phone or fax for personal use, you may be responsible for the charges incurred-sometimes up to $10 per minute! Public phones are available in most ports, and some processing plants have break rooms with phones you may use. Your personal mail can be forwarded by your contractor, but is often delayed by rerouting or weather.

Mid-cruise and Field Support

The NPGOP has field stations in Anchorage, Dutch Harbor, and Kodiak to provide staff support for Observers. When you are working in, or passing through, these ports you need to meet with a staff member for a "mid-cruise" debriefing. The purpose of a mid-cruise is to familiarize the program with your vessel's sampling situation and inform us of what sampling decisions you have made. It is also an opportunity for you to ask questions and receive suggestions on how to solve any problems you may have encountered. All Observers must complete a mid-cruise during each deployment, until they receive an exemption. Although it is termed a

mid-cruise, this interview does not necessarily have to take place during the middle of your cruise. It should be completed early enough to allow you to incorporate suggestions and make improvements on your data collection efforts. It is your contractors responsibility to ensure you have the opportunity to complete a mid-cruise. When you are planning to come into a field station for a mid-cruise, it is a good idea to call before stopping in. Calling ahead will help ensure that a staff member will be available to work with you at a specific time. More information on mid-cruises can be found on page 19-2.

Debriefing

When you complete your contract, you will debrief with a NPGOP staff member. The purpose of debriefing is to:

- complete a computerized survey for each assignment,
- describe the methods used to collect your data,
- inform NPGOP staff of problems you encountered,
- make corrections or changes to your data,
- get recommendations for future cruises, and
- receive a written performance evaluation.

Your debriefing is a vital part of your contract because it allows the NMFS to get feedback from you. It is an opportunity for you to discuss your methods, and ask for suggestions if you encountered problems in the field. The debriefing process is your chance to demonstrate your understanding of the methods you learned in training, and your proficiency at applying them in the field. At the end of your debriefing your debriefer will give you a performance score for each vessel, a written evaluation for your entire cruise, and a briefing recommendation. Your briefing recommendation is the level of training you will need before your next cruise. For more information on the debriefing process, or on evaluations, see the Mid-cruise and Final Debriefing chapter beginning on page 19-1.

The last step in the debriefing process is another computer survey. The “Observer Survey” is an anonymous questionnaire about your training, deployment, and debriefing experience. This is a chance for you to tell NPGOP staff how well you feel you were prepared to do your job, and let the program know what would have made your experience better. This survey only takes about fifteen minutes, and is extremely helpful to our staff.

Briefing

Prior to each subsequent cruise, you will attend a one-day or four-day briefing. All Observers are required to complete a four-day briefing prior to observing each new calendar year. Additional four-day briefings may be required within a year if an Observer needs a more thorough review of the materials than a one-day briefing could offer. The purpose of a briefing is to inform Observers of policy changes, and to review the priorities and duties of different vessel assignments. Often, if an Observer has already received his/her vessel assignment, detailed information about the vessel and sampling situation can be gathered from vessel profiles and training reports.

ESSENTIAL INFORMATION

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Introduction

As an Observer, you will need to refer to this manual frequently. For most topics, you will be able to refer directly to the chapter that addresses a task or vessel type. However, there are some topics which pertain to all Observers, on all vessel types. This information is essential for you to perform your duties correctly, and is explained in greater detail below.

Duties and Priorities

Observer duties are listed below in order of priority. You should use this list to remind yourself of all the different tasks that need to be accomplished for each haul, and recognize which are of a higher priority. There will be times in which you cannot accomplish all that you have to do in a day, and lower priority duties should be reduced first. If you find that you cannot complete all the tasks listed, due to illness or bad weather, concentrate on those with higher priority.

1. Record incidental takes of short-tailed albatross and collect specimens. Record takes of marine mammals. Collect canine teeth from pinnipeds (except walrus), and tissue samples from cetaceans.
2. Record fishing effort and catch information. Make an independent estimate for as many hauls as possible. Record all calculations for your independent catch estimates in your Observer logbook.
3. Sample randomly selected hauls for species composition.
4. As required, send your data to the NMFS Observer Program in Seattle.
5. Document compliance infractions, and suspected violations, in your Observer logbook.
6. For each haul sampled for species composition, collect additional biological data on prohibited species.
7. For each haul sampled for species composition, collect otoliths and sexed length frequency samples from the appropriate predominant species.
8. Maintain your Observer logbook, including: Daily Notes, **all** calculations and formulas, sampling techniques, seabird interactions and banded bird information, scale tests, and sample area diagrams.

9. Collect data and specimens for standard projects.

10. Log sightings of seabird “species of interest,” and marine mammals.

11. Complete special projects as assigned.

Managing Your Time

Your time and effort given to each task should be proportional to its priority. For example, if your vessel catches a killer whale, you should spend as much time as required to gather all the pertinent information, and collect a tissue sample, as that is your highest priority. A few suggestions on how to reduce the time and effort you spend on lower priority tasks are:

- write sightings of seabirds and mammals on your deck sheets, so you can transcribe this information onto the appropriate forms during an offload or other non-fishing period

- use fish from within your species composition or average weight samples for lengths and otoliths

- collect otoliths and record all necessary data while taking lengths; avoid measuring a fish twice

- collect and record all data on prohibited species as you come upon them in your composition samples

- write notes on violations on your deck form as you witness them, so this information can later be transferred to your logbook

- prepare paperwork at least daily and maintain your logbook at the same time; this will allow you to be ready to send your latest information to NMFS when needed

Standards of Conduct

Observers must avoid behaving in any manner that could adversely affect the confidence of the public in the integrity of the Observer Program, the data which you provide, or your fellow Observers. Such behavior is defined by regulation 50 CFR 679.50(h)(2)(ii) and includes, but is 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 the 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:

   a. engaging in excessive drinking of alcoholic beverages,

   b. engaging in the use or distribution of illegal drugs, or

   c. becoming physically or emotionally involved with vessel or processing facility personnel.

Your behavior must be in accordance with these standards from the moment you enter a briefing until you are completed with your debriefing. Any behavior contrary to these standards, or the intent of these standards, is grounds for decertification. Falsification of data is grounds for decertification, and may be a basis for prosecution.

Conflict of Interest

In addition to behaving professionally, Observers are required by regulation 50 CFR 679.50 (h)(2)(i) to maintain an unbiased role by limiting their financial interest in the fishery. Observers must abide by the following conflict of interest standards:

1. 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 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.

2. Observers 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. (Note that this standard restricts Observers from accepting home-packed fish without purchase.)

3. Observers may not serve as an Observer on any vessel or at any shoreside facility owned or operated by a person who previously employed the Observer.

4. 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.

Observers are hard-working and self-motivated. Captains look for these traits in their crew. Be cautious if you are offered crew work. It may later be construed as a conflict of interest, even if you were just trying to be polite!

Confidentiality

While you are deployed, the captain may ask to see your data for his vessel. You may share all your data, **except your logbook**, with the officers of the vessel. Vessel personnel may want this information on a daily basis for their own use. However, you should provide this data when it is convenient for you. It may be easiest to give the skipper the data when you are sending it to NMFS. This will allow you to give him completed data on a regular schedule. Providing data to the vessel is a low priority, and you should not allow this to prevent you from accomplishing any of your duties. Only the vessel owner or operator, NMFS staff, and you are allowed to see the data you collect. Never allow crew from one boat to see any data from another vessel.

Skippers are often intensely secretive of their operations. They count on you to be discrete when discussing their vessel.

If you are on several vessels during your deployment, keep your data and associated "goldenrod" copies of the vessel logbook from earlier vessels in a safe and secure place. No crew member should ever be allowed to see another vessel's data. Sharing another vessel's data, even inadvertently, can be grounds for decertification. Be particularly discreet when discussing problems, "fishing stories," or assignments in public places or on other vessels. You may inadvertently give more information than you mean to.

Completing and Organizing Forms

During an average day on a vessel, you will fill out at least four different forms, usually several of each! The specific directions on how to fill out each form can be found in the following chapters. Always have your manual with you when you are filling out paperwork. Have the instructions to each form type open when filling out that form. This will save you time by allowing you to complete the form correctly and completely the first time, rather than returning to it to fix errors or fill in columns that were missed. More general information for completing your data forms is below.

Legibility

Please ensure that your data and logbook entries are clear and legible. If your writing is unclear, incorrect data may be entered into the inseason database. During debriefing, these errors will need to be fixed, and if the debriefer is unsure of a number, s/he will need to have you present to interpret all your data. This will lengthen your debriefing, and if questions cannot be resolved, may cause some data to be lost. To ensure that your data are legible:

- write carefully in clear, dark writing,
- check the forms for stray marks or incomplete erasures before faxing, and
- record the data in an organized manner.

Cruise Numbers

The Observer Program refers to the time between training and debriefing as a "cruise." A four-digit cruise number is used as the identifier for data that you collect during this time period. Your cruise number will remain the same throughout your cruise. You will receive your cruise number during training or briefing, and this number must be recorded on every form.

Organization of Forms

Keep a separate set of data for each vessel or plant assignment. For each vessel you are on you may have Vessel Haul Forms, Observer Haul Forms, 3US Species Composition Forms, Form 7 Length Frequency of Measured Species Forms, 9US Biological Sampling Forms, 10A Marine Mammal Interaction Data Forms, 10B Marine Mammal Specimen Data Forms, and/or 11US Marine Mammal Sighting Forms.

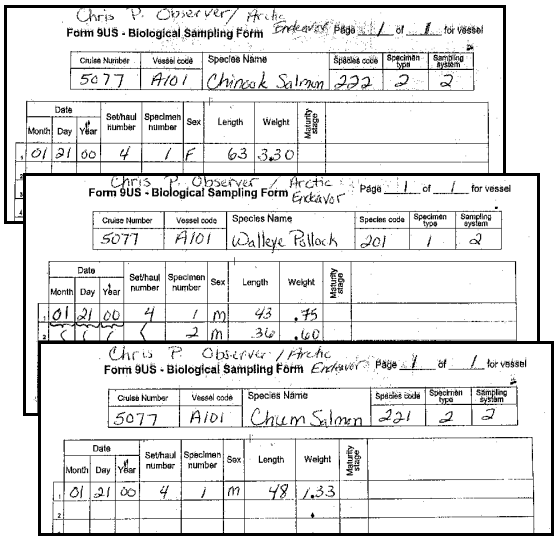
For each plant or floating processor to which you are assigned you may have Form A Plant Delivery Information, Form 7 Length Frequency of Measured Species Forms, and 9US Biological Sampling Forms. Additionally, for any assignment, you may have extra forms associated with standard or special projects.

Write your name and the vessel name on the first page of every form type for every assignment. Observers on ATLAS vessels will need to keep separate backup and archive discs for each vessel, as well as paper copies of the Vessel and Observer Haul Forms and the deck sheets. Label the discs with your cruise number, vessel code, name, vessel name and disk contents.

Observers assigned to processing plants equipped with ATLAS will need to keep separate backup and archive discs for each assignment, as well as paper copies of the Form A. Label the discs with your cruise number, plant code, name, plant name and disc contents.

Page Numbering

Data forms are numbered separately for each form type. Page numbers must be entered at the top of each form type in the “page_ of_” field. Put the number of the page in the first blank, and the total number of pages in the second space. For example, “Page 3 of 40,” indicates that this is the third page of forty for this form type.



example of 9US page numbering

Vessel Haul Forms and Observer Haul Forms are two different form types, so they must be numbered separately. However, to keep these forms orderly, it is suggested that you have one Vessel Haul Form for each Observer Haul Form, and vice versa. For example, if you record hauls 1-9 on page number 1 of your Vessel Haul Form, record only these haul numbers on page number 1 of your Observer Haul Form, even if more space is available.

The Form 9US Biological Sampling Form is an exception to our standard numbering rule. **The 9US forms are numbered separately for each species and specimen type**. For example, if you collected both otoliths and length/weight samples from pollock, you would need a set of 9US forms for the otoliths and a set for the length/weight samples. Each set of 9US forms would be numbered separately.

Recording Time

Some digital watches can be set to a 24-hour clock. This may make tracking and recording time easier.

When recording time, use the 24-hour clock (0000-2359). Record time using Alaska Local Time (ALT) when your vessel is in Alaskan waters. Use Pacific Local Time (PLT) when your vessel is in Washington, Oregon, or California waters. Note that no colons are used with the 24-hour clock, and they should not be recorded on any forms.

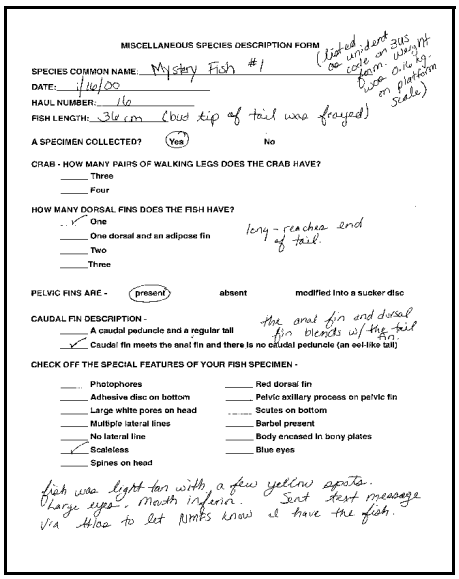
Species Identification Forms

Your species ID sheets are one of the ways that we verify the correct identification of species seen during a deployment. **Complete, detailed, and correct species identification forms are required for all fish and crab species that are new to you**. First time Observers are required to complete species ID forms for the first sighting of all fish and crab species. Prior Observers will need to complete ID forms for species which have not had an acceptable form filled out in the past. If a prior Observer demonstrates a problem with species identification, s/he may be required to complete ID forms for each species seen during his/her next deployment. The rules for filling out these forms are:

- Species ID forms are not needed for invertebrates other than crab species.
- Fish for which you use the Family Key, such as sculpin, eelpouts, and smelts, only need to be keyed to the family level.
- If you further identify an organism that only needs to be keyed to family, you must fill out a new form for the identified species (i.e., red Irish lord would need a separate form than sculpin).
- Sharks should be identified to species using Eschmeyer.
- Species ID forms must be filled out with the fish in hand!
- Species ID forms must describe in detail what you observed about your specimen. Do not copy information verbatim from your key.

During debriefing, you may be asked to provide a verbal description of a fish if you don't have an ID form, or if it is incomplete. If you are not able to provide an accurate description of a species recorded in your samples, you may be recommended for a four-day briefing in order to take a fish ID test. It is advisable to redo ID forms on species that you do not encounter frequently, so that you will have a record to refer back to.

Unidentified Fish



MISCELLANEOUS SPECIES DESCRIPTION FORM

SPECIES COMMON NAME: Mystery Fish #1 (Weighed, dent 3US on cover on weight from. Weighing was on platform scale)

DATE: 1/16/00

HAUL NUMBER: 16

FISH LENGTH: 36 cm (but tip of tail was frayed)

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

long - reaches end of tail.

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)

the anal fin and dorsal fin blends w/ the tail fin.

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

fish was light tan with a few yellow spots. Large eyes, mouth inferior. Sent text message via Alice to let NMFS know I have the fish.

example of a species ID form for an unidentified fish

Never guess on the identification of a species. If you come across an individual fish or crab that you cannot identify, fill out a species description form with as much information as possible. You may find that you come across a more identifiable specimen of the same species later, so organize your unidentified fish descriptions with names such as “unidentified black rockfish #1,” or “mystery fish #5" as appropriate. Use these same names on your 3US forms, so that the data can be changed if the fish is identified later. Ideally, you should bring the specimen back to NMFS, but if you are unable to, you may want to take some photographs of the specimen for ID purposes.

Observer Logbook Entries

Your logbook is probably the single most important piece of data you return with, because it contains additional information about all other data. Have your logbook with you each time you complete any other paperwork so you can easily record your calculations, make notes regarding your data collection, fill out scale verification records, and document seabird sightings and regulation issues. Many Observers make notes on their deck forms in order to jog their memory of particular events that happened while they were out on deck or in the factory. This is an excellent idea, but is only an effective tool if the details of the events are filled out as soon as possible in the logbook. Set aside time each day to write in the Daily Notes section. Remember that events which seem ordinary to you on this vessel may be unusual to the fleet or fishery, so don’t hesitate to write down any information which affects your work or day to day life aboard a vessel.

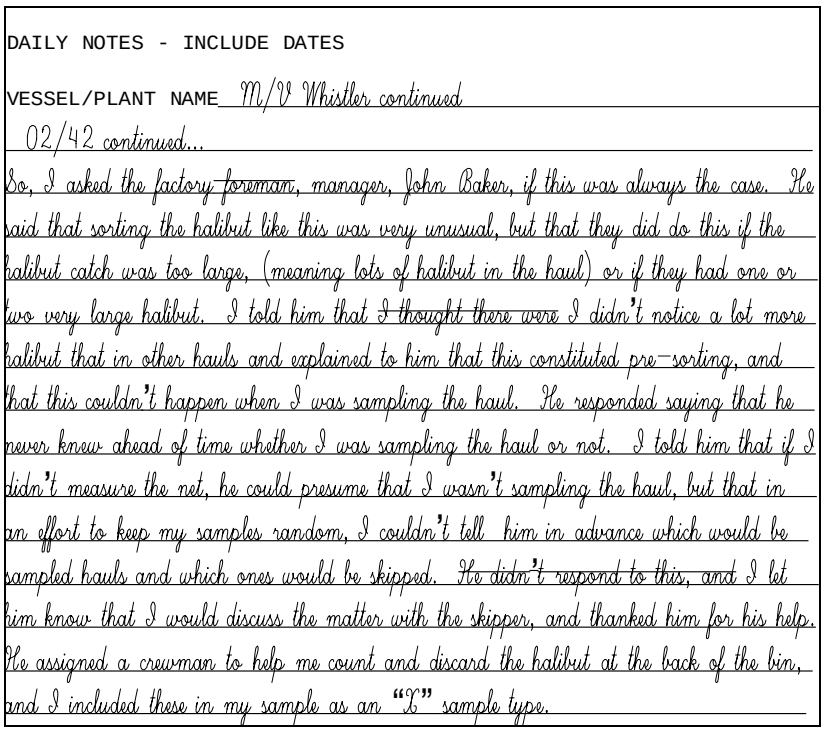
Your logbook is your field biology notebook, and must be treated as such; do not use it as a personal journal. Although you should document any interference or inappropriate behavior toward you, avoid venting frustrations or making slanderous, derogatory, or discriminatory remarks in your logbook. Your logbook must be kept private while you are on the vessel, but is a public document and part of the data turned over to NMFS during debriefing. After this, the contents of the logbook and your name may be released.

Daily Notes Section

Use the Daily Notes section to include specific notes on problems that occurred while you were aboard the vessel, any illnesses or injuries you suffered, the reasons you chose the methods used for catch estimation, species composition sampling, length and otolith collection, halibut viability sampling, etc. Record the circumstances surrounding any violation you witness, including: interference with your duties, harassment, mishandling of prohibited species, harassing or harming marine mammals, and MARPOL (marine pollution) violations.

Make an entry for each day, describing the day's events, even if it was what you would consider an "ordinary day." The more self-explanatory your cruise is, the better. Logbooks may be referred to months or even years after your cruise is complete. Therefore, good documentation is vital to what the NMFS considers "meeting expectations" for a successful cruise.

The Logbook as Evidence



DAILY NOTES - INCLUDE DATES

VESSEL/PLANT NAME M/V Whistler continued

02/42 continued...

So, I asked the factory ~~foreman~~, manager, John Baker, if this was always the case. He said that sorting the halibut like this was very unusual, but that they did do this if the halibut catch was too large, (meaning lots of halibut in the haul) or if they had one or two very large halibut. I told him that ~~I thought there were~~ I didn't notice a lot more halibut that in other hauls and explained to him that this constituted pre-sorting, and that this couldn't happen when I was sampling the haul. He responded saying that he never knew ahead of time whether I was sampling the haul or not. I told him that if I didn't measure the net, he could presume that I wasn't sampling the haul, but that in an effort to keep my samples random, I couldn't tell him in advance which would be sampled hauls and which ones would be skipped. ~~He didn't respond to this, and~~ I let him know that I would discuss the matter with the skipper, and thanked him for his help. He assigned a crewman to help me count and discard the halibut at the back of the bin, and I included these in my sample as an "X" sample type.

logbook with properly corrected entries

Your logbook is archived and used as a reference to give more information about your data. It may also be used as evidence if regulatory infractions were noted. Therefore, your calculations may be recorded 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 continue with the correct wording. Do not completely cross-out anything, use correction fluid, or tear out pages or parts of pages! If you obscure any part of an original entry, you leave the reader wondering what was originally there. This may affect the validity of your logbook and data.

Calculations

All calculations, no matter how small, must be recorded in your Observer logbook. The only exception to this rule is for average weight calculations, which may be written on the 3US or ATLAS deck form. Write your calculations directly into your logbook; do not write them on scrap paper and copy them into the logbook. It is important to document all your calculations, and the formulas used, in order to make your data self-explanatory. Record and label your calculations so that another person could easily understand them without any interpretation.

Calculations may be in pencil, but all other logbook entries must be made in ink!

Calculations which you may think are trivial or obvious must also be recorded. This includes, but is not limited to, conversions from pounds to kilograms, product recovery rate calculations, halibut length to weight conversions, and the differences between start and end weights when using a flow scale for OTC or partial haul sample weight.

Rounding Rules

When you are performing a calculation, carry the numbers out full field until you have reached your final product. Do not round any numbers within the calculation! It is important for you to recognize what final product you are calculating when deciding when to round a number. For example, you may need to use an average weight to calculate the total weight of a species within your sample. In this calculation, you would not round until you had calculated the total weight within your sample. It is a common mistake to round once the average weight is calculated. Rounding within a calculation reduces its precision, and may cost you time in debriefing.

When you round a number to put on a form, round to the number of decimal places required by the column. To round your final product:

- look only at the first digit to the right of the number you are rounding,
- if $X \geq 5$ round up, if $X < 5$ round down.

For example, if you were recording your final density on the Observer Haul Form, you would need to round to two decimal places. If your final calculation was 0.9278226, you would round up to 0.93 mt/m^3. If your final calculation was 0.9728226, you would round down to 0.97 mt/m^3.

How to Select Hauls to Sample for Species Composition

You will take a number of steps to ensure that your samples are as random as you can make them. The first step is to randomize which hauls you will sample for species composition. There are three ways in which to randomly select hauls to sample:

1. sample all hauls,

2. use the Random Sample Table (RST), or

3. use the Random Break Table (RBT), either alone or in concert with the RST.

When you cannot sample all the hauls, using the RST and/or the RBT to determine which hauls to sample allows the Observer Program to stand behind your data, and makes it legally and scientifically defensible. Do not try to randomize which hauls to sample in any other manner unless you discuss the method with an NMFS staff member first.

When All Hauls Should be Sampled

Observers aboard catcher-only trawlers participating in the pollock fishery should sample every haul. Catcher vessels in the pollock fishery make relatively few hauls each day, so that sampling all hauls is possible. In general, Observers aboard vessels participating in different fisheries can sample all hauls if the vessel is taking three or fewer hauls per day. Catcher/processor longline vessels are the exception to this generality, and Observers may need to use the RST or RBT on a longline C/P retrieving more than two sets a day.

When to Use the Random Sample Table (RST)

If you doubt that you will be able to sample all of the hauls that your vessel brings aboard on a normal day, you should use the RST to determine which hauls to sample. It will be necessary to use the RST to select hauls in most fisheries, except for the catcher vessel pollock fishery and some fixed gear fisheries. If you feel that you will usually be able to keep up with all the hauls, but may need an occasional break if fishing picks up or you fall behind on other duties, the Random Break Table may be a better choice. A discussion on when and how to use each of these tables follows.

Versions of the Random Sample Table (RST)

There are three versions of the RST, any of which you can use:
1) an RST usually used on catcher vessels,
2) an RST used on C/Ps landing more than 6 hauls per day, and
3) an RST used on C/Ps 6 or fewer hauls each day.

There are three versions of the RST; one is usually used on catcher boats and two are used aboard catcher/processors and motherships. The difference between the tables is the number of "off" hauls in each sequence. Hauls for which you are not supposed to collect species composition data are referred to as "off," and hauls which are to be sampled are referred to as "on." The catcher boat table has one "off" haul in each sample sequence, while C/P-mothership tables can have between one and three "off" hauls in each sequence. Choose an RST which is appropriate and will best fit your needs. You may choose to use a more rigorous schedule, but you may not use less stringent schedule than your vessel requires.

Use the RST which is most appropriate to your vessel. You may always use a more stringent table if you can keep up with it!

Look at the title of the table to be sure you are using the correct one. There is one for C/P-motherships which routinely bring aboard less than six hauls a day, and another for C/P-motherships which routinely land six or more hauls a day. When you first board a vessel, ask the captain how many hauls he expects to land each day. Use this number to determine which table to use. Once you choose an RST, you should stick to it, unless the vessel changes fisheries, or drastically changes their fishing habits.

	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

Figure 2-1: Random Sample Table (example)

How to Use the RST

In the RST, the bold-face rows of type indicate the number of consecutive "on" hauls that should be sampled. The normal-face type rows are the number of consecutive "off" hauls that are not sampled. You will be instructed how to enter the RST during your training or briefing. Once you enter, your first hauls selected will always be "on" hauls. From this 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, begin again at the top of the next column. If you reach the end of the table (Z, Z) continue at the top of the table (A, A).

Vessel Responsibility and the RST

Vessel personnel must notify you 15 minutes before fish are brought on board, unless you ask not to be notified!

The Random Sample Table (RST) was designed to randomize the hauls sampled by an Observer. Working a random schedule is difficult at times due to our natural biorhythms. 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 captain to ensure he understands that you must be notified of haul backs. If problems with notification continue, be sure to document this in your logbook and inform NMFS staff when you are in port.

DO NOT give your RST to vessel personnel. Rather, verbally notify crew each time you do not wish to be notified of a haul.

The Random Sample Table is for your use only. Your samples are meant to represent the catch under normal fishing activities. If the crew knows which hauls will or will not be sampled, they may inadvertently alter their fishing activities. In order to avoid this possible bias, do not give your RST to vessel personnel. If you need to let the captain know your immediate schedule in order to be notified of hauls, do this verbally.

How to Use the Random Break Table (RBT)

The Random Break Table can be used alone, or with the RST.

Break tables are designed to give Observers a six-hour break each day when normal vessel operations do not permit adequate break time. The RBT is another tool that can be used to randomize which hauls are sampled. The break table should only be used by Observers on catcher/processors or motherships when it is used with the RST. The RBT can be used alone on any vessel type when all hauls cannot be sampled if an RST gives you too much time off. Remember, the break table should only be used if you cannot sample all the hauls. If your 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.

Unlike the RST, you can use the break table on some days, and not on others. Of course, you may also use it every day. Once you use it once, you must track each day on the break table, whether the break time is taken or not. For example, if you use the break table on one day, then it is not used for two days, record just the date on the second and third lines and use the time on the fourth line for a break on the fourth day.

DATE	01/16	~~0100~~ 0245
DATE	01/17	0700
DATE	01/18	0700
DATE	01/19	~~0200~~ 0215
DATE	01/20	~~0600~~ 0730
DATE	01/21	1300
DATE	01/22	~~1500~~ 1705
DATE	01/23	0400
DATE	01/24	~~0900~~ 1115
DATE	01/25	0600
DATE	01/26	0000
DATE	01/27	~~1700~~ 1500 (See log pg. 156)
DATE		1600

example of a completed break table

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. A 24-hour clock is used, so 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 Break 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.

You are responsible for all the “on” hauls brought aboard the vessel prior to the start of your break, so you may not actually start your break on time. For example, you are on a longline vessel, following only the break table, and your break starts at 1800 hours. The vessel picks up a set at 1745. You need to sample this set, since it started being retrieved before your break began. When you finish your sample at 2015, you would start your six-hour break. To document your change, draw a line through the 1800 on the table and write 2015 next to it. Additionally, if you are too exhausted to wait for your break, follow the same documentation procedure, and write the circumstances in your logbook.

Break Table Summary

- Take a break only on days you need it.
- If the retrieval time of an “on” haul is before your break time, complete your sample before taking the six-hour break.
- Break for six hours.
- Sample the next "on" haul which has a retrieval time after the end of your six-hour break.
- Hauls retrieved during your break continue to be counted against the Random Sample Table.

Documenting RST and RBT Use

Your use of the Random Sample and Break Tables must be documented on the Observer Haul Form. Fill in the "Random Sample Table" and "Random Break Table" columns to indicate what tables you were using. If you use the break table, staple it into your logbook, so that any changes you made regarding when you took a break are properly documented.

If Your Sampling Schedule is Too Rigorous

If you find that you cannot sample all the "on" hauls on a vessel, or that your other work is suffering, there are a few things you can try:

1. If you are on a C/P or mothership and are only using the RST, start using the break table on some or all days.

2. Reduce your sampling time by reducing the sample size of one or more hauls in the "on" haul series. If you are taking a larger sample for prohibited species, reduce this sample to your composition sample size. It is preferred to have more random, smaller samples from more hauls than large samples from fewer hauls.

3. Look ahead at your schedule and plan to make best use of your rest time. For example, if your RST reads that you have a four "on," one "off," four "on" series coming up, you should plan on getting more rest before this series. Try to complete paperwork, nap, and eat in between samples so you have a larger block of rest time in between the sets of four "on" hauls.

4. If you get caught in an unworkable situation, you can skip one of the hauls in the series to be sampled. If you do not sample an "on" haul, continue sampling the rest of the series as if you had. As in the example of the four "on," one "off," four "on" series, if you needed to rest for two hauls, you would sample four hauls, rest for two, and sample three hauls to complete the series. If it is necessary to skip "on" hauls on a continuing basis, get in contact with an Observer Program office for advice. **Do not sample "off" hauls to make up for skipped "on" hauls!**

Frequently Asked Questions on Using the RST and RBT

Q1: I am supposed to sample four 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?
A1: 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 Sample Table. To re-enter, check the fishing schedule against the Random Sample Table to see when the next “on” haul will be retrieved.

Q2: 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 aged for four hours. Do I sample this haul?
A2: 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.

Q3: Can I skip breaks and only take them on a few days when I need to?
A3: Yes. On the table, record the date of each day whether or not a break was taken. You cannot accumulate break time by skipping a day and taking a longer break the following day. You cannot take more than one break per day.

Q4: Can I sample more hauls than those indicated on the Random Sample Table?
A4: No. Do not sample “off” hauls on the RST unless you can sample all the hauls. If the number of hauls taken by the boat was overestimated, you may switch to a more rigorous RST. However, you should not switch more than once unless the vessel changes fisheries or fishing activities.

Q5: My break is over and the haul currently being processed is an "on" haul and is about half processed. Can I take a basket sample from the remaining portion?
A5: No. Since the catch is already half processed, half the population from which you want to sample is unavailable to you. This would interfere with your random sampling frame. Additionally, you were not present to verify that no presorting, or other unusual sorting, occurred. Use this time to complete paperwork, get some more sleep, or take some down time for yourself.

Q6: 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?
A6: Yes. You must sample only the designated hauls, resulting in a longer break than the six hours scheduled. Consequently, you may not need to take a break the next day.

Q7: I was just assigned to a different vessel (or, my vessel just completed a delivery and is resuming fishing). How does this effect the random sample table?
A7: When you are assigned to a new vessel, or when fishing resumes after a delivery, continue where you left off on the table if you were in the middle of an "on"series, or were going to start another. If you left off in the middle of an "off" series, or were going to start another, skip to the next "on" series. Your first haul of each new vessel or trip should be an "on" haul.

Introduction to Random Sampling Theory

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 please contact an Observer Program staff member.

Sampling Theory

Observers take samples from a population because it is not possible for them to count, weigh, and measure every individual within the population. By using 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, over time, 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 sample method eliminates any subjectivity on your part. 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.

- 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. **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 to be measured caught in a given haul.

A weight based frame using a flow scale is considered a spacial frame.

2. **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 trawl 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). These gear based frames are still considered spacial frames.

3. **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 five pots, or a group of any number of pots as long as the number for the unit is consistent throughout the sampling frame.

4. **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. **Pick random numbers to choose sampled units.** 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 tables found on page page A-14 and page A-15, or the plastic one provided during your briefing.

6. **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.

How to Use the Random Number Table

To use the random number table, 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 any direction along the column, recording appropriate numbers and skipping numbers too high or repeated, until you have enough random numbers.

For example, if you need to choose 3 numbers between 1 and 25, you could enter the table by placing your finger on the table to choose a column and row. Your criterion is two digit numbers between 01 and 25 (inclusive). You should decide which direction you want to move on the table. For this example, you decided to work up the column from your starting point. As you move up the column, the first number you encounter is 14. This is a two-digit number between 01 and 25; it fits the criterion, so you write it down. The next number is 09; it also fits the criterion, so you write it down. The next number is 58 and does not fit the criterion so you skip this number. Keep moving up the column, skipping the numbers that do not fit the criterion, until you choose the amount of numbers you need.

Unlike with the RST, you do not need to track or record your position in the RNT.

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 zigzag across or up and down the table. Unlike with the Random Sample Table (RST), 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.

Species Sub-Sampling

In the course of identifying, weighing, and counting the individual specimens in your randomly collected species composition sample, you may find 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 random sub-sample for species identification. Sub-samples are frequently used when there are large numbers of rock sole, tanner crab, or individuals of the arrowtooth/ Kamchatka flounder group within a sample.

To collect a sub-sample, pick random portions of your composition sample (baskets, sampled time units, skates) and collect all the individuals from the group and identify them to species. Randomly choose between 20 and 30 individuals from the group to identify. The identified animals are listed on separate lines on the 3US species composition form with the species name. The remaining individuals from the group, which were not further identified, should be weighed, counted and recorded under the more general code for that species group.

Do not extrapolate your species idenfication subsample into the rest of your sample! Record the fish that were not identified to species with the group code (i.e.: rock sole unident., code 104).

For example, you have too many fish from the rock sole group in your sample. You cannot identify each of them, so you choose two random baskets of mixed fish to remove all the rock sole from and identify them. Once these are all identified, you find that of the 29 rock sole in the two baskets, 26 are northern rock sole and 3 are southern rock sole. On the 3US species composition form, you would list 26 northern rock sole, 3 southern rock sole, and the rest of the rock sole in your sample as “rock sole unidentified.” Another example of recording a sub-sample can be found on the form 3US example on 4-42 in Figure 4-8.

Using Your Scales

To obtain accurate weights, you must use the appropriate scale for weighing different organisms or numbers of animals. If your vessel is equipped with a motion compensated electronic platform scale which is passing daily tests, you may use this scale for all sampling purposes, including weighing individual fish for otolith or scale sampling. If you are using NMFS issued scales, you should use your 2.0 kg brass scale for items up to 2.0 kg, your 12.0 kg brass scale for items between 2.0 and 12.0 kg, and your 50.0 kg Salter scale for weighing larger items. If you are on a small vessel out of Dutch Harbor or Kodiak, Chatillon flatbed scales are available from the NMFS field stations. These scales have a gauge that can be read to hundredth of a kilogram, but it is usually not appropriate to do so. Unless the weather is very calm, and the vessel is hardly moving, these scales should be read to the tenth of a kilogram, like your hanging 50.0 kg. Salter scales.

For instructions on how to care for your Chatillon flatbed scale, see "Chattilon Flatbed Scale Care and Maintenance" on page A-57.

Although your scales look sturdy, they are very susceptible to damage and excessive rust. Keep them in good working order by removing them from open areas when you aren't using them, and keep them well oiled. Lastly, you should bring your scales into a field station some time during your cruise to retest them and ensure they are still accurate. Document these test results in the "Scale Verification Record" section of your logbook.

Motion Compensated Electronic Scales

Vessels regulated under the American Fisheries Act, and vessels targeting some restricted access fisheries, must supply and use motion compensated scales. When they are required to, trawlers will have a flow scale and a platform scale on board and longliners will have a platform scale on board.

If your trawl vessel is equipped with a motion compensated flow scale, and it is passing daily accuracy tests, you should use this for determining your partial or whole haul sample sizes and OTC. The vessel is responsible for testing the flow scale each day, with an Observer present. The vessel personnel's responsibilities include:

- Having the scale certified by the Alaska Regional Office.
- Ensuring that hauls are not mixed.
- Performing a daily 400 kg. materials test, using fish or test materials supplied by the scale manufacturer (sandbags).
- Conducting the flow scale test in the presence of an Observer, to verify that the test was conducted in accordance with regulations.
- Recording the flow scale test on the proper form (OMB No. 0648-0330).
- Producing a printout of the total catch weights, which must include the haul number, the date of the haul, and the weight of all the catch as weighed by the flow scale.

If the vessel experiences trouble with their flow scale, have them contact Alan Kinsolving, NMFS Scale Program Coordinator. His phone number is (907) 586-7237. His fax number is (907) 586-7465.

If you plan to use the flow scale and/or platform scale, your responsibilities include:

- Testing the platform scale daily at 10 kg., 25., and 50 kg at least every 24 hours. The Observer Program recommends that observers test the scale at the beginning of each observer shift. If the platform scale fails, it may be retested. Record all test results on the Platform Scale Test Record in your logbook. **This pertains to both longline and trawl vessel Observers.**
- Observing the flow scale test, and signing the vessel's test form. Bring a copy of each of these forms back with your data.
- Obtaining a copy of the flow scale catch weight printouts for each haul. Bring copies of these back with your data.

The platform scale cannot be used to determine any part of your sample if it does not pass. The flow scale cannot be used to determine sample size or OTC if the platform scale does not pass. The accuracy of the weight used to test the flow scale is dependent on the platform scale being accurate.

Working with Two Observers

Vessels regulated by the American Fisheries Act are also required to carry two Observers. Some other vessels voluntarily carry two Observers, even during an open access fishery. 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 from that of the second. The following applies only to non-CDQ or AFA fisheries.

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 whom 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 19-4). NMFS staff will try to debrief you and the second observer at the same time whenever the logistics work out. Both NMFS staff and the Observers involved prefer this, since speaking to both Observers at the same time helps clear up any data questions and makes a cruise self explanatory and complete.

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. Remember, if you and the lead Observer do not debrief at the same time, you will need to reconstruct your time aboard the vessel during your debriefing interview alone. Keep very detailed notes in your own logbook regarding how you sampled and any problems you encountered to assist you in remembering specific events aboard the vessel. 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 s/he 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 the data for the Vessel and Observer Haul Forms 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.

Sending Catch Messages

During the course of your cruise, you may need to contact NMFS for many reasons, but the most common reason is to send catch messages. Catch messages contain information on fishing effort and species composition used for inseason management. When the Observer Program receives your data, preliminary quality control checks are done, and the information is made available to the Sustainable Fisheries Division in Juneau. This division uses the information from Observer catch messages to determine how much catch has been removed from each regulatory area. If you do not submit catch messages on time and in the proper format, the Observer Program cannot provide the information necessary for making sound management decisions.

Faxing Catch Messages

How often you send catch messages will depend upon your vessel type, and the fishery in which it is participating. Observers who use fax communications must fax their catch messages on a weekly or trip by trip basis (whichever is more frequent). If you are using fax communications, your catch message will consist of your Vessel and Observer Haul Forms and the corresponding 3US information. If no fishing was done for a trip, fax in the Vessel Haul Forms with the non-fishing day locations recorded on them. **If your vessel landed catch, but you were unable to sample for any one day, you must include a text message to explain why.** You may have been ill or the weather may have been bad, but whatever the reason, the Observer Program needs to be able to track how many days occur in which no samples are collected.

Fax your catch message to the Groundfish Observer Program in Seattle at 206-526-4066 or 206-526-4207. If you have trouble sending your catch message don't give up, call the Observer Program collect at 206-526-4205. If no one is available to take your call leave a voice mail message, including your name, cruise number, vessel name, and the reason why you can't send your data. If you have a communication related question, call Glenn Campbell at 206-526-4240.

Questions or text messages can be included with your catch message on a blank, unlined sheet of paper and may be hand written or typed. Please print or use a large font so faxes can be easily read.

Sending Catch Messages via ATLAS

Observers on trawl vessels using ATLAS should send their data daily, while Observers on longline or pot vessels using ATLAS should send catch information weekly. Send a catch message as often as required, even if your vessel does not fish in this time period. Send in the non fishing day positions to let the NMFS know that there was no fishing activity. If your vessel landed catch, but you were unable to sample for any one day, you must include a text message to explain why. You may have been ill or the weather may have been bad, but whatever the reason, the Observer Program needs to be able to track how many days occur in which no samples are collected. For more information on sending data via ATLAS, refer to "Transmitting Data from Vessels Using INMARSAT A, B, or Mini-M Communications" on page 15-33.

Vessel Type / Fishery	Send data via ATLAS
C/P and mothership trawl / All fisheries	Once per day
Longline or Pot / MSCDQ fisheries	Once per day
Longline / Open access fisheries	Once per week
IFQ fisheries	Once per week
Shoreside and floating processing plants	Once per week
Trawl catcher vessels / all fisheries	Once per trip

Table 2-2: Sending your data via ATLAS

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 all the changes you have made. At the top of the form write "resubmission" so we know you are sending a correction and not new data.

Occasionally, the Observer Program will not receive some or all of your catch message due to a communications problem. If this happens, you may get a message from the Program instructing you to re-send your data. 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.

If you are on an ATLAS boat and you need to change your data, see "Editing in ATLAS" on page 15-9 for specific instructions. Any changed data will automatically be sent to Seattle the next time you transmit data. If you are asked to resubmit a catch message, select a haul or date range while preparing your data to be transmitted.

TRAWLER CATCH DATA

List of Priorities

- Record fishing effort information from the vessel's official NMFS logbook.
- Obtain independent estimates of catch for **at least** every haul sampled for composition, although you may sample a haul for composition even if no independent estimate was made.

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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" on page 8-1 for record keeping information. Observers aboard longline and pot vessels, refer to "LONGLINE DATA COLLECTION" on page 6-1 and "POT VESSEL DATA COLLECTION" on page 7-1. This section covers the collection of fishing effort information for trawl vessels. It also includes methods used 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 Vessel and Observer Haul Forms.

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 successfully 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 haulback

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 the codend on board

Live Tanks - tanks or bins on factory trawler vessels where the catch is dumped prior to sorting or processing

Main Wires - the two large cables used to connect the trawl net to the vessel while fishing

Motion Compensated Flow Scale - a scale built into a conveyor belt; the scale maintains a running tally of weight moving across the belt, in addition to comparing it to a constant weight in order to compensate for vessel movement

Motion Compensated Platform Scale - an electronic flatbed scale with a constant weight load cell which allows for compensation of the vessel's movement

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 - often referred to as "doors," these are two metal plates, each attached to a main wire, designed to keep the mouth of the net open while fishing

Trip - the time period from when the vessel leaves harbor until it returns to harbor to offload product or catch

Winch - a hydraulic machine with one or more drums on which to coil rope, chain, or cable for hauling or hoisting

Fishing Effort Data Collection

Vessel Logbooks

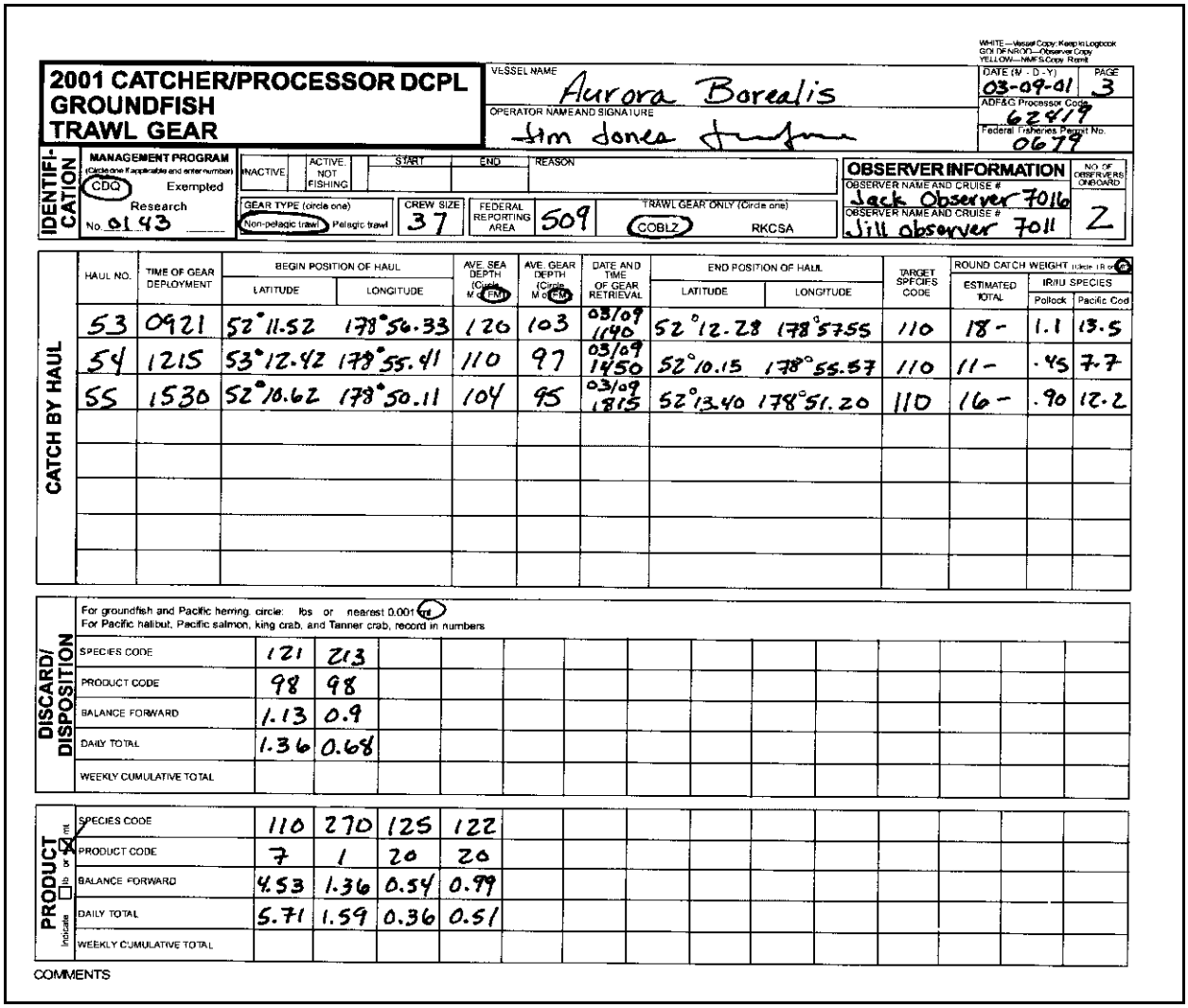
All vessels that carry Observers are required by federal regulation to maintain a current NMFS "Alaska Groundfish" logbook for daily fishing and processing activities. The captain, or an assigned crew member, must enter details of fishing activities, effort, and catch in this logbook, so you will use it to gather all the information for the Vessel Haul Form. Under regulation 50CFR679.50 (see "(vii) Records." on page 18-20), 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 Vessel Haul Form:

- type of trawl gear used,
- date and time of gear deployment,
- latitude and longitude of gear deployment,
- average sea depth and average gear depth,
- date and time of gear retrieval,
- latitude and longitude of gear retrieval,
- the estimated total catch weight,
- whether this haul was from an IFQ, and
- the CDQ number, if applicable.

In addition, you need to record a code corresponding to the gear performance. You will need to ask the captain to let you know if there were any problems during the tow because this information is not recorded in the vessel logbook.

Verifying Logbook Information

Before recording anything from the vessel logbook onto your data forms, you must verify that the data reported are accurate. If you find that a vessel logbook entry is wrong, your should write down the **correct** information on the Vessel Haul Form. Document the incorrect data in your logbook, and mention the discrepancy to the captain, or person in charge of maintaining the logbook. Usually, the error will be corrected by the crew member, so you should check the logbook for these changes. It is important that you record the correct information on the Vessel Haul Form even if the logbook entry is never amended. In general, your Vessel Haul Form should match the vessel logbook. Verify the following logbook entries:



WHITE—Vessel Copy: Keep in Logbook
GOLDENROD—Observer Copy
YELLOW—NMFS Copy: Remit

2001 CATCHER/PROCESSOR DCPL GROUNDFISH TRAWL GEAR

VESSEL NAME: Aurora Borealis
OPERATOR NAME AND SIGNATURE: Jim Jones
DATE (M - D - Y): 03-09-01 PAGE: 3
ADF&G Processor Code: 62417
Federal Fisheries Permit No.: 0677

IDENTIFICATION
MANAGEMENT PROGRAM (Circle one if applicable and enter number): CDQ Exempted Research No. 0143
INACTIVE | ACTIVE NOT FISHING | START | END | REASON
GEAR TYPE (circle one): Non-pelagic trawl Pelagic trawl
CREW SIZE: 37
FEDERAL REPORTING AREA: 509
TRAWL GEAR ONLY (Circle one): COBLZ RKCSA

OBSERVER INFORMATION
OBSERVER NAME AND CRUISE #: Jack Observer 7016
OBSERVER NAME AND CRUISE #: Jill observer 7011
NO. OF OBSERVERS ONBOARD: 2

CATCH BY HAUL

HAUL NO.	TIME OF GEAR DEPLOYMENT	BEGIN POSITION OF HAUL LATITUDE	BEGIN POSITION OF HAUL 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 LATITUDE	END POSITION OF HAUL LONGITUDE	TARGET SPECIES CODE	ROUND CATCH WEIGHT (circle lb or kg) ESTIMATED TOTAL	IR/IU SPECIES Pollock	IR/IU SPECIES Pacific Cod
53	0921	52°11.52	178°56.33	126	103	03/09 1140	52°12.28	178°57.55	110	18-	1.1	13.5
54	1215	53°12.42	178°55.41	110	97	03/09 1450	52°10.15	178°55.57	110	11-	.45	7.7
55	1530	52°10.62	178°50.11	104	95	03/09 1815	52°13.40	178°51.20	110	16-	.90	12.2

DISCARD/DISPOSITION
For groundfish and Pacific herring, circle: lbs or nearest 0.001 mt
For Pacific halibut, Pacific salmon, king crab, and Tanner crab, record in numbers

SPECIES CODE	121	213												
PRODUCT CODE	98	98												
BALANCE FORWARD	1.13	0.9												
DAILY TOTAL	1.36	0.68												
WEEKLY CUMULATIVE TOTAL														

PRODUCT (Indicate ☐ lb or ☒ mt)

SPECIES CODE	110	270	125	122										
PRODUCT CODE	7	1	20	20										
BALANCE FORWARD	4.53	1.36	0.54	0.99										
DAILY TOTAL	5.71	1.59	0.36	0.51										
WEEKLY CUMULATIVE TOTAL														

COMMENTS

Figure 3-1: Vessel Logbook

- **Date and Time of Gear Deployment and Retrieval**

When the vessel is setting gear, try to note the time when the winches stop paying out cable and the vessel increases speed. This is the time when the net reaches fishing depth, and begins fishing. This is the time that should be recorded as the "time of gear deployment" in the vessel logbook and on your forms. The time when the winches start to remove the net from fishing the fishing depth should be recorded as the "time of gear retrieval." The vessel logbook may have erroneous times listed, because they may be listing the time the net leaves the stern and the time the codend is pulled onboard. These times will not accurately record the fishing effort. Let the officer in charge of the logbook know if the wrong times are listed. 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**

  Sometimes, the codend may be retrieved from the fishing depth, not landed, and then reset to the fishing depth. The captain may do this when he is turning the vessel, or to check the contents of the net. When this occurs, the start and stop times recorded on the Vessel Haul Form does not reflect the true fishing effort, since the fishing duration was affected. List all “fishing duration affected” tows on the Vessel Haul Form 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 mate will read the gear retrieval position from the GPS navigation systems located in the wheelhouse. The locations recorded in the vessel logbook should be the ship’s position when the net was removed from the fishing depth. If you notice large changes in position between one haul and the next, check with the captain if these changes are realistic for his vessel. A “large” change in position is more than two degrees of latitude or longitude in the same day, or more than six degrees of latitude or longitude over a two day period. These positions may be due to an incorrectly recorded position, or may be correct if the boat moved a great distance between sets. Occasionally, you should check that the latitude and longitude listed in the logbook match that on the GPS display during the haulback.

GPS showing latitude and longitude

- **Catch Weight Estimate**

  The captain or vessel operator must make his own estimate of what each haul weighs. By regulation, the estimated groundfish catch weight must be entered into the vessel logbook within two hours of the gear retrieval. The vessel operator may record this weight in either metric tons or pounds, but you must record it in metric tons on your Vessel Haul Form. If you need to convert the logbook value from pounds to metric tons, show this calculation in your Observer logbook.

  During your first few days on board, ask the skipper how he makes these estimates. Record his response in your Observer logbook. You need to know how this number was derived, especially if you have to use it as an official total catch (OTC) weight.

Observer Estimates of Total Catch Weight

Occasionally, large items like boulders are caught. This weight should be included either in both the OTC and the composition data, or in neither place. See "Large Items" on page 4-28 for more information.

For as many hauls as possible, make your own independent, substantiated, and unbiased estimates of catch weight. This duty is one of your highest priorities, so it is important to make time to obtain independent estimates. There are three methods for determining an independent total catch weight: **1)** weighing the entire catch using your Observer scales, **2)** calculating weight using a bin volume and density, or **3)** calculating weight using a codend volume and density. You might need to use a combination of these three methods on one vessel, depending upon catch size and composition. **If you are on a vessel using a certified motion compensated flow scale, which is passing daily tests, you should not take volumetric observer estimates.**

Weighed Observer Estimates

Weighed independent estimates can only be obtained using Observer scales. Observer scales are any of the scales provided by NMFS or a certified, motion-compensated platform scale which has been tested. Motion compensated flow scales cannot be used to obtain an independent estimate, even if they are certified. Realistically, you will only be able to use a weighed independent estimate if the haul weight is less than 500 kilograms. A weighed Observer estimate is indicated by a W in the B, C, or W column on the Observer Haul Form (see "Instructions for Completing the Observer Haul Form on Trawl Vessels" on page 3-32).

Volumetric Observer Estimates

The way the catch is handled on each vessel will help you determine which method of independent catch estimation you will be able to use. 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 or bin. In this case, both codend and bin volumes may be obtained, so you should determine which estimate you feel most comfortable with. If the ship is a catcher only 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). In this case, a codend estimate may be the best method for obtaining an independent estimate, although you may be able to use the checker bins or trawl alley to take a bin volume.

Look at all of the areas where fish will be held before processing and delivery, such as the codend, trawl alley, checker bins, and/or live tanks. Determine which "container" is the most accurate and safe to measure. Total catch volume, multiplied by a density factor (see “Testing for Density” on page 3-13), yields total catch weight, termed the Observer Estimate on the Observer Haul Form.

When making volumetric estimates of the total catch, keep the following in mind:

- You will need to make or verify each component of the estimate. Observer estimates cannot be made by guessing the weight of the catch, but rather they must be calculated by actual measurements. All dimensions, calculations, and methods must be noted in your logbook to document and explain your estimates.

- On catcher processors or motherships: make volumetric estimates of live tanks, bins, or codends.

- On catcher vessels: make volumetric estimates of checker bins, trawl alleys, codends, or codend sections- adding the sections together for a total volume.

- The formula for determining catch weight using volume and density is:

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

- Record your total catch weight estimates on the Observer Haul Form, even if you are not confident about the accuracy of the estimate.

- If you find that none of the methods suggested will provide an accurate independent catch estimate, 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:

1. **Measure the area of the empty bin.**
   Many fish bins or tanks are irregularly shaped and need to be divided into several sections in order to be measured. To do this, sketch out the bin, and then visually break up the floor area into regular shaped sections that can easily be measured. Figure 3-2 shows how one fish bin was divided up and measured, so a floor area, and total volume could be calculated.

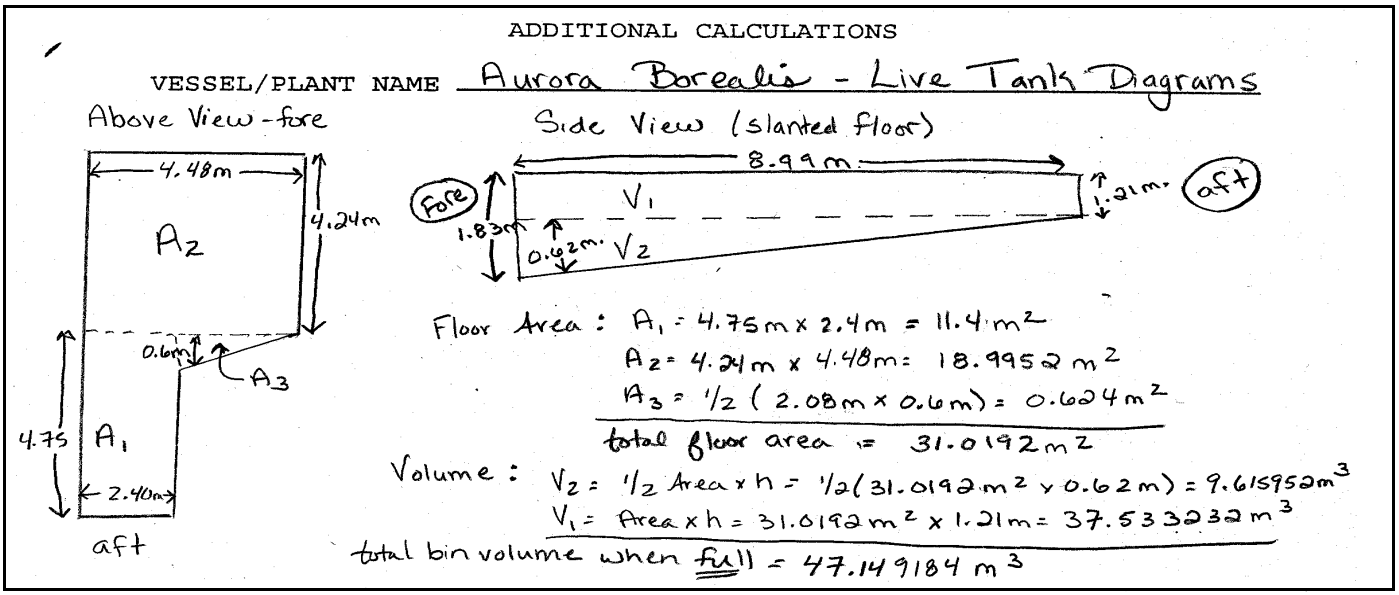


Figure 3-2: Calculating Volume of Irregular Bin

2. **Determine the appropriate formulas for each area of the bin.**
   Consult Appendix D."Area, Volume and Product Formulas" on page A-13 for the volumetric formula for each separate shape. Each mathematical formula will identify what dimensions need to be measured (length, width, 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.

bin marking showing depth of fish

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. If this is the case, you must verify these measurements. If the bin is marked, but meant to be read using a "nomogram," see Appendix X."Bins with Nomograms" on page A-59. You will need to ask the vessel representative if pre-marked bins are meant to be read using a nomogram. If the bin is unmarked, ask permission to mark the bin with your own height gauge. Paint or other permanent writing material may be available from a vessel representative. Be aware that the marks will 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 window or from the processing deck. The height gauge should be in increments of no more than 10 cm. 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. **Calculate and record bin volume and catch weight.**
   Record each haul's height measurements on your plastic deck form and record all area and volume calculations in your logbook. When you take multiple measurements for one dimension, such as height, use an average or a weighted average in your final volume calculation. Make sure that all of your measurements are as precise as possible and describe your methods in your logbook.

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, or if you feel that a bin volume may be inaccurate. Document all methods used for obtaining independent Observer estimates in your logbook. Be sure to include descriptions of any problems you encountered.

Codend Volumes

When measuring a codend always remember that safety is your first concern. Nets tend to slide and roll. Ask crew members for assistance; their help 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 formula(s) you will use to calculate the volume of each codend. Using the formula, determine which dimensions you will need to measure in order to obtain a volume. Refer to "Area, Volume and Product Formulas" on page A-13 for the formulas required to calculate the various volumetric shapes.

measuring codend length

2. **Measure the sections of the codend, using actual measurements and/or reference points.**
   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 mark it for 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, moving around dangerously, or brought aboard in segments, you may need to use pre-measured areas of the deck to obtain codend measurements.

   Pre-measure the deck, if you are using reference points.
   Measure structures on the deck that you can use as a gauge for estimating dimensions of the codend. Make easily read marks on deck structures in increments of 1/10 to 1/4 meters. Verify the measurements of any marks left by previous Observers before you use them.

When measuring a codend, the net is often greater or less than a pre-measured distance. In these circumstances actual measurements from the pre-measured marks are preferred over visually estimated distances. Use 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 pre-measuring 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 pre-measured marks on the ladders, posts, gantry, or other hardware on the trawl deck to gauge the height of the net. A pre-measured, marked stick is also very useful for taking codend heights.

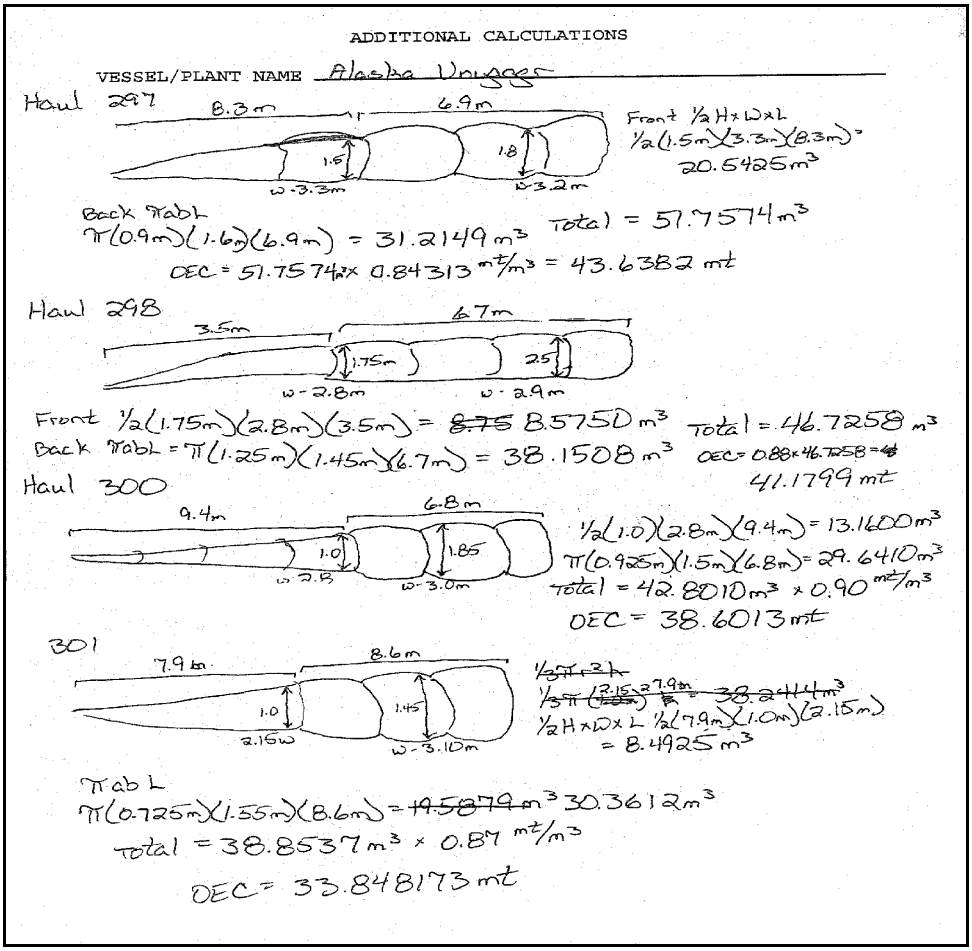
- If the codend is the same height as your shoulder, head, arm, or other part of your body, use this height for the measurement. This is the least preferable method of obtaining a measurement, since it isn't as precise as one obtained with a measuring stick. Use this option if you are unable to take more precise measurements.

measuring codend height

3. **Record dimensions, calculations, and volumetric formula.** In your logbook, record 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, including density calculations when appropriate.

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 sections that are 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 apply a predetermined or constant volume to the number of codend segments to calculate your independent Observer estimate!



Obtaining Densities for Total Catch

Once you have obtained a volumetric estimate of the catch, calculate the weight of the catch. To do this, you will need to determine the density of the catch. Density is weight per unit of volume. For our purposes, it is expressed in metric tons per cubic meter. Multiply the density by a codend or bin volume to calculate the catch weight estimate.

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

Densities are either prescribed for a given fishery, or will need to be estimated from a sample of the haul.

Prescribed densities:

If the catch consists of **50% or more pollock, apply a density of 0.98 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 containers consistently to the same level, or take height measurements for each sample
- 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 shape which can be calculated 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 3-3 when using the Observer Program's standard blue basket to obtain density estimates.

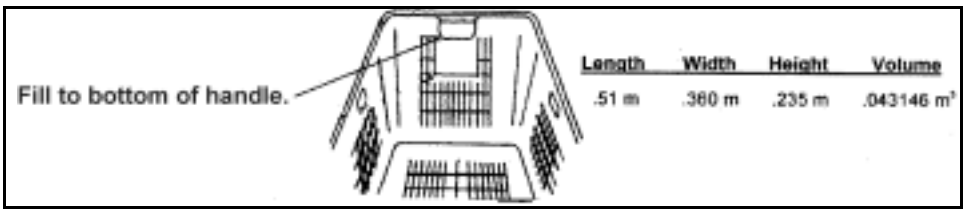


Figure 3-3: Blue Basket Volume

To calculate density:

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. If you are using your blue baskets, use the volume given in the figure above.

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

3. Measure the height of the catch in your containers, or mark a standard fill level on the container so that you can consistently use the same fill level. If you are using your blue baskets to test for density, be sure to fill it to the bottom of the handle. This level corresponds with the standard volume given in Figure 3-3.

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. Ensure that your container is filled to the correct fill level, and record the volume measurements of your sample on your deck sheet.

5. Weigh everything in your density sample. Record this weight on your deck sheet.

6. Use the formula below to calculate density. Remember to document these calculations in your logbook!

$$\text{density (mt/m}^3\text{)} = \text{weight of your sample (mt)} \div \text{volume of your sample (m}^3\text{)}$$

Official Total Catch (OTC) Weight

The Official Total Catch (OTC) is the best estimate, in your judgment, of total catch weight for each haul. The OTC should be a weight estimate, or verified scale weight, of all species caught, whether retained or not. There are four options for OTC's in order of preference: 1) flow scale weight, 2) proportioned plant delivery weight, 3) Observer volumetric estimates of catch weight, and 4) vessel operator's hail weight. The option you choose will depend on your vessel type and fishery. If you find that none of the options will provide an accurate catch weight, or if you have concerns about the accuracy of an OTC method you are using, contact NMFS staff for assistance. As you gain experience, the method you use to obtain the best estimate of total catch may change. All the methods you use should be recorded in your logbook, along with any corresponding calculations.

Options for Official Total Catch on Catcher/Processors and Motherships

Three of the four options for OTC can be used on a catcher-processor vessel. They are, in order of preference: 1) flow scale weight, 2) Observer estimate, and 3) captain's estimate. Catcher-processors completely sort their catch at sea, and make a preliminary or final product from retained species, so delivery weights are not an option for OTC. The three valid options are described in detail below.

Option 1- Flow Scale Weights: Some factory trawlers have installed a motion compensated flow scale, which records the weight of catch as it runs over the scale. If you want to use the flow scale as a tool to determine the OTC, the crew will need to test the scale every 24 hours. You may use the flow scale readout 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 "Motion Compensated Electronic Scales" on page 2-24. When you watch a flow scale test, you will be asked to sign a "Record of Daily Scale Tests" form for the vessel. Signing this form does not infer that the scale passed the test, only that you saw the scale test and the test was preformed correctly. Photocopy this form and keep it for your records, if possible. If copies are not available, record the flow scale test results you witnessed in your Observer logbook.

Motion compensated flow scales have been used in the North Pacific for the last three years. However, the fishing industry and the Observer Program are still learning about their possibilities and the difficulties that may arise when they are used at sea. In your logbook, record any problems you have obtaining scale weights. Record as many details as possible about the problem and it's resolution. **If you are using a certified, tested flow scale to determine your OTC, you do not need to make any independent volumetric estimates.**

Record of Daily Scale Tests

Vessel Name: Pacific Rover Date: 06/01/00
Time test started: 12:13

I. Weigh Fish on Observer Platform Scale

Basket #	Wt Fish + Basket (kg)	Basket #	Wt Fish + Basket (kg)	Basket #	Wt Fish + Basket (kg)	Basket #	Wt Fish + Basket (kg)
1	46.83	8	43.39	15		21	
2	40.91	9	41.16	16		22	
3	36.22	10	40.32	17		23	
4	38.93	11	37.86	18		24	
5	45.25	12	39.22	19		25	
6	40.01	13		20		26	
7	32.64	14		Total weight all fish+baskets			482.64

II. Calculate Percent Error of Flow Scale

Scale Indicator: Begin Test: kg

End Test: kg

Total weight fish and baskets (kg)	- Weight of Baskets	0	Platform scale weight of fish	Weight of Fish on Flow Scale (kg)	Error (B) - (A)	% Error = (C) ÷ (A) x 100
482.64	50.76		431.88 (A)	433.62 (B)	1.74 (C)	0.402887%

III. Sea Conditions (Beaufort Scale) at Time of Scale Test (Circle One):
0 1 (2) 3 4 5 6 7 8 9 10 11 12

Signature of vessel operator

I observed this test and to the best of my knowledge it was conducted in accordance with 50 CFR 679.28 (b)(3)

Signature of observer Chris Observer

INSTRUCTIONS

1. Collect approximately 400 kg of fish in baskets and weigh the baskets of fish on the platform scale. Record the weight of each basket of fish (basket plus fish) in Section I.
2. Record the total weight of all baskets plus fish in the first box in Section II.
3. Record the weight of the baskets in the second box. Subtract the weight of the baskets from the total weight of fish plus baskets to determine the weight of the fish only, record this weight in the third box in Section II. This is the platform scale weight of the fish (A).
4. Record the weight displayed on the flow scale before and after the test fish are weighed.
5. Weigh the fish from the baskets on the flow scale. Record the weight in the fourth box of Section II (B).
6. Calculate error of flow scale by subtracting the platform scale weight (A) from the flow scale weight (B). Record the error (C) in the fifth box of Section II.
7. Calculate percent error by dividing the error (C) by the known weight of the fish (A) and multiplying by 100. Record this information in the last box of Section II. The scale is weighing within 3 percent error if the result is between -3.0% and +3.0%.
8. Record Beaufort Scale sea conditions at time of test.
9. Have form signed by vessel operator and observer.

Figure 3-4: Flow Scale and Record of Daily Scale Tests

Option 2- Observer Volumetric Estimates: 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 your Observer scales. If your independent catch estimates are being used as the Official Total Catch, estimate as many of the catch weights as possible.

Option 3- Vessel or Captain's Estimate: 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. Remember to ask the skipper how he derives this number and record his answer in your logbook. It is very important that you understand how all your OTC estimates were made.

Options for Official Total Catch on Catcher-Only Trawlers

Three of the four options for OTC can be used on a catcher only vessel. They are, in order of preference: 1) proportioned delivery weight, 2) Observer estimates, and 3) captain's estimate. Catcher only vessels are usually fairly small, and none currently carry motion compensated flow scales.

The option you decide to use will depend mostly upon which fishery your vessel is participating in, and the way the crew handles the catch. Pollock is a fairly clean fishery, and the catcher vessels that target it usually do not sort and discard bycatch at sea. Because the majority of each catch is delivered to the processing plant, the best option for OTC is a proportioned delivery weight. Other fisheries usually have more bycatch than does pollock, so the crew may sort the catch at sea, keeping only the desirable fish and discarding the rest. In these situations, at-sea discard is too difficult to keep track of, so Observer estimates or captain's estimates are your best options for OTC.

If you are using a proportioned delivery weight for OTC, you must verify the delivery weight. As the catcher vessel Observer, you are responsible for knowing and documenting where all your data came from. Do not rely on a plant Observer to verify your delivery weights without checking with them first!

Option 1- Proportioned Delivery Weight: Using this method, you will calculate the OTC for each haul by proportioning the total delivery weight of the combined catches. This method should only be used in the pollock fishery when there is little or no sorting at sea. When the vessel delivers it's catch to a processing plant, the fish is weighed. The scales at each plant are tested by the State of Alaska annually, and they do not need to be tested daily for you to use this weight as a delivery weight. The delivery weight information should be verified however, by either yourself or the plant Observer. See "Verifying Delivery Weights" on page 8-4 for more information on how to do this.

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 on your vessel, use the captain's estimate for OTC and contact NMFS staff as soon as possible for advice.

When using proportioned delivery weight for OTC, you 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. Therefore, it is important to track and record the weight of discarded species while you are at sea.

To calculate 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 "ADF&G Groundfish Ticket Instructions" on page 8-8 for information on using the ADF&G fish ticket and tips on how to avoid potential errors.

2. Proportion the plant delivery weight to the individual hauls. Use your independent Observer estimate, the vessel's deck estimate of catch weight, or your estimate by band count for relative percentage of haul size. Whichever estimate you choose to use as your proportioning tool, you must maintain consistency by using only one source for proportioning each delivery. To proportion a delivery weight:

- Subtract any at-sea discards included in the at-sea estimates of haul weight.

- Total the at-sea estimates (minus discards) to obtain a total estimated delivery weight.

- Divide each estimated haul weight (minus discards) 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:

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

Estimate discards at sea if vessel personnel sort out and discard a few undesirable fish or if portions of the catch are dumped overboard. 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 possible if the crew helps by setting aside the portion of catch they sorted out.

- If all of the discard is put into a checker bin or small tote, and it 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 discard of species other than the prevalent, tallied species will need to be weighed and added in for a total discard weight.

- If large amounts of catch are dumped overboard, estimate the tonnage discarded by obtaining a codend estimate of the volume discarded, or by using the estimate determined by the vessel operator.

- Your visual estimate a final option, if a better estimate cannot be made.

3. Calculate the Official 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. Add in the weight of any discards at sea in order to calculate the total catch weight.

proportioned delivery weight + discard at sea = OTC

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. Additionally, your Observer estimates could be used for OTC if something were to go wrong at the plant, and you were unable to get a delivery weight.

ADDITIONAL CALCULATIONS

VESSEL/PLANT NAME Golden Arctic - Delivery #3 Hauls 7-9

Total weight delivered

271203 lbs x 0.4536 kg/lb = 123017.68 kg

See page 155 for verification information.

Total estimated delivery weight: Haul 7 = 43.06 - 0.2 (shark)
Haul 8 = 45.26 (no discard)
Haul 9 = 34.63 - 0.15 (jellyfish)
Total = 122.6 mT

OTC calculations:

Haul 7 : 42.86/122.6 x 123017.68 = 43.006009 + 0.2 at sea discard = 43.206009 mT

Haul 8 : 45.26/122.6 x 123.01768 = 45.41419 mT

Haul 9 : 34.48/122.6 x 123.01768 = 34.597467 + 0.15 at sea discard = 34.747467 mT

Figure 3-5: OTC Calculations Using Proportioned Delivery Weight

Option 2- Observer Volumetric Estimates: When there is extensive sorting of the catch at sea, your Observer estimates of catch weight are the best option for OTC. 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 diverse catch composition. 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, or estimate the weight, of the discard.

Option 3- Vessel or Captain's Estimate: This is the least preferred method of determining an OTC, but may be necessary when you cannot obtain an independent estimate, and the catch was extensively sorted at sea.

Recording Haul Data

Observer Logbooks

Record all your calculations, methods, and justifications for determining the independent Observer estimate and OTC in your logbook. You may be on more than one vessel during your deployment, and what you did on one vessel can easily be confused with your methods on another vessel if your notes and calculations are not detailed. Keep accurate records on the processes and methods you used during your deployment, such that you can recall details by referring to your logbook. You are responsible for your work and must be able to recall all methods and techniques used in the collection and recording of your data.

Completing Haul Forms on Trawl Vessels

In addition to entering your data and calculations in the Observer logbook, all observers must complete a summary of fishing effort and total catch on the Vessel and Observer Haul Forms (see Figures 3-6, 3-7, 3-8 and 3-9). **If you are on a vessel with the ATLAS program you must fill out both forms on paper and enter the data into the computer.**

Keep the "goldenrod" copies of the logbook in a secure place. These forms must be kept confidential, and must not be seen by crew from other vessels.

The fishing effort information required on the Vessel Haul form should come from the vessel's NMFS logbook. Additionally, there is a removable copy of the vessel logbook pages that observers should take with them. These are the "goldenrod" logbook pages. Tear out these copies, and bring them back with your data. Check carefully to ensure that the data are accurate, reasonable, and that no transcription errors are made when you copy data from these forms. The data requested on the Observer Haul Form are those items which you are responsible for calculating or verifying. The instructions on how to fill out each of these forms follows.

Cruise Number	Vessel code	Year
7013	A220	01

ORC
372

VESSEL HAUL FORM FOR TRAWL, POT, AND LONGLINE

Observer name Chris P. Observer

Vessel name c/v Pit Bull

Page _____ of _____ for transmission

Full name of catcher boat	ADF&G #

Page 3 of _____ for vessel

Weekly message
or
Resubmission

Haul #	Gear type	Gear performance	Vessel type	Date of gear deployment Month	Date of gear deployment Day	Time of gear deployment	Begin Position of Haul or Set Latitude (N)	E or W	Begin Position of Haul or Set Longitude (100)	Average bottom depth	Average gear depth	M or F	Date of gear retrieval Month	Date of gear retrieval Day	Time of gear retrieval	Location code	End Position for Haul or Set Latitude (N)	E or W	End Position for Haul or Set Longitude (100)	Vessel's total catch estimate in metric tons	Catcherboat's ADF&G #	IFQ? Y/N	CDQ #	# of segments in set	# of hooks per segment
13	1	1	3	09	03	0620	5732	W	5341	37	37	F	09	03	0700	R	5733	W	5340	4.00		N			
14	1	1	3	09	03	0732	5730		5340	45	45		09	03	1100	R	5731		5336	12.00					
15	1	4	3	09	03	1215	5731		5338	41	41		09	03	1245	R	5732		5337	1.50					
																				.					
0													09	04		N	5734		5340	.					
																				.					
16	1	1	3	09	05	0330	5732		5337	50	50		09	05	0630	R	5733		5336	3.30					
17	1	1	3	09	05	0715	5739	W	5309	46	46	F	09	05	0920	R	5740		5310	11.50		N			
						Began offload to Ocean Beauty							09	05						.					
																				.					
0				Complete offload, disembark at 1430 hrs									09	06		N	5742	W	5215	.					
																				.					
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National Marine Fisheries Service / North Pacific Groundfish Observer Program

Revised - 1/1/2001

Figure 3-6: Vessel Haul Form For Trawl, Pot, And Longline (catcher vessel)

Cruise Number	Vessel code
7013	A220

OBSERVER HAUL FORM FOR TRAWL, POT, AND LONGLINE

Page 3 of _____ for vessel

Observer name Chris P. Observer

Vessel name c/v Pit Bull

Page 2 of 6 for transmission

Plant/Processor name	Location	Processor code
Ocean Beauty	Kodiak	F01929

Haul #	Haul samped by	Random sample table	Random break table	% Monitored for marine mammals	Bird deterrence	Deterrence Verified?	Total hooks or pots in set	Official Total Catch in metric tons	Observer's Total Catch Estimate in metric tons	B, C, or W	Density in mt/m³	Processor code	Date fishing began for delivery Month	Date fishing began for delivery Day	Notes
13	1	9	1	100				7.69	7.69	C	.99	F01929	09	03	
14	1	9	1	100				11.63	11.63	C	.99				
15	1	9	1	100				.93	.93	W	.				
								.	.		.				
0								.	.		.				no fishing - fixing net
								.	.		.				
16	1	9	1	100				3.30	.		.				
17	0	9	1	100				12.54	12.54	C	.97	F01929	09	03	no sample - bad weather
								.	.		.				offloading
								.	.		.				
0								.	.		.				disembark
								.	.		.				
								.	.		.				
								.	.		.				
								.	.		.				
								.	.		.				
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								.	.		.				
								.	.		.				

National Marine Fisheries Service / North Pacific Groundfish Observer Program

Revised - 1/1/2000

Figure 3-7: Observer Haul Form For Trawl, Pot, And Longline (catcher vessel)

Cruise Number	Vessel code	Year
7011	A110	01

ORC
523

VESSEL HAUL FORM FOR TRAWL, POT, AND LONGLINE

Observer name Chris P. Observer

Vessel name C/P Aurora Borealis

Page _____ of _____ for transmission

Full name of catcher boat	ADF&G #

Page 4 of _____ for vessel

Weekly message or Resubmission

ATLAS

Haul #	Gear type	Gear performance	Vessel type	Date of gear deployment Month	Date of gear deployment Day	Time of gear deployment	Begin Position of Haul or Set Latitude (N)	E or W	Longitude (100)	Average bottom depth	Average gear depth	M or F	Date of gear retrieval Month	Date of gear retrieval Day	Time of gear retrieval	Location code	End Position for Haul or Set Latitude (N)	E or W	Longitude (100)	Vessel's total catch estimate in metric tons	Catcherboat's ADF&G #	IFQ? Y/N	CDQ #	# of segments in set	# of hooks per segment
53	2	9	1	03	09	0921	5211	W	7856	120	103	F	03	09	1140	R	5212	W	7857	50.00		N	C43		
54		1		03	09	1215	5212	W	7855	110	97		03	09	1450	R	5210		7855	60.00			C43		
55		4		03	09	1530	5210	W	7850	104	95		03	09	1816	R	5213		7851	.50			C43		
56		1		03	09	2037	5216	W	7854	127	100		03	09	2320	R	5215		7855	45.00			C43		
																				.					
0													03	10		N	5127	W	7931	.					
																				.					
57		1		03	11	2030	5011	E	7917	90	80		03	11	2210	R	5012	E	7918	25.00					
58	2	1	1	03	11	2230	5010	E	7917	90	70	F	03	11	2337	R	5010	E	7916	40.00		N			
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Cruise Number	Vessel code
7011	A110

OBSERVER HAUL FORM FOR TRAWL, POT, AND LONGLINE

Page 4 of _____ for vessel

Observer name Chris P. Observer

Vessel name Aurora Borealis

Page _____ of _____ for transmission

Plant/Processor name	Location	Processor code

Haul #	Haul samped by	Random sample table	Random break table	% Monitored for marine mammals	Bird deterrence	Deterrence Verified?	Total hooks or pots in set	Official Total Catch in metric tons	Observer's Total Catch Estimate in metric tons	B, C, or W	Density in mt/m³	Processor code	Date fishing began for delivery Month	Date fishing began for delivery Day	Notes
53	1	1	1	100				51.79	51.79	B	.98				miscounted, sampled by mistake
54	0	1	1	0				60.00	.		.				
55	1	0	1	100				.31	.31	W	.				not ripped
56	1	0	1	100				47.90	47.90	B	.98				finish pollock
								.	.		.				
0								.	.		.				start Atka
								.	.		.				
57	1	0	1	100				31.73	31.73	C	.89				
58	0	0	0	0				40.00	.		.				
								.	.		.				
								.	.		.				
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National Marine Fisheries Service / North Pacific Groundfish Observer Program

Revised - 1/1/2000

Figure 3-9: Observer Haul Form For Trawl, Pot, And Longline (catcher processor)

Instructions for Completing the Vessel Haul Form on Trawl Vessels

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 Vessel 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 for species composition or not. Keep the data from each vessel separate from other vessels.

- **Heading:** Enter the cruise number and vessel code supplied in your training or briefing. Vessel codes can be found in Appendix J."Vessel/Plant Codes, Names, Vessel Lengths, USCG and NMFS Permit Numbers" on page A-23. For "Year" enter only the last two digits, such as "01."

- **ORC:** When transmitting the Vessel Haul Form data to the Observer Program via a fax, you will need to enter an Observer Routing Code (ORC) number in this field. The ORC is a three-digit security code entry which will be explained to you during training.

- **Haul number:** All hauls must be recorded and assigned a number. Haul numbers must be unique and should be sequential and ascending. 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.

- **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 a type of trawl gear not listed, please contact the Observer Program for instructions.

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 18-25).	4 - Pair trawl - A trawl net (usually a large pelagic net) towed between two vessels. Each vessel tows the net by 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 18-25.	5 - shrimp trawl

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

1 - no problem	5 - problem--other problem, write an explanation in the “Notes” area of the Observer Haul Form
2 - problem--crab pot was in the haul	
3 - problem--net hung up on some obstacle and 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 was stored in a freezer hold aboard.

  2 - Mothership. This vessel received unsorted catch by codend transfer from a catcher vessel for this haul.

  3 - Catcher-only vessel. This vessel caught its own fish and retained it for delivery to a processing plant. On board, the catch was kept on ice or in refrigerated seawater (RSW) tanks, but not frozen.

  4 - A mothership or catcher/processor received this tow as sorted (or potentially sorted) catch from a catcher vessel. Catch was transferred by brailer, by pumping, or by another method other than 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 which will utilize the fish for bait.

- **Date of gear deployment:** Enter the month and day the gear was deployed.

- **Time of gear deployment:** Enter the time the gear reached fishing depth. Copy this time from the vessel logbook, unless you have identified a problem with this data. If the skipper is entering data that may not be accurate (see “Start and Stop Times that Do Not Reflect True Fishing Duration” on page 3-5), enter your own independently gathered times whenever possible. All entries must be in Alaska Local Times (ALT). Use 24 hour time notations, in four digits with no colons.

- **Begin Position of Haul:** Record the latitude and longitude of the "Begin Position of Haul or Set" from the vessel logbook into this field. One hundred+ degrees of longitude are assumed, so do not enter the "1." In addition to truncating the "1," you need to round the positions to the nearest minute if the ship logbook has positions to seconds or hundredths of seconds (see Figure 3-6 and Figure 3-8). Enter only numbers in the latitude and longitude columns. Do not enter any marks indicating degrees, minutes, or seconds. Fill out the "E or W" column to indicate if the longitude is east or west of the 180 degree line.

The most common haul form errors are: <u>missing processor codes and missing OTCs.</u> These missing fields cause a delay in entering the data into the in-season database. Please check these fields carefully before sending!

- **Average bottom depth and Average gear depth:** Copy the "Ave. Sea Depth" and the "Ave. Gear Depth" 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 them as fathoms (F) or meters (M) in the "M or F" column.

- **Date of gear retrieval:** Enter the month and day the gear was retrieved. A haul is assigned to a date according to the time the net is retrieved from the fishing level, which may not necessarily be the same day the net was set or the day 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.

- **Time of gear retrieval:** Enter the time the gear was removed from fishing depth. Copy this time from the vessel logbook, unless you have identified a problem with this data. If the skipper is entering data that may not be accurate (see "Start and Stop Times that Do Not Reflect True Fishing Duration" on page 3-5), enter your own independently gathered times whenever possible. All entries must be in Alaska Local Times (ALT). Use 24 hour time notations, in four digits with no colons. Enter all 2400-hour notations as 0000 hours, and 0000 hours starts a new date entry.

- **Location code:** This column corresponds to the location you will enter in the “End Position for Haul or Set” columns. For most hauls, you will enter “R” to indicate the position is for the retrieval of a net. A day in which no hauls were retrieved is termed a “non-fishing day.” For these days, enter an “N” to indicate that no hauls were retrieved. This will let NMFS know that the position entered is only a vessel location. Observers on motherships should refer to “Catch Information (Vessel and Observer Haul Forms)” on page 5-2 for instructions on entering delivery information.

  Non-fishing 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 in the **“End Position for Haul or Set”** column. On the remainder of the line, write a comment on the reason there was no fishing. All days aboard must be accounted for with either a fishing or non-fishing position, as this is the Observer Program’s only way to account for your sea time. Remember that a non-fishing day is one in which no hauls were **retrieved.**

  Delivery locations and dates: If you are on a catcher ship, each delivery must be noted on a line of the Vessel Haul Form. 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. This information does not need to be accompanied by a non-fishing day position if hauls were retrieved on the same day as the delivery.

For days spent in these ports, use the coordinates listed below for the non-fishing position:

Port	**Latitude**	**Longitude (W)**	**Port**	**Latitude**	**Longitude (W)**
Adak	51 53	176 39	King Cove	54 55	162 20
Akutan	54 08	165 46	Kodiak	57 42	152 15
Cordova	60 25	146 00	Sandpoint	55 19	160 33
Dutch Harbor	53 53	166 31	Seattle	47 42	122 13
Homer	59 35	151 35	Seward	60 00	149 25
Juneau	58 10	134 18			

- **End Position for Haul or Set:** Record the latitude and longitude of the “End Position of Haul or Set” from the vessel logbook into this field. Follow the same rules given for recording the “Begin Position of Haul” above.

- **Vessel’s total catch estimate in metric tons:** Record the "Estimated Round Catch Weight" from the vessel's NMFS logbook. Convert the estimate to metric tons if it is recorded in pounds, and round to the nearest two decimal places. There must be an entry for every haul.

- **Catcher boat’s ADF&G number and Full name of catcher boat box:** Fill in these two items on the Vessel Haul Form **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 Vessel Haul Form.

- **IFQ? Y/N:** Enter a “Y” or “N” to indicate which hauls were fished under an Individual Fishing Quota (IFQ). This column must be filled out for all hauls.

- **CDQ number:** For each haul taken under a Community Development Quota (CDQ), record the last 2 digits of the CDQ permit number (found on the ship's log page) after a “C.”(see Figure 3-8).

- **Number of segments in set and number of hooks per segment:** Leave these columns blank for trawl vessels, they pertain only to longline vessels.

Instructions for Completing the Observer Haul Form on Trawl Vessels

- **Haul number:** Haul numbers should correspond to the ones used on the Vessel Haul Form. If a line is skipped on the Vessel Haul Form, you should skip the same line on the Observer Haul Form so that the haul data is continuous if the forms were laid end to end.

- **Haul sampled by:** This field is used to indicate whether a haul was sampled, and by whom. All hauls must have one of the following codes in this field:

  0- not sampled
  1- sampled by lone or lead observer
  2- sampled by second observer
  9- sampled by unknown (please describe the situation surrounding the sample if this code is used)

- **Random sample table:** Enter the code that corresponds with your position on the random sample table (RST). Enter “9” if you are not using the random sample table. Enter “0” if the RST indicates that the haul is an “on” haul. Enter “1” if the RST indicates the haul is an “off” haul. See page 2-15 for information on how to use the RST.

  9- table not used (you are sampling all hauls)
  0- on haul
  1- off haul

- **Random break table:** Fill out this column to indicate if the haul was “on” or “off” according to the random break table. Use a “0" to record that you were on a break during this haul, and a “1" to record that you were not on a break during this haul. If you decide not to use the break table, use a value of “1" as your default.

- **Percent monitored for marine mammals:** On trawlers, if you monitor for marine mammals during the dumping of the haul, enter “100.” If the haul was not monitored for marine mammals, enter a “0.” Please note that no other values are valid entries on trawl vessels.

- **Bird deterrence and Deterrence verified:** Leave these columns blank for trawl vessels, they pertain only to longline vessels.

- **Total hooks or pots in set:** Leave these columns blank for trawl vessels.

- **Observer's Total Catch Estimate in metric tons:** Enter your independent estimate of catch weight for each haul where one was made. Record the weight estimate in metric tons, rounded to two decimal places. If you did not estimate the haul weight or actually weigh the entire catch, leave this field blank for that haul. A 0.00 MT entry indicates that you determined no weight was caught in that haul. Record how each catch estimate was made by filling out the next column with a W, C, or B. Enter "W" if the entire catch was weighed by you on your Observer scales, "B" you used a bin volume calculation, or "C" if you used a codend estimate.

- **Density in mt/m^3:** Record the density used to calculate volumetric Observer estimate. Record the density in metric tons per cubic meter, rounded to two decimal places. You must record a density if the Observer estimate was obtained using a bin or codend volume.

- **Processor code and Plant/Processor name, Location, and code number box:** On catcher-only vessels, you must record the processing plant's permit number for each haul. There is a list of the processor codes for shoreside or floating plants, and motherships on page A-20. If the plant your vessel delivers to is not on the list, use code F9999 in the body of the form.

  In the box in the upper right hand corner, fill in the name and processor code for each of the plants to which your ship delivers. You only need to record each plant once for each data set.

  If a delivery is split and sold to more than one processor, and you are unable to separate hauls which hauls are delivered to which plant, enter the processor code for the plant that receives the greater share of the delivery. If this, or any other incident out of the ordinary, occurs please note this in the "Notes" section of this form.

- **Date fishing began for delivery:** This field is only for catcher vessels. Fill in the date that the vessel first sets their gear within each trip. All the hauls that are included in a single delivery will have the same date listed in this field. The date should be the same as the deployment date for the first haul of each trip (see Figure 3-7).

- **Notes:** This field is for your own use. Enter comments that pertain to individual hauls, such as comments on gear performance, marine mammal interactions, and explanations of unusual data. Additional comments can be made at the bottom or top of each form, but must always be in a “non-keypunch” field.

- **Official Total Catch in metric tons:** Record the best estimate of total catch weight for each haul (see “Official Total Catch (OTC) Weight” on page 3-15). There must be an entry of OTC for every haul! OTC must be recorded in metric tons, rounded to two decimal places.

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 marine mammals or endangered seabirds 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 group 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 aspects of species composition 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 groups - 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.

Systematic- Referring to a methodical method of sampling continuing throughout an entire population. For example: collecting a basket of fish every ten minutes of processing time on a catcher processor, or partial haul sampling every other thousand kilograms if using a flow scale would be systematic sampling procedures.

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 Alaska Region 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 16-1 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 2-13).
- What sample type and size to gather.
- Where to collect your sample.
- What sampling biases occur in your collection area and how to minimize them.
- How to collect your sample.
- How to process your sample.

Draw a diagram of your sampling station in your logbook. Additionally, fill out a Random Sample Frame Detail form in your logbook for each frame you plan to use. On this form 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 2-15 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 4-21). 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.

catch on deck

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.

Presorted organisms are discussed in detail on page 4-12.

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.

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 affect 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 larger, potentially biased samples.

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 4-12).

- **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 18-3 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.

Inform the captain the first time pre-sorting occurs. Document all occurrences and conversations you have regarding this 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 4-12).

large shark removed on deck

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 used. 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-35).
- A species can have more than one sample type only if one of the sample types is "X," <u>but no species can have an X and a W sample type in the same haul.</u>
- 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 following two criteria must be met in a basket sample:**

- A basket sample must have **all items actually weighed** on your NMFS scales, or on a verified motion compensated platform scale. Applying average weights to the number of fish to obtain a total weight **cannot** be used in a basket sample. You may use the length/ weight table (page A-35) to determine the weight of halibut over 1 meter long.

- The sum of the animals/items weighed must equal the sample weight in a basket sample.

A basket sample is a sub-sample of catch used for one of three purposes: 1) to determine the species composition, 2) as a subsample to determine a proportion of two predominant species when a larger species composition sample is taken, or 3) as a subsample for one predominant species when a larger species composition sample is taken. 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 **one** 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.

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.

diverting catch

- Collecting fish directly off the belt--- Collect all catch in a prescribed area of the belt. 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

collecting a sample from a trawl alley

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 that hit your basket 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 4-25).

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

watching for bycatch at the belt

A whole haul sample is an account of all organisms in the haul. It will not be possible to count and weigh the predominant species, so 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 change your sample type and collect a smaller, more accurate sample.
- 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, space to store bycatch, or time to monitor the entire haul. 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 only sampled the portion of the haul that was not discarded at sea. 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 3-17). 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 "Obtaining Densities for Total Catch" on page 3-13), to determine the sample weight.:

$$\text{difference in fish height (m)} \times \text{bin area}(m^2) \times \text{density } (kg/m^3) = \text{ sample weight (kg)}$$

Refer to "Observer Estimates by Bin Volumes" on page 3-8 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 4-22) 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 or 200 kg basket sample (see page 4-13) 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. 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 Multi-Species Community Development Quota (MSCDQ) fisheries. An additional certification is required to observe on MSCDQ 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 the scale daily according to the instructions in "Motion Compensated Electronic Scales" on page 2-24. 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 or 200 kg (see page 4-13) 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.

$$\text{weight} \div \text{number} = \text{average weight}$$

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 (see page A-14), dice, slips of paper, or some other documented method.

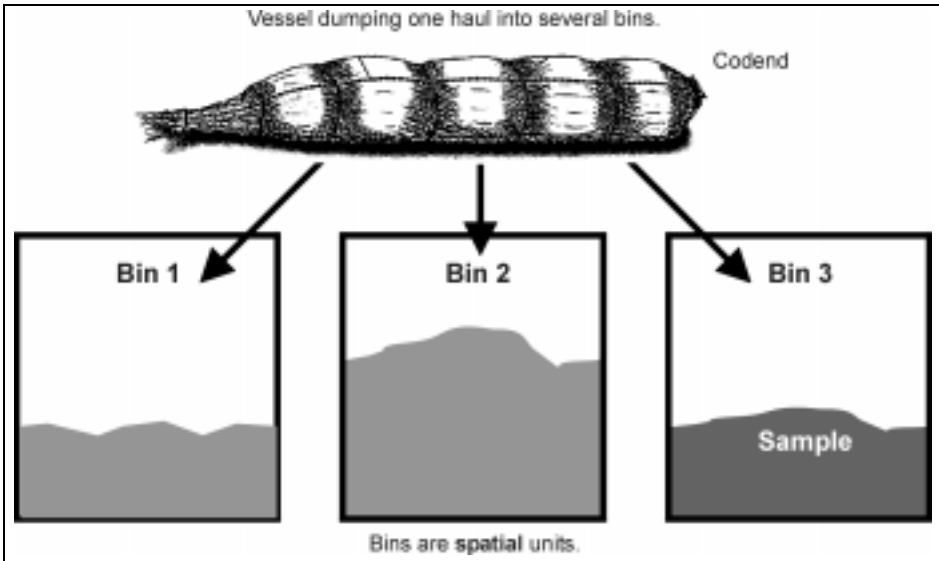
The units which make up your frame can either be spatial (units of space) or temporal (units of time.) When the entire population is available at one time; for instance when a codend is dumped out on deck, spatial sampling units should be used. When the entire population is available over time, such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



Use your random numbers table to choose which bin to take your sample from. In pollock and other "clean fisheries," you could partial haul the entire chosen bin. In diverse fisheries, such as yellowfin sole, you would take basket samples from the chosen bin. In this example, bin 3 was randomly picked, and will be sampled.

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).

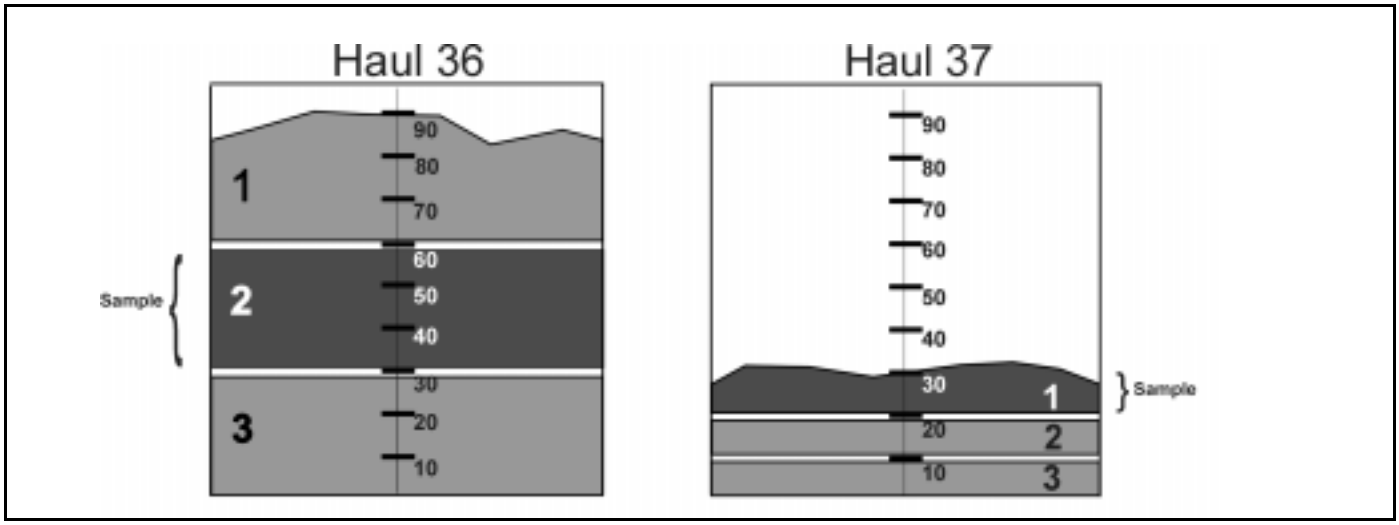


Figure 4-2: Spatial Sampling (single bin)

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.

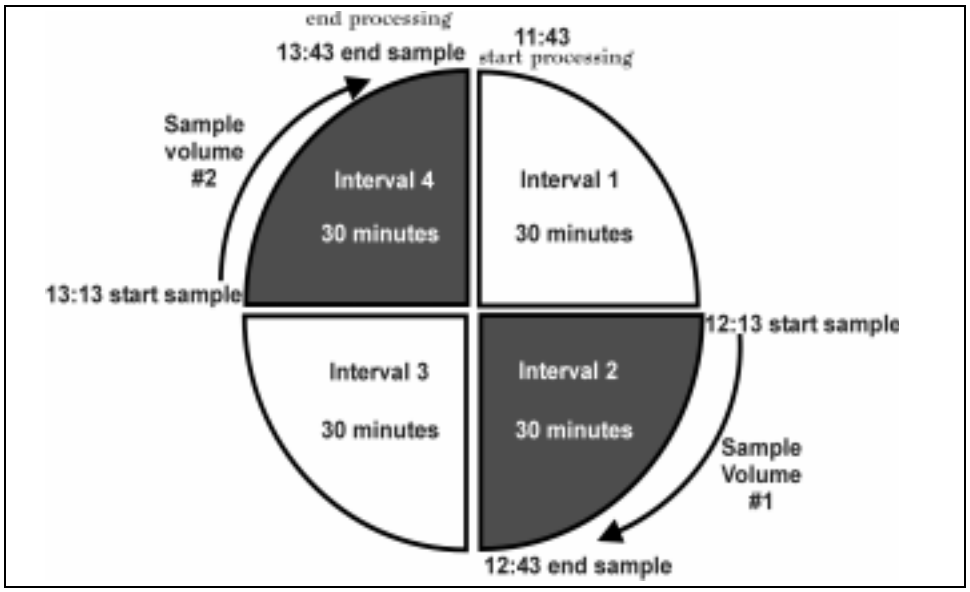


Figure 4-3: Temporal Frame

Your yellowfin sole vessel lands a 30 ton bag. They process about 7-8 tons per hour, so you expect the running time to be about 4 hours. It usually takes you 20 minutes to sort through two baskets, and you need 10 baskets to collect 300.0 kg., so you decide to use half hour sample intervals and collect two baskets from each chosen interval. The four hours of processing time can be divided into eight 30-minute intervals. Number the intervals one through eight. Using your random number table, you pick five intervals in which to sample. You pick numbers 8, 3, 6, 5, and 6. You chose interval 6 twice, so you can collect four baskets from this interval. If you don't have the storage space for all these fish, you may disregard duplicate intervals, and choose another. Since it doesn't take you a half hour to collect two baskets of fish, you choose a random time within your intervals to collect fish. Choose a number between one and thirty minutes, and collect both your baskets at the chosen time. If you chose minute 18, you would collect your baskets during the 18th minute of your intervals. Your first sample is taken during the 3rd half hour interval, at the 18th minute, so it would be taken one hour and 48 minutes after they began processing fish.

Example 4-1: Temporal Frame Using Basket Samples

If you systematically sample an entire haul, you must randomize your start time within the first interval, and sample throughout the entire haul!

Another way to use time intervals to sample is to set up a random systematic frame. Systematic sampling involves taking a sample during every "nth" defined time interval. To make a random systematic frame, you need to randomize your sampling start time within the first interval. In the example above, you could have set up a systematic sample frame by taking a basket every 30 minutes. Use the random number table, numbered slips of paper, or some other method to choose a time in the first interval in which to start sampling. In the example above, you would need to pick a number between one and thirty. If you picked the 13th minute in which to begin sampling, you would wait until thirteen minutes of processing time had passed prior to taking a basket. Once you started, you would collect a basket at every 13+30n minutes. For example, you would take baskets at 13 minutes, 43 minutes, 1 hour and 13 minutes, 1 hour and 43 minutes, etc. until the end of the haul.

If you systematically sample a portion of a haul, you must randomize your start time within the first unit in that portion and sample throughout the entire portion!

If you want to use a systematic sampling frame, but don't want to be in the factory for the entire running of a haul, you can systematically sample a randomly chosen portion of the haul. If the haul in the example above was a 60 ton bag, the running time would have been estimated at eight hours-too long to spend on one basket sample! If this was the case, you could divide the haul into two, and choose a random half to systematically sample. Once you chose the half, you could use the same frame described above. If you chose the first half, and used the exact frame above, you would collect samples at minute 13, 43, 1 hour and 13 minutes, etc. until four hours of processing time had passed. If you chose the second half, and used the exact frame above, you would wait for four hours of running time to pass, then take your samples after 4 hours and 13 minutes, 4 hours and 43 minutes, 5 hours and 13 minutes, etc. until the end of the haul.

Implementing a Random Sample Frame on a Catcher Vessel

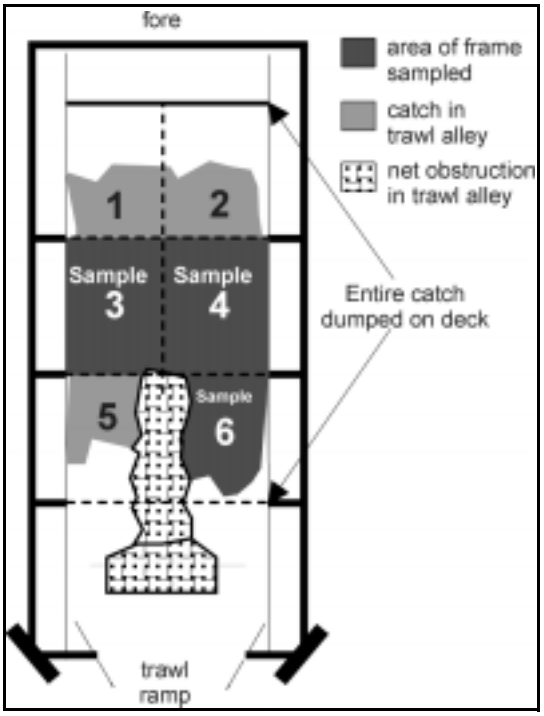


Figure 4-4: Spatial Frame Using Trawl Alley

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.

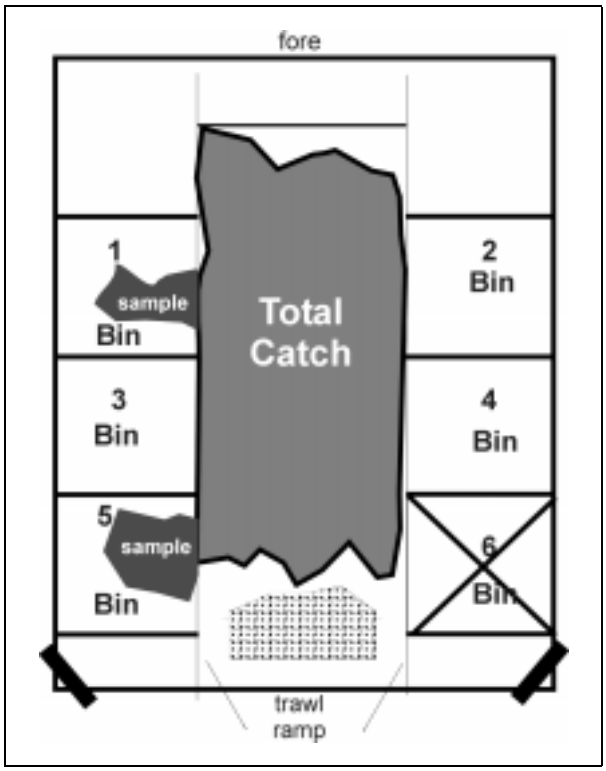


Figure 4-5: Spatial Frame Using Checkerbins

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 “nth” 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 a systematic sample frame. Use the random number table, numbered slips of paper, or some other method to choose a start time. Since two minutes will be your unit, break the first two minutes up into one minute intervals. For example, if you picked the second minute interval in which to start your sampling, you would wait until one minute of the dumping time had passed prior to taking a basket of fish. Once you started, you would collect a basket every two minutes until the end of the dumping. In this example, you would collect fish at minutes 2, 4, 6, 8, etc.

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

counting and weighing fish

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

crab pot caught in trawl net

Trawlers occasionally will pick up a crab pot in the net. The incident is recorded on your Vessel Haul Form (see page 3-27). Generally observers do not include crab pots in either the OTC or the species composition sample. However, if the crab pot actually occurs in your sample you will need to record it appropriately. Estimate the weight of the crab pot and include this in your codend estimate, rather than the volume. Record the crab pot on your species composition form as a “miscellaneous item” (code 900) with the estimated weight. 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, 55-gallon drum, or large organism 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 your species composition sample data is extrapolated to the entire haul.

- 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 and how to sample and record data from deliveries to a shoreside plant for pollock catcher boats.

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 4-33 for directions on how to proportion sample data. The only difference in proportioning your species composition sample instead of just prohibited species is that proportioning for basket samples is usually done by weight instead of by number.

- 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 18-20).

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. If the vessel you are on is sorting catch and you cannot monitor for, or collect all, the prohibited species for which you will be whole haul sampling for at the plant, reduce your sampling effort to a basket or partial haul sample for these 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 "Basket Sampling on Catcher Boats" on page 4-15). 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 are using a proportioned delivery weight for your whole haul weight, it must be verified. As the catcher vessel Observer, you are responsible for knowing and documenting where all your data came from. Do not rely on a plant Observer to verify your delivery weights without checking with them first!

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, and you must return to your vessel, document this thoroughly in your logbook. Notify NMFS and your contractor to explain that the vessel is leaving port and you are unable to complete your offload. Assisting vessel Observers is a top priority of plant Observers, so it should be a rare event that the plant Observer would not be available to relieve you.

It is unacceptable to miss any portion of an offload when recording the hauls as whole haul sampled. If any of your offload is not monitored, record only the basket sample portion of the hauls in this delivery. Document all the circumstances explaining why parts of the delivery were missed.

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

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 10-1). Take scale samples (see page 10-11) from salmon species as needed.

salmon collected from a whole haul sample

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! 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 8-8.

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

20

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

128

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

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 composition, or just for prohibited species. This is preferred in these fisheries, but is not always possible. Vessels in these fisheries are involved in the Vessel Incentive Program.

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. 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.

Be aware that crew members aboard vessels participating in the VIP may scrutinize your data. Additionally, they are used to observers using basket sample techniques exclusively during these fisheries. **The basket sample requirement in VIP fisheries has been lifted in 2001.**

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.
- 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!
- Write as dark as possible, with rinsing your writing will fade.

Haul # 116	W P B Halibut ☐ ☑ ☐ Salmon ☐ ☑ ☐ King Crab ☐ ☑ ☐ Tanner Crab ☐ ☑ ☐ Herring ☐ ☐ ☑	Page 112 of
Date 09-08-01		CR# 7068 Vessel A069
Partial haul sample weight in kg. 20919.60 kg	Keypunch ckeck for species #'s. 357	Keypunch ckeck for species wt's. 417.2 kg

Species	Sex	#	Weight	#	Weight	#	Weight	% Ret.	ST	Length data, Viabilities, and Measurements
Pollock		39	23.7	54	43.6	56	39.8	100	B	
Pollock		51	38.6	53	37.0	43	26.2	100	B	Too many herring... took subsample for 2 predom. species.
Herring		6	2.15	2	1.05				B	
Pac. Cod		3	15.6					100	P	
Arrow		9	8.5					0		
N. RockSole		2	0.95							
yellowfin		2	1.5							
jellyfish		26	12.5					0		
Squid		3	0.65	(all retained for consumption on boat)				100		
Poacher		1	0.2					0		
sandfish		1	0.4					0		
sculpin		5	4.8					0	P	For salmon retention 3 kings outside sample
Pac. Sleeper		1	160.0	(estimated)				0	X	

Notes: Flowscale reading at end of haul = 94.95 mT = OTC
Partial haul: Flow scale reading start = 20200.8, stop = 41120.4 } = 20919.60 kg

Revised 1/1/2000

Figure 4-7: Atlas Deck Form

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 4-39.

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 Vessel Haul 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.

- **W/P/S field for prohibited species:** 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.

- **Keypunch Check for Species #’s:** Sum the entries from the “#” column(s) for all species groups, and sample types and enter the value in this field. For the Species Composition form in the ATLAS program this sum will be entered under species code 999 in the **Number** field (see “Data Check and Verification” on page 15-21).

- **Keypunch Check for Species wt’s:** Sum the entries from the “Weight” column(s) for all species, groups, and sample types and enter in this field. For the Species Composition form in the ATLAS program this sum will be entered under species code 999 in the **Weight** field.

- **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. Record the percent retained to the nearest whole number.

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

The most common problem on this form is the whole haul sample weight not equal to the OTC listed on the haul form. This affects the accuracy of the in-season database. Please check these fields carefully before sending data!

- **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.

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	00	09	03	16

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

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Species Name (keypunch check)	Sex	Species code	ST +	Number	Species weight in kg. w/ decimal	Quantity sampled (hooks, pots, or kilograms)	% retained
		4021		1273	383.14		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		2.3	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:	converts 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	00	09	03	16

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

Species Name (keypunch check)	Sex	Species code	ST +	Number	Species weight in kg. w/ decimal	Quantity sampled (hooks, pots, or kilograms)	% retained
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	

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

FORM 3US -- SPECIES COMPOSITION

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Species:	Whole haul and OTC by bin volume.				
Wt. of above:	basket. Sampled for two predominant species				
No. weighed:					
Avg. weight:					

Cruise	Vessel Code	Year	Month	Day	Haul
6011	A110	00	03	09	56

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

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Species Name (keypunch check)	S	Species code	ST	Number	Species weight in kg. w/ decimal	Quantity sampled (baskets, pots, or kilograms)	% retained
	X	2360	+	345	249.75		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				Switched to Atka Mackerel
Wt. of above:	31.3	Northern Wt = 172 x ave wt = 103.53 kg.			
No. weighed:	52	Partial haul by bin volume, tallied Northerns after			
Avg. weight:	0.6019228	enough for average weight collected.			

Cruise	Vessel Code	Year	Month	Day	Haul
6011	A110	00	03	11	57

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

Species Name (keypunch check)	S	Species code	ST	Number	Species weight in kg. w/ decimal	Quantity sampled (baskets, pots, or kilograms)	% retained
	X	2917	+	370	247.18		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
Ronquil		240		2	.15		0
Dusky Rockfish		330	P	3	1.7	10436.82	100
Atka Mackerel		204	B	147	89.5	89.5	100

National Marine Fisheries Service - North Pacific Groundfish Observer Program

Revised 1/1/00

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 Vessel Haul 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 4-9).

- **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, beginning 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 4-29 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 or codend volume (if required).
- Collect haul information for delivering catcher boats.
- Send daily catch messages.
- Sample for species composition.
- Collect otoliths on predominant species.
- Collect length frequency data for:
  - prohibited species found within your sample
  - predominant species from every sampled haul.
- Complete assigned standard and special projects.

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Introduction

catcher boat delivery

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.

Currently, all three of the motherships listed above are part of a co-op allowed under the American Fisheries Act (see “Restricted Access Fisheries” on page 1-7). When these vessels participate in the Bering Sea pollock fishery, they carry two or three observers, one of whom has to have additional NMFS Level 2 training. For more information on the roles of each observer, see “Working with Two Observers” on page 2-25

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 NMFS for information on how to report delivered catch.

Catch Information (Vessel and Observer Haul Forms)

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. The fishing effort information required on the Vessel Haul form should come from the vessel’s NMFS logbook. Check carefully to ensure that the data are accurate, reasonable, and that no transcription errors are made when you copy data to this forms. The data requested on the Observer Haul Form are those items which you are responsible for calculating or verifying. The instructions on how to fill out each of these forms follows. See “Instructions for Completing the Vessel Haul Form on Trawl Vessels” on page 3-26 and “Instructions for Completing the Observer Haul Form on Trawl Vessels” on page 3-32 for rules and instructions on how to fill out the Vessel and Observer Haul Forms. The particulars that are specific to motherships are listed and explained below.

Keep only one set of Vessel and Observer Haul Forms. List self-made tows and deliveries together, in the order which they occurred. Most motherships will have a radio schedule for when they gather 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 may not be reliable. Some Observers create a "worksheet" for the person doing the radio schedule, although most vessels will already have one. See Figure 5-1 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.

Del. #	Vessel Name	Date Set	Time Set	Set Latitude	Set Longitude	Bottom Depth	Fishing Depth	Date Retrieved	Time Retrieved	Retrieval Latitude	Retrieval Longitude	Catch Estimate
40	Ald.	1/24	1602	54°32'	165°18'	111 F	102 F	1/24	1815	54°33'	165°17'	29.13
41	Whis.	1/24	1950	54°38'	165°52'	112 F	88 F	1/24	2240	54°38'	165°52'	75.46
42	M.D.	1/24	1830	54°36'	165°39'	92 F	65 F	1/25	0025	54°37'	165°39	36.90
43	A.D.	1/24	1810	55°29'	164°49'	85 F	68 F	1/24	2030	55°29'	164°48'	39.50

Figure 5-1: Observer Radio Schedule Worksheet (example)

Haul Order

The retrieval time always determines the date of the catch. This is not necessarily the same day the catch was delivered to the mothership. Although the retrieval time determines the date on the Vessel Haul Form, it does not have to determine the order in which the codends were delivered to your mothership. Often, codends are delivered out of sequence from when they were hauled back. It will be easiest for you to use the order of delivery to number the catches coming aboard, since that is the way the vessel will be numbering the hauls in their logbook. Your retrieval times will be out of sequence, but most of your haul numbers will correspond to the vessel's delivery numbers. Using this method, the only haul numbers which may not match the vessel's delivery numbers are those retrieved around midnight, or 0000 hours.

When filling out the Vessel Haul Form, you may find it easier to fill out the gear retrieval information first. You will avoid recording hauls on the wrong date if these columns are completed before recording the gear deployment information. An example of changing the sequence of deliveries in order to keep the haul date correct is shown with delivery 42 in the worksheet example, Figure 5-1. Note that this delivery has been renumbered as Haul 43 in the Vessel Haul Form example, Figure 5-2. Hauls 42 and 43 are out of sequence because Haul 42 (the vessel's 43rd delivery) was actually hauled back the day before it was delivered, but the mothership received Haul 43 (the vessel's 42nd delivery) first. It is very important that the correct date and haul number get recorded on the corresponding 3US, Form 7 and 9US if you are using paper forms. Note the reason why you deviated from the vessel delivery number in your logbook, or in the margin of your Vessel Haul Form.

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 Vessel Haul Form, 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

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 the catch during the dumping of the codend. If you cannot monitor every delivery, this should be done on as many **randomly selected** catches as possible. If you monitor the 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.

.

Codend Delivery Rules	Pumped Fish Delivery Rules
1) Vessel type: Enter a "2" to indicate that the vessel received unsorted catch. 2) Date and Time of Gear Deployment: you will need to get this data from the catcher vessels. Remember that hauls must be listed by the date of gear retrieval, so these dates and times may be out of sequence! 3) Begin Position, Bottom depth, and Gear depth: Collect this data from the catcher boats. 4) Date and Time of gear retrieval: Enter the day and time the catcher boat retrieved these hauls. It may be easier to fill these columns out first, so that your haul order is established before filling out the Date, Time, and Position of the beginning of the set. 5) Location Code: Enter an "R" and the corresponding latitude and longitude of the catcher boat's retrieval position. 6) Vessel Estimate: Enter the catch estimate made by mothership personnel. 7) Catcher boat's ADF&G#: Enter the ADF&G number for the catcher boat which made this delivery.	1) Vessel type: Enter a "4" to indicate that the vessel received potentially sorted catch. 2) Date and Time of Gear Deployment and Average bottom and gear depth: Leave these columns blank. Often, pumped fish is made up of several hauls, so these data are not applicable. 3) Date of gear retrieval: Enter the day on which the delivery occurred. 4) Time of gear retrieval: Leave this column blank. 5) Location code: Enter a "D" and the corresponding latitude and longitude of the mothership when it received the delivery. If your vessel is in port when it accepts the pumped fish, you may use one of the port locations given on page 3-30. If your mothership is floating, you will need to record the location off the G.P.S. 6) Vessel Estimate: Enter the weight of the entire delivery to the mothership. 7) 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 Vessel Haul Form on a Mothership

Cruise Number	Vessel code	Year
6015	A316	01

ORC
999

VESSEL HAUL FORM FOR TRAWL, POT, AND LONGLINE

Observer name Chris P. Observer

Vessel name Whistler

Page ____ of ____ for transmission

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

Page 8 of ____ for vessel

Weekly message
or
Resubmission

Haul #	Gear type	Gear performance	Vessel type	Date of gear deployment Month	Date of gear deployment Day	Time of gear deployment	Position of gear deployment Latitude (N)	E or W	Position of gear deployment Longitude (100)	Average bottom depth	Average gear depth	M or F	Date of gear retrieval Month	Date of gear retrieval Day	Time of gear retrieval	Location code	Position of gear retrieval Latitude (N)	E or W	Position of gear retrieval Longitude (100)	Vessel's total catch estimate in metric tons	Catcherboat's ADF&G #	IFQ? Y/N	CDQ #	# of skates in set	# of hooks skate
32	2	1	2	01	23	2345	5418	W	6555	106	91	F	01	24	0605	R	5419	W	6555	29.63	39946	N			
33			2	01	24	0032	5433		6535	113	87				0815		5433		6534	36.90	68858				
34			2			0930	5510		6423	103	75				1045		5511		6423	36.96	00028				
35			1			1103	5545		6414	106	73				1215		5543		6415	91.38					
36			2			0850	5438		6411	110	80				1155		5439		6411	33.72	55199				
37						1210	5643		6424	90	70				1640		5643		6423	36.59	39946				
38						1306	5546		6553	90	56				1430		5546		6553	37.61	68858				
39						1415	5409		6535	144	125				1705		5411		6535	37.55	00028				
40			2			1602	5432		6518	111	102				1815		5433		6517	29.13	48215				
41			1			1950	5438		6552	112	88				2240		5438		6552	75.46					
* 42	2	1	2	01	24	1810	5529	W	6449	85	68	F	01	24	2030	R	5529	W	6448	39.50	00028	N			
* 43	2	1	2	01	24	1830	5436	W	6539	92	65	F	01	25	0025	R	5437	W	6539	36.90	68858	N			
44			2	01	24	2315	5430		6543	95	61				0335		5430		6542	38.32	48215				
45			2	01	25	0601	5502		6533	91	80				0945		5502		6533	38.96					
46			1	01	25	0630	5434	W	6435	89	75	F			0900	R	5433		6423	32.15	55199				
47	2	1	4										01	25		D	5413	W	6635	163.24	39946	N	C53		
0													01	26		N	5353	W		Offloading at City Dock - D.H.					

Revised - 1/1/2000

Figure 5-3: Vessel Haul Form For Trawl, Pot And Longline (mothership)

Cruise Number	Vessel code
6015	A316

OBSERVER HAUL FORM FOR TRAWL, POT, AND LONGLINE

Page 8 of _____ for vessel

Observer name Chris P. Observer

Vessel name Whistler

Page _____ of _____ for transmission

Plant/Processor name	Location	Processor permit #

Haul #	Haul sampled by	Random sample table	Random break table	% Monitored for marine mammals	Bird deterrence	Deterrence Verified?	Total hooks or pots in set	Official Total Catch in metric tons	Observer's Total Catch Estimate in metric tons	B, C, or W	Density in mt/m³	Processor permit	Date fishing began for delivery Month	Date fishing began for delivery Day	Notes Using flow scale - no obs. est.
32	2	9	1	0				29.63	.		.				
33	2			0				36.90	.		.				
34	2			100				36.96	.		.				
35	2			100				91.38	.		.				
36	2			100				33.72	.		.				
37	2			100				36.59	.		.				
38	2			0				37.61	.		.				
39	1			100				37.55	.		.				*large halibut didn't go over the flow-scale; added to OTC
40	1			100				29.13	.		.				
41	1			100				75.46	.		.				
42	1	9	1	0				39.50	.		.				vessel haul #43
								.	.		.				
43	1	9	1	0				36.90	.		.				vessel haul #42
44	1			100				38.32	.		.				
45	2			100				38.96	.		.				
46	2			100				32.15	.		.				
47	0	9	1	0				163.24	.		.				CDQ fish / pumped fish
								.	.		.				
0				offloading in Dutch Harbor							.				
								.	.		.				

Revised - 1/1/2008

Figure 5-4: Observer Haul Form For Trawl, Pot And Longline (mothership)

Observer Estimates

Refer to "Observer Estimates of Total Catch Weight" on page 3-6 for methods to obtain independent catch estimates. All motherships accepting pollock in the Bering Sea, must have a motion compensated flow scale, as required by the American Fisheries Act. If you are on a vessel that is using a motion compensated flow scale, and it is being tested properly each day, you should use this to determine OTC, and no observer estimates should be taken. If your mothership is not accepting pollock, or you are not able to use a flow scale for OTC, look for the best method of obtaining an independent estimate. Some motherships have readable fish bins, but these bins may not have been certified by a marine engineer, or may have been altered since they were certified. Check certified bin markings yourself and/or measure the uncertified bins if you are planning to use them to make catch estimates. See Appendix X. "Bins with Nomograms" on page A-59 for instructions on how to read certified bins, and page 3-8 for information on how to measure and use uncertified bins.

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:

- obtaining an independent Observer estimate (if a flow scale is not being used),
- sampling for species composition and density (if applicable),
- collecting otoliths for predetermined hauls,
- collecting length frequency samples on prohibited and predominant species, and
- 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. If the flow scale is not being used, you should try to take an independent estimate. 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 one of the Random Sample Tables (page 2-13) if you cannot sample all hauls. If there are several deliveries being made each day, you may also need to use the Random Break Table (page 2-15). Record the appropriate codes for which tables you are using on the Observer Haul Form (see page 3-32).

If you are the only Observer aboard an exclusive 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 2-15, 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.

If you are aboard a mothership with another Observer, the two of you should be able to sample all hauls. If you are unable to keep up with the work load, use the lead Observer's Random Sample Table. Try using the RST for less than six hauls a day first, since this schedule should give each Observer at least one haul off per shift. Notify your Inseason Advisor if you need to use an RST when there are two Observers aboard. For more information on the roles of each observer, see "Working with Two Observers" on page 2-25.

Length Frequency and Otolith Sampling

Mothership Observers take lengths following the same protocol as other Observers (see 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 your length collection by taking predominant species 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.

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 Vessel or Observer Haul Forms. It will be accounted for by the mothership Observer. Your only duties are to obtain catch information (Vessel Haul Form 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 dumping fish into 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, under your cruise number.

LONGLINE DATA COLLECTION

List of Priorities

- Collect all marine mammal and endangered sea bird specimens.
- Record the vessel's total fishing effort for every gear retrieval.
- Sample for species composition and Official Total Catch (OTC) estimates.
- Send data to NMFS once weekly (unless otherwise instructed).
- Document any compliance concerns.
- Measure and assess injury of Pacific halibut. Measure and sex other prohibited species.
- Collect sexed lengths and otoliths from predominant species.
- Record calculations and daily logbook notes.
- Complete special projects.
- Record sightings of bird "species of interest."
- Record marine mammal sightings.

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Introduction

Nearly one third of all observer days at sea are spent on longliners. In 1998, observers spent nearly 6,000 days aboard longliners. The primary target species of the longline fishery are Pacific cod, sablefish (black cod), Pacific halibut, and Greenland turbot. In addition to these species, longline vessels will often retain incidentally caught species such as skates, rockfish, arrowtooth flounder, and grenadier. The fish species that longliners retain depends heavily on the prices they hope to receive at markets. Some of the incidentally caught species are only retained by a vessel if market prices are high at the time of capture.

Terminology

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

Autobaiters - A piece of machinery that cuts bait into strips and places the strips on the hooks as the groundline is being set.

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

Combi - A piece of machinery through which the groundline, gangions, and hooks move during gear retrieval. The combi mechanically places hooks 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 the deck of a factory vessel.

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

Drop-off - Those organisms that fall or are knocked off of a hook prior to their being landed.

Gangion - The length of line that connects the hook to the groundline. It is often only two to three feet long.

Groundline/Mainline - The length of line to which all of the hooks are attached. This line is the “backbone” of the gear

Hook Counts - The average number of hooks per segment of gear.

Horn Off - To knock organisms off of a hook using the butt of a gaff.

Magazine - (Mag) A term used to describe a segment of gear within a set containing up to as many as ten thousand hooks. The length of this segment of gear is dictated by the length of the magazine rack on which the hooks and groundline are hung.

Magazine rack - (Mag rack or Rails) A piece of equipment onto 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.

Mustang suit - Insulated and waterproof coveralls worn in the cold months while sampling on deck.

Roller - A device made up of one or more metal pins that spin allowing the groundline to be pulled up and over the rail of a vessel during retrieval such that tension and friction on the line is reduced.

Roller station/pit - Term used to describe the area where fishermen stand while retrieving the line and gaffing fish coming in over the roller.

Rollerman - A crewman who stands in the roller station and monitors the retrieval of the gear. The rollerman lands any commercially valuable fish and excludes any non-commercially valuable fish from being landed.

Segment of Gear - In this manual a segment of gear refers to the standard unit the vessel uses for measuring gear. This could refer to a mag, skate, tub, or coil of gear.

Set - The entire length of groundline from the first hook to the last hook, also referred to as a “string” of gear.

Skates/Tubs/Coils - Terms used to describe the smaller segments of gear within a set or a magazine.

Skate or Mag markers - Markers in the groundline that separate the sections of gear. These may be fluorescent tape woven onto the line, knots, line splices, carabineers, or magazine (mag) clips.

Tuning/Overhauling gear - Term used to describe the work involved in straightening hooks, replacing gangions, or splicing the damaged groundlines.

Description of Longline Operation

Buoys are attached to each of the anchors by buoy lines. The length of the groundline will depend on the size of the vessel and the species targeted. Usually it will be several miles long. Hooks are attached to the groundline by gangions. Gangion length and the distance between gangions is usually consistent for a vessel during a particular fishery, but will differ between target fisheries and vessels. A groundline usually consists of several segments of gear tied to one another. Segments of gear are commonly referred to as magazines (mags), skates, coils, or tubs. On some vessels the terms are used interchangeably, while on others the crew will mean a specific amount of gear for each term.

Longline gear is set by dropping a buoy and anchor and allowing the groundline to trail out of the aft of the vessel. The skipper maneuvers the vessel in the direction he wishes to set the gear. On some vessels hooks are baited by hand before setting the gear and the gear is set from tubs or canvas skates. On other vessels, typically the newer or larger vessels, an autobaiter baits the gear as it is deployed. After all of the hooks have been deployed another anchor and buoy complete the set.

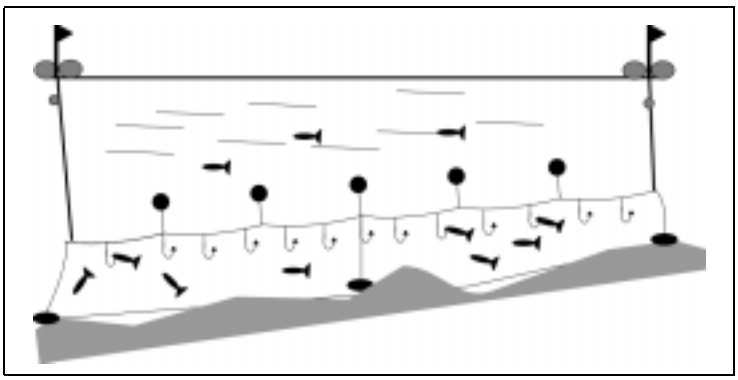


Figure 6-1: Diagram of a Longline Set

The gear is allowed to soak for a period of time and is then retrieved. Longline gear is retrieved by pulling in the groundline and landing one gangion and hook at a time. The vessel pulls the buoy aboard, then pulls up the anchor using the block. The rollerman transfers the groundline to the block and begins hauling the groundline. The line comes in over the rollers, through the crucifier, over the block, and then is either coiled or the hooks are placed onto magazine racks.

Often a vessel will have more then one set of gear in the water at a time and will rotate between them. A vessel will retrieve one string of gear then set it. After which the vessel will move to another string, retrieve it, and set it. This cycle may be continued for three or four sets per day.

Uses of the Data

Data from observers on longline vessels are used in the assessment of fishing mortality for the longline fishery. NMFS fisheries biologists use longline species composition and total catch data to estimate total fishing mortality. Fishery managers use these data to determine when to close fishing seasons in specified regulatory areas.

Observer longline data are used for a variety of other purposes after the season is over. NMFS biologists use observer data on fishing mortality, fish measurements, and otoliths in the assessment of fish stocks. The annual quotas for the following years are a product of these assessment. Longline observer data have also been important in determining the range of species for which there are little other available data. In short, the magnitude of data collected by longline observers help give NMFS, U.S. Fish and Wildlife Service, Alaska Department of Fish and Game, and numerous universities a window into the ecology of the Gulf of Alaska and the Bering Sea.

Safety Concerns on the Longliners

It is your highest priority to stay safe and always be aware of what is going on around you. Remember that every vessel is different and no two situations are the same. There are several safety concerns on longliners of which you should be especially aware. When sampling on some longliners you stand outside on the weather deck above the roller station and are exposed to the elements. In the winter months you could experience freezing conditions, snow, spray, and high winds for long periods of time. The Observer Program provides Mustang suits, but Observers are highly advised to bring additional winter clothing.

On other longliners you will be sampling near the roller station. Here the wind may be lessened but you are exposed to waves. Roller stations are usually wide open areas near the water line. It is not uncommon for a vessel rolling in high seas to be turned by the weather and have a wave come through the roller station. When gear being brought on board, the area between the roller and block is usually full of moving hooks and line. If a moving length of line becomes entangled around a leg or an arm, the line can drag a person overboard or into machinery. Moving hooks are also a serious threat, it is not uncommon for crewmembers to be seriously injured by incoming and outgoing hooks.

gaffing a fish

Lastly, decks are often awash with water, fish entrails, and whole fish, making them very slippery and falling is a very real possibility. In order to reduce your risk of injury, always be conscious of the potential dangers in your immediate area.

Vessel Types

For purposes of explaining Observer duties we classify longliner vessels as either catcher processor (C/P) vessels or catcher vessels (C/V).

Catcher Processor Vessels

Longline catcher processor vessels typically have crews of 10 to 50 people. These vessels may conduct fishing operations 24 hours a day, 7 days a week, and have crewmembers working in shifts. You will need to schedule your work time not only to achieve sampling objectives but also to obtain adequate rest. The lack of adequate rest is a safety concern.

In a C/P longline operation, after the fish are removed from the hooks by the crucifier, the fish move through a trough or a series of conveyor belts to holding tanks. The fish are removed from the tanks by more conveyors or chutes and then processors sort the fish to species and size for easier handling. Mechanical sorting occurs at incline belts and in some operations large fish are separated by crewmen in order to process the larger fish in a different manner from the rest of the catch.

Processing on catcher processor vessels entails freezing product. On many vessels with limited crew the entire vessel compliment often work on “freezer breaks” periodically during operations. Freezer breaks are when crew remove the pans of product from the freezer and “break” the product free of the freezer pans. These breaks may last from one to three hours and generally occur when the vessel is setting gear. Freezer breaks are a good time for you to complete paperwork or catch up on needed rest.

One of the main problems encountered on C/P longliners is a lack of communication between the Observer and crewmembers, especially the rollermen. Upon boarding a vessel you should seek out the factory manager(s) and the rollermen, and explain to them your needs before you begin sampling. They will have suggestions for you; listen to them, but decide independently how and where you will obtain the best sample. Work out a communications system with the rollerman. If you are sampling from the weatherdeck he will not always be able to hear or understand you. Hand signals are the most common form of communication in these situations, but on many vessels the rollerman may not be able to see you. Try different techniques and be creative, but remember your sampling goals.

Catcher Vessels

Catcher vessels are defined as vessels that do not have the ability to freeze catch. Catcher longliner vessels are similar to C/P longliners in that the same type of gear is deployed and retrieved in a similar manner. Most of the differences between the two vessel types lie in the scale of the operations. C/V longliners tend to have smaller crews of only 3 to 8 people. C/V longliners generally fish fewer hooks and catch smaller quantities of fish. On the majority of C/V longliners hooks are hand baited, but in some of the larger and newer vessels autobaiters are used. Operations on the C/V longliners tend to be more relaxed then on the C/P longliners. The setting and retrieval of gear may be timed so that the crew is allowed a sleep break of 6 to 8 hours. C/V longliners deliver catch to processors every four to ten days, as compared to the two to four weeks between offloads on C/P longliners.

On a C/V longliner you will need to work closely with crew members when choosing a sampling area. Space is almost always limited and there may not be a permanent observer sampling station. Be creative; you may need to use baskets or bin boards to construct sampling tables. To save space you may need to sort fish into a basket hanging from your scale. Look around, talk to the crew, and use what is available.

Composition Sampling

In an ideal situation you could monitor the entire retrieval of every longline set. In addition to watching the line come aboard and counting catch, you would be able to weigh all catch and complete biological sampling duties as assigned.

Unfortunately, the fishing schedule on a longliner is too arduous to census the entire catch and complete all other sampling duties. It may take many hours to retrieve gear and some vessel operate 24 hours a day. You must make time to sleep, eat, and do paperwork. Thus, you need to determine an unbiased method to select which longline sets, and which portions of each, to sample.

We refer to two distinct sampling periods for composition sampling on a longliner; the tally and non-tally periods. Tally sampling on a longliner is conducted as the gear is being retrieved by counting (tallying) everything that comes up on the line during a randomly or systematically chosen number of gear segments or time periods. During a tally period, count all catch including drop offs and things that are horned off.

Non-tally periods refer to the segments of gear or periods of time of a sampled set when you are not tallying and gear is being retrieved. The non-tally period is used for weighing organisms, measuring predominant and prohibited species, assessing injuries of Pacific halibut, and performing other duties.

Goals and Objectives for Longline Composition Sampling:

The goals of longline composition sampling are:

1. To obtain adequate data to support the management of the longline fisheries in the Gulf of Alaska and Bering Sea and Aleutian Island Areas and,

2. To obtain an unbiased sample of the composition of species caught by a vessel.

These goals may be achieved by completing the following:

- Sample all of the sets, use the Random Sampling Table (RST), or use the Random Break Table to determine which sets to sample.

- Use a random sampling frame to determine which hooks of each set will be tallied.

- Tally sample at least 1/3 of all hooks in each sampled set.

- Count everything that comes up on the line during each tally period.

- Weigh every member of a species that is counted, or determine an average weight for each species and multiply it by the number counted to obtain the total weight of each species in a composition sample.

When to Sample for Species Composition

Consider two elements when deciding when to sample on a longliner; 1) which sets to sample, if all sets cannot be sampled, and 2) which segments of gear from these sampled sets are to be in the tally and non-tally periods.

Which Sets to Sample

Ideally you would be able to sample every set of a cruise, but in practice, this will most often not be possible. If you believe you will not be able to sample every set, then use the appropriate Random Sampling Table (RST) for the number of sets your vessel retrieves per day. See page 2-15 on how to use a RST. However, operations vary and it may be possible to sample all sets on many of the longline vessels fishing black cod or halibut under an Individual Fishing Quota (IFQ). Talk to the skipper and ask him about his operating procedures. Usually skippers are consistent in how they set and haul gear. Another option would be to use the Random Break Table (RBT) without the Random Sample Table (see "How to Use the Random Break Table (RBT)" on page 2-15).

Which Segments of Gear to Tally Sample

Tally at least one-third of all hooks in a set and employ a random sampling frame to determine which third you will sample. To accomplish this, determine how much gear the vessel is deploying or how much time it takes for a vessel to retrieve a set. Once this has been ascertained, you may then determine which random sampling frame would be most appropriate for your vessel and sampling situation. The following sections describe how to determine the amount of gear the vessel is fishing and provides several methods that may be used to divide a set into tally and non-tally periods.

Verifying the Number of Mags/Skates/Tubs of Gear in a Set

The first step in instituting a random sampling frame is to determine the amount of gear the vessel is fishing. There are several ways to verify the amount of gear deployed in a given set. You may employ one of the following methods to verify the amount of gear deployed for a given set (in the following explanation segments of gear refer to mags, skates, or tubs of gear):

- **Count gear before it is set -** On catcher vessels and some C/P vessels, the segments of gear that are not deployed are stored separately in plastic tubs or in canvas bags. On these vessels, verify the amount of gear on board by counting the number of tubs or canvas bags of gear. After each set determine how many tubs or bags of gear remain. Subtracting the remaining number from the total number gives you the amount of gear set.

On most C/P vessels and some catcher vessels gear is stored in magazine racks with several segments of gear being attached to one another. Ask the crew what the vessel uses as a standard segment of gear and how these segments are distinguished from one another; every vessel differs in its techniques. Count the number of segments of gear on each magazine before the gear is set, then again after each set. Subtract the number deployed from the total to obtain the number of gear segments in a set.

- **Count gear as it is being set -** You may be able to count the segments of gear on catcher vessels if you are able to watch the gear as it is being set. Go into the setting area and tally the segments of gear deployed as they are being set.

- **Count gear as it is retrieved -** For vessels that fish smaller sets with fewer segments of gear it may be possible to count the gear as it is being retrieved. On many C/P vessels this method is not feasible because the retrieval of gear may take an entire day or you may not be able to see the gear during the non-tally period.

Determining the Average Number of Hooks Per Segment of Gear

There is great variation in the length of gear segments and number of hooks per segment. You must determine the average number of hooks attached to each segment of gear. We refer to the average number of hooks per gear segment as “hook counts.” These data are used by fisheries biologists in determining fishing effort and in comparing fishing activity between vessels. More importantly, they are essential in your calculations of total catch and thus our estimates of fishing mortality (see “Official Total Catch (OTC) and the Observer Estimate” on page 6-43).

The number of hooks recorded in the vessel logbook is generally the number of hooks attached when gear is first constructed. The average number of hooks per segment of gear can change from set to set due to hook loss, therefore the number in the vessel logbook may not accurately reflect the current condition of the gear.

Accurate hook counts are essential for sampling of longline sets. You must count the number of hooks attached to each segment of gear for at least one-fifth of a set twice per week throughout your tenure on a vessel. The following methods may be employed for determining hook counts:

Do not use the autobaiter counters to verify hook counts. Many vessels that use magazine racks will also have a machine that mechanically cuts bait and attaches it to each hook. This machine also gives a count of the number of hooks that have been baited. Unfortunately, many of these machines are not kept in good repair and the counts are not verified. Do not use autobaiter counters for your hook counts.

- **Count hooks in the coils/tubs/magazine racks -** As stated above, longline gear is stored on the vessel prior to deployment, this is an opportune place to tally the number of hooks on a given segment of gear using a thumb counter. Employ this method as you are steaming to the fishing grounds or between sets.

- **Count hooks as they come aboard -** During your tally sample period you may determine the number of hooks on a segment of gear by tallying the empty hooks as they are retrieved. Add the number of organisms you counted during sampling to the tallied number of empty hooks to obtain a hook count. You may not be able to use this method on some C/P longliners because the gear is retrieved too quickly for you to obtain an accurate hook count.

The average number of hooks per segment of gear can now be ascertained. Determine an average number of hooks per segment of gear by summing the number of hooks in the average hook count sample then dividing this number by the sum of gear segments used for the average hook count sample.

$$\frac{\text{sum of the number of hooks in the average hook count sample}}{\text{sum of gear segments in the average hook count sample}} = \text{average hook count}$$

With an average hook count you can now calculate the total hooks in a set and the total number of hooks in a sample. The following section shows how this may be accomplished.

Calculating Total Hooks in the Set and in Your Sample

Average number of hooks per segment must be rounded to the nearest whole number.

Use the average number of hooks to calculate the total number of hooks for the entire set and in some instances to determine the total number of hooks in your tally sample. To obtain a total number of hooks in a set, multiply the total number of gear segments in a set by the average number of hooks per gear segment.

$$\text{average hook count} \times \text{total number of skates in the set} = \text{total number of hooks in the set}$$

If you did not count empty hooks during your tally sample you should use the number of gear segments sampled for composition to determine the number of hooks in your sample. To do this, multiply the average number of hooks per segment of gear by the total segments of gear tallied.

average hook count ×	total number of skates in the sample	=	total number of hooks in the sample

If you tally empty hooks during your sample, calculate the total hooks sampled by adding empty hooks to the total number of animals in the sample.

If the vessel has Pacific halibut IFQ (page 6-50), the skipper may fish two different kinds of longline gear (halibut and black cod gear) with differing numbers of hooks per gear segment in a single set. The average number of hooks per segment of gear and number of gear segments must then be determined for each kind of gear. Ask the skipper or setting crew if they are using segments of gear with differing hook counts.

Now that you know how much gear is deployed in a set, determine which part of the set will be your tally period. Please refer to "Introduction to Random Sampling Theory" on page 2-19 for a more general description of sampling frames.

Using a Sampling Frame on a Longliner

There are four types of sampling frames that can be used successfully on longline vessels: spatial, temporal, combined temporal-spatial, and systematic sampling frames. You can use any of these sampling frames for a particular set, and you can alternate between sampling frames on a vessel depending on which type is best in each situation. If you wish to use a method not listed, please contact NMFS and discuss your technique with a staff member **before** you use it.

Using a Spatial Sampling Frame

The sampling frame for the spatial method on a longliner is the total number of gear segments in a set. To use a spatial sampling frame, first determine the number of segments of gear in a set. Then decide how many segments you wish to tally in each tally period. This will be your sampling unit. Base your decision of the size of your sampling unit on how long you can stand on deck tallying and on how much bycatch can be stored in the fish collection area. In colder months you may wish to have a small sampling unit, while in warmer months you may be able to tally for longer periods of time. On vessels with a lot of space you may be able to have a larger sampling unit, while on vessels where space is limited you may need to have smaller sampling units.

To obtain the total number of sampling units in a set, divide the total number of segments of gear in a set by the segments of gear per sampling unit. Number the units consecutively. Use the random number table (RNT) to choose which of these units are to be your tally periods. Remember that you must sample at least one third of each set.

The spatial method is illustrated in Figure 6-2. The set is composed of 24 segments of gear. To tally sample at least one third of this set you must tally at least eight segments. You decide to use a sampling unit of one segment of gear, therefore there are 24 sampling units. Number the 24 segments 1 through 24, and use the RNT to randomly pick eight segments of gear. In this example, you used the RNT to choose gear segments 20, 15, 4, 11, 8, 19, 23, and 7 to tally sample for composition. The segments of gear which not being tallied make up your non-tally periods.

Skate	Activity	Skate	Activity	Skate	Activity	Skate	Activity
1	non-tally	7	tally	13	non-tally	19	tally
2	non-tally	8	tally	14	non-tally	20	tally
3	non-tally	9	non-tally	15	tally	21	non-tally
4	tally	10	non-tally	16	non-tally	22	non-tally
5	non-tally	11	tally	17	non-tally	23	tally
6	non-tally	12	non-tally	18	non-tally	24	non-tally

Figure 6-2: Spatial Sampling Frame

You are not limited to the random number table for picking which segments of gear to sample. Many observers have used other methods; i.e. dice or drawing numbers out of a hat. If you use any method other than the RNT, be sure that your method is truly random and confirm you methods with a NMFS staff person. Document all methods in your logbook.

Use a temporal sampling frame when you can not keep track of gear segments as they are being retrieved, but are able to count hooks.

Using a Temporal Sampling Frame

Another method of applying a random sampling frame on longliners is a temporal or timed sampling method. The frame for the temporal method is the total time it takes to retrieve all the gear in a set. The sampling units in a temporal sampling frame are time intervals. To apply a temporal sampling method on a longliner, the first step is to estimate the time it takes to retrieve the entire set of gear. If you are not sure, ask the crew to estimate an average retrieval time. Divide the total estimated retrieval time of a set into equally timed intervals: an equal number of hours, ½ hours, minutes, or other appropriate time interval. Number these time intervals consecutively. Using the random number table ascertain which of these intervals are to be your tally period(s).

Because sample size is determined by hook count, when you use a temporal sampling frame you must determine total hook counts by either tallying empty hooks (and adding them to your fish counts) or counting all the hooks during the tally periods.

The temporal method is illustrated in Figure 6-3. For example, a set of gear takes six hours to retrieve. You decided that the tally sampling unit will be 30 minutes. Divide the total retrieval time of 6 hours into twelve 30 minute intervals. Number these 1 through 12. Because you must tally sample at least 1/3 of the set, use the RNT to choose four of these units for your tally period. In this instance, time intervals 7, 1, 10, and 5 are selected. The time you are not tallying will be your non-tally period. At the end of the set you will have tallied for a total of two of the six hours, or 1/3 of the total set.

Time Interval	Skate	Activity	Time Interval	Skate	Activity
1 (30 min.)	1	tally	7 (210 min.)	7	tally
2 (60 min.)		non-tally	8 (240 min.)		non-tally
3 (90 min.)		non-tally	9 (270 min.)		non-tally
4 (20 min.)		non-tally	10 (300 min.)	9	tally
5 (150 min.)	6	tally	11 (330 min.)		non-tally
6 (180 min.)		non-tally	12 (360 min.)		non-tally

Figure 6-3: Temporal Sampling Frame

Combined Temporal-Spatial Sampling

The temporal-spatial method is a combination of the two previously discussed frames. This sampling frame is based on time, but which gear segments are actually sampled is determined by space.

Use a combined temporal-spatial sampling frame when there are too many gear segments to accurately determine a spatial sampling frame and the gear is being retrieved in such a manner that you are unable to count hooks.

To use the temporal-spatial method, choose your sampling times using a temporal frame and use segments of gear as your tally sampling units. You must know approximately how much time it takes the crew to pull the entire set of gear. Like the temporal method, decide how to divide the total retrieval time into sampling units, i.e. 10-minute, 15-minute, 30-minute, or 60 minute intervals. Divide the total retrieval time by the length of each of your tally periods, this gives you the total number of sampling units in your frame. Number these time intervals sequentially starting with one. Use the RNT to pick at least 1/3 of the time intervals to tally sample.

The difference between this method and a straight temporal frame is that you will not start tallying at the beginning of your designated time interval. Instead, you will wait until the beginning of the next segment of gear to start tallying. You will not stop tallying at the end of your designated time interval, but will continue to tally sample until the end of the segment you are tallying. Repeat this method for each of your selected tally periods.

In applying a combined temporal-spatial sampling frame the method you use for randomly choosing the intervals of gear to be tallied is the same as the temporal model. The set of gear takes six hours to retrieve. For this set you choose a sampling unit of 30 minutes. Divide the total retrieval time of six hours into twelve 30 minute intervals. Number these 1 through 12. Since you must tally sample at least 1/3 of the set, use the random number table to choose four of these units. In this instance you would sample units 7, 1, 10, and 5.

Systematic Sampling

A systematic sampling frame can be employed in any situation where a spatial or temporal sampling frame can be used. You may prefer a systematic sampling frame when you require a significant pause between the tally and non-tally periods.

A systematic sampling frame is comprised of several tally periods which are of a consistent length or time separated by non-tally periods of a consistent length or time. In designing your sampling frame keep in mind that you must tally at least one-third of a set and have a random starting point. You can conduct a systematic sample either spatially or temporally. Like the spatial and temporal frames, the systematic sampling population is the total number of gear segments or the total amount of time it requires to retrieve a set.

The first step in conducting a systematic sample is to determine which framework you wish to use. When you can accurately count the segments of gear as they are being retrieved, the spatial systematic sampling frame will be easiest. If you cannot count segments of gear, a timed method will be more applicable. In the following explanation, segments of gear and units of time will only be referred to as segments of gear, since you can treat units of time in the exact manner as segments of gear in a systematic sampling frame.

If you use a timed systematic sampling frame you must count hooks during your tally sample. When you use a timed systematic sampling frame sample size is determined by hook count. You must determine total hook counts by either tallying empty hooks (and adding them to your fish counts) or counting all the hooks during the tally periods.

After you have determined the type of systematic frame you wish to use, follow the instructions below to devise a sampling frame for the specific set.

1. Determine the size of your sample units. Base your decision as to the size of your sample unit on how long you can stand on deck tallying and on how much bycatch can be stored in the fish collection area. You may select any number of gear segments as your sampling unit, in the sampling unit is 2 gear segments.

2. Divide the set into sampling units. If the total number of gear segments is not evenly divisible by the number of segments in a sampling unit, there will be remaining gear segments. Any remaining gear segments should be counted as a separate sampling unit. Number the total sampling units in the set consecutively starting at one. Make a diagram similar to Figure 6-4 in your logbook.

Sampling frame for a set with 17 gear segments and a sampling unit of two gear segments																	
Sampling Units	Unit 1		Unit 2		Unit 3		Unit 4		Unit 5		Unit 6		Unit 7		Unit 8		Unit 9
Gear Segments	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Figure 6-4: Systematic Sampling Frame

3. Determine what fraction of a set you wish to tally sample, i.e. 1/3, 2/5, ½, 2/3. The Observer Program requires that you tally sample at least 33% or 1/3 of each set. Your sampling pattern will be tallied units followed by the units that are not tallied. For example, if you wish to sample 1/3, your sampling pattern would be to tally sample one unit and not tally sample the next two.

4. Determine which sampling units you will tally sample.

   a. Pick a random number between one and the total number of sampling units. The randomly selected sampling unit will be the first tally sampled unit in your sampling pattern.

   b. Using the sampling diagram made in step 2, plot your sampling pattern starting with the randomly selected unit.

   c. At the end of the first sampling pattern, plot the sampling pattern again, repeat plotting the sampling pattern until the end of the set. When the last sampling unit of the set is reached, loop back to the first sampling unit and continue to plot your sampling pattern until you reach the sampling unit at which you started.

For example, in Figure 6-5 if you determined that you were going to sample 1/3 of the set and then randomly selected a five, you would mark unit 5 as tallied, and units 6 and 7 as not tallied, unit 8 as tallied, units 9 and 1 as not tallied, unit 2 as tallied and units 3 and 4 as not tallied.

Set with 17 gear segments and a sampling unit of two gear segments																	
Sampling Units	Unit 1		Unit 2		Unit 3		Unit 4		Unit 5		Unit 6		Unit 7		Unit 8		Unit 9
Gear Segments	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Figure 6-5: Selected Units of a Systematic Sampling Frame

5. Sample the set according to your sampling diagram. For the set in Figure 6-5 you would tally sample gear segments 3, 4, 9, 10, 15, and 16. Gear segments 1, 2, 5, 6, 7, 8, 11, 12, 13, 14, and 17 would be your non-tally periods.

Conducting a Composition Sample

This section will describe what the observer sampling duties are for the tally and non-tally periods. Generally, you will count the numbers of organisms during the tally period, and determine weights or average weights during the non-tally periods.

Before Going on Deck to Sample

Prior to beginning a longline composition sample you must take into account several details. Each vessel will have a different set up with which you will have to become familiar. The following items should be considered:

Tally Station - The tally station is where you will stand to count organisms as the groundline is being retrieved. The tally station should be no more than six meters from where the fish are landed and you must have a clear line of sight to the groundline coming aboard. From your tally station you must be able to clearly identify fish as they come aboard and identify drop-offs. Choose a location that is safe, away from direct wave action, and out of reach of the pole gaffer and rollerman, if at all possible. Often the best place will be on the weather deck above the roller station.

Weigh Station - The weigh station is the location where you will weigh and measure catch. Many of the C/P vessels will have a weigh station already set up for you. On vessels that do not, try to select a location that is away from wave action and crew traffic, and has enough room to store one or two baskets of fish. On some small longliners this will be a challenge. Sometimes you may not have a choice and will need to make the best out of the area provided. Explain your needs to the crew and work with the them as much as possible.

Equipment - You will need three to six thumb counters, a clip board, and a plastic deck sheet. If you are on an ATLAS vessel you will also need a longline ATLAS deck form. Prior Observers have devised many innovative techniques to make using multiple thumb counters easier. The most common is to use duct tape to attach multiple thumb counters to a clip board. Other Observers have used duct tape and line to create thumb counter belts that fit around the waist. Tying multiple thumb counters to a line attached to a clipboard is probably the easiest device to construct and has worked for Observers in the past. Be creative, experiment, and find out what works best for you

The Tally Period

The tally periods are the segments of gear or increments of time in which you count all catch that you observe hooked on the longline. These numbers are used to determine the total number and estimate the weight of organisms caught by the vessel during the tally period. The numbers of catch counted during the tally periods are also used to estimate the amount of catch for an entire set. The method of conducting a tally sample will be very similar between vessels.

tallying at the rail

Most observers use thumb counters to tally the predominant species and empty hooks, and use the plastic deck sheets to tally everything else. On some vessels the rollerman may be able to collect all of the uncommon species during the tally periods. Continue to tally these species because some may be missed or lost before they can be weighed. This is especially true for sampling on factory vessels. The following instructions describe the tally process and are designed to be general enough to fit all longline vessel tally sampling. The following descriptions are not meant to be taken as a step by step method for tally sampling, but describe a number of techniques that will be used simultaneously.

Predominant Species and Empty Hooks

Use thumb counters to tally predominant species and, if possible, empty hooks as they are retrieved. The predominant species will change depending on the area you are fishing and the depth. At the beginning of your trip, or when you travel to a new fishing area, ask the crew what species they believe will be predominant in the catch. This will give you a general idea of what to expect. The crew are usually correct in their assessment. If you observe a change in composition you may want to change the species you tally with the thumb counters.

Non-predominant Species and Drop-Offs of Retained Species

Non-predominant catch is also counted during the tally period, but it is not practical, or even possible, to have a thumb counter for every species that is caught. Use the back of the ATLAS deck form or a blank plastic sheet to keep track of these less abundant species (see Figure 6-7). Create several columns on the blank side of a form for every species observed. Make a tally mark in the column for each individual of that species observed. Keep a separate count of any drop-offs or discarded fish of the species that are being retained. The separate counts of drop-offs will be used to determine the percentage of the fish retained.

For some species you may not be able to collect enough individuals for an accurate average weight. For these species you must try to weigh every one of them from your sample to obtain their sample weight. Before you begin a tally sample you will not know what is rare for the depth or area you are fishing. At the beginning of a tally period ask the rollerman to retain all non-predominant species, after a short period you may determine which species are not rare and inform the rollerman to stop retaining these species.

Always subsample for any fish for which you are using group codes. Your weight sample fish should be keyed to species, and the rest of the tally sample would be recorded under the group code.

Often it is not possible to determine the species of fish that drop off the line prior to being landed. It may be necessary to use a group code for your species composition. This will be necessary for dropoffs of such fish as arrowtooth and Kamchatka flounder (arrowtooth/Kamchatka group), northern and southern rocksole (rocksole unidentified group), shortraker and rougheye rockfish (shortraker/rougheye group) and longspine and shortspine thornyhead rockfish (thornyhead unidentified group). Some flatfish you may need to identify as flatfish unidentified, and roundfish as roundfish unidentified. Identify each fish to the most accurate category possible. If you do not feel comfortable with an identification, record the fish in a group category and bring a specimen back.

Non-Tally Period

The non-tally periods are often referred to as the weigh periods. This is because you will use these periods to weigh organisms. Groundfish stocks are managed by weight, not by number of fish, therefore it is necessary to calculate the weight of fish counted during the tally period. For each species, use one of the following methods to calculate the weight of fish in each sample: 1) weigh every individual of a species, 2) obtain an average weight and multiply the number of the species counted by the average weight, or 3) for halibut only, use the halibut length to weight table to convert a length to weight. Each of these options is discussed in detail below.

Weighing Everything

You will only be able to weigh every individual of a species from your tally period if: 1) the species is not very abundant in the sample, and 2) the rollerman is able to retain them for you during your tally periods. The method for this is very simple; retain the organisms during your tally periods and weigh them during your non-tally periods.

On ATLAS vessels record total weights in the Total Weight column of your ATLAS Longline Deck form (see page 6-31). For non-ATLAS vessels record the total weights on the blank plastic form in the area or column you have designated for the particular species, then transfer this to a paper 3US species composition form.

Average Weights

For most species it is impossible to weigh all the individuals from your tally period, therefore you will need to take average weights. Collect 50 individual fish for the predominant species (up to three species per set) and 15 organisms for all other species. If there are three or more predominant species, collect 50 individual organisms for up to three of these species and weigh 15 individual of each of the other species.

The recommended number of each species of fish you should weigh to determine average weights.

- **50 individuals of each targeted species, up to 3 species per set**
- **15 individuals of every other species**

Attempt to randomize your collection of fish for average weights. A method that has worked for prior Observers is to randomly pick several of the non-tallied segments of gear in the set sampled. Then ask the rollerman to set aside all of the fish that are caught until you fill one or two baskets. Continue to collect baskets in this manner until you have enough of each species for average weights. Another method that has worked on smaller vessels, where you have direct communication with the rollerman, is to ask the rollerman to retain every other or every "N^{th}" fish for a particular species until you have the minimum number for the set. Determine the method that best suits your situation. Fully document your methods in your logbook.

On ATLAS vessels, record the number and weight of fish collected for average weights in the four left-hand columns, marked **"#"** and "Ave. Weight," of your ATLAS Longline Deck form (see page 6-31). Do not enter numbers from average weight collections in the Total Weight column. For non-ATLAS vessels record the numbers and weights of fish used for average weight on the top of the paper 3US forms in the space provided.

Calculating Average Weight and Total Weight

To calculate an average weight, divide the total weight of organisms collected for average weight by the total number of organisms collected for average weight. To calculate a weight for a species tallied in your sample, multiply the number tallied during a tally period, including drop offs, by the average weight.

$$\frac{\text{total weight of species in average weight sample}}{\text{total number of individuals from a species in average weight sample}} \times \text{total number of species counted during the tally period} = \text{total species weight in composition sample for each species}$$

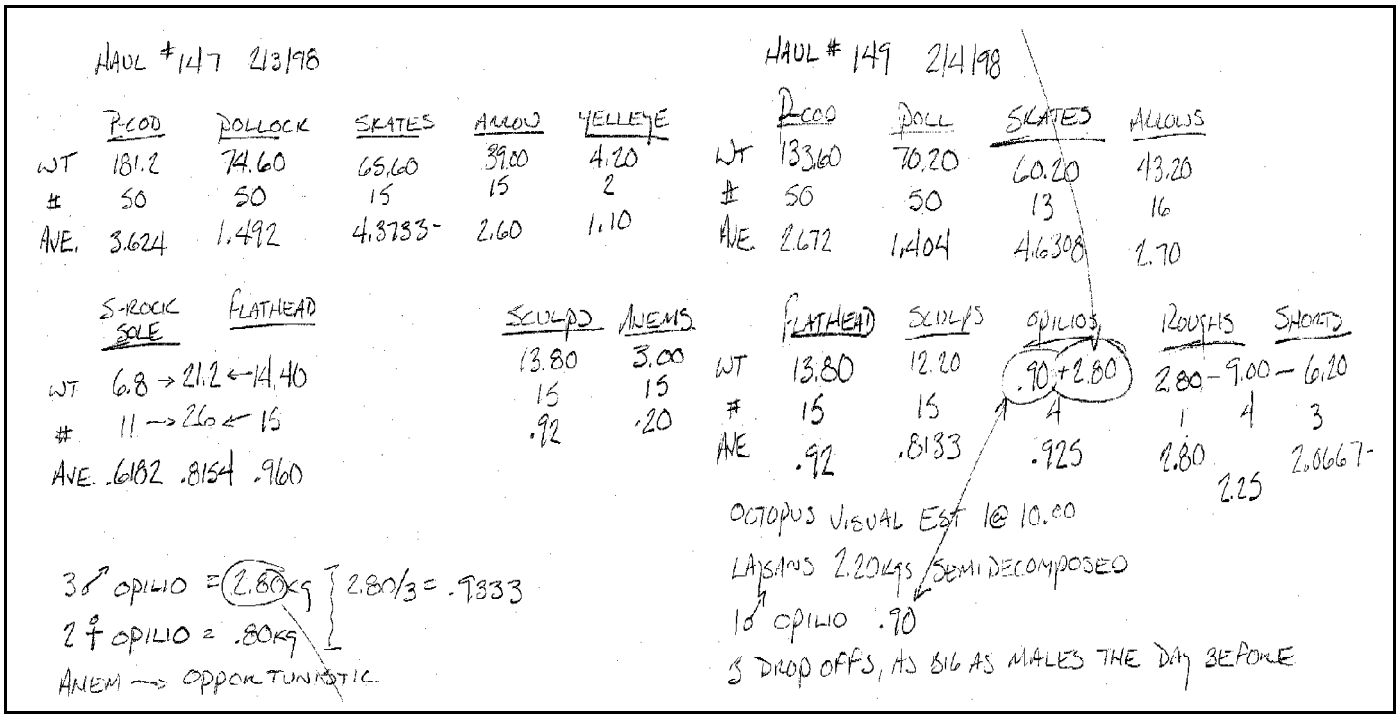


Figure 6-6: Average Weight Calculations

Halibut

Management of the Pacific halibut fishery is conducted by the International Pacific Halibut Commission (IPHC). This commission sets the total allowable catch of halibut for both the United States and Canada. Accurate accounting of halibut mortality is necessary for the IPHC to assess the health of the halibut stock and determine future allocations. Halibut are a prohibited species and must be released (unless the vessel has IFQ). Many released halibut survive and fishermen are required to use careful release methods to minimize injury to these fish. Mortality rates are applied to the total catch of the halibut to estimate total mortality. Fleets which carefully release halibut are able to reduce the overall halibut mortality to prevent halibut bycatch mortality from limiting their fisheries.

Careful Release Methods for Halibut

NMFS has regulations requiring the careful release of halibut. These regulations require that rollerman employ at least one of the following methods for the release for halibut.

- Cutting the gangion - the rollerman cuts the line attaching the hook to the groundline.
- Twisting the Hook - the rollerman uses the gaff hook to twist the hook out of the halibuts mouth.
- Straightening the hook - the rollerman uses the gaff to straighten the hook and slide the halibut off the hook. This is different from “horning off” in that the rollerman will not tear the fish’s mouth in the straightening process and the hook is slid out of the entrance wound.

One of your duties is to assess the way halibut are handled on your vessel. Address the following subjects in your logbook:

- the methods that each rollerman employs to release halibut and the effectiveness of this method in reducing injuries to halibut,
- the amount of halibut that hit the crucifier,
- how halibut are handled and an estimate as to how many are killed,
- and whether the Captain and crew are cooperative with your sampling efforts.

If the rollermen are not utilizing careful release methods, document it thoroughly in your logbook and advise the captain in a diplomatic manner. Document all conversations with the captain on the subject and note if the skipper is aware that the halibut are being released improperly. Document whether there is a general disregard of careful release methods or if it is just a particularly careless rollerman. Bring all of these issues to the attention of the NMFS staff as soon as possible.

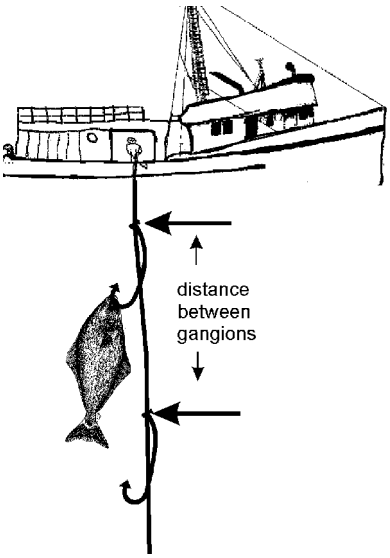
Halibut in the Composition Sample

Halibut are tallied at the same time as all other species. The method you use for determining the weight of halibut in a sample is different than any other species. Halibut are often too large to obtain an accurate weight with the scales provided to observers and very large halibut may not be brought on board the vessels at all. The IPHC has generated a halibut length to weight table (see page A-35) which lists an approximate weight of halibut for each centimeter of length. Estimate the weight of halibut in your tally samples in one of two ways; estimate the length of each halibut and look up the weight on the Length to Weight Table, or if the halibut are small enough, collect an average weight sample and apply this weight to a tallied number.

Using the Length to Weight Table

The Length to Weight table can be used to determine the weight of halibut in a species composition sample. The example in Figure 6-7 of how to fill in a plastic sheet also illustrates a technique used to record data when using the length to weight method for sampling halibut. In the example, a range of size categories are listed in increments of 10 centimeters. As halibut are observed on the line, make a visual estimate the length of each halibut and place a tick mark next to the appropriate size category.

The following suggestions will help you estimate the length of halibut:



Estimating halibut length using distance between gangions

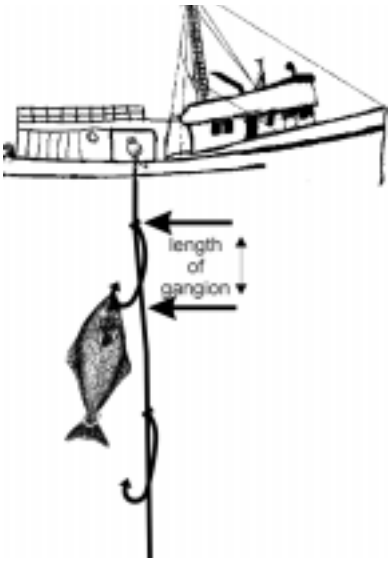
- Measure the distance from the roller to weld marks on the side of the vessel or the waterline, if weather permits.

- Measure the distance between the gangions on the groundline and measure the length of the gangions themselves. On most longline vessels, the distance between the gangions and the length of the gangions are consistent. Under normal operations you will be able to see the fish being pulled by the groundline and gangion. Estimate the length of the halibut in reference to the length of groundline between the gangions or the length of the gangion itself.

- Use the length of the gaff or the pole gaff to compare to the lengths of halibut.

- Pre-measure the length of the longline trough, some halibut will be brought on board either to be retained or by accident, having several marked measurements in the trough will allow you to quickly estimate the length of the landed halibut.

If the vessel is retaining halibut, practice your estimates on fish the vessel retains and you are able to actually measure.



Estimating halibut length using the length of the gangion

The methods you employ may change from vessel or even day to day. Use the method(s) with which you are most comfortable and attempt to be as accurate as possible. With experience you will become more proficient at estimating halibut measurements and knowing which methods work for you in different situations.

After sampling a set, use the Length to Weight Table on page A-35 to determine the proper weight. Multiply the number of halibut for each length by the weight on the table. Sum the weights for all sizes to obtain the total weight of halibut in your sample.

Average Weights for Halibut

Use average weights to estimate the weight of halibut in your sample only if you are catching a great deal of halibut or if you are unable to accurately estimate the length of the halibut being caught. For this method tally the number of halibut that are retrieved during the tally period, then apply an average weight to determine total weight of halibut in your sample.

The halibut may be divided up into size groups; those that are small enough to be landed and fit on your scale and those that are not. Randomly collect at least 20 fish per set for average weights if halibut is the predominant

species (15 if halibut is not predominant) by either determining a random start point then selecting every Nth fish or randomly determining several collection points and collecting the next X number of fish. For the large fish you will need to estimate their length and use the Length to Weight Table to determine weight.

If you are on a vessel without the ATLAS program and are required to use paper 3US forms, you can not have more than one halibut entry per form. The number and weights for all size groups must be summed before entering them on the form. This is not a problem for ATLAS deck forms since the ATLAS program will accept multiple entries for a single species (see page 15-19).

Assessing Injuries to Halibut on a Longliner

Longline vessels are required to release bycatch halibut in a fashion which will cause as little harm as possible. In concert with this careful release program, observers are required to assess injuries to halibut caused by incidental take in longline fisheries. The injury data collected by Observers are analyzed by the IPHC staff and used to estimate mortality rates for the following year.

The halibut mortality rates have a direct impact on the duration of the longline fishery. As a result, you must be careful in conducting your assessments. The halibut you assess must be handled in manner as has halibut not assessed for injuries. You must collect halibut for the injury assessment in a random or systematic manner from sets sampled for composition. If necessary, you may assess injuries from halibut outside of your tally period and therefore from outside your species composition sample. Only assess the level of injury to halibut that are landed and in your hands. Conduct halibut injury assessments near the roller station in order to reduce observer caused injuries.

Attempt to assess the level of injury from a maximum of 20 halibut per day. Collect halibut for the injury assessment using a random sampling frame. The easiest method is to collect every fifth, tenth, or Nth halibut during a randomly selected non-tally period. To complete the halibut injury assessment measure the halibut, check for injuries, and return the fish to the water.

Do not assess injuries of halibut on hauls that are not sampled for species composition.

Follow the rules listed below when assessing halibut injuries on a longliner:

- Only assess halibut from sets sampled for species composition.
- Halibut used for the injury assessment must actually be measured.
- Ensure that vessel personnel use the same release methods when you assess halibut injuries as they use during normal operations.
- Only assess injuries from halibut that are in your hands. These halibut must be landed by the crew.
- Ignore any injuries caused by the crew landing the halibut for the injury assessment, including gaff wounds to large animals.
- Over the duration of your cruise attempt to obtain injury assessments of halibut landed by each rollerman.
- Include in your assessment only fishing related injuries.
- Use the dichotomous key in Appendix Q. "Injury Criteria and Injury Key for Hook & Line Caught Pacific Halibut" on page A-43 to categorize the injury.

If you are working on a vessel with ATLAS, record halibut injury assessments in the electronic Length/Frequency Data form (see page 15-23). On vessels without ATLAS record all injury data on the paper Form 7s in the same manner as other species. See page 9-21 for instructions.

Some vessels that have a halibut individual fishing quota (IFQ) (see page 6-50) are allowed to retain halibut of legal size. The vessel crew are required to carefully release any undersized halibut. The IPHC is interested in the injuries caused to released halibut. In order to obtain an accurate representation of the total population all halibut must be measured. For your sample, randomly collect halibut regardless if they will be retained or not. Collect and measure all the halibut that are in your sample, **but only assess the injuries of fish that are to be discarded**. Record the sublegal or discarded halibut with the injury code that you determined. Record the additional legal, retained halibut from your sample with a code 9, "Unknown," in the Injury column of the Form 7. Remember, do not sex halibut. Always record an "U" in the sex column of the Form 7.

Collect halibut injury assessments in a manner that reflects the normal operations of the vessel. Vessel personnel have an incentive to bias these data. Lower mortality rates, in affect, increase the amount of halibut that can be caught in a fishery before the fishery is closed. Be aware of how halibut are handled when you are not sampling and compare this to when you are sampling. Fully document any differences in your logbook, try to resolve the problem diplomatically, and contact NMFS as soon as possible about the problem.

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	00	02	03	147

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

Page _____ of _____ for transmission

Species Name	Sex	Species code	ST	Number	Species weight in kg. w/ decimal	Quanity sampled (hooks, pots, or kilograms)	% retained
(keypunch check)		2935	+	2256	6247.13		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	35.52		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		41	37.72		0
ANEMONE		55	L	25	5.00	3960	0

HAUL 147 2/3/98 @

COUNTERS
P-COD 1153
POLLOCK 729

SKATES
1ST 20 17
2ND 20 20 9 139
3RD 20 20 12

ARROWS/KAMS
1ST 44 6 78
2ND 21
3RD 31

SALMON 5 4
TANNERS 4
YELLOWEYE 2
FLAT HEAD SOLE 20 9 37
ROCK SOLE UNIDENT. 7
SOUTHERN ROCK SOLE 11
FLAT FISH UNIDENT. 9
BIRDS
SCULPIN 20 20 41
GRENADIER
ANEMONE 25
SHARKS
OCTOPUS
IRISH LORDS
STILFISH

HALIBOT
30 II x .26 = .52
40 III x .65 = 1.95
50
60 IIII 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

Figure 6-7: 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 Form 7 as viability samples because they were not inspected. Refer to the halibut length to weight table on page A-35.

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 black cod.

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 6-8: Data Entry Explanation (Haul 147)

3US - Species Composition Form Instructions

If your assigned vessel does not have the ATLAS computer program fill out 3US species composition forms for every haul sampled for species composition.

Observers Name/Vessel Name - For each vessel deployment write your name and the vessel's name across the top of the first page.

- **Cruise No#/Vessel Code -** Enter the cruise number and vessel code on all forms. The cruise number is a four digit number issued to you at your briefing or training prior to your deployment. The vessel code is an Observer Program code we assign to each vessel that requires observer coverage. There is a list of vessel codes in Appendix J. "Vessel/Plant Codes, Names, Vessel Lengths, USCG and NMFS Permit Numbers" on page A-23.

- **Date -** Enter the date the last hook of a set was retrieved. For the month and the day use leading zeros when needed i.e. 01/01/01 for January 01, 2001. This date must match the date on all other forms.

- **Species Name/Sex/Species Code/Sample Type -** Enter the species name and species code in the proper columns. The Sex column is only used for prohibited crab and salmon species, and only **M** and **F** are valid entries (leave this field blank if the sex is unknown). Enter the gender only if you were able to hold the organism and determine it's gender by direct observation. The Sample Type on a longliner is always **L**, on a pot boat is always **T**, and on a Jig boat is always **J**.

- **Number -** Enter the total number of all of the individuals of a specific species that were counted during your tally period. This should be the total of all your tick marks and numbers from your thumb counters for the species indicated, including any dropoffs.

- **Weight of Specimens -** Enter the total weight of all of the individuals of each species counted during your tally period. Obtain these numbers by either weighing all of the tallied organisms for that species, or by multiplying the average weight of each species by the total number of organisms tallied.

- **Quantity Sampled -** Enter the total number of hooks counted during your tally sample or calculated based on the hooks/skate counts. The total number of organisms tallied can not be larger than the total number of hooks tallied for a given set.

- **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 the line or being sorted off the line. Additionally, fish may be discarded in the factory or from other locations after being landed. Some observers tally drop-off fish separately from retained fish, and use this to calculate discard at the roller. To do this, use the formula below:

$$100 - \left(\frac{\text{calculated weight of dropoffs from sample}}{\text{calculated total weight of species in sample}} \right) = \text{percent retained}$$

Haul # 147 Date 2/3/01	Total Skates or Segments Sampled 24 skates / 3 mags	Page 98 of CR# 9876 Vessel A987
Number of hooks or pots sampled 3960	Keypunch check for species #'s. 2256	Keypunch check for species wt's. 6247.13

Species	Sex	#	Weight	#	Weight	Total #	Total Weight	% Ret.	ST
Halibut						16	62.06		L
opilio tanner	M	3	2.80			3	2.8		
opilio tanner	F	2	.80			2	.80		
tanner unident		→				4	3.73		
pacific cod		9	32.60	10	36.40	1153	4178.47	100	
pacific cod		12	37.00	10	40.00				
pacific cod		9	35.20						
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	
yelloweye rockfish		2	4.20			2	4.20	0	
pollock		11	16.80	14	22.80	729	1087.67	100	
pollock		12	15.20	13	19.80				
flathead sole		15	14.40			37	35.52	0	
southern rock sole		11	6.8			11	6.8	0	
rock sole unident		→				7	4.33	0	
flats unident		→				9	7.34	0	
sculpin		15	13.8			41	37.72	0	
anemone		→				25	5.00	0	L

Length data, Viabilities, and Measurements

30 II
40 III
50
60 IIIII
70 II
80
90 III
100 I

VIABILITIES

53 P
116 E
42 P
37 D
36 D
99 E
63 E

Notes:

Total hooks in set 10560

Revised 1/1/2000

Figure 6-9: Longline Deck Form

ATLAS Deck Sheets

If your assigned vessel has the ATLAS computer program, fill out an ATLAS deck sheet for every haul sampled for species composition. Refer to the ATLAS section of this manual for a more detailed discussion on the ATLAS AtSea Program.

- **Haul #/Date/Cruise #/Vessel Code/Observers Name/Vessel Name -** Fill out the headings on this form in the same format as the 3US form (see page 6-29).

- **Total Hooks or Pots Sampled** - Enter the total number of hooks counted during your tally sample or calculated based on average hook counts and segments of gear sampled. The total number of specimens tallied can not be larger than the total number of sampled hooks.

- **Total Mags or Skates Sampled -** Enter the total segments of gear sampled. In a temporal sample frame this field will be left blank.

- **Keypunch Check for Species #'s:** Sum the entries from the **Total #** column for all species groups, and sample types. Enter this sum into the **Keypunch Check for Species #'s** field. For the Species Composition form in the ATLAS program this sum will be entered under species code 999 in the **Numbe**r field (see page 15-21).

- **Keypunch Check for Species wt's:** Sum the entries from the **Total Weight** column for all species, groups, and sample types. Enter this sum into the **Keypunch Check for Species wt's** field. For the Species Composition form in the ATLAS program this sum will be entered under species code 999 in the **Weight** field.

- **Species / Sex -** Enter the species or group name in the proper columns, as neatly as possible. The Sex column is only used for prohibited crab and salmon species. Enter the gender only if you were able to hold the organism and determine it's gender by direct observation.

- **# / Weights** - Enter the number and weight of specimen actually weighed for each species. Use these numbers and weights to calculate the average weights for specimens that were only tallied.

- **Total #** - Enter the total number of all of the individuals of each particular species that were counted during your tally sample. Total all of your tick marks and the numbers from your thumb counters for the specified species, including drop offs.

- **Total Weight** - Enter the total weight of the organisms of each species that were counted during your tally period. Obtain this weight by either weighing all the specimen of a species tallied or by multiplying the average weight (per species group) by the total number of specimens counted during the tally period.

- **% Ret**- This is a rough estimate of the weight of each species retained by the vessel. Tally drop offs and discards and use average weights to determine the total weight discarded. Determine the total percent of the species discarded by dividing this weight by the total weight of the species group. Enter this number rounded to the nearest whole percent in the Percent Retained column.

- **ST -** The Sample Type on a longliner is always **L**, on a pot boat is always **T**, and on a jig boat is always **J**.

Vessel's Fishing Effort Data Collection

Vessel Logbooks

Under regulation 50CFR679.E (see "(vii) Records." on page 18-20), Observers have the right to inspect and copy the NMFS logbook and all other documentation of fishing effort. Transfer the following information from the vessel logbook to the Vessel Haul Form for Trawl, Pot, and Longline (see Figure 5-3 on page 5-6).

- Date and Time of Gear Deployment
- Date and Time of Gear Retrieval
- Position of Gear Deployment - Latitude and Longitude
- Position of Gear Retrieval- Latitude and Longitude
- Average Sea Depth
- Individual Fishing Quota (IFQ), Yes or No
- Community Development Quota (CDQ) number, if applicable
- Number of Skates or Pots
- Average Number of Hooks per Skate

In addition, record information on any problems associated with the retrieval of the longline gear. This information is not recorded in the vessel logbook. Ask the person responsible for logbook entries to record problems with gear somewhere on the logbook page or on a separate page for you.

Vessels Fishing IFQ

All longline and pot vessels both IFQ and non-IFQ use the same logbook. However, data is entered differently depending on if the vessel is fishing for IFQ species or not. On the vessel logbook (Figure 6-12), check the columns "IFQ Halibut" and "IFQ Sablefish." A > 0.00 entry in these columns indicates IFQ fishing. For a more detailed description of IFQ, see page 6-50.

Problems with Logbook Information

Before copying anything from the ship logbook to your data forms, you must determine the accuracy of the data reported. Misunderstandings are possible about how the log is filled out. You will need to verify the following entries:

Date and Time of Gear Deployment, and Date and Time of Gear Retrieval

Whenever possible, note the time when the crew begins to deploy hooks and note the time the last hook is retrieved for a set. You will not be able to verify deployment or retrieval times for all sets. For unverified sets rely on the information provided by vessel personnel in the vessel's logbook. If your vessel's logbook contains erroneous times, 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 set data.

Position of Gear Deployment and Position of Gear Retrieval - Latitude and Longitude

The latitude and longitudes entered in the Begin Position of Set and End Position of Set columns in the vessel's logbook should be the position of the first and last hook set. The captain or a mate reads these positions from the GPS navigation systems located in the bridge. Occasionally check that the positions listed in the vessel's logbook match that on the GPS position finder during the retrieval or deployment of a set. Review positions listed in the vessel's logbook. Question any large changes in position between one set and the next if you have not had a long run between sets. The person responsible for the logbook may have incorrectly entered the position.

Cruise Number	Vessel code	Year
9876	A987	01

ORC
123

VESSEL HAUL FORM FOR TRAWL, POT, AND LONGLINE

Observer name John J. Observer

Vessel name Alaska One

Page _____ of _____ for transmission

Full name of catcher boat	ADF&G #

Page 20 of _____ for vessel

Weekly message
or
Resubmission

Haul #	Gear type	Gear performance	Vessel type	Date of gear deployment		Time of gear deployment	Begin Position of Haul or Set			Average bottom depth	Average gear depth	M or F	Date of gear retrieval		Time of gear retrieval	Location code	End Position for Haul or Set			Vessel's total catch estimate in metric tons	Catcherboat's ADF&G #	IFQ? Y/N	CDQ #	# of segments in set	# of hooks per segment
				Month	Day		Latitude (N)	E or W	Longitude (100)				Month	Day			Latitude (N)	E or W	Longitude (100)						
0													02	01		N	5353	W	6631	.					
																				.					
0													02	02		N	5721	W	7401	.					
																				.					
146	8	1	1	02	02	2035	5740	W	7506	80		F	02	03	0015	R	5751	W	7507	10.00		N		64	165
147	8	1	1	02	03	0400	5752	W	7532	82		F	02	03	0815	R	5801	W	7534	9.00		N		64	165
* 148	8	6	1	02	03	1210	5800	W	7558	91		F	02	03	1800	R	5809	W	7559	5.00		N		56	165
																				.					
149	8	1	1	02	03	2355	5813	W	7621	89		F	02	04	2330	R	5821	W	7620	8.00		N		64	165
																				.					
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National Marine Fisheries Service / North Pacific Groundfish Observer Program

Revised - 1/1/2000

Figure 6-10: Vessel Haul Form For Trawl, Pot and Longline (longline example)

Cruise Number	Vessel code
9876	A987

OBSERVER HAUL FORM FOR TRAWL, POT, AND LONGLINE

Page 20 of _____ for vessel

Observer name John J. Observer

Vessel name Alaska One

Page _____ of _____ for transmission

Plant/Processor name	Location	Processor code

Haul #	Haul sampled by	Random sample table	Random break table	% Monitored for marine mammals	Bird deterrence	Deterrence Verified?	Total hooks or pots in set	Official Total Catch in metric tons	Observer's Total Catch Estimate in metric tons	B, C, or W	Density in mt/m²	Processor code	Date fishing began for delivery Month	Date fishing began for delivery Day	Notes
0								.	.		.				At Petro Marine dock Dutch Harbor
								.	.		.				
0								.	.		.				Vessel steaming to new area
								.	.		.				
146	1	9	1	33	2	2	10560	15.28	15.28		.				
147	1	9	1	33	2	1	10560	16.66	16.66		.				
148	1	9	1	33	2	2	9240	11.66	11.66		.				
								.	.		.				
149	0	9	1	0	2	1	10560	15.69	.		.				No sample - weather bad
								.	.		.				
								.	.		.				
								.	.		.				
								.	.		.				
								.	.		.				
								.	.		.				
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								.	.		.				
								.	.		.				

National Marine Fisheries Service / North Pacific Groundfish Observer Program

Revised - 1/1/2008

Figure 6-11: Observer Haul Form For Trawl, Pot and Longline (longline example)

WHITE—Vessel Copy; Keep in Logbook
GREEN—IFQ Distribution
BLUE—Discard Report; Submit to Processor
YELLOW—NMFS Copy; Remit
GOLDENROD—Observer copy

2001 CATCHER VESSEL DFL GROUNDFISH/IFQ LONGLINE AND POT GEAR

VESSEL NAME: High Seas

OPERATOR NAME AND SIGNATURE: Stan Wood Stan Wood

IPHC USE ONLY — PAGE: 2

ADF&G VESSEL NO.: 123040

FEDERAL FISHERIES PERMIT NO.: 04111

IDENTIFICATION

INACTIVE	START	END	REASON	FEDERAL REPORTING AREA

IFQ		CDQ
Operator IFQ Permit #: 648797	IFQ Permit #	Groundfish CDQ #
IFQ Permit #	IFQ Permit #	Halibut CDQ Permit #
IFQ Permit #	IFQ Permit #	MANAGEMENT PROGRAM (Circle one if applicable and enter number): Exempted Research No.____
IFQ Permit #	IFQ Permit #	

OBSERVER INFORMATION

NO. OF OBSERVERS ONBOARD: 1

OBSERVER NAME & CRUISE #: Chris Observer 6215

OBSERVER NAME & CRUISE #:

NO. OF CREW: 4

If same as previous page check ☐

GEAR TYPE (check one): ☐ Pot ☐ Jig ☐ Troll ☐ Handline ☐ Hook & Line ☐ Other

If Hook & Line, complete boxes immediately below.

GEAR ID	✓ GEAR TYPE: FIXED HOOK CONV	FIXED HOOK TUB	AUTOLINE	SNAP	LENGTH OF SKATE (feet)	HOOK Size	Spacing (feet)	No. Per Skate
A		✓			300	6	2	150
B								
C								
D								

Complete these boxes once per delivery

CATCH BY SET

SET #	DATE SET / TIME SET	DATE HAULED / TIME HAULED	Buoy or Bag #	BEGIN POSITION LATITUDE / LONGITUDE	Buoy or Bag #	END POSITION LATITUDE / LONGITUDE	BEGIN & END DEPTH (Fath.)	IPHC OFFICE USE ONLY
5	03-20	03-20	1	57 40	1	57 51	60	
5	0300	0900	2	175 06	3	175 07	90	
6	03-20	03-20	1	57 52	1	58 01	64	
6	1030	2030	4	175 32	5	175 34	80	
7	03-21	03-21	16	58 13	1	58 09	80	
7	1100	1330		176 21	7	175 59	92	
8	03-21	03-21	1	58 00	1	58 20	65	
8	1500	2000	8	176 19	9	176 13	70	
9	03-22	03-22	2	57 00	2	57 22	84	
9	1020	1400	0	174 20	1	174 40	75	

GEAR ID	NUMBER OF SKATES OR POTS: Set	Lost	TARGET SPECIES CODE	CDQ/IFQ HALIBUT (Pounds)	IFQ SABLE (Pounds) ~~RD Round wt~~ WC Western cut ~~EC Eastern cut~~	ALL OTHER SPECIES Est. Total (lbs. or mt.)	BIRD AVOID GEAR
A	30	0	710	400	Wt. 800 / No. 200	1,000	2
A	28	0	710	326	Wt. 1800 / No. 444	1,200	2
A	26	2	710	360	Wt. 1300 / No. 212	2,000	2
A	28	0	710	252	Wt. 1150 / No. 309	900	2
A	28	0	710	188	Wt. 625 / No. 150	1350	2
					Wt. / No.		
					Wt. / No.		

DISCARD/DISPOSITION

For groundfish and Pacific herring, circle: lbs. or mt.
For Pacific halibut, Pacific salmon, king crab, and Tanner crab, record in numbers

DATE	03-20	03-20	03-20	03-21	03-21	03-21	03-22
SPECIES CODE	710	121	200	710	121	710	121
PRODUCT CODE	7	98	8	7	98	7	98
BALANCE FORWARD	0	0	0	2600	1300	2050	
DAILY TOTAL	2600	1300	726	2450	700	625	
CUMULATIVE TOTAL SINCE LAST DELIVERY	2600	1300	726	5050	2000	2625	

DELIVERY

DATE	ADF&G FISH TICKET NO.	RECIPIENT'S NAME or IFQ REGISTERED BUYER	UNLOADING PORT	IPHC USE ONLY
03-23	699018475	Adak SF	Adak	

COMMENTS

Figure 6-12: Vessel Logbook (Longline and Pot)

Vessel Haul Form for Longline and Pot Vessels

The Vessel Haul form is used for recording fishing effort data from all gear types. This includes trawl, longline, pot, and jig fishing vessels. 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. Each delivery or day in port must be noted on a line of the Vessel Haul form. Skip a line between each day's entries. Observers on catcher boats must use one line to document each delivery even if there are also sets retrieved on the same day. **Make sure that all of the sets retrieved during your deployment are recorded on your Vessel Haul form whether you sampled them or not.** Keep the data from each vessel you are on separate.

- **Heading:** Enter the cruise number supplied in your training or briefing. Enter the vessel code found in Appendix J. "Vessel/Plant Codes, Names, Vessel Lengths, USCG and NMFS Permit Numbers" on page A-23. For "Year" enter only the last two digits, such as "01."

- **Observer name/Vessel name:** Enter your name and the name of the vessel.

- **ORC:** When transmitting the Vessel Haul form data to the Observer Program via a fax, you will need to enter an Observer Routing Code (ORC) number in this box. The ORC is a three-digit code which will be provided to you during training or briefing.

- **Haul Numbers:** There should be an entry for every set of gear retrieved. Each set should have its own distinct number and you should try to keep them in consecutive order. You may want to number your set numbers so that they correspond to the set numbers in the vessel's logbook. This should make it easier to track the sets and enter the corresponding data to your forms. Enter a zero in this field for all non-fishing day entries.

- **Gear Type:** Enter the appropriate gear code in this column:. The **Gear Type** codes for the Vessel Haul form are:

  8 - Longline vessels
  7 - Jig vessel
  6 - Pot vessels

- **Gear Performance:** Enter the appropriate code. This code denotes if their were any problems with the gear that may affect the amount of fish caught. There are five different codes that may be applicable to longline fishing.

  1 - No problems.
  5 - Problems, retrieving the gear, tangle in the line coming up.
  6 - Problem, Longline gear cut
  7 - Considerable predation of the catch by sea lions.
  8 - Considerable predation of the catch by killer whales.
  10-Considerable predation of the catch by sperm whales.

  Note: Document a quick description of what occurred whenever you use a gear performance code other than 1. You may do this in either the "Comments" field on the Observer Haul Form or in your logbook. If you use your logbook to document the incident, make note of the page number in the margin of you haul forms, or in the "Comments" field. This is especially important if the problem led to complications in obtaining an accurate OTC. When codes 7, 8 or 10 are used, complete a Form 10 - Marine Mammal Interaction form. Refer to "Form 10" on page 12-4 for more information.

- **Vessel Type:** Enter the Vessel Type code. There are three Vessel Type codes relevant to longline vessels:

  1 - Catcher Processor, (C/P) Vessel that processes its own catch.

  3 - Catcher Vessel, vessel that has retained fish for delivery to a shore based plant, a floater, mothership or a processor.

  5 - Bait, the vessel used the catch, or sold the catch to other vessels to use as bait.

  Note: The definitions of Catcher Processor and Catcher vessel are discussed in "Vessel Types" on page 6-6.

- **Date of Gear Deployment:** Enter the date the first hook of a set is deployed, month and day must both be two digits as in 01/01 for January 1st.

- **Time of Gear Deployment:** Enter the time the first hook of a set entered the water. You can find this time in the "Time Set" field in the vessel logbook. All entries must be in Alaska Local Time (ALT). Always enter four digits with no colon marks.

- **Begin Position of Haul or Set:** Enter the latitude and longitude of the vessel when the first hook of the set was deployed. This position can be found in the "Begin Position" field in the vessel logbook. The first digit of the Longitude is understood to be 1 and does not need to be entered. If the ship's log has positions to seconds or hundredths of seconds, round the position to the nearest minute for your Vessel Haul form entry. Coordinates with minutes greater than 59 are not valid. Enter only numbers in the latitude and longitude columns. Do not enter any marks indicating degrees, minutes, or seconds.

- **Average Bottom Depth:** Average the start and stop depths found in the vessel's logbook. Round the depth to the nearest whole number. Do not enter decimals in this field.

- **Average Gear Depth:** Leave this column blank.

- **M or F:** The vessel logbook instructions request that the bottom depth be recorded in fathoms (F). Check with the captain to ensure that this is the case, and record an F in this column.

- **Date of Gear Retrieval:** Enter the date the last hook of a set is retrieved, month and day must both be two digits as in 01/01 for January 1st. Attribute the set to the **day retrieval is completed.**

- **Time of Gear Retrieval:** Enter the time the last hook was retrieved. You can find this time in the "Time Hauled" field in the vessel logbook. All entries must be in Alaska Local Time (ALT). Always enter four digits with no colon marks.

- **Location Code:** Enter R if the location is a retrieval position. Enter a "D" if you are on a mothership receiving catch and are unable to obtain a retrieval position. Enter N for all days there is no gear retrieved (vessel is in port, steaming, or waiting out a storm). For a list of positions for common ports, see page 3-30.

Non-fishing Days: For all non-fishing days enter a "0" in the Haul Number column, a location code of "N", and enter the latitude and longitude of the vessel at or around noon, Alaska Local Time (ALT) in the "End Position of Set" column. On the remainder of the line, comment on the reason the vessel did not fish. All days aboard must be accounted for with either retrieval or non-fishing positions.

- **End Position for Haul or Set:** Enter the latitude and longitude of the vessel when the last hook of a set was retrieved. This position can be found in the "End Position" field from the vessel logbook. Follow the same rules for these entries as for the "Begin Position for Haul or Set" columns.

- **Vessel's Total Catch Estimate in Metric Tons:** Leave this column blank.

- **IFQ? Y or N:** Was the particular set fished under an Individual Fishing Quota? Enter an "N" if it was not. Enter a "Y" if it was. Check the IFQ permit number columns in the vessel's logbook. An entry in these columns indicates IFQ fishing. For a more detailed description of IFQ, see page 6-50.

- **CDQ #:** Record a "C" then the last two digits of the CDQ permit number for each haul taken using the Community Development Quota (CDQ). This number can be found at the top of the vessel logbook in the boxes marked "CDQ #."

- **Catcher Boat's ADF&G # and Full Name of Catcher Boat box:** Fill in these two items only if you are on a mothership. For all catch delivered to your ship, record the ADF&G permit number of the delivering vessel, then write in the delivering ship name and its ADF&G permit number in the box at the top of the Vessel Haul form (see Figure 5-3 on page 5-6).

- **# of Segments in Set:** Enter a whole number that represents the total number of segments of longline gear in the set. Record only the amount of gear retrieved, **do not record gear that has been lost**. This number may be found by subtracting the number of skates lost from the number set. These two numbers are recorded in the vessel's log in the "Number of Skates or Pots" columns. What skippers consider to be a "skate" differs between vessels. The skipper may be counting skates, mags, tubs, or coils of gear, any of which you may designate as a segment of gear. Remain consistent in what you designate as a segment of gear for your entire time on a vessel.

- **# of Hooks per Segment:** Enter the average number of hooks per segment of gear (page 6-10). This must be entered as a whole number. You may be using a measure of gear other than skates, enter the average number of hooks for the type of gear segment you and the skipper are using.

Observer's Fishing Effort Information

Official Total Catch (OTC) and the Observer Estimate

One of your most important tasks is to calculate the Observer Estimate and the Official Total Catch (OTC). The accuracy of these estimates depends upon the accuracy of your species tallies, sample weights, and hook counts. Every calculation for Observer Estimates and OTC must be recorded in your logbook. Thorough documentation is required to meet the NMFS' expectations and will generally make the debriefing process faster.

Sets Sampled for Composition

If you have sampled the set for species composition, the Observer Estimate will always be the same as the OTC. Use the formula shown below to determine the Observer Estimate and Official Total Catch (OTC) for sampled sets on longliners.

$$\frac{\text{sample weight}}{\text{hooks sampled}} = \frac{\text{Observer Estimate and Offical Total Catch (OTC)}}{\text{total hooks retrieved}}$$

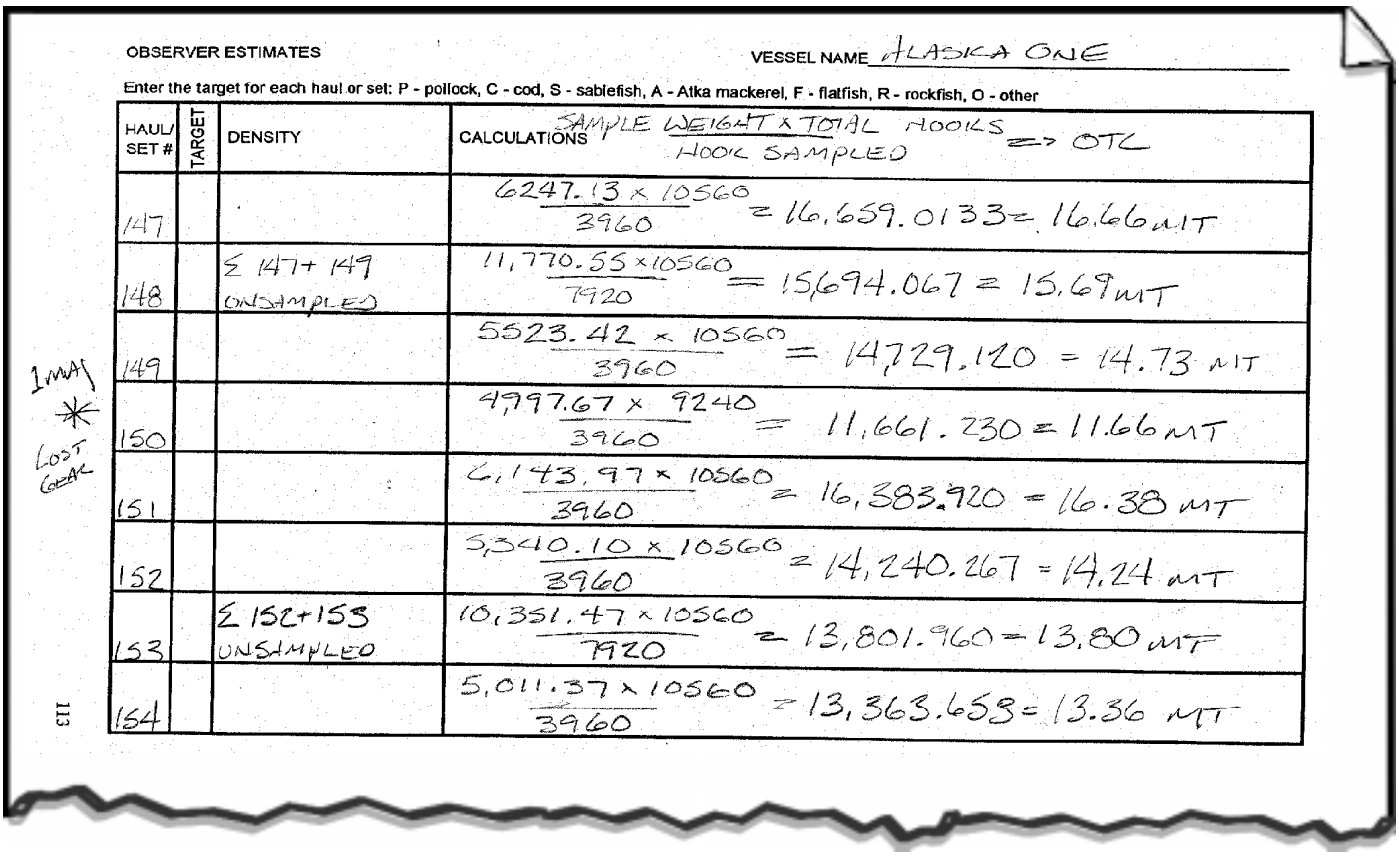
- **Sample Weight -** The total sample weight of all the species counted during the tally period. The sample weight appears on the 3US Species Composition form at the top of the column under species weight. For ATLAS vessels, add all of the weights in the total weight column. Sample weight is a total of all the weights for all the species encountered in a set.

- **Hooks Sampled -** This is the total count of all the hooks that were sampled during your tally periods for this set (page 6-11).

- **Total Hooks Retrieved -** Is the average number of hooks per segment of gear multiplied by the total number of gear segments in a set.

Unsampled Sets

You must account for every set retrieved on a deployment. Every set must have an OTC recorded. For sets that are unsampled employ a "sum of like sets" to determine OTC. This method for calculating an OTC is an estimation of catch based on catches from similar areas, depths, and times. Since actual measurements are unavailable and vessel estimates may be unreliable, "sum of like sets" is the best alternative available.



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			$\frac{5,340.10 \times 10560}{3960} = 14,240.267 = 14.24$ 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 MT * LOST GEAR

113

Figure 6-13: Logbook Calculations

Don't use the vessel's estimate for OTC on a longliner, unless instructed to do so by NMFS Observer program personnel.

When you are estimating the OTC for an unsampled set you must use more than one "like set" for your calculation. "Like sets" should be close in proximity to the unsampled set and deployed near the same date, time, and depth. In most circumstances you will be able to use the sets just before and after your unsampled set. The lengths of the set or the number of hooks in the comparison sets do not need to be similar for the calculation of "like sets."

To estimate the OTC for an unsampled set, sum the total sample weights from several “like” sampled sets then divide this by the total number of hooks sampled for these sets. This number will be a ratio of the weight per hook (the average weight of organisms caught on each hook). Multiply this ratio by the total number of hooks in the unsampled set to obtain the OTC. **An unsampled set will never have an Observer Estimate. Leave the Observer Estimate column blank.** Record all calculations in your logbook.

“Like Sets”		**Unsampled Set**
$\frac{\text{sum of the sample weights}}{\text{sum of the hooks sampled}}$	=	$\frac{\text{Official Total Catch for unsampled set}}{\text{total hooks retrieved for an unsampled set}}$

- **Sum of the Sample Weights** = The total weight of everything in the “like sets’” composition samples.

- **Sum of the Hooks Sampled** = Number of hooks retrieved and sampled during all of the tally periods for the “like sets.”

- **Total Hooks Retrieved** = The total hooks retrieved in the unsampled set.

Observer Haul Form for Trawl, Pot, and Longline

The Observer Haul form is used for recording fishing effort data from all gear types. An **entry must be made for every set made by the vessel whether it was sampled or not.** Follow the same guidelines as for the Vessel Haul Form. Data should be in the same format as the Vessel Haul form. Include the same spacing and 0's for non-fishing days. Always start a new Observer Haul form when you start a new Vessel Haul form. Keep the data from each vessel you are assigned to separate from one another.

- **Heading:** Enter the cruise number and vessel code supplied in your training or briefing. Each vessel you are on has a different vessel code.

- **Observers Name/Vessel Name:** Enter your name and the name of the vessel.

- **Haul #:** The haul number must correspond with the haul number on the Vessel Haul form and all other data forms. Non-fishing day entries must also match the Vessel Haul form with a haul number of zero.

- **Hauls Sampled By?:** Enter the code that corresponds with the person that sampled the set for composition. For vessels with only one observer enter “1” for sampled sets or “0” for unsampled sets. For vessels with two observers enter “1” if the lead observer sampled the set for composition, enter “2” if the second observer sampled the set, or enter “0” if the set was not sampled.

- **Random Sample Table:** Enter the code that corresponds with your position on the random sample table (RST). Enter “9” if you are not using the random sample table. Enter “0” if the RST indicates that the haul is an “on” haul. Enter “1” if the RST indicates the haul is an “off” haul. See page 2-15 in the Essential Information section on how to use the RST.

  9 - RST not used
  0 - On haul
  1 - Off haul

- **Random Break Table:** Enter the appropriate code as to whether you were using the random break table or not. Enter “0” if you are using the random break table and the table indicates you should be on break. This is independent as to whether you sampled the haul or not. Enter “1” if the break table was not used or if the table indicates that the set should be sampled, whether it was or not.

  0 - On a break
  1 - Not on a break

You may include unsampled gear as monitored for marine mammals as long as you were near enough to the line to ensure that you could have seen any mammal interactions or bycatch.

- **% Monitored for Marine Mammals:** This is the percent of the gear you monitored for the presence of marine mammals. This is normally the percent of the gear that was tallied, but **may include more if you also watched the gear at other times.** Divide the number of segments of gear you watched being retrieved by the total segments of gear in the set, or divide the total time you watched gear being retrieved by the total retrieval time of the set. Multiply this number by 100, round it to the nearest whole percent, and enter it into the **% Monitored for Marine Mammals** column. See “MARINE MAMMAL INTERACTIONS AND SIGHTINGS” on page 12-1 for duties related to marine mammals.

- **Bird Deterrence:** For each haul, enter the code for the type of bird deterrence recorded in the vessel's logbook. This does not indicate that the vessel was using the device. See "BIRD SIGHTINGS AND INTERACTIONS" on page 13-1 for further information on seabird deterrence.

  1 - Bird streamer line
  2 - Buoy bag, bird bag, or other float device
  3 - Lining tube and/or line shooter
  4 - Any combination of the above
  9 - No device used

- **Deterrence Verified?:** This column is in reference to the seabird deterrence device recorded in the **Bird Deterrence** column. For each haul enter the appropriate code.

  1 - No, I didn't check the bird gear on this set

  2 - Yes, I checked it and it is what the vessel recorded in the logbook

  3 - Yes, I checked it but no, it wasn't the type of gear that the vessel recorded in the logbook

  Enter a "2" or "3" only when you have actually observed a deterrence device in use or not in use for a particular set. Enter a code of "1" when you do not observe the setting of gear and were not able to verify the use of the seabird deterrence device.

- **Total Hooks or Pots in Set:** Enter the total number of hooks in a set. Total Hooks must be a whole number and there must be an entry for every set.

The most common haul form errors are: <u>missing processor codes, missing OTCs and missing total number of hooks.</u> These missing fields cause a delay in entering the data into the in-season database. Please check these fields carefully before sending!

- **Official Total Catch:** Enter an OTC for every set of gear that the vessel has retrieved. Enter the Official Total Catch estimate in metric tons rounded to two decimal places.

- **Observer's Total Catch Estimate:** Only fill out the Observers Total Catch Estimate when you have conducted a species composition sample and have extrapolated an OTC. Record the weight estimate in metric tons rounded to two decimal places. **If you did not complete a species composition sample for a set leave this field blank**.

- **B, C, or W:** For longliners leave this column blank.

- **Density in Mt/M^3:** For longliners leave this column blank.

- **Processor Permit:** This field is for catcher vessel observers only. For each set, enter the processor code where the catch was delivered. There is a list of shoreside plant, floating plant, and mothership processor codes on page A-20. If the plant your vessel delivers to is not on the list, use code F99999. For each plant to which your vessel delivers, fill in the name and processor code in the Plant/Processor Name box in the upper right corner of the Observer Haul form. This information needs to be entered into the box only once per data set.

  If one delivery is sold to two different processors, and you are unable to separate the catch by individual sets, 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 the non-key punch area of the form and explain the incident.

- **Date Fishing Began for Delivery:** This field is only for catcher vessel observers. For each set, enter the date that the vessel first deployed gear for the delivery. This means that all sets that are included in a single delivery will have the same entry for the "Date Fishing Began for Delivery" field.

Fish Measurements: a Longline Supplement

Your duties for measurements and other biological data are the same as for all other vessels. Performing these duties however may be constrained on a longliner by the lack of space or lack of cooperation from crews. The lack of space will always be a problem on the smaller catcher vessels. You may need to construct a table in checker bins or other out of the way spaces. You may need to measure fish directly on the deck. If you are unable to collect measurements or otoliths because of space constraints, contact a NMFS Observer program staff person as soon as possible and inform them of your difficulties. NMFS staff may be able to relay an acceptable solution. In most cases Observers have served on your vessel in the past and may have devised a method or technique that works on your vessel. In your logbook document any difficulties encountered and the methods you employed.

Uncooperative Crews

In the past, some longline crews have refused to allow observers to cut the fish in order to obtain sexed length frequency data. You should attempt to determine the sex of all fish measured for length frequency (see "FISH MEASUREMENT AND OTOLITH COLLECTION" on page 9-1). In your logbook document any interference to your collection of sexed length frequency measurements and contact a NMFS Observer program staff person as soon as possible.

In January 1999, the NMFS circulated a memo reminding all fishing companies of the requirement to allow observers to cut fish. Please alert NMFS if you are being prevented from doing this, or any, part of your job.

If you encounter difficulties seek the cooperation of the vessel skipper in completing your observer duties. Vessel crew are required to allow you to determine the sex of fish and we are seeking their cooperation. Be mindful that the crew may only protest you cutting fish if the cut damages their final product. If this is the case, ask them which cuts would not damage the product. Many observers have successfully used a pectoral cut to sex roundfish, without destroying product. If the cut you need to use is time consuming or difficult, request crew assistance. Most fisherman are cooperative when they realize the extra time you are taking is to prevent damage to their product.

If the crew continues to be uncooperative, ask the skipper if it would be acceptable to cut only a subsample of your measured fish. Request that he allow you to cut 15 or 10 fish from your ~20 measured fish. If you do sex fewer fish than you measure, the sexed subset should be randomly selected. Unsexed data is more valuable than none at all, so if the captain is adamant that no fish are cut, you should collect unsexed length frequency samples. Fully document in your logbook all interactions with the crew and all methods you used to collect lengths.

Individual Fishing Quota (IFQ)

In 1993 the North Pacific Fisheries Management Council and the Secretary of Commerce approved the Individual Fishing Quota (IFQ) program for the halibut and sablefish fisheries. This policy changed these fisheries from an open access fishery with a limited season to a limited entry fishery managed through an individual quota assigned to each fisherman. The individual quotas are allocated to fishermen that have historically been involved with either the sablefish or halibut fisheries. The individual shares of the quota can be sold or transferred to different individuals and companies. The IFQ system now allows fishermen to fish for their individual quota throughout the fishing season when prices are high or as the weather permits.

Vessels and Gear

Typically the vessels that fish sablefish and halibut IFQ's are smaller vessels, although some larger C/P's also hold quota. When targeting sablefish the vessels typically set gear much deeper and retrieve the gear at a slow pace compared to cod or Greenland turbot fisheries. When targeting halibut the vessels set their gear in areas that are shallower, but halibut gear tends to have less hooks spread farther apart so the rate of hook retrieval will be equivalent or even slower than sablefish retrievals.

Composition Sampling

The methods of choosing which hauls to sample and sampling methods are the same as those discussed earlier in this chapter. IFQ vessels tend to be less automated and gear retrieval is slower. Follow normal sampling procedures for tally and weighing periods to collect your composition sample. On some IFQ vessels, observers have been able to weigh all non-predominant species from the tally period. Obtain average hook counts in the same manner as in the regular fisheries. Because the gear is maintained by hand and may not be repaired as diligently, you may need to verify hook counts more often. Remember, you should verify hook counts on at least 1/5 of a set of gear twice per week.

When Halibut is the Predominant Species

For information on how to collect halibut viability on an IFQ longline vessel, see page 6-26.

Halibut present a problem for observers when they are the predominant species on an IFQ vessel because of their size. When observing on halibut IFQ vessels, you will need to account for halibut on the line either by estimating and recording each fish's length or by collecting an average weight sample and applying it to halibut in your tally. If you decide to use an average weight collection, you will need to randomly collect at least 20 halibut per set. Do this by using either a random start point and collecting the next "n" number of halibut or every nth halibut. Ideally, you could weigh these selected fish, but as they may be far too large to weigh, you may use the halibut length to weight table. If you plan on measuring the halibut for an average weight sample and you want to use the same sample for your halibut injury assessment, the fish must be measured flat and a fork length recorded (see "Technique for Measuring Halibut" on page 10-8).

Marine Mammals

Interactions between longline fishing operations and marine mammals occur simply because marine mammals feed on the fish targeted by longliners and lifting the longline provides marine mammals easy access to the fish. As the longliners are retrieving their gear, the hooked fish are being brought to the surface and are easy prey for marine mammals. When marine mammal predation is taking place, often only the heads, or just the upper and lower jaws of fish, are left on the hooks.

Whale predation is the most common form of marine mammal feeding interaction observed in the North Pacific. Orcas and sperm whales have been observed feeding on catch from longline gear in both the Bering Sea and Gulf of Alaska.

Signs of whale predation:

1. Raked carcasses, heads, or lips are coming up on hooks where normally whole fish would appear, and/or
2. Whales are observed diving on the longline.

You'll need to count carcasses, heads and even lips in your tally sample since these fish were caught by the line. Do not weigh partial fish as part of your weight sample; use only whole fish to obtain average weights, and apply the average weight of the whole fish to any parts of fish tallied. If you are unable to identify a fish to species or group using just the head or lips left on the line, include these animals as "unidentified fish" in your tally sample.

When marine mammal predation occurs, this should be documented in your logbook on a haul by haul basis. Important issues to address are:

- How many marine mammals did you see around the line and what were the behaviors you witnessed?
- How much of your tally sample was made up of gear containing predated upon fish?
- What is your estimate of how much of the total line had predation (i.e.: were whales feeding from the line only before, during or after your tally or were they consistently feeding throughout the line)?
- How egregious was the predation (i.e.: were whales taking only a few fish, were lots of heads left on the line for you to tally or was the line just empty, etc.)?
- How do you feel about the data you collected? Do you feel that it closely represented the true catch, or did the predation severely effect the composition and resulting OTC?

All marine mammal interactions must be fully documented on the Form 10A - Marine Mammal Interaction Data. For a more detailed explanation of how to document a marine mammal interaction see “Form 10” on page 12-4 in the Marine Mammal Sightings and Interactions section of this manual.

Seabirds

Longline vessels attract significant numbers of birds which feed on the fish discards. In addition to feeding on the discards, sea birds attempt to feed on the baited hooks as they are being set. Birds are often hooked and dragged down with the gear and drowned. For information on what observer duties are in regards to seabirds, see “BIRD SIGHTINGS AND INTERACTIONS” on page 13-1.

POT VESSEL DATA COLLECTION

List of Priorities

- Collect all marine mammal and endangered sea bird specimens.
- Record the vessel's total fishing effort for every gear retrieval.
- Sample for species composition and the Official Total Catch (OTC) estimates.
- Document any compliance concerns.
- Lengths and viabilities of the prohibited species.
- Lengths and otoliths of the predominant species.
- Complete special projects.
- Record calculations and daily logbook notes.
- Record marine mammal sightings.
- Record "species of interest" bird sightings.

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Introduction

In 1998, Observers served over 800 days on pot fishing vessels. The National Marine Fisheries Service defines pot fishing as using 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 monitor Pacific cod fisheries and some sablefish fisheries.

Terminology

Bait bags/jars - Containers filled with ground bait that are hung inside pots to attract fish.

Bag - Another name for a buoy.

Block - Hydraulically driven wheel that is used to retrieve line and lift pots.

Bridle - A length of line that attaches two sides of a pot to the buoy line.

Bleeder/Sorter - Crewman assigned to sort bycatch out of the catch, and to cut the "throat"of the cod.

Chopper - Machine used to grind frozen herring or squid for bait or the person assigned this duty.

Coiler - Person or machine that is designated to coil line as it is retrieved by the block.

Diver/Trailer buoys - A small buoy attached to the main buoy with a length of line. The diver buoy "trails" behind the main buoy and allows a larger target for grappling. Some vessels may even call the main buoy the diver buoy.

Dogs - Metal hooks that are hydraulically controlled to secure a pot to a launcher.

Door - A panel on a pot that can be unhooked and swung open to remove catch. The door is usually held shut by bungee cords.

Fingers/Triggers - Small plastic strips located in the tunnel of a pot which allow fish to enter a pot but not exit.

Halibut excluder - A divider located in the tunnel of a pot that restricts the size of the opening.

Hook - Usually a three pronged grappling hook used to snag the trailer buoy line.

Launcher - Hydraulic lift, usually located on the port side of a vessel, used to "launch" pots over the side of the vessel and to adjust the angle of the pot when it is being emptied.

Panel - Mesh netting attached to a square metal frame. Two large panels and four smaller panels are attached to a heavy steel frame box to form the six sides of a pot.

Pick/"Running the hook" - Hook connected to the end of the boom which is attached to the bridle and is used to lift a pot onto the launcher as the pot is being retrieved.

Plotter - Electronic mapping device that displays the local area and the vessel's position on it. The plotter allows skippers to record the area of a string and also the number of pots in a string on a digital map display.

Pot Tie - A short piece of line used to tie pots together when they are stacked on deck.

"Run pots" - A phrase used interchangeably with "retrieve pots". It is the phrase used in the vessel logbook to indicate the number of pots that have been retrieved from a string.

Shot - A pre-measured length of buoy line, usually 10 to 20 fathoms long. Normally there are two set lengths, a "Long" shot and a "Short" shot. When setting a string, the skipper will tell the crew how many shots to tie to a pot for various bottom depths.

Stack - This term is used on pot vessels to refer to pots stacked on the deck.

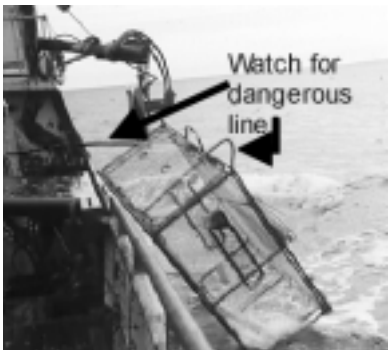
String - Pots deployed individually and are not attached to one another in any way. This term refers to pots set at a similar time in a similar area and depth. What a skipper calls a string varies considerably between vessels. Strings are analogous to sets.

Table - Some vessels have a sorting table on the deck that pivots on one axis. The contents of a pot are dumped onto the table, and the table is swung out of the way to re-launch the pot.

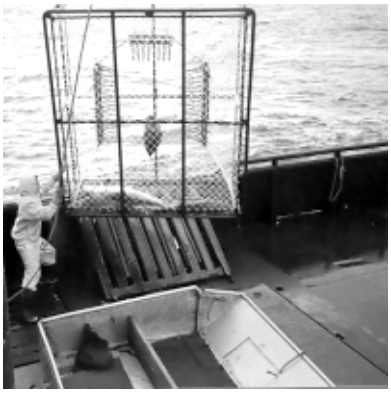
Tunnel - Short mesh-lined openings on two or three sides of a pot. These are the entrances to the trap. Fish and crab are able to swim in but are unable to make their way back out due to the fingers/triggers.

Pot Fishing Operations

The pot is launched.



After soaking, it is retrieved,



and the catch is dumped for sorting.

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 are required for all pot groundfish fisheries. The excluders are fitted into tunnels to restrict the width of the opening. This prevents large halibut from entering the pots while permitting entry of smaller fish.

The deck of a pot boat is equipped with a launcher and a boom. 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 so that it is horizontal to the deck. A single length of line is attached to the pot and the coil is set next to the launcher. The pot is baited, the doors shut, and the pot is “launched” over the side. The coil of line plays out as fast as the pot is sinking. A set of buoys are 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 buoys. The buoys are dragged on deck and the line is placed into the rotating “block”. The block retrieves the line and pulls the pot from the water. When the pot reaches the side of the boat the pot bridal 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 or to redeploy the pot. The “dogs” on the sides of the launcher grab the pot and secure it as the pot door is opened and the contents are dumped into a tote or sorting table. Once all of the catch has been dumped into the tote or sorting table, the crew pulls the tote or table out of the way, sorts out the bycatch, bleeds the cod or heads the black cod, and throws the fish into the hold.

If pots are to be redeployed, the bait bag is replaced, the doors are tied shut, 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 placed on the stack and secured by pot ties and chains.

Pots are deployed in units called strings. When the skipper decides to set gear, the crew ready the pots and drop them overboard one at a time. The result is a row or string of pots. Pots may also be deployed in a cluster, grouped around favorable fishing bottom. Skippers use various means of recording the numbers and locations of pots 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 numbers of pots retrieved in a day as one string, regardless of the set information.

Safety Concerns on Pot Vessels

On a pot vessel all work is conducted on 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 you access to the catch. The area needs to have a clear view of the pots as they leave the water and are dumped. This area should also be located outside the reach of swinging pots. On many vessels, this location will be at the base of the wheelhouse, but will differ from boat to boat.

Discuss with the crew how best to collect samples. The best option would be to have the crew push the totes or swing the table to you. If not, be sure to coordinate your activities 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 the pots 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 the crew for danger warnings. Be aware of possible hazards and plan a safe response.

Delineating Strings

One of the greatest difficulties faced by observers on pot vessels is determining what constitutes a string of gear. Pots are set individually, each with its own buoy. Though pots of a string may be set at varying depths, areas, and may have different soak times, skippers sometimes list them as a single, long string. Try to obtain the most discrete data you can, by working with the skipper, consulting the plotter, and tracking the gear retrieval yourself. Be sure to document in your logbook any difficulties you encounter when determining strings on your vessel.

Composition Sampling

When to Sample for Species Composition

In the pot fishing fleet, there are vast differences in the amount of gear each vessel fishes and how quickly each vessel retrieves and deploys gear. Some vessels work around the clock fishing multiple strings per day. Others spend days prospecting or pulling a few short strings. Many catcher vessels do not retrieve pots at night; while catcher processors, with larger crew sizes, set and retrieve pots around the clock. All of these factors will affect your ability to sample for species composition on these vessels. Develop sampling strategies to randomly sample as many strings and pots within a string as possible, while keeping in mind all the other observer duties.

A skipper may utilize one of two strategies in deploying pots; he may set one long string of pots or he may set several, smaller groupings of pots. How you sample will be determined by the skipper's method of setting gear.

- For several short strings of pots use the appropriate random sampling table (RST) to determine which strings to sample or use the random break table (RBT). If the strings have greater than 20 pots, use a random sampling frame to sample at least 30% of the pots retrieved from each string. When strings have less than 20 pots, observers are generally able to sample every pot in the selected string.

- If the skipper sets one or two long strings of gear per day, sample every string. Use a sampling frame to sample at least 33% (one third) of the pots retrieved from each string.

Random Sampling Frame

Sampling all of the pots in a string is preferred over using a random sampling frame. Sampling all pots would require you to count and/or weigh everything in every pot of a string. This may be possible in many situations, but when it is not, you must use a random sampling frame to determine a manageable number of pots to sample.

Spacial Sampling Frame

The sampling frame for the spatial method on a pot vessel is the total number of pots in a string.

Employing a spacial sampling frame requires the ability to identify when selected pots are pulled. This 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 strings, actually counting pots retrieved while sampling on deck.

To employ a spacial sampling frame on a pot vessel:

1. Determine the total number of pots in a string.

2. Determine your sampling units. For example, divide the string into units or groups of pots. A string of 70 pots could be split into 70 separate units, seven units of ten pots, or any other grouping where there are an equal number of pots in each unit. Base the number of pots in your sampling unit on the amount of bycatch that can be stored in the fish collection area. On vessels with space available you may be able to have a larger sampling unit, while on vessels where space is limited you may need to have smaller sampling units.

3. To obtain the total number of sampling units in a string divide the total number pots in a string by the number of pots per sampling unit.

4. Number the units consecutively starting with one and randomly select at least a third of the total units to sample. Use the Random Number Table, dice, numbers from a hat, or any method that is truly random to select units to sample.

Temporal Sampling Frame

Another method of applying a random sampling frame on a pot vessel is a temporal or timed sampling method. The frame for the temporal method is the total time required to retrieve all the pots in a string. The sampling units in a temporal sampling frame are intervals of time. Consider a temporal sampling frame when you are unable to keep track of individual pots in a string. This method requires the ability to know approximately how long it takes to pull a given string of gear. You do not need to know the exact amount of time it takes to retrieve a string of gear. An estimate close to the actual retrieval time will suffice. This method is most appropriate for long strings.

To employ a temporal sampling frame on a pot vessel:

When using a temporal sampling frame, determine the total number of pots in your sample by actually counting them. Do not attempt to use a pots per time interval to determine the number of pots sampled.

1. Estimate the amount of time it takes to pull a string of gear.
2. Split this time into equal time intervals.
3. Use a random method to select at least 33% (one third) of the time intervals to sample. The Random Number Table, dice, or numbers from a hat could be used to predetermine which intervals are to be sampled.
4. Sample all the pots that are retrieved within the time interval, make sure to count the number of pots sampled for your sample size.

Systematic Sampling

A systematic sampling frame can be employed in any situation where a spatial or temporal sampling frame can be used. You may prefer a systematic sampling frame when you require a significant pause between the tally and non-tally periods.

A systematic sampling frame is comprised of several sample periods which are of equal numbers of pots separated by non sampled periods of a consistent number of pots. In designing your sampling frame keep in mind that you must sample at least one-third of a string and have a random starting point. You can conduct a systematic sample either spatially or temporally. Like the spatial and temporal frames the systematic sampling population is the total number of pots or the total amount of time it requires to retrieve a string.

The first step in conducting a systematic sample is to determine which framework you wish to use. When you can accurately count the pots as they are being retrieved the spatial systematic sampling frame will be easiest. If you cannot keep track of pots, a timed method will be more applicable. In the following explanation, pots and units of time will only be referred to as pots, since you can treat units of time in the exact manner as pots in a systematic sampling frame.

After you have determined the type of systematic frame you wish to use, follow the instructions below to devise a sampling frame for the specific set.

When you use a timed systematic sampling frame, sample size is determined by pot count. Therefore, you must count all the pots while sampling.

1. Determine the size of your sample units. Base your decision as to the size of your sample unit on how long you can stand on deck sampling and on how much bycatch can be stored in the fish collection area. You may select any number of pots as your sampling unit, in Figure 7-1 the sampling unit is 2 pots.

2. Divide the string into sampling units. If the total number pots is not evenly divisible by the number of pots in a sampling unit, there will be remaining pots. Any remaining pots should be counted as a separate sampling unit. Number the total sampling units in the string consecutively starting at one. Make a diagram similar to Figure 7-1 in your logbook.

Sampling frame for a set with 17 gear segments and a sampling unit of two gear segments

Sampling Units	Unit 1		Unit 2		Unit 3		Unit 4		Unit 5		Unit 6		Unit 7		Unit 8		Unit 9
Gear Segments	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Figure 7-1: Systematic Sampling Frame

3. Determine what fraction of a string you wish to sample, i.e. 1/3, 2/5, ½, 2/3. The Observer Program requires that you tally sample at least 33% or 1/3 of each string. Your sampling pattern will be sampled units followed by the units that are not sampled. For example, if you wish to sample 1/3, your sampling pattern would be to sample one unit and not sample the next two.

4. Determine which sampling units you will sample.

   a. Pick a random number between one and the total number of sampling units. The randomly selected sampling unit will be the first sampled unit in your sampling pattern.

   b. Using the sampling diagram made in step 2, plot your sampling pattern starting with the randomly selected unit.

   c. At the end of the first sampling pattern, plot the sampling pattern again, repeat plotting the sampling pattern until the end of the string. When the last sampling unit of the string is reached, loop back to the first sampling unit and continue to plot your sampling pattern until you reach the sampling unit at which you started.

For example, in 7-2 if you determined that you were going to sample 1/3 of the string and then randomly selected a five, you would mark unit 5 as sampled, and units 6 and 7 as not sampled, unit 8 as sampled, units 9 and 1 as not sampled, unit 2 as sampled and units 3 and 4 as not sampled.

Set with 17 gear segments and a sampling unit of two gear segments																		
Sampling Units	Unit 1		Unit 2		Unit 3		Unit 4		Unit 5		Unit 6		Unit 7		Unit 8		Unit 9
Gear Segments	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Figure 7-2: Selected Units of a Systematic Sampling Frame

5. Sample the string according to your sampling diagram. For the string in Figure 7-2 you would sample pots 3, 4, 9, 10, 15, and 16. Pots 1, 2, 5, 6, 7, 8, 11, 12, 13, 14, and 17 would be your non-sample periods.

Sampling Methods

Tally Sampling

Collection of species composition samples will depend on the amount of gear retrieved, the speed of gear retrieval, and the amount of fish that is being caught. When there is little catch, all of it may be sorted, counted, and weighed from each sampled pot. Most often this method will not be possible. When counting and weighing everything in a pot is not possible, you should tally the predominant species. Count and weigh all other catch from the selected pot. The number of individuals of the predominant species will later be multiplied by average weights of each predominant species to obtain a total weight for the sample.

As a pot is dumped into a tote or onto a sorting table, count the predominant species using thumb counters and collect all other bycatch in a separate tote or your blue baskets. At the same time, randomly collect fish of each species that you are tallying for average weights. You must collect approximately 50 individual fish of each species tallied for every string sampled. If there are significantly less than 50 individuals of a species in your sample you should weigh all of them. Therefore, you must retain all rare or non-predominant species.

Collecting Catch for Average Weights

How you collect catch for average weights will depend on the configuration of the vessel, how the crew processes the catch after dumping it from the pot, and how much is being caught in each pot. The best way to obtain fish for average weights is to randomly determine which of the sampled pots to collect fish from prior to gear retrieval. Number the sampled pots consecutively from 1 to the total number of sampled pots. Use the random number table to determine the pot or pots from which you will collect catch for average weights. It is often difficult to know exactly how many pots you will need, and in many instances you may need to rely on haphazard sampling. Try to randomize your selection as much as possible. If this does not work, do the best you can and document how you determined when to collect catch for average weights.

If there is an extra tote on board, have the crew place all the catch from the selected pot into this tote. Move the tote out of the way of the crew and any swinging pots. If there is not too much catch, weigh everything from the selected pot. This will help you avoid hand selection of fish. If there are greater than 50 individuals of a species, devise a system to avoid hand selection. For example, if the catch is dumped into a tote, divide the tote

into halves or quarters and select all the fish from a randomly selected side or quarter. If you are collecting fish from a sorting table, mark the table into sections and pull the fish from a randomly determined section.

Tips for Sampling on a Pot Vessel

As the vessel is retrieving gear, there is generally enough time between pots to weigh fish from the predominant species for average weights and to weigh bycatch. There may even be enough time to measure fish for length frequencies. Sometimes it helps to have the crew show you how to bleed or cut the fish in your sample in the same manner as they do. The crew tends to be more willing to cooperate with your sampling needs when you make attempts to reduce your effect on their processing time. This may be accomplished by bleeding or cutting the fish in your sample yourself. Processing the fish in your sample is not required and should not be done if you find yourself running low on time.

3US Species Composition

Follow the instructions given on page 6-29 of the Longline section. There are two differences for filling out the form:

- **Sample type** must be “T” for trap.
- For **Quantity Sampled** column enter the total number of pots sampled.

Atlas Deck Forms

For vessels having the ATLAS AtSea transmission system, observers use the ATLAS deck forms. The ATLAS deck forms are filled out in the same manner as on a longline vessel, refer to page 6-32 in the Longline section. 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 page 6-31).

Halibut on Pot Vessels

Assessing the Viability of Halibut on a Pot Vessel

Criteria for assessing the viability of halibut caught by pot vessels differs somewhat from the criteria used for assessing trawl caught halibut. The main issues to be concerned with on pot vessels are listed in Appendix P. "Viability Key and Criteria for Pot Caught Pacific Halibut" on page A-40. Halibut used in viability samples must be in your hands and actually measured. Length estimates are not acceptable. All halibut viabilities must be recorded on the Form 7 Length Frequency of Measured Species Form or in the ATLAS program. Use E, P, and D in the **Viability** column to indicate Excellent, Poor, or Dead. For halibut viability place a U in the sex column and leave the injury column blank.

Halibut for viability assessments must be randomly selected from sampled sets. Do not assess the viability of halibut from unsampled sets. Halibut assessed for viability do not need to come from your species composition sample, but they must be randomly collected from sampled sets and reflect how the vessel handles the fish. If the vessel is not catching many halibut, the easiest method to determine which halibut to assess for viability is to assess the viability of every halibut in your composition sample.

If the vessel is catching a great deal of halibut, randomly select individual pots and assess halibut viabilities from all the halibut in these pots. Number the pots and then use the random number table to select an appropriate number of pots. Determine the number of pots to sample for halibut viabilities by estimating the number of halibut that could be in each pot. Assess a maximum of 20 halibut per day for viabilities.

Document in your logbook all methods you employed for collecting fish and assessing viabilities. Use your best judgment to determine how much time you can spend assessing halibut viabilities. If you assess less than 20 halibut per day, record in your logbook what factors limited your ability to conduct viability assessments.

Other Halibut Related Issues on a Pot Vessel

If the vessel is catching a great deal of halibut make sure to verify that the halibut excluder devices are in place. The halibut excluders are required. Record in your logbook any instances of missing excluders. For a specific definition of halibut excluders that must be used see "Groundfish Pots Requirements" on page 18-28.

In addition, be aware of how the crew is discarding halibut. The fish should be supported as it is lifted or slid off the deck. The spine of halibut can be broken by mishandling, especially lifting the halibut by the caudal peduncle. Record in your logbook any incidences of the crew lifting halibut by the caudal peduncle or any other mishandling of halibut by the crew.

Fishing Effort Data From Vessel Logbooks

Vessel Logbooks

Under regulation 50CFR679.E (see "(vii) Records." on page 18-20), 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 Vessel and Observer Haul Forms for Trawl, Pot, and Longline see Figure 5-7 and Figure 6-11.

- Date and Time of Gear Deployment
- Date and Time of Gear Retrieval
- Position of Gear Deployment - Latitude and Longitude
- Position of Gear Retrieval- Latitude and Longitude
- Average Sea Depth
- Individual Fishing Quota (IFQ), Yes or No
- Community Development Quota (CDQ) number, if applicable
- Number of Skates or Pots

In addition you need to record in your logbook information on any problems associated with the retrieval of the pots. This information is not recorded in the vessel logbook. Ask the person responsible for entering information in the vessel's logbook to record missing pots or problems with pot retrieval somewhere on the logbook page or on a separate page for you.

All longline and pot vessels both IFQ and non-IFQ use the same logbook. Check the columns "IFQ Halibut" and "IFQ Sablefish." A > 0.00 entry in these columns indicates IFQ fishing.

Verifying Logbook Information

Before copying anything from the vessel logbook to your data forms, you must verify that the data reported are accurate. Misunderstandings about how the log is filled out are possible. Note that unlike on trawl and longline vessels, observers on pot boats may use different haul data than that from the vessel logbook. You may break a "string" into several separately recorded units, or combine several units into one string if it will provide better data. Please note that this will take working closely with cooperative vessel personnel so that you can collect the correct time and position data for any altered sets. Because of this, you should undertake this endeavor only if you are sure it will increase the accuracy of your data, and that you will be able to obtain the correct haul data. In any case, you should verify the following logbook entries:

Date and Time of Gear Deployment, and Date and Time of Gear Retrieval

Whenever possible, note the time when the crew begins to deploy gear and note the time the last pot is retrieved for a set. You will not be able to verify deployment or retrieval times for all sets. For unverified sets rely on the information provided by vessel personnel in the vessel's logbook. If your vessel's logbook contains erroneous times, 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 set data.

Position of Gear Deployment and Position of Gear Retrieval - Latitude and Longitude

The Begin Position of Set is the position of the vessel when the first pot of a string was deployed. The End Position of Set is the position of the vessel when the last pot of a string was deployed. The captain or a mate reads these positions from the GPS navigation system located in the bridge. Occasionally check that the positions listed in the vessel's logbook match that on the GPS position finder during the retrieval or deployment of a string. Review positions listed in the vessel's logbook. Question any large changes in position between one set and the next if you have not had a long run between sets. The person responsible for the logbook may have incorrectly entered the position.

Number of Skates or Pots Run

The total number of pots retrieved in a string are key pieces of data needed to determine OTC. Never rely solely on the number of pots the skipper lists as being run for your total number of pots in a set. Due to the variability in gear deployment and differences in how skippers log the number of pots in

a string, you will need to develop a method for verifying the number of pots retrieved. Actual counts of the pots are the most reliable. While on deck you 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 in a string, count the number of pots in an identifiable section of a string, and cross check these numbers with the plotter and skipper's logbook.

Vessel Haul Form for Pot Vessels

The Vessel haul form is used for recording fishing effort data from all gear types. For most of the columns on the Vessel Haul Form you may refer to the Longline section, page 6-39. Listed below are some specific rules for pot vessels.

The most common haul form errors are: missing processor codes and missing OTCs. These missing fields cause a delay in entering the data into the in-season database. Please check these fields carefully before sending!

- **Gear Type** code for a pot or trap vessel is 6

- There are three **Gear Performance** codes applicable to pot vessels:

  1- No Problem
  5- Miscellaneous problem in retrieving gear, requires a note in the margin
  6 - Problem pots lost

- **Vessel Type** can be one of three:

  1 - Catcher/processor (c/p). This vessel catches and processes its own catch on this string. 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 will utilize the fish for bait.

- **# of Segments in Set:** Leave this field blank.

- **# of Hooks per Segment:** Leave this field blank.

Observer's Fishing Effort Information

Official Total Catch (OTC) and the Observer Estimate

One of your most important tasks is to calculate the Observer Estimate and the Official Total Catch (OTC). The accuracy of these estimates depends upon the accuracy of your sample weights, and pot counts. If these figures are skewed or biased, your OTCs will be biased as well. Every calculation for Observer Estimates or OTCs must be documented in your logbook. Thorough documentation will ease verification of calculations and speed the debriefing process.

Strings Sampled for Composition

If you have sampled the string for species composition, the Observer Estimate will always be the same as the OTC. Use the formula shown below to determine the Observer Estimate and Official Total Catch (OTC) for sampled strings on a pot vessel.

$$\frac{\text{sample weight}}{\text{pots sampled}} = \frac{\text{Observer Estimate and Offical Total Catch (OTC)}}{\text{total pots retrieved}}$$

- **Sample Weight -** The total weight of all the species in your composition sample. The sample weight appears on the 3US Species Composition form at the top of the column under species weight. For ATLAS Vessels add all of the weights in the total weight column.

- **Pots Sampled -** This is the total count of all the pots that were sampled for a string.

- **Total Pots Retrieved -** Is the total pots run in a string.

Unsampled Sets

You must account for every string retrieved on a deployment. Every string must have an OTC recorded. **Never use the vessel's estimate for OTC on a pot vessel**. For strings that are unsampled employ a "sum of like strings" to determine OTC. This method for calculating an OTC is an estimation of catch based on catches from similar areas, depths, and times. Since actual measurements are unavailable and vessel estimates may be unreliable, "sum of like strings" is the best alternative available.

Never use the vessel's estimate for OTC on a pot vessel.

When you are determining the OTC for an unsampled string you must use more than one "like string" for your "sum of like strings" calculations. "Like strings" should be close in proximity to the unsampled string and deployed near the same date, time, and depth. In most circumstances you will be able to use the strings just before and after your unsampled string. The number of pots in a string in the comparison strings do not need to be similar for the calculation of "like strings."

To determine the OTC for an unsampled string sum the total sample weights from several sampled "like strings" then divide this by the total number of pots sampled for these strings. This will give you a weight to pot ratio, meaning the amount of organisms by kilogram caught on average per pot. Multiply this ratio by the total number of pots in the unsampled string to obtain the OTC. An unsampled string will never have an Observer estimate. Leave the Observer estimate column blank. Document all calculations in your logbook.

"Like Sets"		Unsampled Set
$\frac{\text{sum of the sample weights}}{\text{sum of the pots sampled}}$	=	$\frac{\text{Official Total Catch for unsampled set}}{\text{total pots retrieved for an unsampled set}}$

- **Sum of the Sample Weights** = The total weight of everything in the "like strings'" composition samples.
- **Sum of the Pots Sampled** = Number of pots of the "like strings" sampled.
- **Total Pots Retrieved** = The total pots run in the unsampled string.

Observer Haul Form for Pot Vessels

The Observer Haul form is used for recording fishing effort data collected by observers from all gear types. Follow the same guidelines as for the Vessel Haul Form. For most of the columns on the Observer Haul Form you may refer to the Longline section, page 6-45. Include the same spacing and 0's for non-fishing days as you have entered on the Vessel Haul form. Always start a new Observer Haul form when you start a new Vessel Haul form. Keep the data from each vessel you are assigned on separate sets of forms. Listed below are some specific rules on how to complete the Observer Haul form for pot vessels.

- **% Monitored for Marine Mammals:** This is the percent of the gear you monitored for the presence of marine mammals. Divide the number of pots you watched being retrieved by the total number of pots in the set to obtain this number. See "MARINE MAMMAL INTERACTIONS AND SIGHTINGS" on page 12-1 for duties relating to marine mammals.

- **Bird Deterrence:** Leave this column blank.

- **Deterrence Verified?:** Leave this column blank.

- **Total Hooks or Pots in Set:** Enter the total number of pots in a set. Total Pots must be a whole number. There must be an entry in this field for all sets.

- **B, C, or W:** Leave this column blank.

- **Density in Mt/M^3:** Leave this column blank.

Fish Measurements on a Pot Vessel

Your duties for predominant and prohibited species measurements and other biological data are the same as for all other vessels. How these duties are conducted may be further constrained on a pot fishing vessel by the lack of cooperation from crews. In your logbook document any difficulties encountered and the methods you employed. If you are having difficulties with cooperation from the crew please refer to “Uncooperative Crews” on page 6-49 for further instructions.

Vessels Fishing IFQ

All longline and pot vessels both IFQ and non-IFQ use the same logbook. However, data is entered differently depending on if the vessel is fishing for IFQ species or not. On the vessel logbook (Figure 6-12), check the columns “IFQ Halibut” and “IFQ Sablefish.” A > 0.00 entry in these columns indicates IFQ fishing. For a more detailed description of IFQ, see page 6-50.

SHORESIDE PLANTS AND FLOATING PROCESSORS

List of Priorities

- Verify delivery weights for as many deliveries as possible
- Prepare and distribute a Delivery Weight Verification explanation
- Collect Form A data from captains, logbooks, or vessel Observers
- Record delivery information on the Form A
- Assist vessel Observers
- Collect lengths and age structures
- Submit a weekly report (if you are not using ATLAS)

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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, if they are not using the ATLAS program.

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, please contact a NMFS office. If your accommodations are inadequate, contact NMFS and let your contractor know about the problem.

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. These data are recorded on the Form A. 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, fishing start date and NMFS area 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 the 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).

Vessel_____		Date_____
Gear Type (circle one)	NMFS Areas Fished:	
Trawl	_____	Salmon Retention:
Pot/Trap	_____	(Total for Trip)
Jig	Date Fishing Began:	King _____
Longline	_____	Other _____
Target Species Discarded? Y / N		Unid. _____

Figure 8-1: Catcher Vessel Trip Information Form

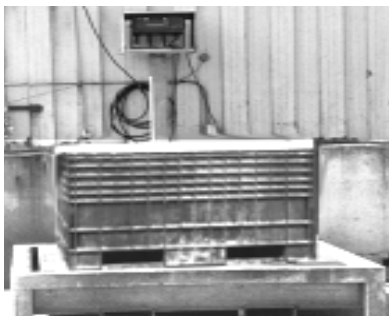
Regardless of which method you use, it is important to meet each vessel at the dock when it comes in, and to establish a working relationship with the captain and Observer onboard.

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: **(1)** actually sum the scale weights, or **(2)** 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 and display panels are sealed and protected against tampering. Therefore, it is not necessary to verify that the scale displays the correct weight, and the plant scales will not be tested daily. Plant Observers will need to check that plant personnel are recording the weights accurately and that the entire delivery is weighed.

Items to check:


tote of fish on platform scale

- 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 has occurred in the pollock fishery, but is 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.

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.

You will need to let each vessel Observer know how you are getting delivery weights if they will be using a proportioned delivery weight for OTC. This is a very important task, and crucial to the vessel observers delivering to your plant. To do this, prepare a paragraph or two explaining how the delivery weights are verified, and what the weights include. In this description, you will need to address each of the concerns listed on page 8-8. Make several copies of this to give to each of the Observers delivering to your plant. An example of such a description is shown in Figure 8-2.

Alaska Processing Inc. Delivery Weight Verification

For All Vessel Observers:

I will verify the delivery weight for each pollock delivery weight in the following manner:

- Delivery weights are usually taken from the ADF&G fish ticket. The plant manager does not want me giving out copies of the fish ticket, so I will give you a copy of all my calculations. I will add up the fish ticket weights myself, after they have been verified. If I find any discrepancies during the verification process, I will use the sum of the scale weights, and leave you a note. (I checked all the fish tickets during cod, and never found any discrepancies.)
- Every fish ticket is checked against the hopper scale ticker-tape for pollock weights. These are stapled to a copy of the fish ticket in the plant office, if you ever need them.
- All bycatch weights are double checked against the tote weights from the dock tally. (These are also stapled to a copy of the fish ticket.)
- Jellyfish weights are not usually listed on the fish ticket. I take this weight directly from the dock tally sheet.
- I try to check the dock tally once a day during a non-observed delivery. The tote tare weights are checked, and I check to ensure the forklift drivers are recording the information correctly. If you notice any totes being weighed incorrectly during your offloads, please let me know!
- Delivery weights will NOT include prohibited species weights! I will give you a separate herring weight, and I'll give you all the necessary data from after scale halibut, salmon and crab. Salmon and crab will be identified to species, and their sex and length will be recorded. I'll give you halibut lengths. The after-scale area is in the north part of the factory (near the break room, by fillet machine #6). Prohibited species are put in the basket, and the delivering vessel is written on the white board above.
- No water weight is deducted at this plant.
- Any partially processed fish, such as bled cod, will already have the PRR applied when I give you the delivery weight. I'll give you a copy of these calculations.

Please leave me a note with any salmon and at-sea discard information. I need this information for my Salmon Retention and Form A! Thanks!

Figure 8-2: Delivery Weight Verification Process (example)

After-Scale Area

The “after-scale” area is another place where weights may not be accurately recorded. This is an area where factory workers will set aside bycatch that has made it past the sorters, and into the factory. This bycatch has been weighed as the target species. Factory personnel should deduct the weight of the after-scale bycatch from the target species weight. They also need to add after-scale weights to the appropriate group on the fish ticket. Check to ensure that after-scale bycatch is being recorded as the correct species, and not as the target species. You should also **check the after scale-area for any prohibited species that the vessel Observer may have missed during sampling.** You should identify these fish to species, and record their weight, sex, and length. Give these data to the vessel Observer.

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 is 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. Catch with code of “98" should not be included in your delivery weights on your Form A. Vessel Observers should have an estimated weight for the discard at sea, and use their own weights when calculating 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 and weights of prohibited species when they calculate their proportioned OTC.

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. 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.

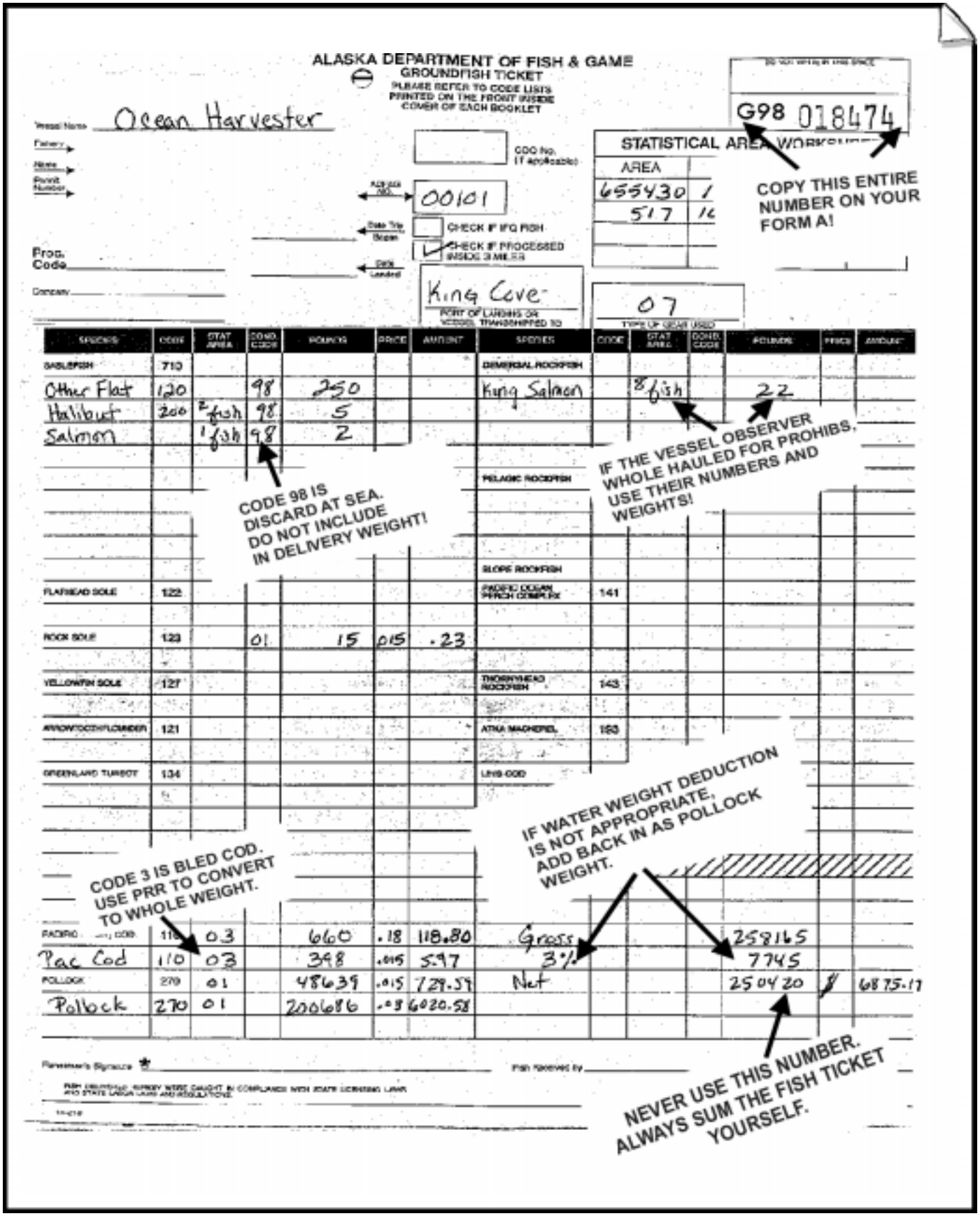
F. The bycatch species listing is often incorrect, unless the species was paid for. Bycatch species may all be lumped together. You must check that the weight for total bycatch was recorded properly somewhere, even if it is combined under one species listing and one weight. This should not be a concern 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.

G. 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.

H. Water weight deductions may appear on the fish ticket. These deductions may occur 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.

I. Species may be missing from the fish ticket. Some plants do not record jellyfish, and other “non-allocated species” weights. Processing plants are not required to record these weights, but you must include them in your delivery weights!

Figure 8-3: ADF&G Groundfish Ticket Instructions



ALASKA DEPARTMENT OF FISH & GAME
GROUNDFISH TICKET
PLEASE REFER TO CODE LISTS PRINTED ON THE FRONT INSIDE COVER OF EACH BOOKLET

G98 018474

Vessel Name: Ocean Harvester
Fishery
State
Permit Number
Adjusted No.: 00101
Date Trip Began
Date Landed
CDQ No. (If applicable)
CHECK IF IFQ FISH
CHECK IF PROCESSED INSIDE 3 MILES
Proc. Code
Company
King Cove — PORT OF LANDING OR VESSEL TRANSSHIPPED TO
07 — TYPE OF GEAR USED

STATISTICAL AREA WORKSHEET

AREA	
655430	1
517	16

SPECIES	CODE	STAT AREA	COND. CODE	POUNDS	PRICE	AMOUNT
SABLEFISH	710					
Other Flat	120		98	250		
Halibut	200	2 fish	98	5		
Salmon		1 fish	98	2		
FLATHEAD SOLE	122					
ROCK SOLE	123		01	15	.015	.23
YELLOWFIN SOLE	127					
ARROWTOOTH/FLOUNDER	121					
GREENLAND TURBOT	134					
PACIFIC COD	110	03		660	.18	118.80
Pac Cod	110	03		398	.015	5.97
POLLOCK	270	01		48639	.015	729.59
Pollock	270	01		200686	.03	6020.58

SPECIES	CODE	STAT AREA	COND. CODE	POUNDS	PRICE	AMOUNT
DEMERSAL ROCKFISH						
King Salmon		8 fish		22		
PELAGIC ROCKFISH						
SLOPE ROCKFISH						
PACIFIC OCEAN PERCH COMPLEX	141					
THORNYHEAD ROCKFISH	143					
ATKA MACKEREL	193					
LING COD						
Gross				258165		
3%				7745		
Net				250420	$	6875.17

Fisherman's Signature *
Fish Received By
FISH DELIVERED ABOVE WERE CAUGHT IN COMPLIANCE WITH STATE LICENSING LAWS AND STATE LABOR LAWS AND REGULATIONS

COPY THIS ENTIRE NUMBER ON YOUR FORM A!

CODE 98 IS DISCARD AT SEA. DO NOT INCLUDE IN DELIVERY WEIGHT!

IF THE VESSEL OBSERVER WHOLE HAULED FOR PROHIBS, USE THEIR NUMBERS AND WEIGHTS!

CODE 3 IS BLED COD. USE PRR TO CONVERT TO WHOLE WEIGHT.

IF WATER WEIGHT DEDUCTION IS NOT APPROPRIATE, ADD BACK IN AS POLLOCK WEIGHT.

NEVER USE THIS NUMBER. ALWAYS SUM THE FISH TICKET YOURSELF.

Figure 8-4: ADF&G Groundfish Ticket

Form A - Plant Delivery Form

Page 1 of _____

Cruise Number	Plant code	Year
6444	P016	01

Catcher boat name	ADF&G #	CG #	Permit #
Aleutian Spray	00991		
Forum Star	59687		
Hoover	21702		
Sea Venture	08225		
Tordenskjold	36037		
Ocean Harvester	00101		

Delivery sampled?	Observer aboard?	Delivery date Month	Delivery date Day	Delivery number	Gear type	NMFS area	Total weight (round weight)	LB or MT	Was all groundfish weighed?	ADF&G # of catcher boat	ADF&G fish ticket number	Date fishing began for delivery Month	Date fishing began for delivery Day
		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	187297	LB	Y	00991	G99018470	01	15
	✓	01	18	2	8	519	6534			59687	G00018471	01	16
✓		01	19	3	2	517	205639			08225	G00018472	01	15
✓	✓			4	2	517	258190			00101	G00018474	01	14
				5	8	521	849			36037	J98013626	01	17
	✓			6	6	519	11375			24255	G00018475	01	16
	✓	01	19	7	2	517	17396	LB	Y	32817	G00018477	01	16
		01	20	0	No deliveries, processing, observer present								
		01	21	0	No deliveries, No processing, Observer present								
		01	22	8	8	519	736	LB	Y	59687	J97013627	01	18
✓	✓	01	22	9	2	517	237692		Y	08225	G00018473	01	20
✓		01	22	10	6	519	6275		Y	53247	G00018478	01	20
		01	23	11			1057649	LB	U	06525		01	17
		01	24	0	No deliveries, processing, observer present								
		01	25	0	Released from plant to do 2 day trip on vessel Aleutian Spray								
		01	27	0	Returned to plant, no deliveries								
	✓	01	28	12	2	517	166239	LB	Y	00991	G00018479	01	25
	✓	01	29	13	2	517	213322			08225	G00018480	01	24
				14	7	519	490			57765	G00018481	01	27
				15	1	517	134520			23131	G00018483	01	26
				16	1	517	113692			59838	G00018482	01	27
✓	✓	01	29	17	2	517	205394	LB	Y	00991	G00018484	01	27
		01	30	No deliveries, still processing, observer present									

National Marine Fisheries Service / North Pacific Groundfish Observer Program

Revised 1/1/2001

Figure 8-5: Form A - Plant Delivery Form

Form A- Plant Delivery Form Instructions

You must maintain and bring back paper copies of the Form A, even if you are at a plant equipped with ATLAS!

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, try to locate the Coast Guard number or the NMFS permit number. These numbers will help NMFS staff find the ADF&G number when you debrief.

- **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 Form 7 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 processor logbook 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 Form 7 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:** 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-32, A-33, and A-34.

- **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

- **Was all groundfish weighed?:** Enter Y, N, or U (for unknown) to indicate if all groundfish **delivered** to the plant was actually weighed. If you enter an "N" or "U," you must note why all fish was not weighed, or why you are unsure, in your logbook. For normal groundfish deliveries, enter "Y" if all species delivered were weighed. For halibut IFQ deliveries, enter "Y"if all species other than halibut were weighed. For more information on the recording of halibut IFQ deliveries, see page 8-13.

- **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. Do not enter Coast Guard or NMFS permit numbers in this field. If these are the only numbers available to you, leave this column blank and make note of which vessel the delivery is from.

- **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.

- **Date fishing began for delivery:** Record the date on which each delivering vessel first set gear for this delivery. You can obtain this date from the vessel's log, from a vessel observer, or by asking the captain of the delivering vessel.

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 or NMFS area 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, the ADF&G number of the tender vessel, and the date fishing began for delivery (see Figure 8-5).

Halibut Deliveries

IFQ vessels generally offload by brailer

When IFQ boats fish for halibut, they are required to keep all incidental catch of rockfish, and abide by IR/IU regulations by keeping some or all pollock and Pacific cod. 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 the delivery 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 and let them know how you are obtaining delivery weights, and what they include. The orientation of the plant should include:

salmon set aside during a whole haul

- 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 location of the office, phone, fax machine, and computer, and
- where they can obtain verified delivery weights and messages from you.

You will 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

monitoring the offload for prohibited species

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.

As a plant Observer, you are responsible for checking the after-scale area after each offload if the vessel Observer needs to return to sea. Unlike whole-haul samples on factory vessels, in which all fish need to be caught at the sampling location, some prohibited species may slip by vessel Observers and sorters during an offload at the plant. These fish will turn up in the after-scale area, and need to be accounted for by the vessel Observer. Record the species, length, weight, and sex of prohibited species found in after-scale area and give these data to the vessel Observer with the rest of their delivery information.

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

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, delivery that was not size sorted at sea based on the priority lists below. During some fisheries, you may get many deliveries that fit the following criteria, however you should not collect more than 150-200 lengths per day, even if more could be done! You need to take lengths from deliveries meeting the following criteria:

- The delivery is from a vessel 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 the roundfish 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 exception to this rule is for the flatfish fishery (see "Requested Flatfish in Order of Priority" on page 8-17). If all roundfish deliveries are sorted at sea, do not take lengths.

- Take lengths and otoliths from at least **four** deliveries each day, whenever you have four or more vessels which meet the above criteria.

- Note that plant observers **do not** collect pollock length-weight samples.

If more than one preferred target species is delivered, you should take lengths from each delivered 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 all roundfish deliveries are sorted 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

cutting Pacific cod

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.)

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.

Requested Flatfish in Order of Priority

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.	*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 out the Form 7 according to standard directions (see page 9-21). Use the delivery completion date on your Form 7, 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, and should be collected from every delivery from which you take lengths. Follow the length priority tables on page 9-8 to determine which species to collect lengths and otoliths from. It is preferred that you take otoliths as a subset of your length frequency sample, but if you are unable to, the fish you use for your collection must be randomly chosen. If you are unable to complete both a length and otolith collection for a delivery, the otolith collection takes priority.

Refer to "Taking Otoliths" on page 9-17 for collection methods. The number of otoliths you collect each day will depend on the number of target species being delivered to your plant. **You should try to collect at least 20 otoliths per day from four unobserved, unsorted deliveries.** During some fisheries, there may be many deliveries which fit the criteria for collecting lengths and otoliths, however you should not collect more than 25 otoliths per day, even if more could be collected. Collect otoliths according to the following frequencies:

- If only one species is being delivered that is 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.
- Try to collect otoliths from at least four deliveries per day that meet length frequency collection criteria, for a total of at least 20 otoliths per day.

Note that you should not take otoliths from arrowtooth flounder or trawl caught Pacific cod. Remember that if you are collecting otoliths from pot, jig, or longline caught Pacific cod, the fish will likely have been bled before delivery, you must divide the weight of the individual fish by the PRR of 0.98. Show your calculations in your logbook, and record the calculated weight on the 9US.

$$\frac{\text{bled weight of individual cod}}{0.98\ \text{PRR}} = \text{whole weight of cod recorded on 9US}$$

cutting Pacific cod for otolith removal

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 will be used, and are especially important for species which are targeted for a short amount of time. Vials from different species should be kept separately.

The 9US form should be filled out according to directions on page 9-24. 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. If you are asked to collect fish, please work with the plant personnel to obtain secure, easily accessible freezer space in which to store your collection. 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. When you are picking which fish to collect, try to choose fish which have just been delivered, and freeze them 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 Observer Program needs to verify any species reported outside these ranges.

Although fish collections are a common special project assignment, there are many projects that may be assigned. Contact a NMFS office if you have questions about your project, or if you are having difficulty completing it while keeping up with your other duties.

WHITE—Processor Copy, Keep in Logbook.
YELLOW—NMFS Copy, Remit.
GOLDENROD—Observer Copy

2000 SHORESIDE PROCESSOR DCPL PART I

SHORESIDE PROCESSOR NAME: ALASKA PROCESSORS INC.
MANAGER NAME AND SIGNATURE: JOE MANAGER Joe Manager
WEEK ENDING DATE: 02-19-00 PAGE: 40
ADF&G PROCESSOR NO.: 39246
FEDERAL PROCESSOR NO.: 3921

IDENTIFICATION

INACTIVE		ACTIVE, NOT RECEIVING OR PROCESSING	✓	START	END	REASON
				2-18-00	2-19-00	NON-Groundfish Deliveries only

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

FEDERAL REPORTING AREA: 517 — Trawl Gear Only: ☒ COBLZ ☐ RKCSA

OBSERVER

NO. OF OBSERVERS ONSITE	DATES PRESENT	OBSERVER NAME AND CRUISE #
1	2-13 to 2-19	CRIS P OBSERVER 6715
	DATES PRESENT	OBSERVER NAME AND CRUISE #

MANAGEMENT PROGRAM (CHECK ONE): ☐ CDQ ☐ Research Program ☐ IFQ ☐ Experimental Fishery ☐ AFA Co-op
ENTER NUMBER

DELIVERY INFORMATION

DATE OF DELIVERY	CV or BS	RECEIVE DISCARD REPORT	NAME	ADF&G NO.	RECEIPT TIME	GROUNDFISH DELIVERY WEIGHT (LB OR MT)	FISH TICKET #
2-13	CV	Yes	ALASKA DAWN	62537	1000	63972	60001843
2-13	CV	Yes	OCEAN HARVESTER	31204	1100	822	60001844
2-13	CV	Yes	JAMIE MARIE	58330	1900	72963	60001845
2-13	CV	Yes	BARBARA 5	44971	2345	23692	60001846
2-14	CV	Yes	ROYAL AMERICAN	40840	0030	82391	60001847
2-14	CV	Yes	PACIFIC FURY	00033	0600	26392	60001848
2-14	CV	Yes	TONQUIN	00054	1030	14326	60001852
2-14	CV	Yes	COLUMBIA	39056	1800	106830	60001853
2-14	CV	Yes	CONSTITUTION	19267	2345	13462	60001851

DELIVERY INFORMATION (CONTINUED)

DATE OF DELIVERY	CV or BS	RECEIVE DISCARD REPORT	NAME	ADF&G NO.	RECEIPT TIME	GROUNDFISH DELIVERY WEIGHT (LB OR MT)	FISH TICKET #
2-15	CV	Yes	BARBARA 5	44971	1300	17682	60001854
2-16	CV	Yes	ALASKA DAWN	62537	0400	54326	60001855
2-16	CV	Yes	PACIFIC FURY	00033	1800	40619	60001856
2-17	CV	Yes	ROYAL AMERICAN	40840	0030	0030	60001857

LANDINGS (Indicate ☒ lb or ☐ nearest 0.001 mt)

	Species Code	110	110	270	270	270	710	154	141	143
	Product Code	2	8	30	23	14	8	7	7	7
SUN										
MON		2740	3682	141260	29539	10814		75	75	398
TUES		3629	452	213964	11894		13462			
WED		592	17040							
THUR		326	13256	40682	37835	2847				
FRI		NO PRODUCTION								
SAT										
WEEKLY CUMULATIVE TOTAL										

For groundfish and Pacific herring, indicate lbs. or nearest 0.001 mt
For Pacific halibut, Pacific salmon, king crab and Tanner crab, record in numbers

Indicate pounds (lb) ☒ or metric tons (mt) ☐

DISCARDS/DISPOSITION

	Species Code	200	235	235	410	410	410	450	450	450
	Product Code	99	99	98	86	98	99	86	98	99
SUN										
MON										
TUES		6	140	280	23	2	13	93	—	14
WED		23	75	—	46	1	2	462	12	21
THUR		NO DISCARDS								
FRI		NO DISCARDS								
SAT										
WEEKLY CUMULATIVE TOTAL										

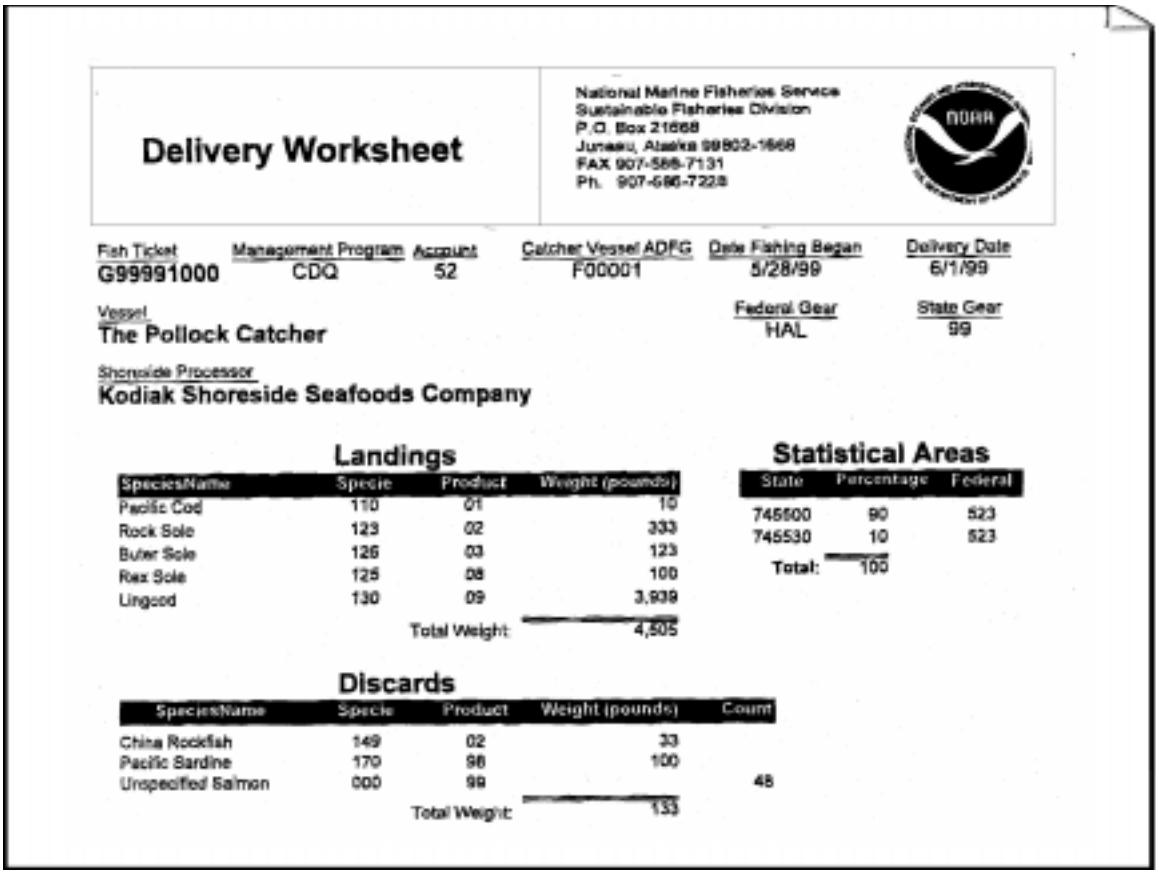
Figure 8-6: Shoreside Processor Daily Cumulative Production Logbook

Checking Plant Logbooks and Delivery Worksheets

Processing plants are required to maintain either a paper or electronic NMFS log. The paper version is shown in Figure 8-6, and the printout from the electronic version is shown in Figure 8-7. You should compare the NMFS Plant Daily Cumulative Production Log against your Form A. These logs are used by plant personnel to prepare the plant's Weekly Production Report, which is sent to NMFS and 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 paper 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).



Delivery Worksheet

National Marine Fisheries Service
Sustainable Fisheries Division
P.O. Box 21668
Juneau, Alaska 99802-1668
FAX 907-586-7131
Ph. 907-586-7228

Fish Ticket	Management Program	Account	Catcher Vessel ADFG	Date Fishing Began	Delivery Date
G99991000	CDQ	52	F00001	5/28/99	6/1/99

Vessel: The Pollock Catcher

Federal Gear	State Gear
HAL	99

Shoreside Processor: Kodiak Shoreside Seafoods Company

Landings

SpeciesName	Specie	Product	Weight (pounds)
Pacific Cod	110	01	10
Rock Sole	123	02	333
Butter Sole	126	03	123
Rex Sole	125	08	100
Lingcod	130	09	3,939
		Total Weight:	4,505

Statistical Areas

State	Percentage	Federal
745500	90	523
745530	10	523
Total:	100	

Discards

SpeciesName	Specie	Product	Weight (pounds)	Count
China Rockfish	149	02	33	
Pacific Sardine	170	98	100	
Unspecified Salmon	000	99		48
		Total Weight:	133	

Figure 8-7: Electronic Printout of Plant Logbook

Check the printout from the electronic log for the following:

- The Fish Ticket number and Delivery Date should be checked to ensure that they correspond to the Form A information that you collected independently.
- The Landings section should be checked for the total delivery weight.
- The Discards section should be checked to verify that the Delivery Worksheet reflects the species groups you know to be discarded by the vessel (product code 98) and by the plant (product code 99).

Weekly Plant Report Form

If your vessel is equipped with ATLAS, send your messages weekly unless otherwise instructed. Sending more frequently is always acceptable.

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 8-8: Weekly Plant Report Form (example)

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.

Figure 8-9: Weekly Plant Report Form

FISH MEASUREMENT AND OTOLITH COLLECTION

List of Priorities

- Collect otoliths from randomly selected fish from your length frequency sample. If you are unable to collect length frequencies and otoliths, the otolith sample takes precedence, and may be done outside a length frequency sample.
- Collect length frequencies from species, according to the table on page 9-8.
- Collect length-weight information from Bering Sea pollock.

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Introduction

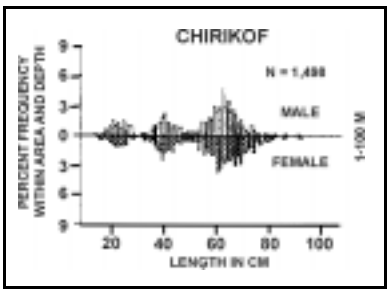
Fish measurements and otolith collections are used by NMFS fisheries biologists to determine the relative abundance of each year class of predominant and selected bycatch species. Fish measurement data provide information on the abundance of fish in each size category, while otolith and/or scales provide corresponding age information. The age/length relationship of a species may change from year to year and may be quite different for each sex of a species.

Goals for Biological Data Collection

The goal is to determine the sex and record the length for approximately 20 fish of the predominant species for each sampled haul, and to collect a very small number of otoliths from a subset of the measured fish (no more than 7 pairs of otoliths will be collected from any sampled haul). This means that a variable number of “sexed 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).

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.

Uses of Biological Data



frequency of length at depth

Researchers and resource managers use the length and sex data you collect 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. Otoliths are read to determine the age of the fish, then the data are combined with the fish length and weight to provide length-age ratios. Length measurements 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 health of the stock 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 measurement samples and otolith collections refer to the following guidelines:

- where a predominant species is listed on the otolith priority list in 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

Before you begin collecting fish for length measurement samples, 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.

All Observers on all vessels are to collect length-frequency samples. 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. Predominance is determined by your visual estimate and you do not need specific weights or numbers of organisms to determine which species to measure.

If you collect northern/southern rock sole lengths from your species composition sample, please list these fish as northern/ southern rock soles on the 3US as well.

Measure approximately 20 fish per sampled haul/set. Fish may be collected outside of your species composition sample if necessary. Samples of selected species should be collected in a random fashion for length measurement and otolith collection. When basket sampling, the easiest way to collect fish for length samples is to randomly select one or more baskets from your basket sample, then measure all of the fish in the basket(s). If you are whole or partial haul sampling, randomly collect unsorted catch for the required subsample of the predominant species and sort out all of the selected fish in one or more baskets. Use these subsamples of selected species for your length samples. Determine the sex of all of the measured fish. If you cannot determine the sex of all the of the fish, determine the sex of a random subsample of the measured fish. Record the unsexed fish lengths with a “U” in the sex column on the Form 7.

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. Under no circumstance, should you select 20 fish by hand from your sorted composition sample. You may collect sexed fish lengths from inside 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.

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 random systematic sampling system to determine which sampled hauls to collect otoliths from. Pick a haul or set at random to start your otolith samples. For example; 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 hth 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.

Ideally, your otolith collection will come from your length collection. However, since otoliths are a higher priority than lengths, there may be times when you have only an otolith collection. If this occurs, record your otolith sample as a small length frequency so that the sample appears on both your 7US and your 9US.

If you miss a sampled haul for some reason, collect otoliths from the next sampled haul; do not skip the otolith collection. Do not start counting hauls again if you switch vessels. For example if you randomly choose haul 3 to begin taking pollock otoliths, but then the vessel only fishes two hauls, you would take otoliths from the next sampled tow on your next vessel assignment.

It may be difficult to track what otoliths to collect, especially if the predominant species the vessel is catching changes often. One way to track when to collect otoliths is to use the Observer Sampling Record in your logbook. Enter the haul numbers, whether the haul was sampled or not and the predominant species that you measured for each haul. Determine from which hauls you will be collecting otoliths by reviewing this chart. For example, you are sampling all hauls, you chose the third haul to begin otolith sampling, and are fishing in the Gulf of Alaska. The predominant species is arrowtooth flounder, so you measure arrowtooth for the first two hauls. Haul 3 is an otolith haul and otoliths are not collected from arrowtooth, so you must measure and collect otoliths from the second most predominant species. You peer over your sample and it looks like rock soles and flathead occur in equal amounts. Since rock soles are higher in priority, you randomly collect approximately 20 fish and key them to northern and southern rock sole while you measure and sex them. Additionally, you collect 5 pairs of otoliths from randomly selected fish from your length sample, regardless if they are northern or southern rock sole and record the samples appropriately.

OBSERVER SAMPLING RECORD
(OPTIONAL)

VESSEL NAME Aurora Borealis (Gulf of Alaska fishery)

Haul Number	Sampled (Y/N)	Species
1	No, watched operations	Arrowtooth
2	Yes, will sample all hauls now	Arrowtooth
3	Yes, first otolith haul	N/S rocksole (2nd predom) (took otoliths)
4	Yes	Arrowtooth (1)
5	Yes	Pacific cod
6	Yes	POP (took otoliths)
7	Yes	Arrowtooth (2)
8	Yes	Arrowthooth (3)
9	Yes	Arrowtooth (4)
10	Yes	Flathead sole (2nd predom) (took otolths)

Collect otoliths from the selected sampled haul using a random or random systematic method. Never use a haphazard method or hand pick your fish. For a random method simply number you length sample fish from one to the total number, then randomly pick the number of fish from which you need otoliths. For a random systematic method. 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 +2x, k+3x, 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 = 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.

Predominant Species	Size and frequency of length samples	Frequency of otolith samples	Number of otolith pairs to be collected
Bering Sea pollock	~20 from every sampled haul/set	every 5th sampled haul/set	2 otoliths & length-weight samples from the rest of the length sample fish
Gulf of Alaska pollock	~20 from every sampled haul/set	every sampled haul/set	4
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	3
Atka mackerel	~20 from every sampled haul/set	every sampled haul/set	4
Pacific hake	~20 from every sampled haul/set	every 5th sampled haul/set	5
Bering Sea flatfish 1st - yellowfin sole 1st - N/S rock sole 2nd - Greenland turbot 3rd - flathead sole 3rd - Alaska plaice	~16 of the most predominant species from every sampled haul **AND** ~4 of another flatfish species on this list from every sampled haul	every 5th sampled haul/set	4 from the most predominant species **AND** 1 from your second measured species
Gulf of Alaska flatfish 1st - N/S rock sole 2nd - Dover sole 3rd - flathead sole 4th - rex 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 of the most predominant species from every sampled haul **AND** ~8 of another rockfish species on this list from every sampled haul	every sampled haul/set	5 from the most predominant species **AND** 2 from your second measured species

Table 9-2: Otolith and Length Sampling Priorities

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 “Otoliths” on 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 for length-weight samples were from the otolith samples. The number of otoliths required from the Bering Sea pollock fishery has been reduced from previous years collections. 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 Form 9US** with a specimen type of 3 “Length-weight Sample.” When you take both length-weights and otoliths from the same set, all the fish that were in your length frequency sample should also be recorded on a Form 9US. You must be very careful that the data from your **otolith fish do not appear on your length-weight Form 9US!** Each fish must be recorded as **either** an otolith sample or a length-weight sample, but must never be recorded as both!

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 Form 7, 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 vent. 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.

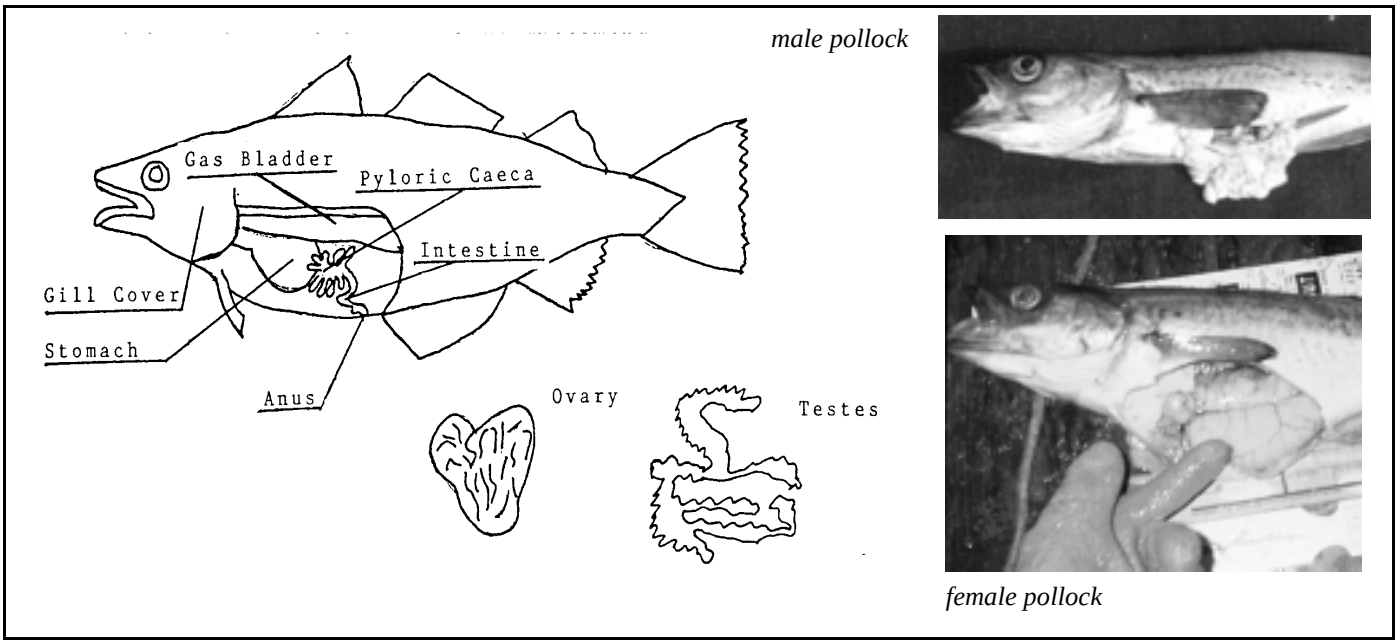


Figure 9-1: Diagram and Photo of Male and Female Pollock Gonads

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

When checking the number of gonad "lobes," you must look at the posterior part of the gonad. The lobes of males are fused at the anterior point of the gonad, and you may mistake the fish for a female!

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 posterior 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 correct number of lobes. It is important to count the lobes at the posterior portion of the gonad, since the lobes will be fused anteriorly and will always look like two lobes.

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 non-ripe 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.

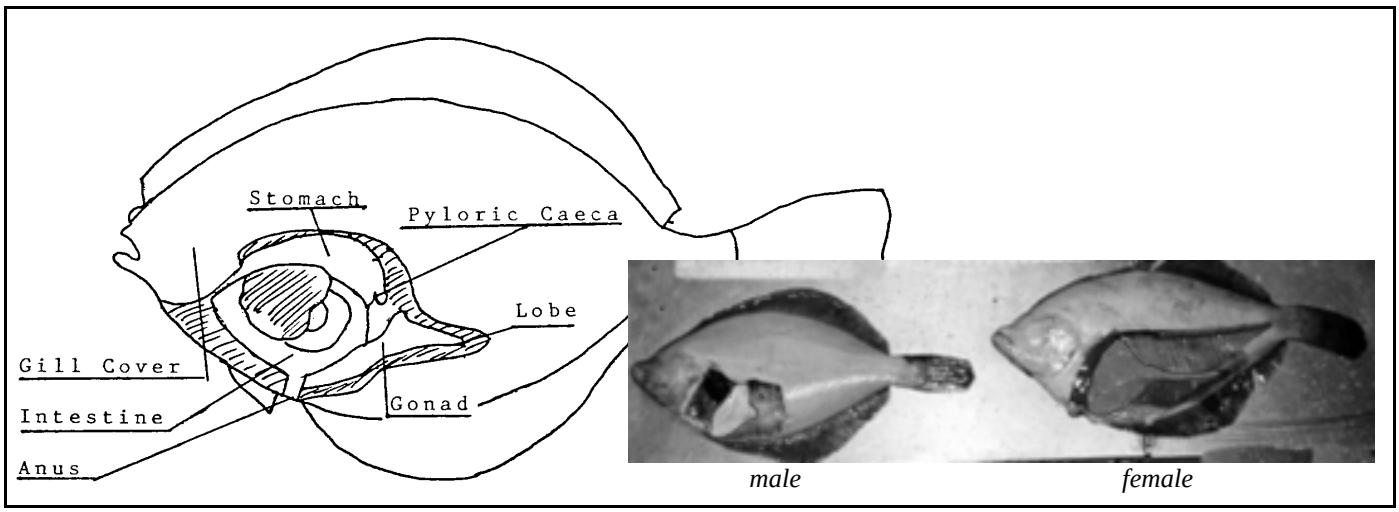


Figure 9-2: Diagram of Flatfish and Photo of Male and Female Flatfish Gonads

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.

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)

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. 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.

Measuring Fish

Fork length is the fish length measurement method used by the Observer Program and by NMFS researchers. Fork length is 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 (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.

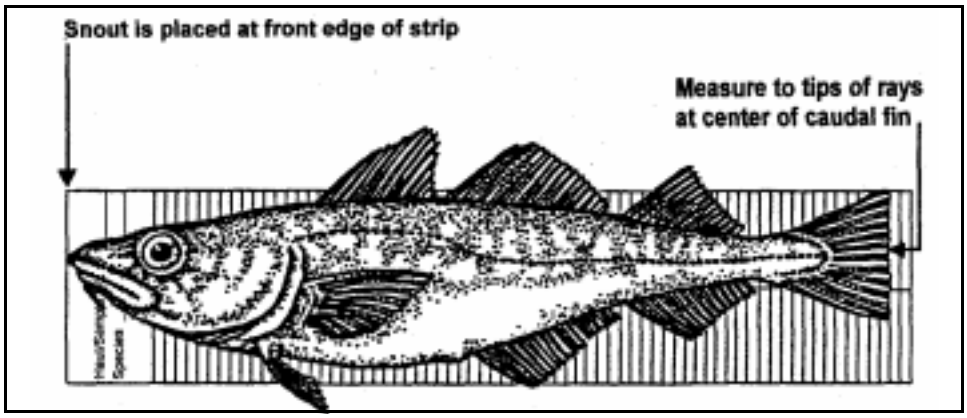


Figure 9-3: Measuring Fish

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. 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).

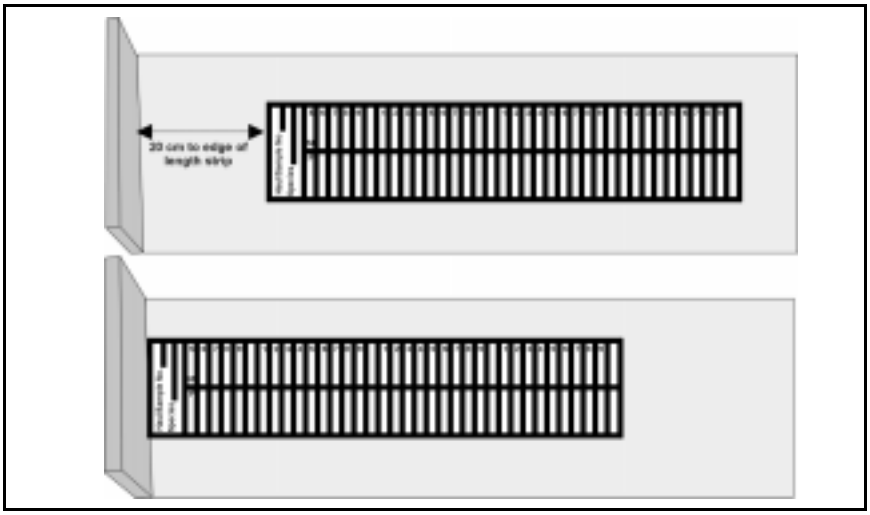


Figure 9-4: Measuring Strip Placement

The steps of measuring a fish follow:

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 (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).

measuring fish

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 7. 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 that the numbered vials match the data for that fish.** A mistake in the numbering used to relate the otoliths to associated biological data makes that sample useless.

First and second observers collect otoliths as one collection. All otoliths from both observers should be listed under the same cruise number. The primary observer is responsible for returning all data and specimens to debriefing.

The otoliths are located ventrally, and to either side, of the brain tissue, just above where the pre-operculum 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 pre-operculum, 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 (Figure 9-5). Species with tiny otoliths are best cut using the horizontal technique (Figure 9-6).

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!*

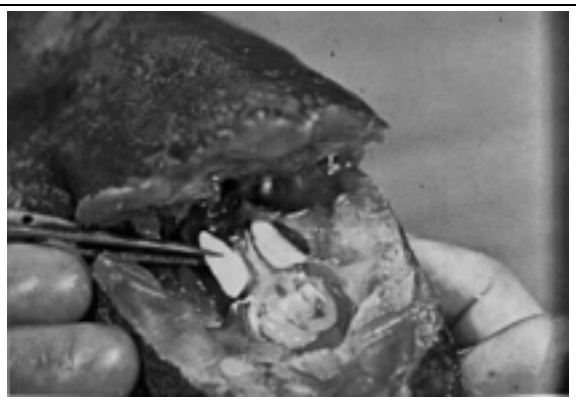
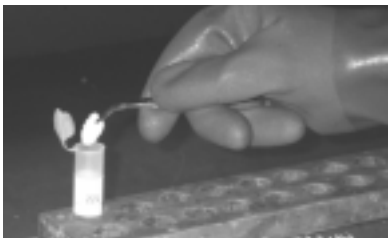


Figure 9-5: Location of Roundfish Otoliths

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.


placing otolith in vial

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 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.

Broken Otoliths

Otoliths are fairly fragile and must be in good condition to be read accurately. If you will be taking otoliths from a species from which you haven't collected them before, it is a good idea to practice during a non-otolith haul. Since these will only be practice fish, the otoliths should not be kept or recorded on any forms. Collect a variety of size fish and practice removing the otoliths. Try a variety of cuts and knife sizes until you feel comfortable.

Some otoliths may break or be cut accidentally during your real collection. Keep samples with otoliths that have a single break, if you have both pieces. **Discard samples with a shattered otolith or with only one otolith.** Do not replace the sample by taking otoliths from another fish in that haul.

Each time three or more samples from one species are lost or discarded you should collect otoliths from an additional randomly chosen haul to replace the discarded samples. You do not need to replace samples unless three or more are lost for that species during your cruise. Take the replacement sample from a non-otolith haul which was randomly selected. Document these circumstances in your logbook. If you run into problems of consistently breaking otoliths, contact an Observer Program office for advice.

Collecting Otoliths from Atka Mackerel and Sablefish

Sablefish and Atka mackerel have very tiny otoliths. Employ a horizontal cut method when working with these two 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 (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.

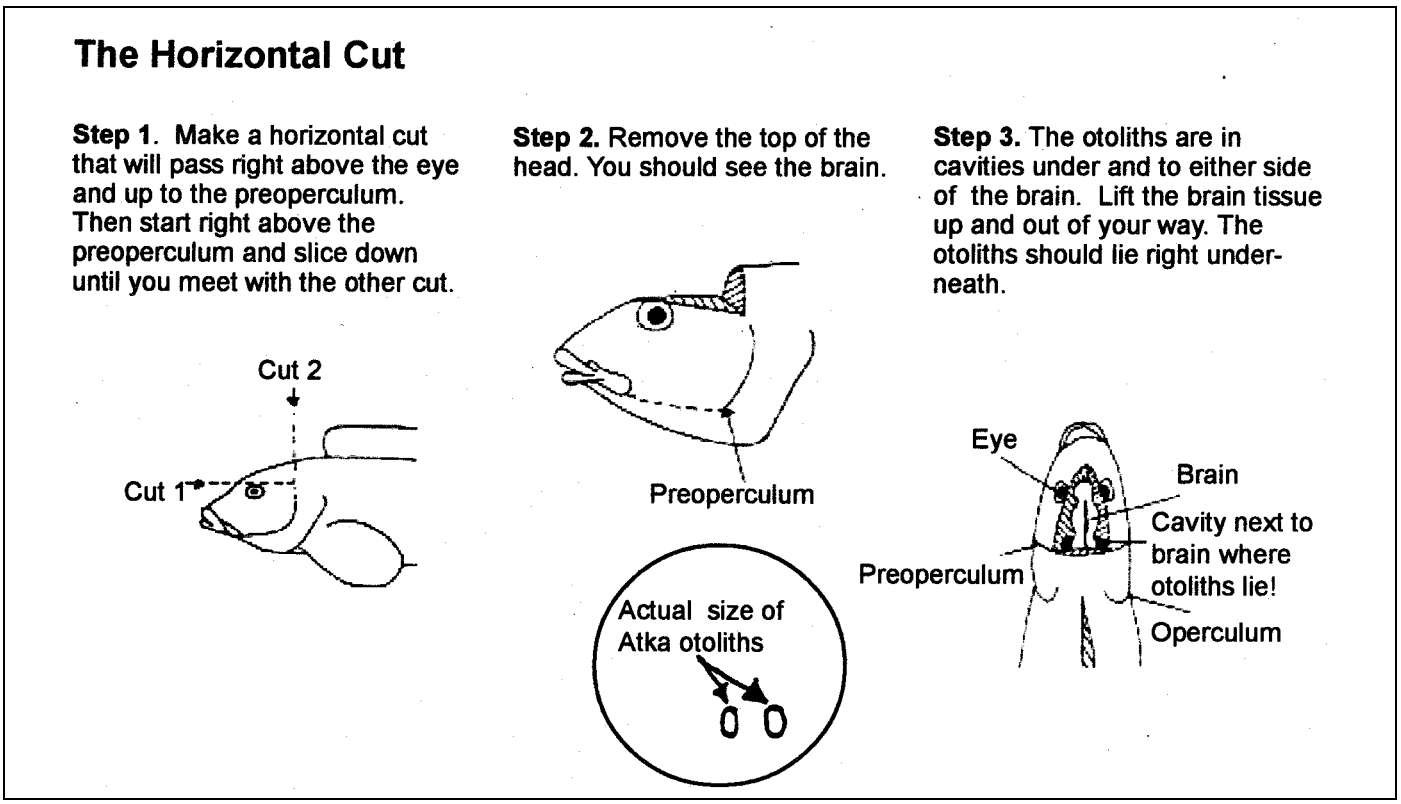
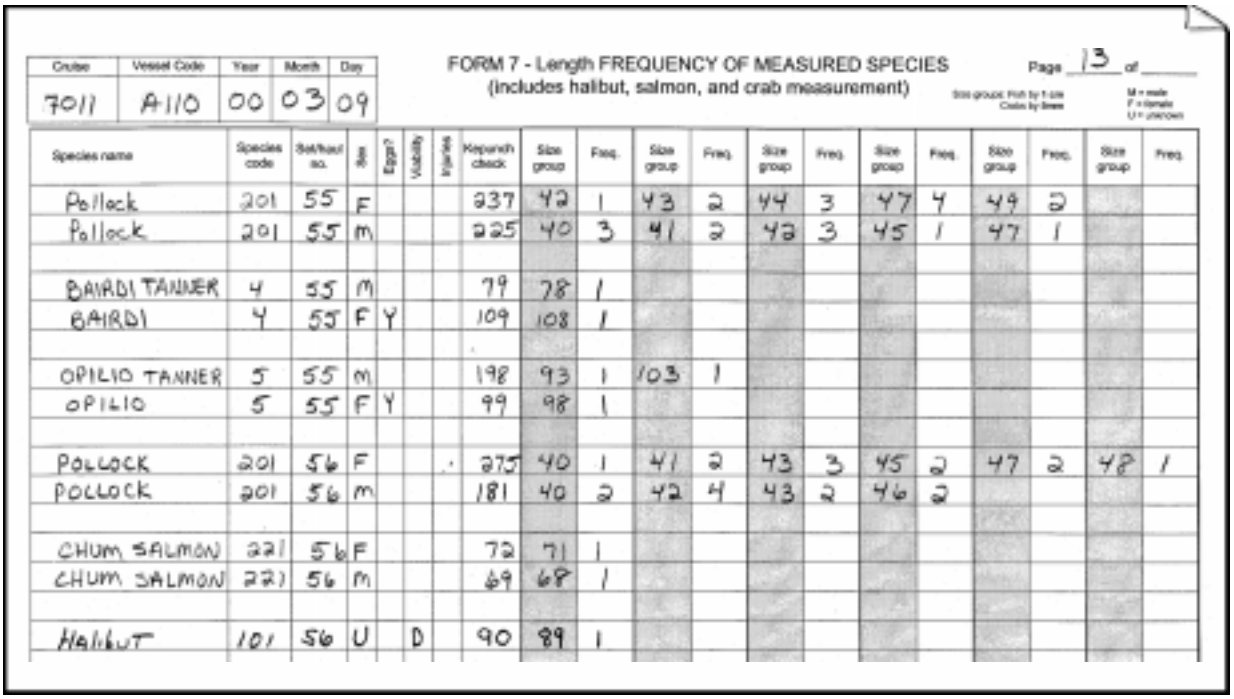


Figure 9-6: Horizontal Cut of Atka Mackerel



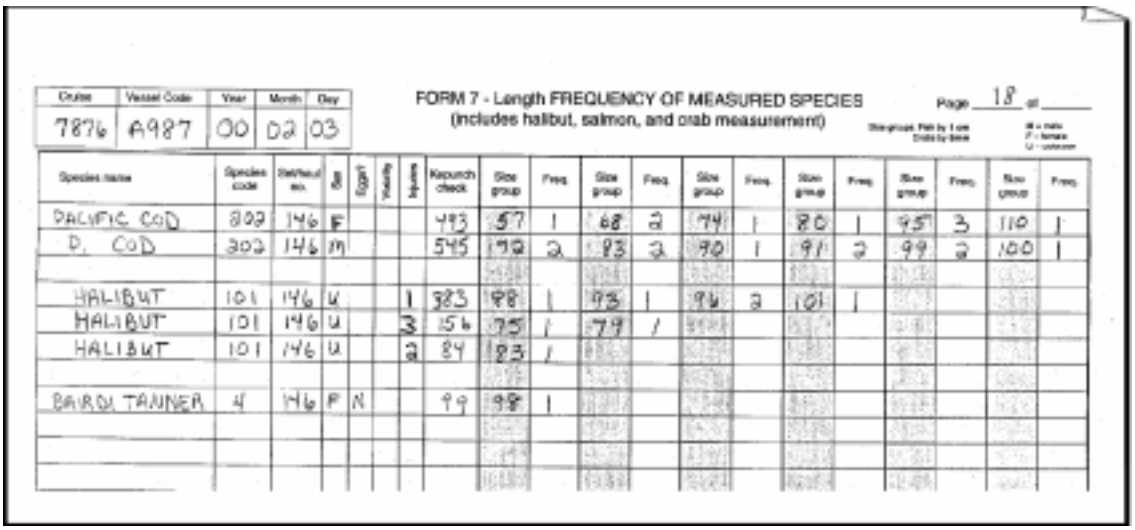
Cruise	Vessel Code	Year	Month	Day
7011	A110	00	03	09

FORM 7 - Length FREQUENCY OF MEASURED SPECIES
(includes halibut, salmon, and crab measurement)

Page 13 of

Species name	Species code	Set/haul no.	Sex	Eggs?	Viability	Injuries	Kepunch check	Size group	Freq.	Size group	Freq.	Size group	Freq.	Size group	Freq.	Size group	Freq.	Size group	Freq.
Pollock	201	55	F				237	42	1	43	2	44	3	47	4	49	2		
Pollock	201	55	m				225	40	3	41	2	42	3	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				181	40	2	42	4	43	2	46	2				
CHUM SALMON	221	56	F				72	71	1										
CHUM SALMON	221	56	m				69	68	1										
HALIBUT	101	56	U		D		90	89	1										

Figure 9-7: Form 7 - Length Frequency of Measured Species (trawl vessel example)



Cruise	Vessel Code	Year	Month	Day
7876	A987	00	02	03

FORM 7 - Length FREQUENCY OF MEASURED SPECIES
(includes halibut, salmon, and crab measurement)

Page 18 of

Species name	Species code	Set/haul no.	Sex	Eggs?	Viability	Injuries	Kepunch check	Size group	Freq.	Size group	Freq.	Size group	Freq.	Size group	Freq.	Size group	Freq.	Size group	Freq.
PACIFIC COD	202	146	F				493	57	1	68	2	74	1	80	1	95	3	110	1
P. COD	202	146	m				545	172	2	83	2	90	1	91	2	99	2	100	1
HALIBUT	101	146	U			1	383	98	1	93	1	96	2	101	1				
HALIBUT	101	146	U			3	156	75	1	79	1								
HALIBUT	101	146	U			2	84	183	1										
BAIRDI TANNER	4	146	F	N			99	98	1										

Figure 9-8: Form 7 - Length Frequency of Measured Species (longline vessel example)

Form 7 - Length Sampling of Measured Species Instructions

The paper Form 7 is used for recording the lengths of the target species, measurements of prohibited species, presence of crab eggs, and halibut viabilities/injuries. Never list estimated lengths on this form. Never proportion length data between hauls or sets unless they are lengths of prohibited species from pollock deliveries. 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.

- **Heading**: Fill in the cruise number and vessel code of your ship or plant. A list of these codes can be found on page A-23.

- **Date:** Fill in the date of the haul/set retrieval, or if at a plant, fill in the delivery date. This date should match the Vessel and Observer Haul forms, or Form A for that haul number. The date must be numerical and in the YY/MM/DD format. Use leading zeros when appropriate.

- **Page Numbers:** Number the pages "Page ___ of ___" starting with page one for each vessel or plant and ending with the total number of pages in the Form 7 set. Keep separate sets of Form 7s for each vessel or plant. Put your name and the ship name on the first page in each set.

- **Species Name:** Record the common name of the fish or crab.

- **Species Code:** Enter the species code of the species found on page A-1. The species code column is keypunched so use brackets and arrows if you need more than one line for that species.

Pollock catcher vessel Observers note - predominant species 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

- **Set/Haul No.:** Record the haul, set, or delivery number. Use arrows and brackets on continuation lines.

- **Sex:** In the Sex column, record the fish or crab sex as "F"(female), "M"(male), or "U" (unsexed or uncertain).

- **Viability:** For all halibut viability measurements list viability codes in this column. Use condition codes "E" (excellent), "P" (poor), "D" (dead), or "U" (condition not assessed).

- **Injury:** For all halibut injury assessments list the injury codes in this column. For more information, see Appendix Q. “Injury Criteria and Injury Key for Hook & Line Caught Pacific Halibut” on page A-43. Use one of the following injury codes:

  1 - Minor
  2 - Moderate
  3 - Severe
  4 - Dead/Sand Fleas/Bleeding
  9 - Unknown

- **Eggs?:** This 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. Use another line for female crabs that you do not know if there are eggs and enter a "U" in the column. Leave the column blank for male crabs and all fish.

- **Keypunch Check:** This column should contain the sum of all of the lengths and frequencies on that line. Sum this more than once to ensure it is correct.

- **Size Group:** 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.

- **Freq:** Frequency is the number of animals in the particular length group for that species, sex, and in some instances Eggs?, Viability, or Injury.

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 or fields except the date.

Form 9 - Biological Sampling Form

Page 2 of _____ for vessel

Cruise Number	Vessel code	Species Name	Species code	Specimen type	Sampling system
7011	A110	Pollock	201	1	2

	Date			Set/haul number	Specimen number	Sex	Length	Weight	Maturity stage	
	Year	Month	Day							
1	03	09	01	56	239617	M	40	.87		
2	03	09	01	56	239618	F	43	.92		
3								.		

Figure 9-9: Form 9US - Biological Sampling Form (otolith data)

Form 9 - Biological Sampling Form

Page 2 of _____ for vessel

Cruise Number	Vessel code	Species Name	Species code	Specimen type	Sampling system
7011	A110	Pollock	201	3	2

	Date			Set/haul number	Specimen number	Sex	Length	Weight	Maturity stage	
	Year	Month	Day							
1	03	09	01	56	19	M	40	.70		
2					20	M	42	.72		
3					21	M	42	.68		
4					22	F	43	.68		
5					23	M	43	.70		
6					24	F	48	.84		
7					25	F	41	.65		
8					26	F	43	.76		
9					27	M	46	.82		
10					28	F	47	.83		
11					29	F	45	.66		
12					30	F	41	.66		
13					31	M	42	.60		
14					32	M	43	.66		
15					33	M	46	.74		
16					34	M	40	.63		
17	03	09	01	56	35	F	45	.68		
18								.		

Figure 9-10: Form 9US - Biological Sampling Form (length/weight data)

Form 9US - Biological Sampling Form Instructions

The Form 9US- Biological Sampling Form is used for otolith collections, pollock length-weight collections, and salmon scale collections by all Observers.

Keep separate groups of pages for each species and specimen types. Do not list one specimen type by 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 form 9USs 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.

- **Heading:** Fill in your cruise number and vessel code in the first two boxes.

- **Specimen type:** Record the specimen type code from this list:

  1 - otoliths only
  2 - salmon scales
  3 - lengths and weights only
  8 - maturity only
  9 - maturity and age structures

- **Sampling system:** Record the Sampling System. There is only one valid sampling system for 2001:

  2 -Random: This is the most common system. Fish are chosen using a random sampling frame. No stratification is made by size or sex.

- **Date:** Fill in the date of the haul/set retrieval, or if at a plant, fill in the delivery date. This date should match the Vessel and Observer Haul forms, or Form A, for that haul number. Use leading zeros in dates to record month, day, and year to two digits.

- **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 specimen type, species and ship.

- **Specimen number:**

  Otoliths: Copy the bar coded specimen number on the otolith vial for each pair of otoliths taken for that haul.

  Salmon Scales: Label your salmon scale envelopes (see page 10-11) 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.

  Length/Weight: For each length/weight recorded, create a specimen number that does not match any otolith specimen number. An easy method is to choose a number 500 greater than your highest otolith collection vial number. Thus if your otolith vials end at 100 start your length/weight specimen number at 600. Number your length/weight specimen consecutively from the starting number.

- **Sex:** Try to 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. Weigh fish for otolith samples on the brass 2kg, 5 kg, or 12 kg scales, or your motion compensated platform scale. Do not use the 50 kg salter scale for individual fish weights unless the fish is over 12 kg and you do not have access to a motion compensated!

- **Maturity Stage:** Leave this column blank unless otherwise instructed.

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 or injuries.
- Collect salmon scales.

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Introduction

Certain species can not be retained when fishing in particular fisheries and are referred to as prohibited species. This group includes 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, with the exception of herring

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 to monitor 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 estimate 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 estimate 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.

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 7. Data from salmon scale collections will be recorded on Biological Sampling Form 9.

Subsampling

All fish and crab listed on Form 7 or Form 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 “Collecting Fish for Length and Otolith Samples” on page 9-3 for instructions on 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 10-2.

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 North Pacific Fisheries Management Council 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 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

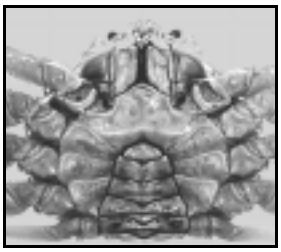
If you see more than 100 king crab, measure and sex 50-100 randomly selected king crab. These crab do not need to come from the composition sample as long as they are randomly collected. The Alaska Department of Fish and Game needs more length data from the incidentally caught king crab to design time-area 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.

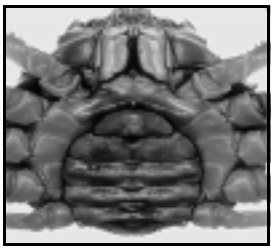
- Female king or Tanner crab have an abdominal flap that completely covers the carapace bottom. It will be round and extend to the leg insertions on mature females. If you lift the flap slightly, you can determine if the females are carrying eggs.

- 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

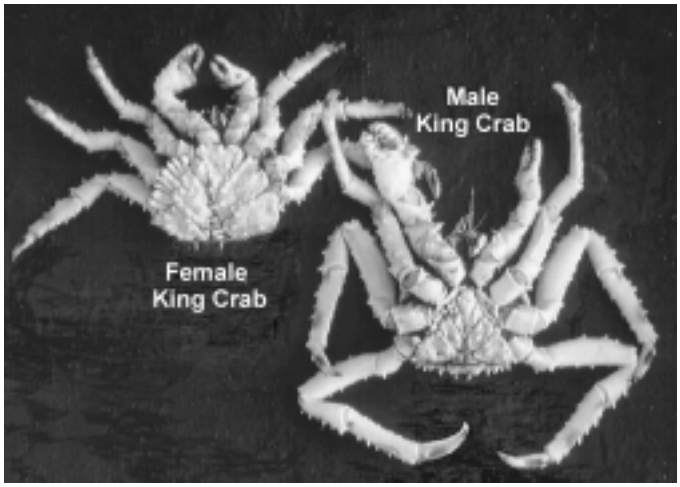


Figure 10-2: Female and Male King Crab

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 (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.

- 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 10-3).

- 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 Form 7 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.

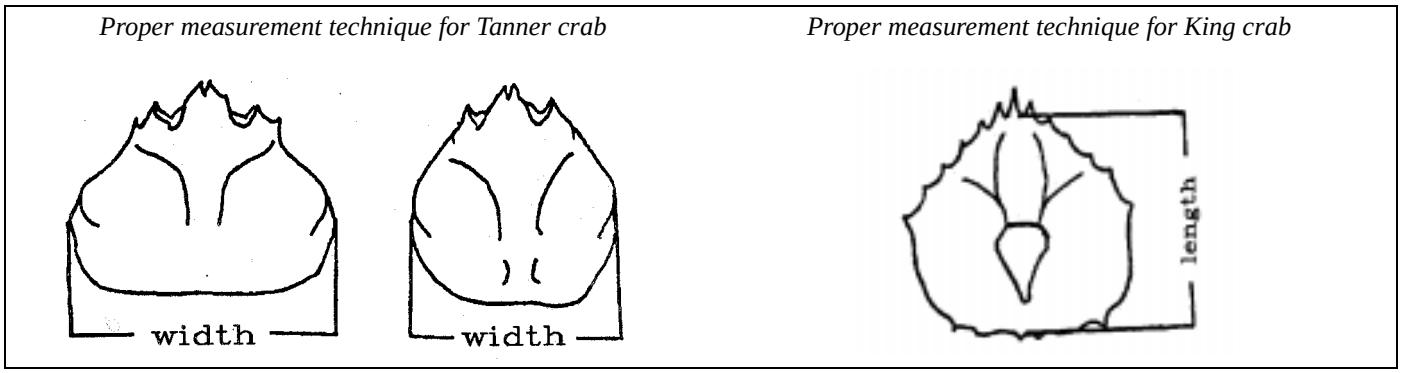


Figure 10-3: Measurement Techniques for Crab

Transferring Measurement to the Plastic Sheet

measuring crab

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 Form 7. This could result in a total of three lines on the Form 7 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 on Trawl and Pot vessels

Introduction

Complete halibut tasks in the following order of priority:

- Determine species composition
- Measure halibut and assess halibut viability at the point of discard (a maximum of 20 per day) from sampled sets. (The individual fish may be from either inside or outside your composition sample.)
- Check for tagged halibut

Tasks for halibut data collection on a longliner are discussed on page 6-22 of the longline section. The following discussion on halibut data collection is only for trawl and pot vessels.

Species Composition

Count and obtain the total weight of Pacific halibut in your composition sample. Halibut are never sexed by Observers for species composition and should only be sexed for certain special projects.

Measurements and Viability Assessment

Viabilities without a corresponding length **cannot** be used, but lengths without viability **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 use the dichotomous keys in Appendix O. “Viability Key and Criteria for Trawl Caught Pacific Halibut” on page A-37 for trawlers and the dichotomous keys in Appendix P. “Viability Key and Criteria for Pot Caught Pacific Halibut” on page A-40 for pots. 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. The only exception to this rule is for halibut found when whole hauling at a plant in the pollock fishery and you are proportioning halibut to unsampled hauls. These halibut should be listed on the Form 7s as if the haul was sampled.

Technique for Measuring Halibut

All halibut are measured by fork length, see the definition of fork length in your Species Identification Manual or see page 9-15 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 7. Even though there are instructions for estimating halibut lengths in order to obtain approximate weights beginning on page 6-23, never record estimated lengths on the Length Frequency Form.

Determining the Viability of Trawl and Pot Caught Halibut

On trawl and pot vessels the guidelines listed below must be followed, or the data collection cannot be used.

- Halibut lengths and viability assessments 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, for trawlers use the dichotomous key in Appendix O. “Viability Key and Criteria for Trawl Caught Pacific Halibut” on page A-37. For pot vessels use the dichotomous key in Appendix P. “Viability Key and Criteria for Pot Caught Pacific Halibut” on page A-40.

- 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 and When to Sample for Viability

Example 1: An Observer on the factory trawler F/T Aurora borealis has two possible locations in the 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.

Example 2: An Observer is on the shoreside catcher only vessel F/V Pit Bull 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 a 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 Figure 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 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.

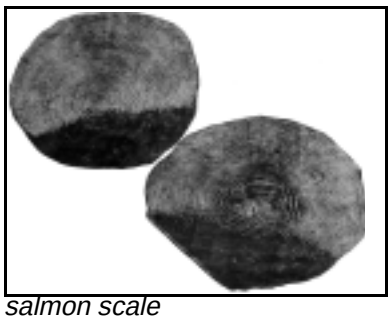
Sexing Salmon for Terra Marine

Some shoreside and floating processors retain delivered salmon bycatch for a food donation program called Terra Marine. If a plant your vessel delivers to participates in this program, it is preferred that you sex salmon with a cut from the anus to the isthmus so as not to damage the product.

Length Measurement

Measure all salmon within your composition sample to the fork length (see "Measuring Fish" on page 9-15). 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 Form 7. Do not measure salmon from outside of your species composition sample. The salmon recorded on the Form 7 must be the same salmon recorded on the 3US form. The only exception to this rule is for salmon found when whole haul sampling from Prohibited species at a plant in the pollock fishery and you are proportioning salmon to unsampled hauls. These salmon should be listed on the Form 7s as if the hauls were sampled.

Scale Sample Collection


salmon scale

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.

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 Form 7s and Form 9USs.

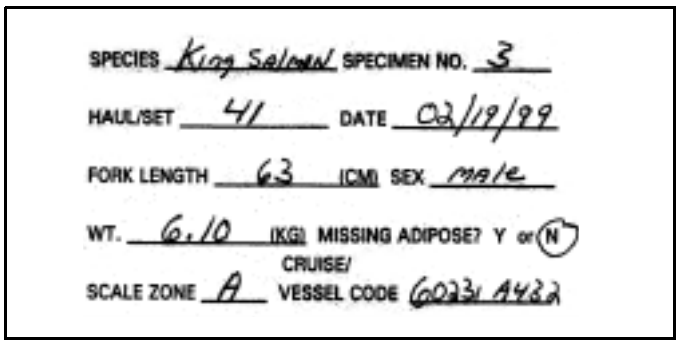

SPECIES King Salmon SPECIMEN NO. 3
HAUL/SET 41 DATE 02/19/99
FORK LENGTH 63 (CM) SEX male
WT. 6.10 (KG) MISSING ADIPOSE? Y or N
SCALE ZONE A CRUISE/ VESSEL CODE 6023/ A432

Figure 10-4: Salmon Scale Envelope

The salmon scale sampling guidelines are: -

- Only record data on the Form 7s and Form 9USs from salmon that are within your salmon prohibited species composition sample including whole haul samples at plants.

- Outside of your prohibited species 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 prohibited species composition samples, do not record the length and weight data on Form 7 or Form 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 10-5). 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.

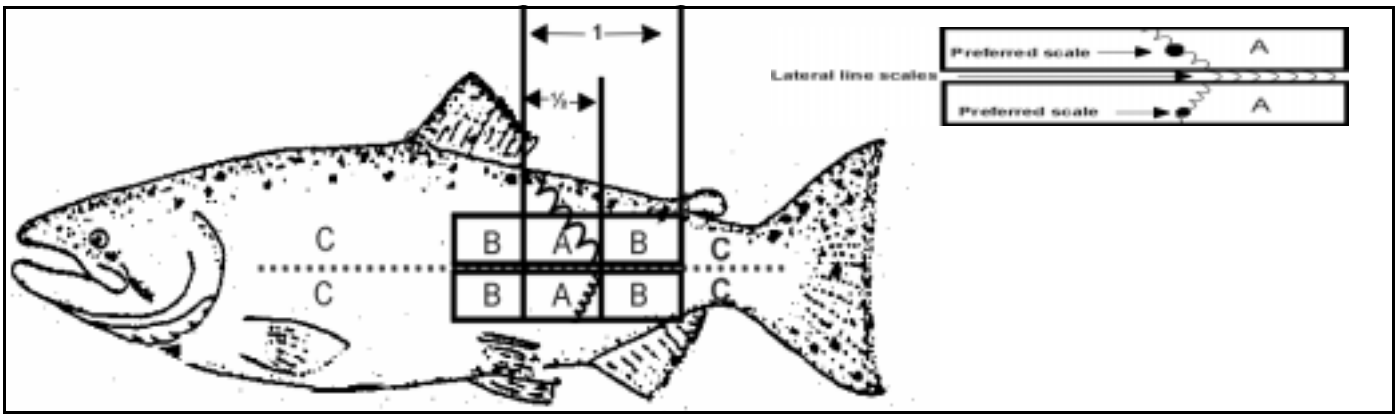


Figure 10-5: Salmon Scale Collection Zones

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 Form 7 nor Form 9USs.

- 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.

For instructions on how to fill out the Form 9 Biological Data, see "Form 9US - Biological Sampling Form Instructions" on page 9-24.

ONLY RECORD SALMON SCALE DATA ON THE FORM 9 FROM SALMON FOUND IN YOUR SAMPLE!

Form 9US - Biological Sampling Form Page 2 of _____ for vessel

Cruise Number	Vessel code	Species Name	Species code	Specimen type	Sampling system
6023	A432	King Salmon	222	2	2

	Date			Set/haul number	Specimen number	Sex	Length	Weight	Maturity stage	
	Month	Day	Year							
1	02	18	00	43	3	M	63	6.10		
2	02	18	00	43	4	F	59	2.50		
3	02	18	00	43	5	F	55	2.10		
4	02	18	00	43	6	M	62	3.20		
5	02	18	00	43	7	M	64	3.60		
6										
7	02	19	00	44	8	F	55	2.00		
8	02	19	00	44	9	F	78	5.40		
9	02	19	00	44	10	M	55	1.80		
10	02	19	00	44	11	M	68	3.60		
11	02	19	00	44	12	F	70	4.40		

Figure 10-6: Form 9US - Biological Sampling Form (salmon scale data)

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: Salmon Snout Tag

.

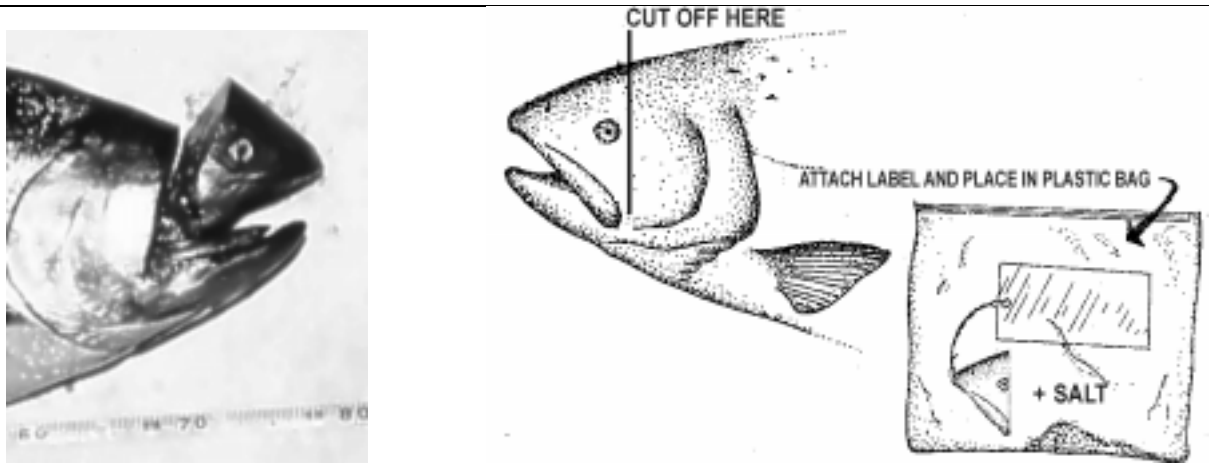


Figure 11-2: Proper Method for Collecting a Sample from a Tagged Salmon

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 11-3). For the most part the form is self explanatory, be clear and concise in your descriptions, and affix the tag 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 are useless.

Vial # 114

TAGGED FISH INFORMATION FORM

Cruise No.: 4921 Vessel Code: A567 Observer Name

Ship Name: Barnaut

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 11-3: 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)	
Greenland turbot, pollock, sablefish, yellowfin sole, shortspine thornyhead, Pacific cod, Atka mackerel	**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.

Figure 11-4: Duties for Tagged Fish and Crab

MARINE MAMMAL INTERACTIONS AND SIGHTINGS

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 owners and operators are required to submit reports of marine mammal injury and mortality that occur as a result of fishing operations. The Observer Program's independent data help 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 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 these animals is of great interest.

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 18-31). The only specimen samples you should ever have in your possession are pinneped snouts or tissue samples from 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 U. S. 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's 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 Form 10.

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 use the random sample table for the fishery you are in and monitor the same ones you sample for composition. For information on the selection of hauls, see page 2-15. Indicate which hauls or sets you have monitored for marine mammals in the appropriate column on the Observer Haul form. You may monitor additional sets, but if there are any marine

mammal interactions you must indicate in the remarks section of the Form 10 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 100% 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.

Form 10

The Form 10s are used to document interactions between fishing operations and marine mammals. This form is made up of two parts: the Form 10A and Form 10B. The Form 10A 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 Form 10B is only used when marine mammals (whole or part) are caught in fishing gear and/or specimen data is taken. Specimen data can include measurements of the animal or part and/or photographs of the animal.

Form 10A - Marine Mammal Interaction Data

Complete the Form 10A only if there are direct interactions between fishing operations and marine mammals. These interactions include:

- **Deterrence Used**: 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. Log this interaction on the 10A even if the deterrence had no affect.

- **Feeding On Catch**: 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 off of 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 or 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 10A unless they occur in conjunction with other interactions. See “Intentional Feedings” on page 12-20 and “Form 11US - Marine Mammal Sighting Form (front side)” on page 12-21.

- **Entangled in Gear**: marine mammals are entrapped or entangled in fishing gear but escape or are released by vessel personnel alive.

- **Killed by Gear:** 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.

- **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.

- **Killed by Propeller**: 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**: 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 Observer / Fishy II

Cruise Number	Vessel code	Year
7011	A110	01

Form 10A - Marine Mammal Interaction Data

Page 1 of _____

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

Date Month	Date Day	Interaction number	Haul or set number	Species name	Mammal code	Did you observe mammal?	Number of individuals	Interaction code	Condition of mammal	Injured?	Deterrence method	Deterrence successful?	Food species	Involved in another interaction?
03	15	1	83	Killer Whale	00	Y	13	10	3	N			102	Y

Remarks: (see manual for list of required information)
About 1/3 of the way through the set, a pod of killer whales appeared and began feeding on the line. Two large males (identified by the tall dorsal fins) were taking a great deal of turbot off the line (nearly 50 in my tally sample of 1753 hooks). A few halibut had gashed bellies and scrapes as well. Crew tried to deter - see interaction #2.

Date Month	Date Day	Interaction number	Haul or set number	Species name	Mammal code	Did you observe mammal?	Number of individuals	Interaction code	Condition of mammal	Injured?	Deterrence method	Deterrence successful?	Food species	Involved in another interaction?
03	15	2	83	Killer Whale	00	Y	13	1	3	N	6	N		Y

Remarks: (see manual for list of required information)
Same whales as in interaction #1. The rollerman stopped the line and banged on the side of the vessel with the halibut club. The whales were not deterred by the noise.

Date Month	Date Day	Interaction number	Haul or set number	Species name	Mammal code	Did you observe mammal?	Number of individuals	Interaction code	Condition of mammal	Injured?	Deterrence method	Deterrence successful?	Food species	Involved in another interaction?
04	01	3	143	Dall's Porpoise	PX	Y	1	4	1					N

Remarks: (see manual for list of required information)
Dall's porpoise came up tangled in the groundline. There were some scratches on the hide caused by the hooks, but the animal appears to have drowned. Identified as a Dall's by the all white belly and sides being very distinct. I used the mammal guide for identification and took photos.

Date Month	Date Day	Interaction number	Haul or set number	Species name	Mammal code	Did you observe mammal?	Number of individuals	Interaction code	Condition of mammal	Injured?	Deterrence method	Deterrence successful?	Food species	Involved in another interaction?

Remarks: (see manual for list of required information)

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Figure 12-1: Form 10A - Marine Mammal Interaction Data

Instructions for Each Field on the Form 10A

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.

- **Interaction Number** - Assign a number for each marine mammal interaction noted for a particular cruise/vessel. Start with 1 for the first interaction and consecutive numbers for the following interactions. Each interaction must have a different code even if the interaction is by the same individual mammal. For example, two separate records and interaction codes would be documented for an animal that was feeding on catch and then was deterred by the vessel.

- **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 with a new interaction number.

- **Mammal Code** - Record the two digit species code found in Appendix C. “Species Code List - Marine Mammals” on page A-10.

- **Did you observe mammal?** - Record “Y” if you actually saw the animal, and “N” if you did not.

- **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 Form 10A 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.

- **Interaction code -** Enter the interaction code as given in Table 12-1. If an animal is involved with more than one interaction during one haul or set list them as separate records with different interaction numbers.

1 - Deterrence Used - Marine mammal was deterred or a deterrence was attempted. Log this interaction using this code even if the deterrence was not successful. 2 - Entangled in Gear (Not Trailing Gear) - A marine mammal was captured by the fishing gear and the animal was released/escaped without fishing gear attached. 3 - Entangled in Gear (Trailing Gear) - A marine mammal was captured by the fishing gear and the animal was released/escaped alive with some fishing gear attached. 4 - Killed By Gear - A marine mammal was captured and died due to interactions with the fishing gear. 5 - Killed By Propeller - A marine mammal hit the propeller and died. 6 - Previously dead - A marine mammal was captured by the fishing gear and was dead prior to coming into contact with the vessel or fishing gear. 7 - Lethal removal (Trailing Gear) - Vessel personnel killed a marine mammal entangled in fishing gear, but death was not due entirely to the entanglement. Gear was observed attached to the animal after the animal was removed from the gear. 8 - Lethal removal (Not Trailing Gear) - Vessel personnel killed a marine mammal entangled in fishing gear, but death was not due entirely to that entanglement. No gear was observed trailing from the animal after the animal was removed from the gear. 9 - Boarded Vessel - A marine mammal boarded the vessel on its own volition. 10 - Feeding on Catch -A marine mammal was observed feeding on catch not yet landed. 12 - Other - Interaction occurred that is not included in the list of interaction codes. 13 - Unknown - The vessel or vessel personnel had some interaction with a marine mammal, but the observer did not directly view the interaction and/or ascertain what the interaction was.

Table 12-1: Marine Mammal Interaction Codes

- **Condition of Mammal -** Enter the condition code as given in Table 12-2. Record the condition of the mammal as the outcome of the interaction, 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	6 - Tusk/teeth only (no skull)
2 - Bones other than the skull	7 - Baleen only
3 - Live animal	9 - Fur, Flesh, or Skin
4 - Skull	
5 - Skull and bones	

Table 12-2: Marine Mammal Condition Codes

- **Injured?** - This field is only filled in if the interaction involves a live animal, condition code 3 otherwise the field is left blank. If there is an interaction with a live animal record “Y” if you actually observed the animal to be injured, enter “N” if you observed the animal to be uninjured, or “U” if you are unsure as to the condition of the animal.

- **Deterrence Method** - Fill in this field only for interactions involving marine mammal deterrence, interaction code 1. Otherwise leave this field blank. A list of codes is given in Table 12-3, use the code that is most appropriate.

1 - Seal Bombs - Any explosive devise used to frighten marine mammals from the catch.
2 - Pole Gaff - Using the long pole used by a crewman to gaff drop off catch to scare off marine mammals either by direct contact or by hitting the water.
3 - Skiff - Any use of a skiff to attempt to frighten off marine mammals.
4 - Acoustical device - any electronic acoustical device designed to frighten or annoy marine mammals.
5 - Yelling - Crew yelling at marine mammals in order to frighten them from the catch.
6 - Making noise by any other method - Any other method not described above of making noise to frighten or annoy marine mammals from the catch.
7 - Other Means - Any other means not listed above of deterring marine mammals. Document the method in your logbook.
8 - Unknown - If a deterrence method was used but its exact nature is unknown.

Table 12-3: Marine Mammal Deterrence Codes

If the vessel personnel employed more than one method of deterrence, document this in the Remarks field. Also describe in the Remarks field how the deterrence was conducted.

- **Deterrence Successful?** Fill in this field only for interactions involving marine mammal deterrence, interaction code 1. Otherwise leave this field blank. If you observed that deterrence works to deter marine mammals from the catch enter a "Y". Enter "N" if you observed that the deterrence was unsuccessful in deterring animals from feeding on the catch. Enter "U" if you are unsure as to the success of the deterrence method.

- **Food Species -** Fill in this field only if you have a marine mammal feeding on catch, interaction code 10. Otherwise leave this field blank. Enter the species code from Appendix A. "Species Code List - Fishes, Crabs, and Invertebrates" on page A-1of the species upon which the marine mammals are feeding. If the marine mammals are feeding upon more than one species record the predominant species in Food Species field and list the other species in the Remarks field.

- **Involved in another interaction? -** If this individual marine mammal or group of marine mammals was involved in other interactions listed on the Form 10A for the same set or haul enter a "Y". If not enter a "N".

- **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, 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 feeding. Draw pictures of rare or unusual marine mammal species involved in interactions in the logbook or on the paper Form 10A.

Form 10B - Marine Mammal Specimen Data

This form should only be used when there is specimen data. There are four situations where data should be recorded on the Form10B listed below.

Record Length and Sex Data from all Dead Marine Mammals

All dead marine mammals captured during fishing operations must be measured and, if possible, the sex determined.

Before touching a marine mammal remember that there are many diseases that are transferable from marine mammals to humans. Always where gloves when handling a marine mammal.

There are two acceptable methods for measuring marine mammals:

Standard length - This is the preferred method, 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, belly up, ideally with the head and vertebral column on a straight line (see Figure 12-2).

Curvilinear length - 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.

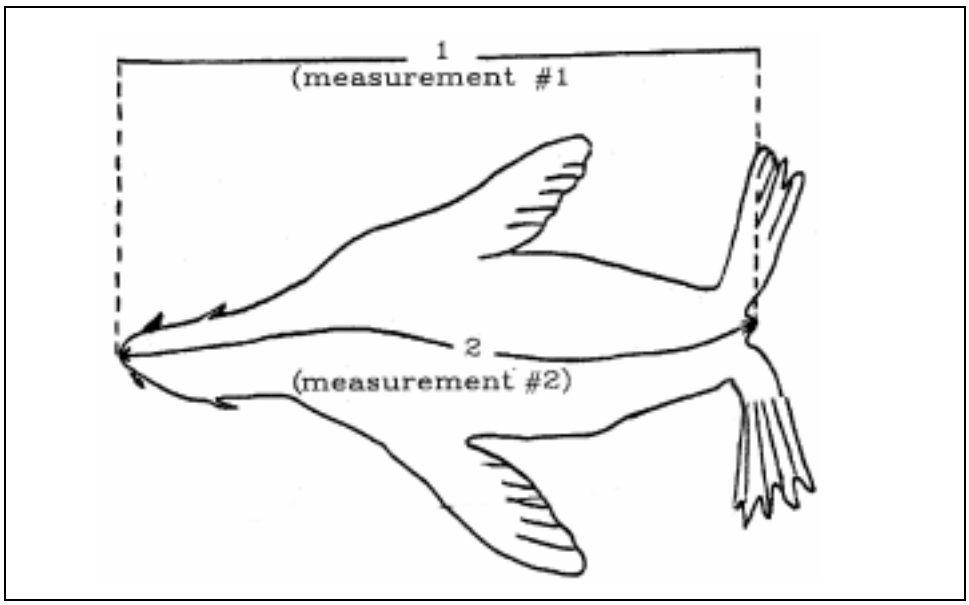


Figure 12-2: Sea Lion and Seal Measurements

Take measurements with the flexible measuring tape provided by NMFS.

Sexing Marine Mammals

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 an enlarged clitoris.

Sexing of marine mammals is not difficult, see diagrams in Figure 12-3 to view the morphological differences between male and female pinnipeds and cetaceans.

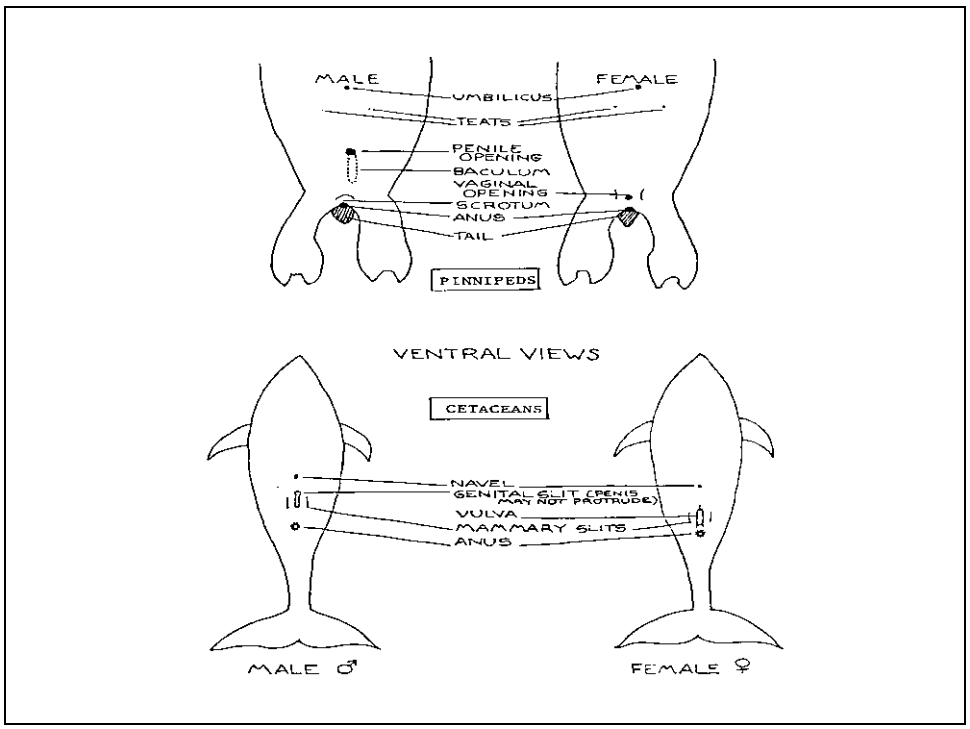


Figure 12-3: Diagram of Pinnipeds and Cetacean Sex Differentiation

Collection of Canine Teeth from Pinnipeds (except walrus)

If a Steller's 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's sea lions have been listed on the endangered species list for much of the Bering sea and Aleutian Island chain. Data on these animals is greatly needed to try to determine the causes of this 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. Skin the snout using a sharp knife.

2. The roots of the canine teeth arch back. To ensure that the entire canine root is collected, you must cut the snout between the second and third post-canine teeth. Use a hacksaw to remove the snout, you should be able to obtain one from the vessel.

3. 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 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.

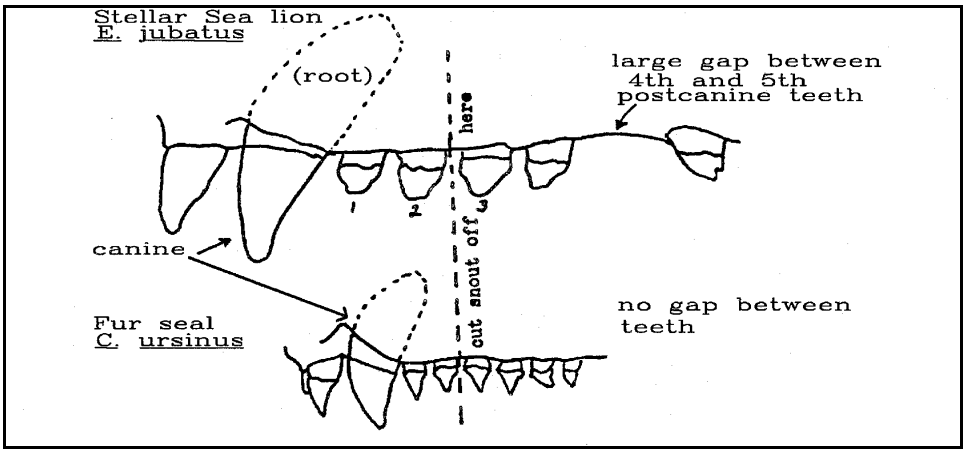


Figure 12-4: Canine Teeth of Sea Lions

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 begin taking tissue samples and have provided the necessary equipment. You have been supplied with a sterile scalpel, a pair of nitrile 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 the nitrile gloves provided when handling DMSO**.

To collect a sample:

1. After recording length data for the Form 10B, exchange your fishing gloves for the non-latex (nitrile) 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. Do not use latex gloves while handling DMSO.

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 in the vial of DMSO.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.

4. 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 there is more than one animal in a haul they should all be listed as separate specimen, placed in separate vials, and labeled accordingly. Record interaction information on the Form10A, and record specimen information on the Form 10B including length and how you obtained the specimen.

Do not freeze DMSO 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.

In the event that a cetacean carcass is available for sampling, but DMSO vials are unavailable, Skin samples should still be collected. These specimen can be preserved in one of the following ways:

1. The sample can be frozen

2. The sample can be placed in an otolith vial filled with a saturated salt solution

3. The sample can be placed in a plastic bag and covered with table salt.

Samples not stored in DMSO are of lesser value, but still extremely useful to NMML.

Photos

Record any photographs taken of marine mammal interactions with a fishing vessel or vessel personnel on the Form 10B. 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.**

Chris Observer / Fishy II

Cruise Number	Vessel code
7011	A110

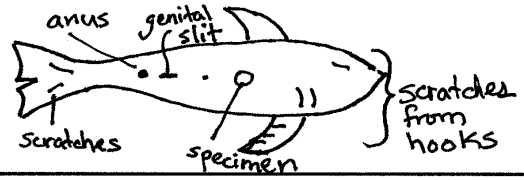
Form 10B - Marine Mammal Specimen Data

Data describing individual specimens;sexing criteria, methods of measuremant, types and extent of injuries, etc.

Form 10A Interaction number	Specimen number	Haul or set number	Species name	Mammal code	Sex	Standard length in cm.	Curvilinear length in cm.	Tooth taken?	Photo taken?	Tissue taken?
3	1	143	Dall's Porpoise	PX	F	179		N	Y	Y

Remarks: (see manual for list of required information)

Tissue sample taken from abdomen, 15 cm forward from naval. Sample stored in DMSO. Frames 1-7 on mammal Camera used for pictures.



Form 10A Interaction number	Specimen number	Haul or set number	Species name	Mammal code	Sex	Standard length in cm.	Curvilinear length in cm.	Tooth taken?	Photo taken?	Tissue taken?

Form 10A Interaction number	Specimen number	Haul or set number	Species name	Mammal code	Sex	Standard length in cm.	Curvilinear length in cm.	Tooth taken?	Photo taken?	Tissue taken?

Form 10A Interaction number	Specimen number	Haul or set number	Species name	Mammal code	Sex	Standard length in cm.	Curvilinear length in cm.	Tooth taken?	Photo taken?	Tissue taken?

National Marine Fisheries Service / North Pacific Groundfish Observer Program

revised 1/1/2000

Figure 12-5: Form 10BUS - Marine Mammal Specimen Data

Instructions for Each Field on the Form 10B

Each entry on the Form 10B should correspond to an entry on the Form 10A. If more than one animal of the same species were involved in an interaction on the Form 10A you may have two or more records on the form Form 10B that correlate to it if a specimen was taken from each mammal involved. Fill out one Form 10B record for each animal from which measurements, specimen, or photos were taken.

- Enter the cruise number, and vessel code in the heading. Start a new sheet for each vessel you are assigned.

- **Form 10A Interaction number -** For each specimen collected enter the corresponding Form 10A interaction number. If for a single set or haul there were more than one interaction involving the same animal, enter the interaction number of the first interaction the animal was involved.

- **Specimen Number** - For each cruise/vessel start the specimen numbers with one and continue consecutively until you disembark the vessel.

- **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.

- **Mammal Code** - Record the two digit species code found in Appendix C. “Species Code List - Marine Mammals” on page A-10. This should match the corresponding Form 10A.

- **Sex -** Record as M = male, F = female, U = unknown

- **Standard length in centimeters** - (see page 12-12) Recorded to the nearest centimeter. Do not record an estimate of length in this field; this field is for actual measurements only. Include length estimates in the remarks section.

- **Curvilinear length in centimeters -** (see page 12-12) Recorded to the nearest centimeter. Do not record an estimate of length in this field; this field is for actual measurements only. Include length estimates in the remarks section.

- **Tooth taken? -** 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? -** Record "Y" if you took photographs; otherwise, record "N".

- **Tissue taken?** - Record "Y" if you took a tissue specimen, otherwise record "N".

- **Remarks -** There are four 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.

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 cetacean. Inert ear tags have been placed on several species of pinnipeds. More common are brands and tattoos, 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 tag, brand, or tattoo numbers, color of the tag or marking, as well as the location of the marking/tag in the daily notes section of your logbook. Also include behavior and the latitude and longitude of where it was observed. An 11US (see page 12-21) 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 page 12-12), collect length and sex information from the animal. 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 so 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/people 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 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: 00 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 meters number sighted (best): 8 number (minimum): 5 number (maximum): 10

For Office Use Only

observer: 49 50 51 52 53 54 55 56 57 58 59

platform: 60 61 62 63 vis.: 64 species: 65 66 conf.: 67

sighting cue: 68 69 70 photos: 71 72 roll: 73 74 frames: 75 76 77 78

behaviors, cues and interactions: 79 80 81 82 83 84 85 86 87 88 89 90

behaviors, cues and interactions: 91 92 93 94 95 96 97 98 99 length multi: 100 101

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 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 jaw color pattern: right side almost white (at least visable part). No flukes seen. Similar to Sei whale description but much bigger. (Sei whales also 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

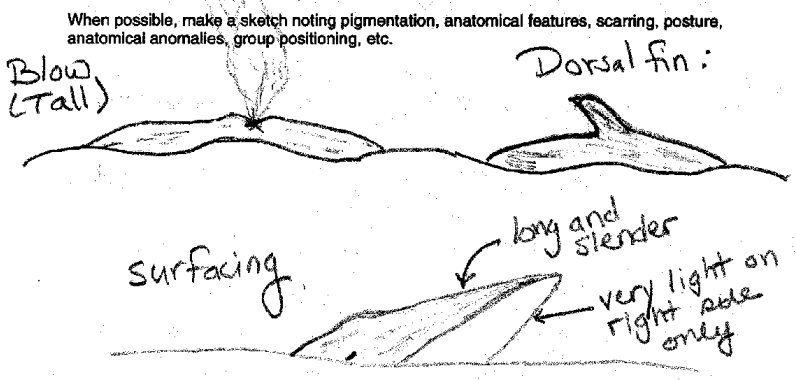
Large cetaceans
Blow visible from a distance
Breaching
Flipper slapping
Group feeding
Lob-tailing
Spy-hopping
Tail raised on dive
Side wake riding
Stern wake riding

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 # _____ personal camera
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

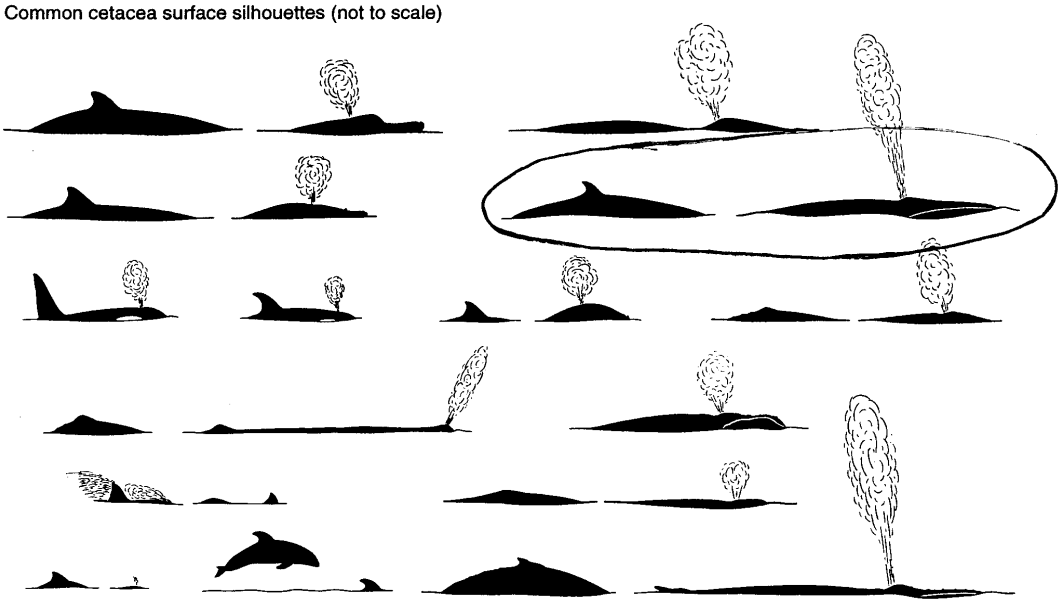
Form 11US: ver. IX.98: Balla, Harkness, Hill, Folkens, Lowell, Mizroch

See silhouettes on other side

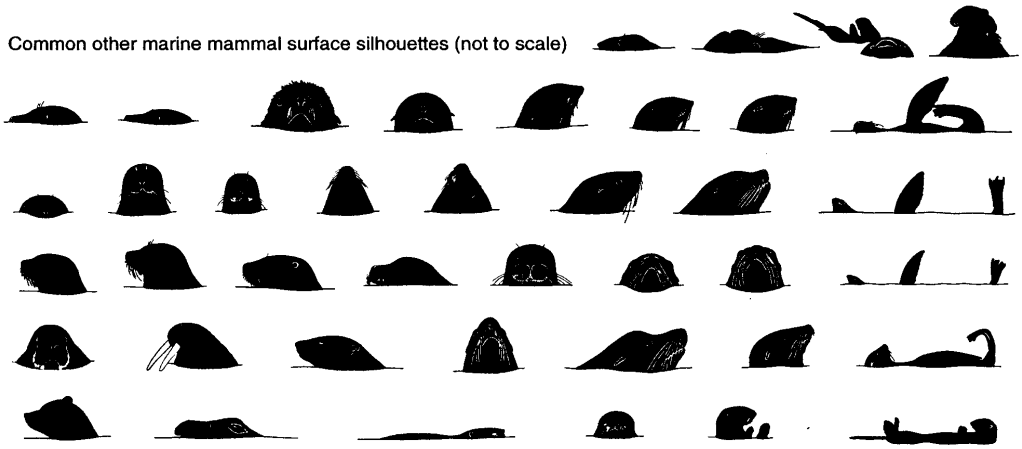
Figure 12-6: Form 11US - Marine Mammal Sighting Form (front side)

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)			

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 ranges.

- **Observer, Vessel -** Write your name and your vessel's name in these blanks.

- **Date -** Enter year (e.g., 00), 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: $C^\circ = (5/9)(F^\circ - 32)$

- **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 found 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. For a list of behaviors, see page 12-25.

- **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.

Small Cetaceans	Large Cetaceans	Pinnipeds
Bow riding.--Animals swim beside the bow or in the bow wave of a moving ship. **Leaping entirely out of the water.**--Animal jumps fully clear of the surface of the water (as opposed to merely breaking the surface of the water), not for forward locomotion but for other reasons (only they know). **Porpoising.**--Animal raises its body to be nearly or fully out of the water while traveling forward at a fast rate of speed, usually in a fluid, arching motion. **Rooster-tailing.**--Animal surfaces at high speed creating a spray of water in front and over the top of the animal which looks like a rooster's tail. Usually seen only in Dall's porpoise. **Slow rolling**.--Animal comes to the surface to breathe, with the blowhole and dorsal area usually showing, and then rolls back underwater.	**Blow visible from a distance.**--Blow can be seen from more than 500 meters away. Usually only seen in certain large cetaceans. **Breaching.**--Used for larger cetaceans (orca sized and larger). The whale accelerates forward underwater and then jumps free of the water, sometimes fully clearing the water's surface, and then lands on the surface of the water, creating a large splash. **Flipper slapping.**--Whale floats or swims at the surface, turns on its side and slaps one pectoral fin against the water, either once or several times in quick succession. **Group feeding.**--Seen primarily in humpback whales, when they coordinate feeding by lunging out of the water with their mouths open, engulfing fish and water. **Lob-tailing.**--Whale raises its tail flukes up out of the water and slaps them down against the surface with great force. This may occur once or be repeated many times. **Spy-hopping.**--Whale is vertical or upright in the water and raises its head up out of the water, usually with its eye showing. **Tail raised on dive.**--When diving, the whale's entire tail lifts completely above the water before going underwater. **Side and stern wake riding.**--Whale is riding in the wake created midships along the side of the vessel, or the wake created by the stern.	**Jug handle.**--Seal or sea lion floats on its side with one front flipper and one rear flipper above the water, creating what looks like a handle. **Porpoising.**--Pinniped is swimming fast, jumping at least partially out of the water in fluid, arching motions. This swimming pattern resembles that of dolphins or porpoises seen at a distance. **Rafting.**--A group of pinnipeds resting at the surface together. **Spooked from haulout.**--Pinnipeds which had been resting on beach, rocks or ice, then dove into the water due to your vessel's interaction with them. **Vocalizing.**--Pinniped making directed noises at you or at another pinniped.

Table 12-4: Marine Mammal Behavioral Descriptions

- **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 (USF&WS) are cooperating to obtain information on the mortality of birds in groundfish fisheries in the Gulf of Alaska and the Bering Sea. Of special concern are six species whose populations are very small, or are declining, referred to here as “species of interest”.

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. While the collection of information on incidental takes of birds is critical, it is accomplished as part of your species composition samples. Information on species of interest is also of high priority. All other bird duties are of low priority but are valuable if they can be accomplished.

Observer data are crucial for the management of seabirds by the USF&WS, which analyzes each year’s incidental mortality and its effect on the health of bird populations. The USF&WS is able to review data collected by Observers by accessing the Observer Program’s database and copies of appropriate Observer Logbook pages (Seabird Daily Notes) are sent on a yearly basis.

Incidental Take

flock of seabirds

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 your species composition samples. Birds in your samples are treated like all 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 13-5.

Birds are much lighter than they appear. Weights over 5 kg are extremely doubtful!

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 13-9.

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.

1. 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 the USF&WS 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 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. Report these in the SeaBird Daily Notes section of your logbook.

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 murrelets, 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. Please retain murrelet and kittiwake specimens that you are unable to identify to species, as well as birds that are banded or tagged (see "Banded Birds" on page 13-9). 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. If you key out a bird to the albatross, kittiwake, murrelet or eider group, but are unable to positively identify it to species, please bring back the specimen for 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 (Stellers's and spectacled) 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.

Your contractor should have provided you with a bird specimen collection permit 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 13-9, if the bird is not banded, discard bird carcass.

Seabird Avoidance Initiatives

In May of 1997 the NMFS put into law the requirement that all longline groundfish fishing vessels must use measures to avoid seabird bycatch. These steps were necessary to mitigate longline fishery interactions with the endangered short-tailed albatross, and other sensitive species. The law states that:

1. All applicable hook-and-line fishing operations must be conducted in the following manner:

    a. Use hooks that when baited, sink as soon as they are put in the water. This could be accomplished by the use of weighted ground lines and/or thawed bait.

    b. Any discharge of offal from the 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.

    c. Make every reasonable effort to ensure that birds brought aboard alive are released alive and that wherever possible, hooks are removed without jeopardizing the life of the bird.

2. All applicable hook-and-line fishing operations are required to employ one or more of the following seabird avoidance measures:

    a. Deploy gear only during the hours specified in Table 13-1, using only the minimum vessel's lights necessary for safety.

    b. Tow a streamer line or lines during deployment of gear to prevent birds from taking hooks;

    c. Tow a buoy, board, stick or other device during deployment of gear to prevent birds from taking hooks. Multiple devices may be employed; or

    d. Deploy hooks underwater through a lining tube at a depth sufficient to prevent birds from settling on hooks during deployment of gear.

Calendar month	Longitude		
	Shoreward to 150 deg.W	151 to 165 deg.W	166 to 180 deg.W
January	1800-0700	1900-0800	2000-0900
February	1900-0600	2000-0700	2100-0800
March	2000-0500	2100-0600	2200-0700
April	2100-0400	2200-0500	2300-0600
May	2200-0300	2300-0400	2400-0500
June	*	*	*
July	*	*	*
August	2200-0400	2300-0500	2400-0600
September	2000-0500	2100-0600	2200-0700
October	1900-0600	2000-0700	2100-0800
November	1800-0700	1900-0800	2000-0900
December	1700-0700	1800-0800	1900-0900

Hours are in Alaska local time
*Note: This copy is not official, see Federal Fishing Regulations for more information.
*This measure cannot be exercised during these months and at these locations.

Table 13-1: Allowable Fishing Times

Observers on longliners must monitor what, if any, avoidance measures the vessel is taking, record the effectiveness of this measure, and report any non-compliance. The captain or vessel personnel responsible for filling in the official logbook must document the type of seabird deterrence used for each set. Record on the Observer Haul Form, in the Bird Deterrence field, the measures the vessel recorded for seabird deterrence. In the "Deterrence Verified?" field document whether you verified the deterrence method and whether the recorded measures were implemented. See page 6-47 in the Longline section of this manual for further clarification. Write all pertinent information on how the deterrence was deployed and how affective the deterrence was in the Seabird Daily Notes section of your logbook.

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 USF&WS.

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).

STOMACH COLLECTION

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Introduction

Each month, several Observers will collect groundfish 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.

The stomach project is assigned to specific vessels rather than to specific observers. Therefore, your participation in the project will depend upon the vessel that you are assigned. The project is primarily assigned to vessels that have historically provided an adequate sampling platform for this project.

- Please read all instructions carefully
- Please stop by the stomach lab (room 1093) anytime you have questions
- Contact us when you return--we need to debrief you:

STOMACH 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) before using formalin to understand its properties.
- ALWAYS wear gloves, rain gear, and goggles/safety glasses 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. 100% formalin 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. Pure formalin is considered a flammable material and should be stored in an appropriate flammable storage area until it has been diluted as described above. Once diluted to a10% solution, formalin can, and should be stored on a weather deck if possible without freezing.

- 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.

Materials for Stomach Project

(Observer program field staff will provide this gear if it is not already available on your vessel)

- 1 liter formalin
- 1 5-gallon bucket
- 2 bucket lids (1 cut and 1 uncut)
- 2 large plastic bags
- 125 specimen bags (50 small, 50 medium, 25 large)
- 100 specimen labels
- 1 notebook containing:
  - 15 specimen forms
- 1 MSDS for 100% formalin
- 1 MSDS for 10% formalin

- Please return all unused forms and supplies to the stomach lab or the field office
- Do not place unused sampling gear in bucket with samples!
- Leave empty plastic formalin bottle at the field office

Stomach Sampling

Stomach Collection Procedure

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 14-6).
4. Use the tally sheet (page 14-15) 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 subsequent fish has food in its stomach, go ahead and collect the specimen. If the subsequent fish has an empty stomach (naturally empty or regurgitated), discard it and go on to the next fish until a non-empty stomach is encountered. 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. Label the uncut lid with your name, vessel name, species collected, year, and seal the bucket with it.

2. Normally, you should return the full bucket to the field office, it is possible to leave it on the vessel, if arrangements have been made to do so through the Observer program. Your forms should be taken to your debriefing.

When you meet with your debriefer, show him or her your completed specimen forms. Then contact our lab so we can debrief you and collect your data forms.

For debriefing contact: The Stomach Lab, Room 1093, Building 4, Alaska Fisheries Science Center, 7600 Sand Point Way N.E., Seattle, WA 98115. Phone: (206) 526-4238.

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 14-15), and use it as a guide.

Try to collect a minimum of 5 stomachs from a given size/time category in one haul and a maximum of 20 (i.e. all 4 size categories for a given time). Therefore, it is possible to complete the sampling for this project in as few as 4 hauls (20 stomachs per haul, 5 from each size category), as many as 16 hauls (5 stomachs per haul from 1 size category), or any number in between. Depending on the catch composition while you are sampling, it may take several weeks to fill all of the size/time categories. Stomach samples may be collected from any hauls that occur during your assignment.

	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: Stomach 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. Stomach sampling should be completed within a maximum of 16 (not necessarily consecutive) 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 requested is a maximum. 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.

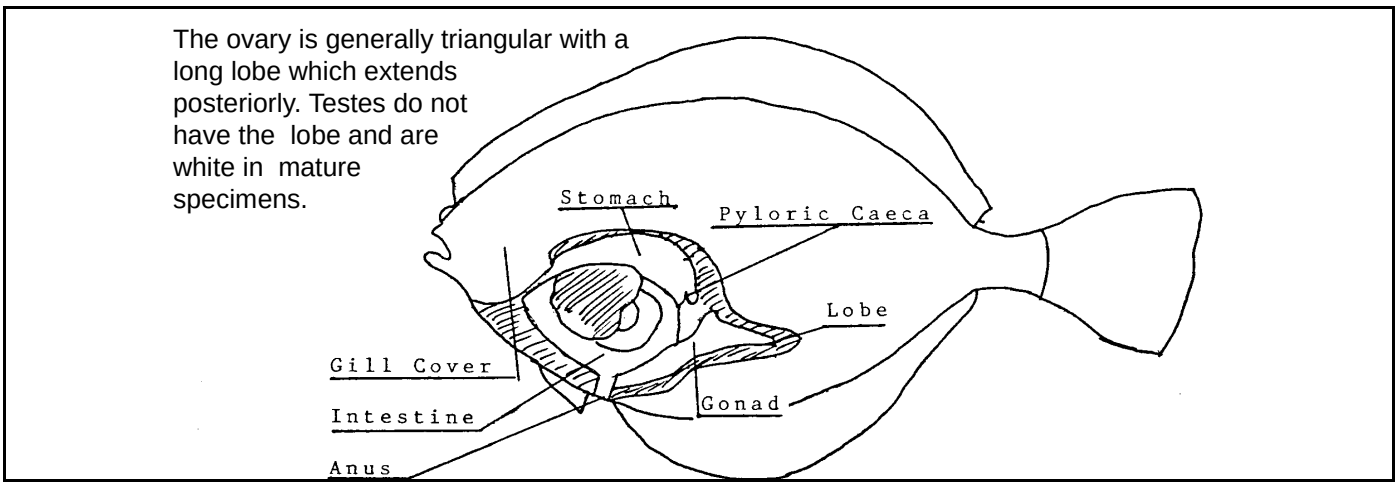


Figure 14-2: Illustration of Flatfish Gonads

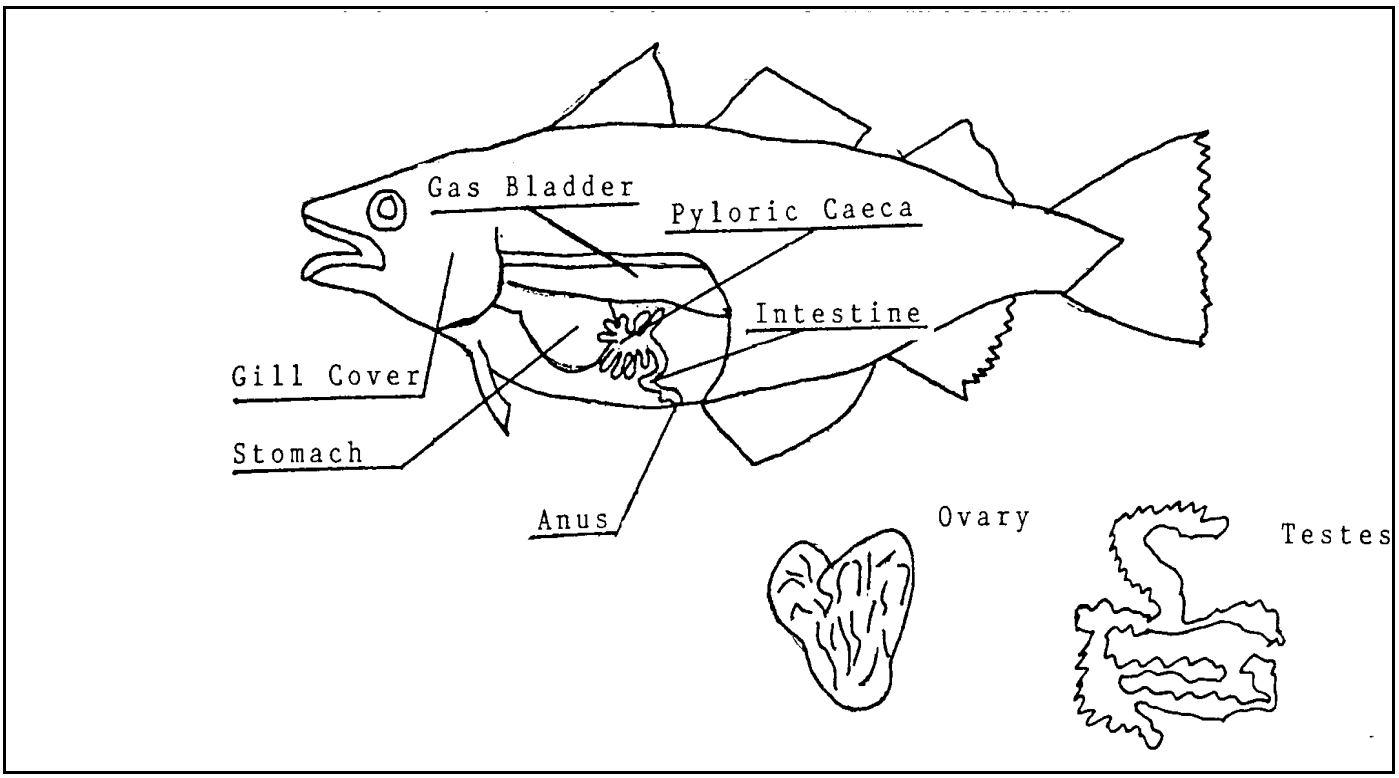


Figure 14-3: Illustration of Gadid Gonads

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.

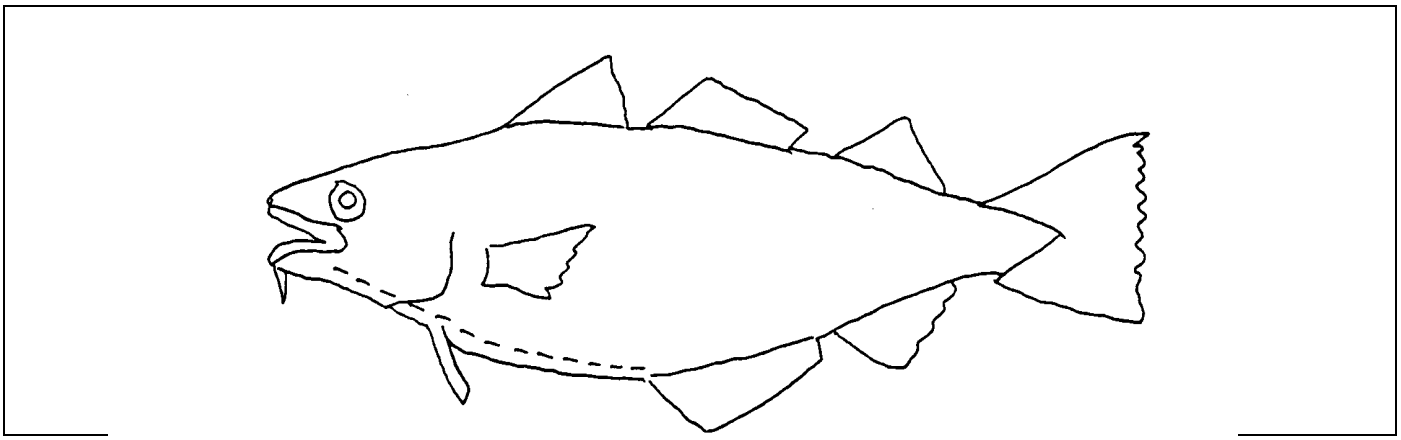


Figure 14-4: First Cut of Gadid

2. Open at incision and examine stomach, if there is no sign of regurgitation:

3. Excise stomach by cutting just anterior to the pyloric caeca and posterior to the gill chamber (Figure 14-5). This should include all of the esophagus.

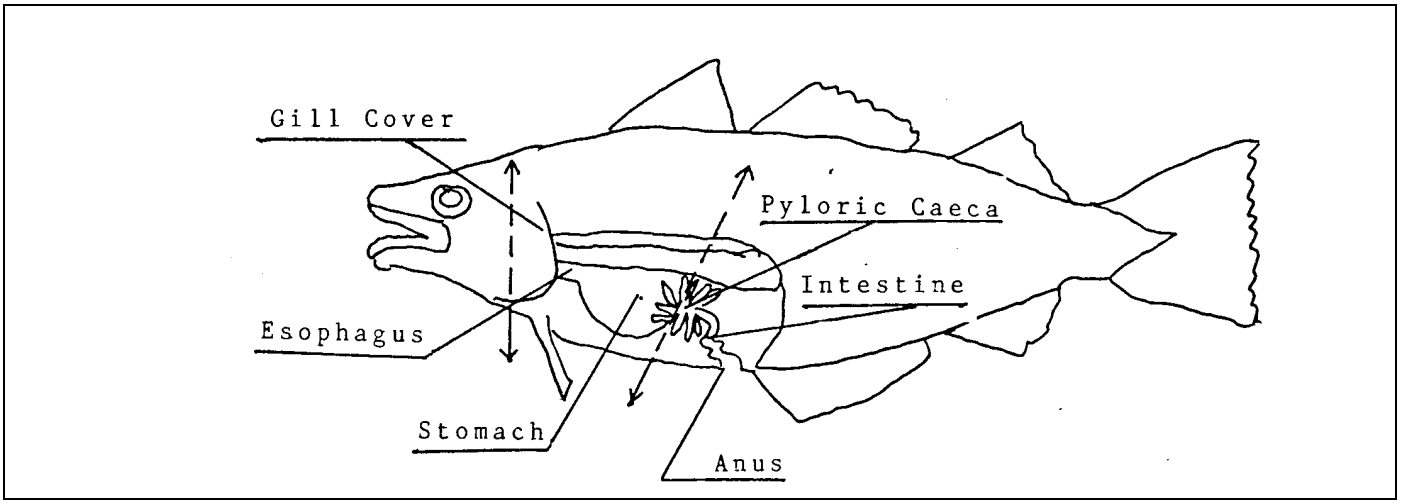


Figure 14-5: Final Cut of Gadid

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).

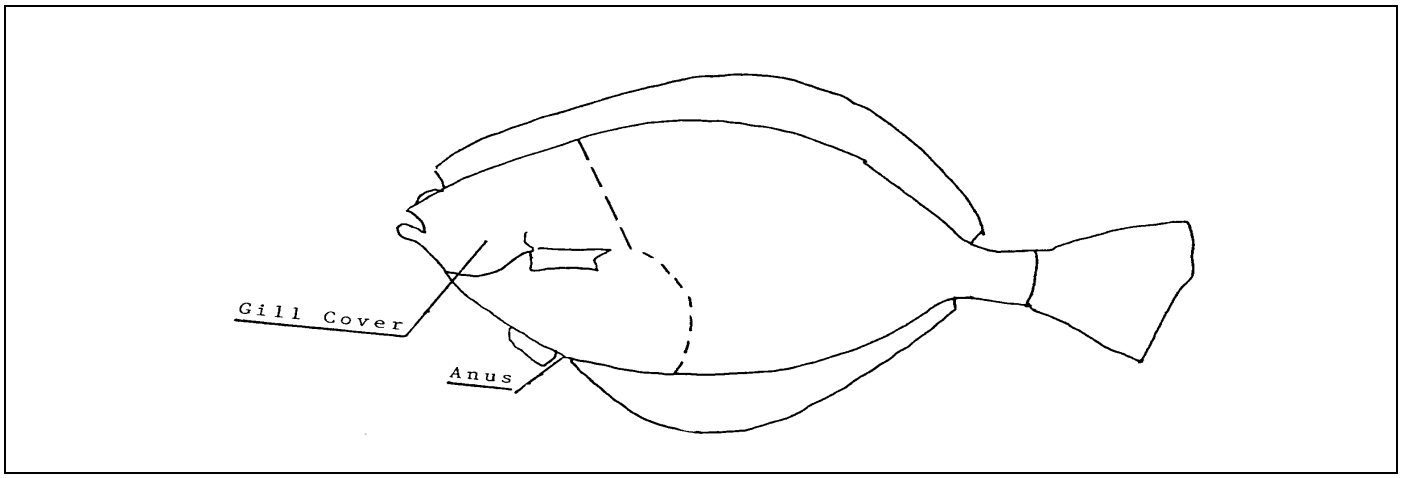


Figure 14-6: First Cut of Flatfish

2. Lift flap and examine body cavity, if there is no sign of regurgitation: make a cut as illustrated by the dashed line below.

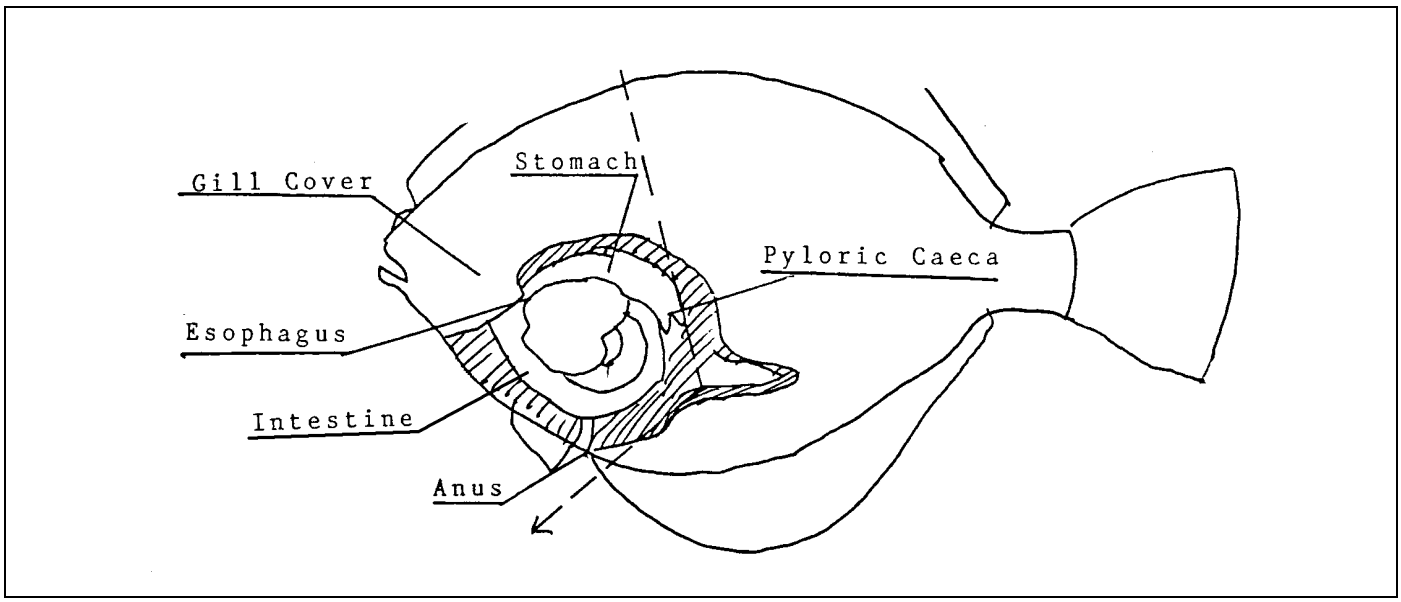


Figure 14-7: Final Cut of Flatfish

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 (see page 14-17). 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 a pencil
- Fill out a Tally Sheet for your species (see Figure 14-8).
- Fill out a Specimen Form for each haul (see Figure 14-9).
- Fill out a Stomach Collection Label for each sample and place it in the bag with the stomach.

Specimen Form

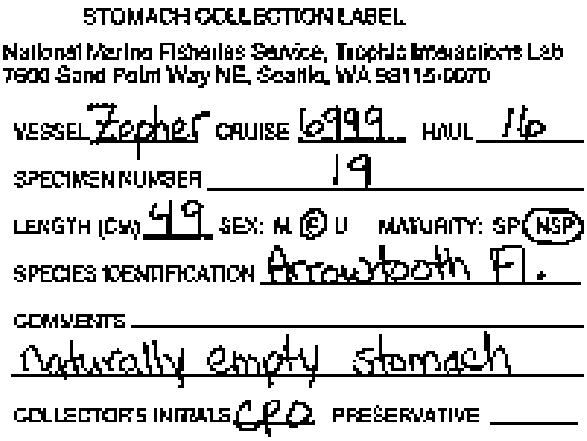
Record only the following where indicated: (page 14-16)

- write your cruise code and vessel code at the top of each form
- vessel name
- haul number
- specimen number (number assigned consecutively throughout the entire cruise to each sample as it is collected)
- predator species name
- your name
- date
- predator length in centimeters (fork length) *Note that the form asks for you to record in millimeters. Centimeters are acceptable!
- predator sex **(1=male, 2=female, 3=juvenile)**
- predator spawning stage **(1-spawning, 0=not spawning)**

Label

Record the following where indicated

- vessel name
- haul number
- specimen number
- predator name
- predator length
- predator sex (M, F or U) and spawning condition


STOMACH COLLECTION LABEL
National Marine Fisheries Service, Trophic Interactions Lab
7600 Sand Point Way NE, Seattle, WA 98115-0070
VESSEL Zephyr CRUISE 6999 HAUL 110
SPECIMEN NUMBER 19
LENGTH (CM) 49 SEX: M (F) U MATURITY: SP (NSP)
SPECIES IDENTIFICATION Arrowtooth Fl.
COMMENTS
Naturally empty stomach
COLLECTOR'S INITIALS CPO PRESERVATIVE

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

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?

6. Where were the buckets and formalin stored onboard? Did you have difficulty locating them?

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

A002/6999

PAGE 3 OF

[redacted] Zepher [redacted]

HAUL 9 10 11 [ ] 1 6

[redacted]

SPECIES NAME Arrowtooth Flounder

[redacted]

[redacted]

YOUR NAME Chris P. Observer DATE 01/17/2001

23 SEX	25 MAT UR	28 29 30 31 LENGTH IN MM.CM	37 38 39 40 41 [redacted]	45 46 [redacted]	53 54 55 56 57 SPECIMEN NUMBER	62 63 64 65 66	68 69 70 71 72
1	1	4.7			1.7		
1	0	3.6			1.8		
2	0	4.9			1.9		
2	1	5.3			2.0		
1	0	3.0			2.1		
2	0	5.9			2.2		
3	0	1.5			2.3		
1	0	2.9			2.4		

Figure 14-9: Specimen Form

COMMISSIONERS:
RICHARD J. BEAMISH
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ANDREW P. SCALZI
HOMER, AK
JOHN SECORD
VANCOUVER, BC

INTERNATIONAL PACIFIC HALIBUT COMMISSION

ESTABLISHED BY A CONVENTION BETWEEN CANADA

AND THE UNITED STATES OF AMERICA

DIRECTOR
BRUCE M. LEAMAN

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SEATTLE, WA 98145-2009

TELEPHONE
(206) 634-1838

FAX:
(206) 632-2983

To Whom It May Concern:

The Alaska Fisheries Science Center, Resource Ecology and Fisheries Management Division (National Marine Fisheries Service) is authorized to capture and retain for scientific purposes up to 500 halibut (*Hippoglossus stenolepis*) per year in each of three areas, using research trawls, handlines, or longlines, during the calendar years 2001 through 2005. The place of and manner of capture will be determined in accordance with the Center's research plans concerning food habits and will include the areas of the eastern Bering Sea, Gulf of Alaska, and Aleutian Islands. Collection may be from research vessels or by research staff aboard domestic commercial fishing vessels. The principal investigator for this study is Dr. Pat Livingston.

Halibut obtained under this permit may not be retained for purposes other than scientific research and may not be sold. Halibut captured in excess of the limits specified in this permit must be returned to the sea with a minimum of delay and injury.

Bruce M. Leaman
Executive Director

Figure 14-10: Halibut Specimen Collection Letter

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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 manual 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.**

Figure 15-1: Introductory Screen to ATLAS Program

ATLAS Basic Keystrokes

In order to learn how to use the ATLAS AtSea transmission 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 15-2).

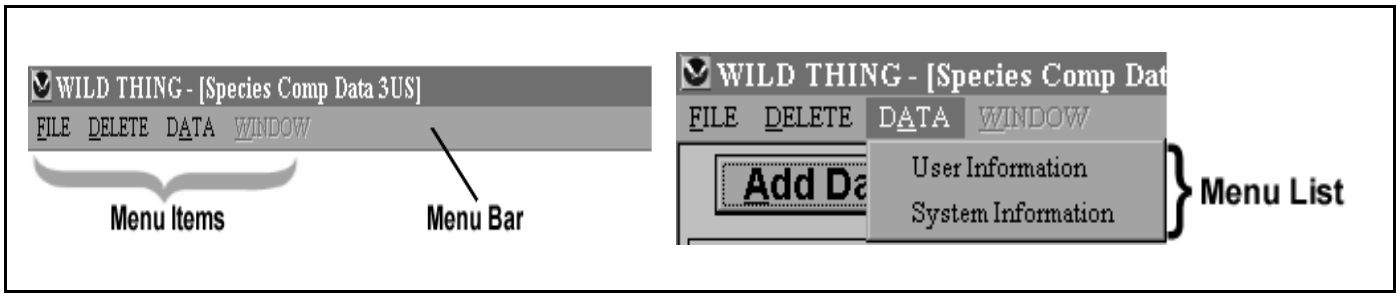


Figure 15-2: Menu Items

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 “The Main Window Command Buttons: What They Mean” on page 15-13). 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 “Haul Data” from the AtSea Main Window, one needs only to press the <H> 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 15-2).

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. 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 "Select Haul and Press 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.

Figure 15-3: Haul/Set Window List

Data Fields

Data fields, or simply fields, are white boxes in which data may be entered (see Figure 15-4). 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. 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 dependency 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.

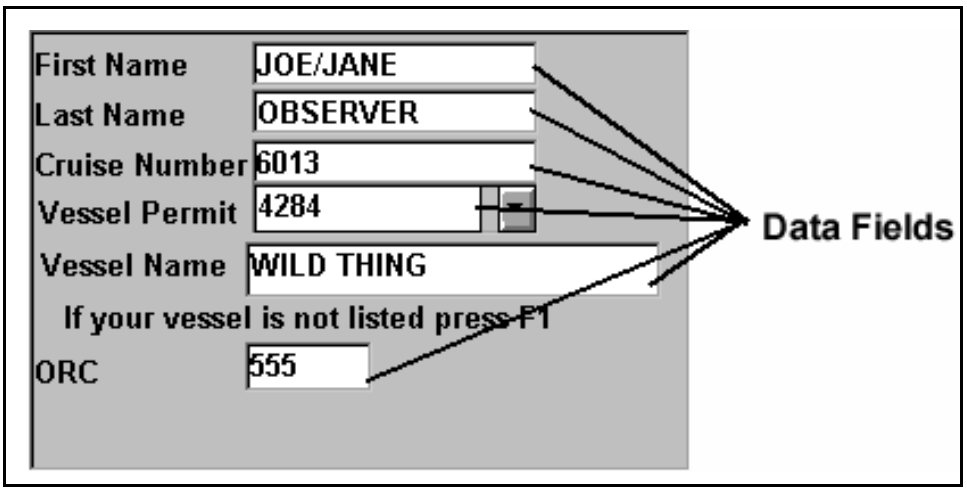


Figure 15-4: Data Fields

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 Species Code data field in Figure 15-5). 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.

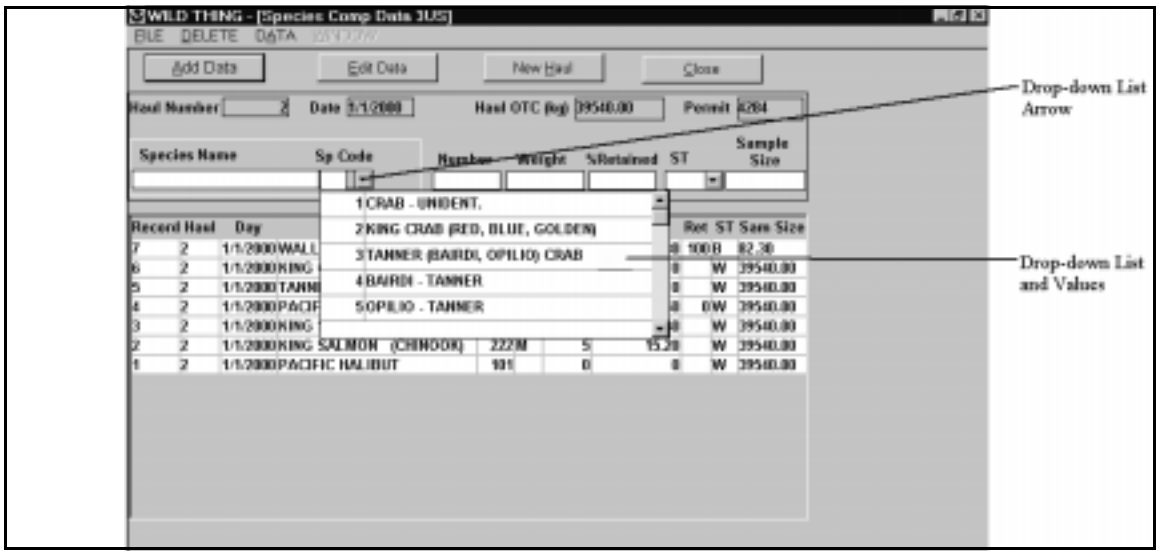


Figure 15-5: Drop Down List

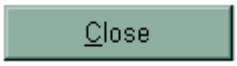
Command Buttons

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. (see page 15-9).



Choose this command button to exit the form and return to the Main Window.

Choose any of the command buttons to 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, add a forgotten entry into a data field, or update a previous entry, 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 data onto 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 this program to edit data. Data saved to the database is listed in the Entered Data Window. This window is located either to the right of or below the Data Fields (see Figure 15-6). 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.

- You may also start while working within a form. Select the appropriate data line from the Entered Data Window on the form, then select and choose the “Edit” data button. A new window will appear asking you to choose whether or not you wish to save or discard any data remaining in the data fields. Choose the appropriate response.

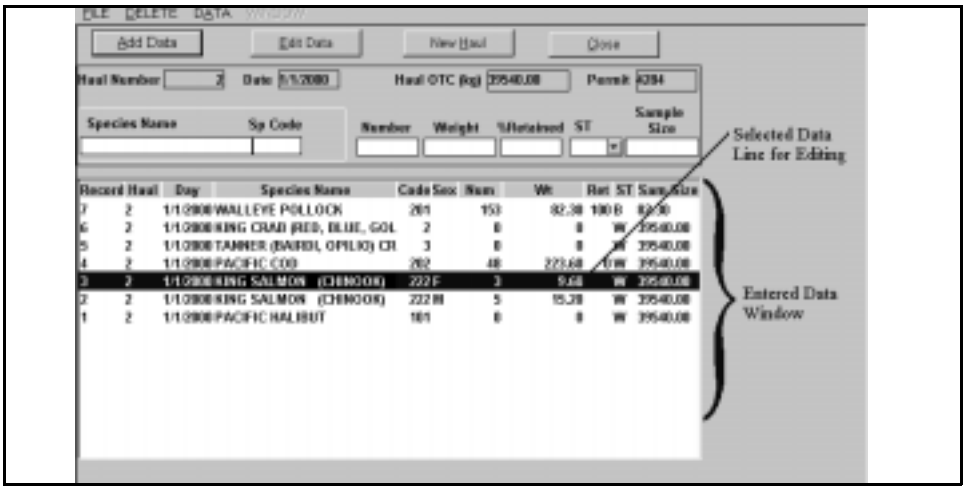


Figure 15-6: Data Edit Screen

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

To delete an entry already on the ATLAS Database, select and highlight the haul/set you wish to delete, point and click on the Delete menu item on the top of the screen. After clicking, you should see a drop-down list. To delete the record, point and click on the Delete Record selection. The program will then ask if you are sure you want to delete the record, choose OK to delete. **On the Haul form deleting an entry will delete all data for that haul or set from every data form.**

Starting the ATLAS AtSea Program

To Start the ATLAS AtSea Program you must choose the AtSea icon (see Figure 15-7). 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 15-8). 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 15-7: Group Window

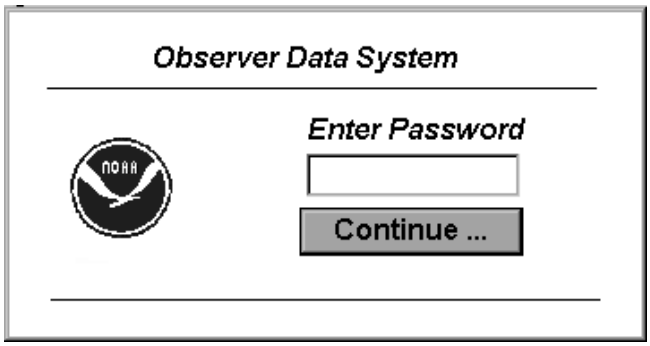


Figure 15-8: Observer Data System Security Screen

Data Entry

Main Window

The first window of the program is the Main Window (see Figure 15-9). 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.

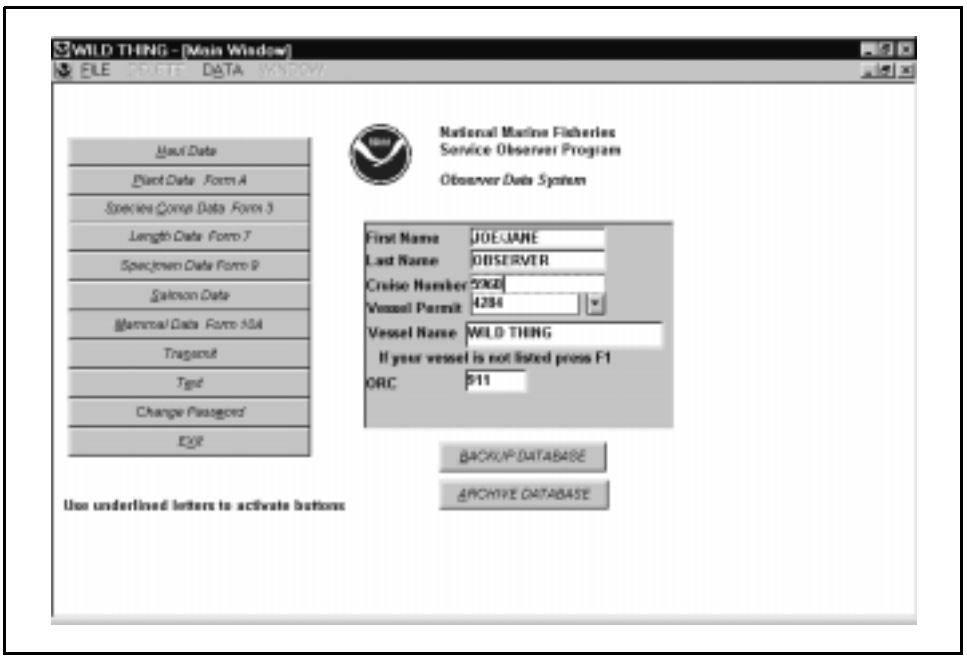


Figure 15-9: Main Window

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.

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.

Title	Data Subject
Haul Data	Haul Information for Trawl, Pot, Longline
Plant Data Form A	Plant Delivery Information
Species Comp Form 3	Species Composition Data
Length Data Form 7	Length/Frequency Data
Specimen Data Form 9	Length, Weight, and Sex Data for Age Structure and Salmon Scale Collections
Salmon Data	Salmon Retention Form Data
Mammal Data Form 10A	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 Program Manager
Backup Database	For creating a **daily** copy of the database.
Archive Database	For creating a **final** copy of the database and deleting all data from the ship's computer.

Choosing any of these Main Window command buttons will open the desired form. But data entry **must** start with the Haul Data Form or the Plant Data Form A; **no other data may be entered until after either haul or set data has been entered.**

Haul Data Form

Choose the “Haul Data” button, and a screen, such as the one in Figure 15-10, will appear. Choose the “Add Data” button, an empty Data Entry Window, such as the one in Figure 15-11, will appear. **There are no differences between the data needed for this form and the data needed for the Vessel and Observer Haul Forms for Trawl, Pot and Longliner. The data should match.**

Figure 15-10: “Haul Data” Button

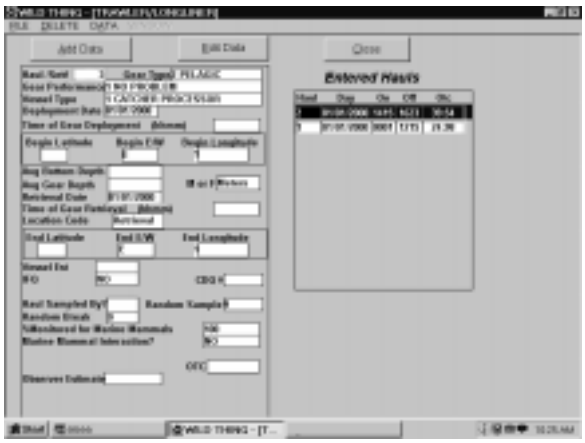


Figure 15-11: “Add Data” Button (haul)

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/Set# 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 00/00/0000, again you may change data in this field by typing the correct date in the mm/dd/yyyy format. You may, in a similar manner, change all other data generated by the computer. You should enter the rest of the data in the same format as if you were entering it on the Vessel and Observer Haul forms (see pages 3-21 and 3-32 for trawlers, pages 6-39 and 6-45 for longliners, or pages 7-16 and 7-19 for pot vessel sampling).

Description of Data Fields

Haul/Set: There should be an entry for every haul or set of gear retrieved. Enter a distinct number for each haul or set. Enter haul/set numbers in consecutive order. You may want to number your hauls so that they correspond to the haul numbers in the vessel's logbook. This will make it easier to track the hauls and enter the corresponding data to your forms. Enter a zero in this field for all non-fishing day entries.

Gear Type: Enter the appropriate gear code in this column. This codes indicates the type of gear deployed. There is a drop-down list in the field or see page 3-27 if you are on a trawler, page 6-39 if you are on longliner, or page 7-16 if you are on a pot vessel.

Gear Performance: Enter the appropriate code. This code denotes if their were any problems with the gear that may have affected the amount of fish caught. There is a drop-down list in the field or see page 3-27 if you are on a trawler, page 6-40 if you are on a longliner, or page 7-16 if you are on a pot vessel.

Vessel Type: Enter the Vessel Type code. This code indicates the type of vessel, whether a catcher vessel, catcher processor, mothership, etc. There is a drop-down list in the field or see page 3-28 if you are on a trawler, page 6-40 if you are on a longliner, or page 7-16 if you are on a pot vessel.

Deployment Date: Enter the day the gear is deployed. Attribute sets deployed at or before 2359 hours to that day, assign sets deployed after 2359 to the following day.

Time of Gear Deployment (hhmm): Copy the "Time of Gear Deployment" from the vessel logbook into this field. This is the time the gear reaches the fishing depth and begins fishing. For longliners this is the time the first hook enters the water. All entries must be in Alaska Local Time (ALT). Always enter four digits, no colon marks. Enter all 2400-hour notations as 0000 hours, and 0000 hours starts a new date entry.

Deployment Positions: Latitude, E/W, Longitude: Copy the latitude and longitude of the "Begin Position of Haul or Set" from the vessel logbook into these fields. For longliner and pot vessels this position is the latitude and longitude of the first hook or pot of a set to be deployed. For trawlers this is the position where fishing began. The first digit of the longitude is understood to be 1 and does not need to be entered. Follow the same guidelines as those for the position of gear deployment, see above. Enter "E" or "W" to indicate whether the longitude is east or west of the 1800 longitude line.

Avg. Bottom Depth: Record the depth reading in the "Ave Sea Depth" column from the vessel logbook. Record depth in whole numbers, do not enter decimals in this field.

Avg. Gear Depth: Record the depth reading in the "Ave. Gear Depth" column from the vessel logbook. Record depth in whole numbers, do not enter decimals in this field

Units: The unit used by the vessel will be circled in the vessel logbook indicating whether the depth recordings are in fathoms or meters, record "F" or "M" in this field to indicate the unit of measure used for depths.

Retrieval Date: Enter the day the first hook of a set is retrieved or when the net stops fishing. The date listed as the retrieval day might not be the same day that a retrieval is begun. Attribute sets retrieved at or before 2359 hours to that day, assign sets retrieved after 2359 to the following day.

Time of Gear Retrieval (hhmm): Copy the "Time of Gear Retrieval" from the vessel logbook into this field. This is the time the gear stops fishing. For longliner or pot vessels this is when the last hook or pot comes out of the water. All entries must be in Alaska Local Time (ALT). Always enter four digits, no colon marks. Enter all 2400-hour notations as 0000 hours, and 0000 hours starts a new date entry.

Location Code: Enter R if the location is a retrieval position. Enter "N", non-fishing day, for all days when there are no fishing activities (vessel is in port, steaming, or waiting out a storm). Enter a "D" for a delivery position if you are on a mothership taking a delivery and you are unsure of the fishing location.

Retrieval Positions: Latitude, E/W, Longitude: Copy the latitude and longitude of the "End Position of Haul or Set" from the vessel logbook into these field. For longliners and pot vessels this position is the latitude and longitude of the last hook or pot of a set to be deployed. On trawlers this is the position of the vessel when the net ceases to fish. The first digit of the longitude is understood to be 1 and does not need to be entered. Follow the same guidelines as those for the position of gear deployment, see above. Enter "E" or "W" to indicate whether the longitude is east or west of the 1800 longitude line.

Vessel Est: Record the "Round Weight Catch - Estimated Total" from the vessel logbook in this column. Record the weight estimate in metric tons rounded to two decimal places. If the estimate is recorded in pounds convert the weight to metric tons, see Appendix D. "Weights, Measures, and Conversions" on page A-12. Never use the vessel estimate for OTC. Do not record a Vessel Estimate for vessels fishing using an IFQ.

Catcherboat ADF&G: This field will only be visible if you have entered a “2 Mothership W/O Sorting” or “4 Mothership with Sorting” in the *Vessel Type* field. For all catch delivered to your ship, record the ADF&G permit number of the delivering vessel, then write in the delivering ship name and its ADF&G permit number in the box at the top of the Vessel Haul form (Figure 5-3 on page 5-6).

IFQ: Enter an “Y” if a set or haul was fished using Individual Fishing Quota. Enter a “N” if it was not. Any vessel that intends to fish IFQ will have an IFQ logbook, but this does not necessarily mean that every set is IFQ. For a more detailed description of IFQ see page 6-50.

CDQ#: For all CDQ hauls or sets record a “C” then the last two digits of the CDQ permit number for each haul taken using the Community Development Quota (CDQ). This number can be found at the top of the vessel logbook in the box marked “CDQ-if yes CDQ number”

 # Segments/Set: This field will only be visible if “8 Longline”, or “7 Jig” is entered in the *Gear Type* field. Enter the number of gear segments in the particular set.

 # Hooks/Segment: This field will only be visible if “8 Longline”, or “7 Jig” is entered in the *Gear Type* field. Enter the average number of hooks per gear segment

Hauls Sampled By?: Enter the code that corresponds with the person that sampled the set for composition. For vessels with only one observer enter “1” for sampled sets or “0” for unsampled sets. For vessels with two observers enter “1” if the lead observer sampled the set for composition, enter “2” if the second observer sampled the set, or enter “0” if the set was not sampled.

Random Sample: Enter the code that corresponds with your position on the random sample table (RST). Enter “9” if you are not using the random sample table and plan on sampling all hauls. Enter “1” if the RST indicates that the haul is an “on” haul. Enter “0” if the RST indicates the haul is an “Off” haul. See page 2-15 in the Essential Information section on how to use the RST.

Random Break: Enter the appropriate code as to whether you were using the random break table or not. Enter “0” if you are using the random break table and the table indicates you should be on break. This is independent as to whether you sampled the haul or not. Enter “1” if the break table was not used or if the table indicates that the set should be sampled, whether it was or not is not.

% Monitored for Marine Mammal: This is the percent of the gear you monitored for the presence of marine mammals. This is the percent of the gear that was tallied but may include more if you also watched the gear at other times. Divide the number of segments of gear you watched being retrieved by the total segments of gear in the set, or divide the total time you watched gear being retrieved by the total retrieval time of the set, to obtain this number. See the Marine Mammal Sightings and Interaction section of the manual page 12-1 for duties relating to marine mammals.

Marine Mammal Interaction?: Enter a "Yes" or "No" indicating whether there was or wasn't a marine mammal interaction for the particular haul. A "Yes" will activate the Form 10A-Marine Mammal Data and upon exiting the Haul form the program will open the Form 10A-Marine Mammal Data.

Bird Deterrence: This column refers to seabird deterrence devices and will only be visible when "8 Longline" is entered into the *Gear Type* field. For each haul enter the code for the type of bird deterrence listed in the vessel logbook as being employed from the drop-down list. This does not indicate that the vessel was using the listed device. See the Seabird Section of the Observer Manual on page 13-1 for further information on seabird deterrence.

Verify Deterrence: This column refers to seabird deterrence devices and will only be visible when "8 Longline" is entered into the *Gear Type* field. For each haul enter the appropriate code from the drop-down list. Enter a "2" or "3" only when you have actually observed a deterrence device in use or not in use. Enter a code of "1" when you do not observe the setting of gear and were not able to verify the use of the seabird deterrence device.

Total Hooks/Pots: The *Total Hooks/Pots* field only appears when "8 Longliner", "6 Pot or Trap", or "7 Jig" is entered in the *Gear Type* field. After entering the *# Segments/Set* and *# Hooks/Segment*, the *Total Hooks* number is automatically generated by the computer by multiplying *# Segments/Skate* by the *# Hooks/Segment*. This number may be changed if you have a different method of determining total number of hooks, i.e., actual hook count.

OTC: Enter the Official Total Catch estimate in metric tons rounded to two decimal places.

Observer Estimate: Record the weight estimate in metric tons rounded to two decimal places.

B/C/W: For trawlers fill in the method that was employed to obtain an observer estimate B= bin, C= Codend, and W = Weighed sample. See page 3-33.

Density: Enter the density used to obtain the Observer estimate. Leave null if no Observer estimate was made.

Processor permit: The *Processor Permit* field only appears when "3 Catcher only" is placed in the *Vessel Type* field. Enter the Permit code for the processor to which the vessel is delivering.

Date Fishing Began: Complete this field only for sets on catcher vessels delivering to shoreside plants. For each set enter the date the first set of a trip was retrieved. This is a required field for all catcher vessel sets. This field allows NMFS to identify which sets comprise a particular trip and delivery.

Non-fishing Day Positions

When a "0" is entered into the *Haul/Set#* field, a new screen will appear. The data fields on this form are *Date, Location Code, Non-fishing Day Latitude, Non-fishing Day E/W, and Non-fishing day Longitude.* All days on board a vessel must be accounted for, on days where there is no fishing you must enter a Non-fishing day position. This position should be taken at or around noon of the non-fishing day. It is not imperative that you determine the position of the vessel exactly at noon, any position for the day will suffice if a noon position is not available.

Species Composition Data Form

Before adding species composition data, you must have already entered haul or set data. Select the "Species Comp Data Form 3" button on the Main Window to begin adding composition data. You should now see the Haul/ Set List window (Figure 15-3). 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 "Select Haul and Press 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 (Figure 15-12 and Figure 15-13).

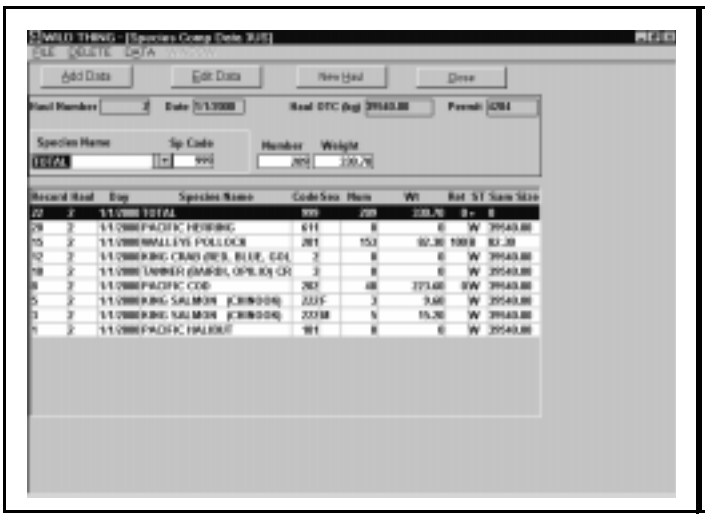


Figure 15-12: “Add Data” (longline species comp)

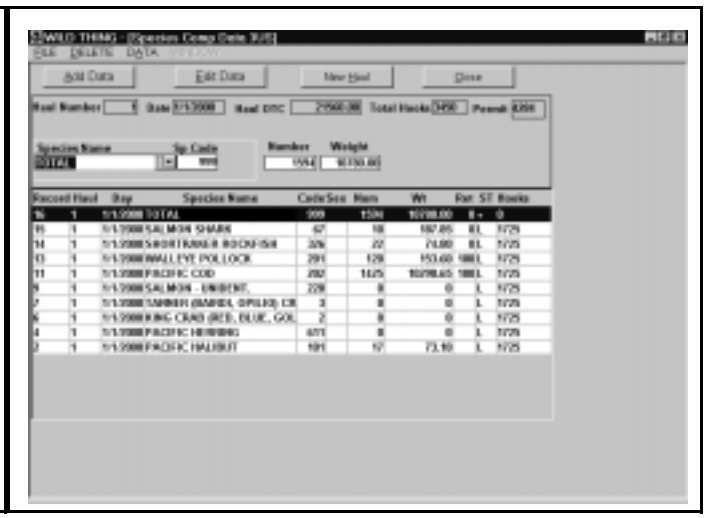


Figure 15-13: “Add Data” (trawl species comp)

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), B (for basket samples or subsamples), and X (presorted organisms). For longliners and pot boats the L (longline) or T (trap) should be selected. The other selections for these vessel types 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 B 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.

Data Check and Verification

In order to increase data quality and reduce debriefing time a required data check has been implemented on the ATLAS program. After entering all the composition data for a particular haul or set you will be asked to enter a summed number and weight with a species code of 999. This is a data check and verification to help insure data quality. Enter a species code 999 in the SP code field. Add all the species numbers for all sample types and enter the summed number under the Number field. Sum all of the weights in every sample type in a set or haul to obtain a total weight. Enter this number into the weight field. If the summed numbers for all your species entered into ATLAS are not equal to the numbers entered into the 999 species row the program will not allow you to continue. If this is the case you must verify your numbers and weights again. Sum the numbers and weights on your deck forms once again, then double check the numbers you have entered into the computer. Re-enter the new value and continue.

Plant Data Form A

Choose the “Plant Data Form A” button, a screen, such as the one in Figure 15-14, will appear. Choose the “Add Data” button, an empty Data Entry Window, such as the one in Figure 15-15, 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**.

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 00/00/0000, again you may change data in this field by typing the correct date in the mm/dd/yyyy format. You may, in a similar manner, change all other data generated 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 page 8-10).

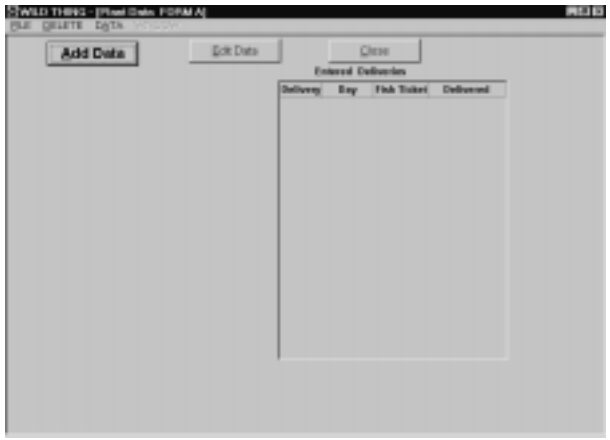


Figure 15-14: “Plant Data Form A” Button

Figure 15-15: “Add Data” Button (Plant Form A)

Plant Observer Duties in Regards to ATLAS

Plant observers using ATLAS must maintain and bring back paper copies of the Form A.

The priority of plant observer duties will not change from those listed on page 8-1 in the Plant Section. Plant observers will continue to be responsible for transmitting data for some vessel observers on shoreside delivery boats. Since it is impossible to require all shoreside delivery boats to have the satellite communications equipment necessary for ATLAS transmissions, it will still be necessary for some observers to transmit their data once they reach port.

Length Data Form 7

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 (see Figure 15-3). Select and choose the haul/set/deliveries 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 "Select Haul and Press 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 15-16). **Data needed for this form are the same as that needed for the Form 7.**

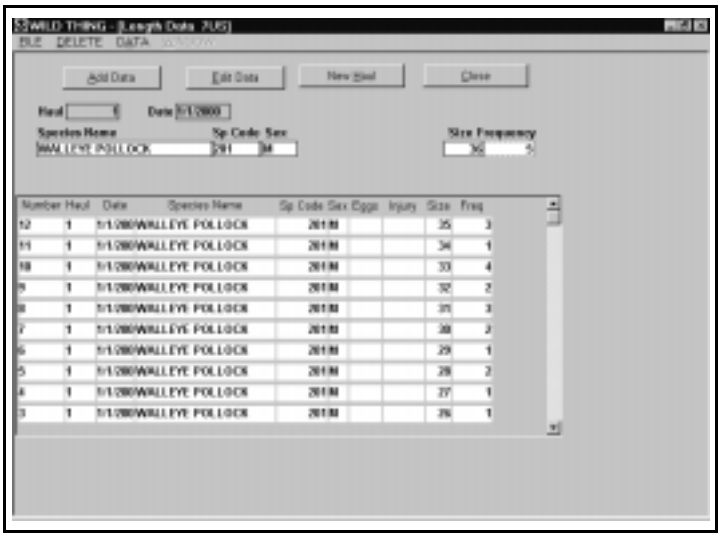


Figure 15-16: "Add Data" Button (length frequency)

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 (see page 4-44).

***Species Code* field:** This field is exactly like the *Code* field for the Species Composition form (see page 4-44).

***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.

***Injury / Viability* fields:** Enter the appropriate code. Criteria and codes are listed in the Appendix beginning on page A-37.

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 9

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 15-3). Select and choose the haul/set/deliveries 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 “Select Haul and Press 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 15-17). **Data for this form is the same as that needed for the Form 9US.**

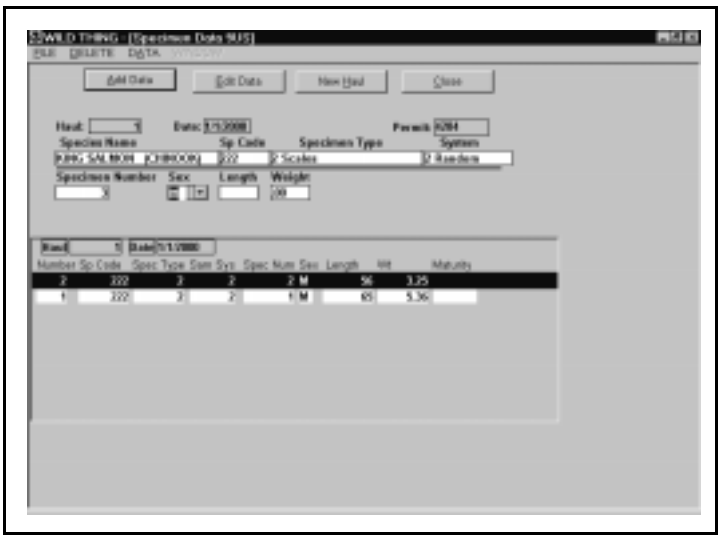


Figure 15-17: “Add Data” Button (specimens)

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 4-44).

***Species Code* field:** Species *Code* may be entered in the same manner as that on the Species composition form (see page 4-44).

***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 Data Form

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 (see Figure 15-3). 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 in Figure 15-19 will appear if you are working with plant data or the screen in Figure 15-18 will appear if you are working with vessel data.

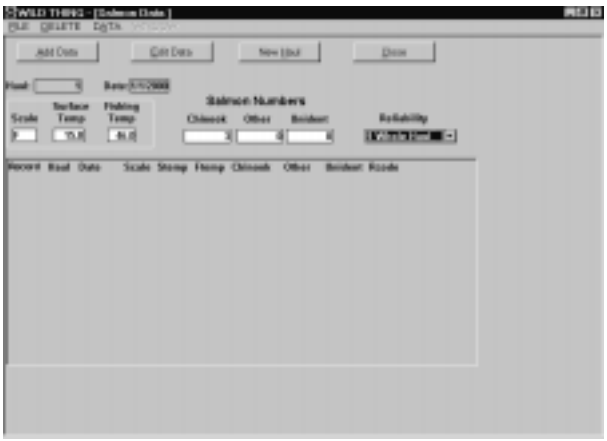


Figure 15-18: “Add Data” Button for Vessels (salmon)

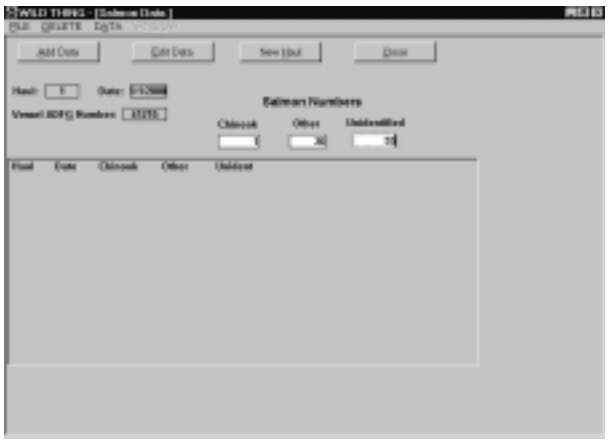


Figure 15-19: “Add Data” Button for Plants (salmon)

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 temperature*s, 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 10A

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 (see Figure 15-3). 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 “Select Haul and Press 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 15-20). **The data needed for this form is the same as that which is needed for the Form 10A.**

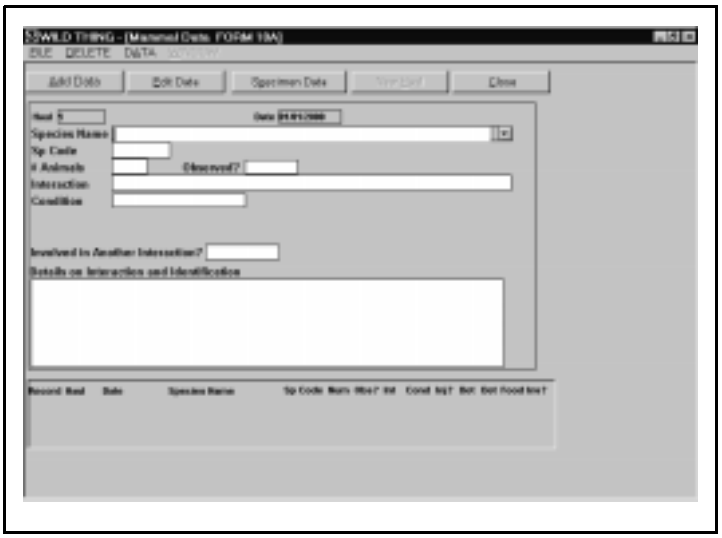


Figure 15-20: “Add Data” Button (marine mammal)

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.

***Injured?* field:** This field is only filled in if the interaction involves a live animal, condition code 3 otherwise the field is left blank. If there is an interaction with a live animal record "Y" if you actually observed the animal to be injured, enter "N" if you observed the animal to be uninjured, or "U" if you are unsure as to the condition of the animal.

***Deterrence Method* field:** Fill in this field only for deterrence interactions, interaction code 1. Otherwise leave this field blank. There is a drop-down list with a list of codes or see page 12-10.

***Deterrence Successful?* field:** Fill in this field only for deterrence interactions, interaction code 1. Otherwise leave this field blank. If you observer that deterrence works to deter marine mammals from the catch enter a "Y". Enter "N" if you observed that the deterrence was unsuccessful in deterring animals from feeding on the catch. Enter "U" if you are unsure as to the success of the deterrence method.

***Food Species* field:** Fill in this field only if you have a marine mammal feeding on catch, interaction code 10. Otherwise leave this field blank. Enter the species code from Appendix C. "Species Code List - Marine Mammals" on page A-10 of the fish species that is being predated upon the heaviest. If there are more than one species that are being predated upon list the other species in the Remarks field.

***Involved in another interaction?* field:** If this individual marine mammal or group of marine mammals was involved in other interactions listed on the Form 10A enter a "Y". If not enter a "N".

***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 on page 12-11. 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 10B

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 Form10A.

Differences from the Paper Form 10A

The main difference from the ATLAS Form 10A and the paper Form 10A is that there are no Interaction numbers. The computer automatically assigns interaction numbers when you make an entry and links them to the appropriate specimen entry on the Form 10B.

Marine Mammal Specimen Form 10B

To add data to the Marine Mammal Specimen Form 10B, you must first have entered data to the Marine Mammal Data Form 10A. Choose the "Add Specimen Data" button on the Marine Mammal Data Form 10A to change to the Marine Mammal Specimen Form 10B. On the Marine Mammal Specimen Form 10B, choose the "Add Data" button and you will see a screen which resembles the screen in Figure 15-21. **The data needed for this form is exactly the same as that which is needed for the Form 10B.**

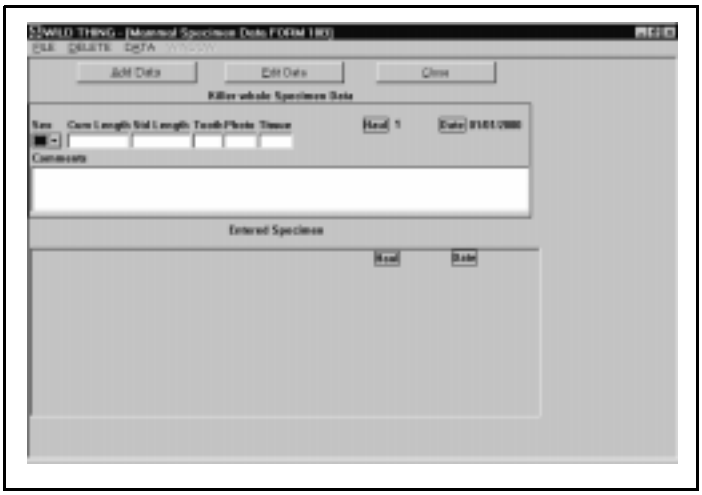


Figure 15-21: "Specimen Data" Button (marine mammal)

Specifics on the Marine Mammal Specimen Form 10B

***Comments* field:** Comments should be entered in the as they are described on page 12-19. 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 they will appear at the bottom of the screen with INCOMING listed in the *Type* field. Click on the message, then click on the “Edit/Read” button at the top center of the window.

Recording Text Messages to Send

To record a text message click on the “Add” button and type your message in the *Message Text:* box. The screen will look like the screen in Figure 15-22.

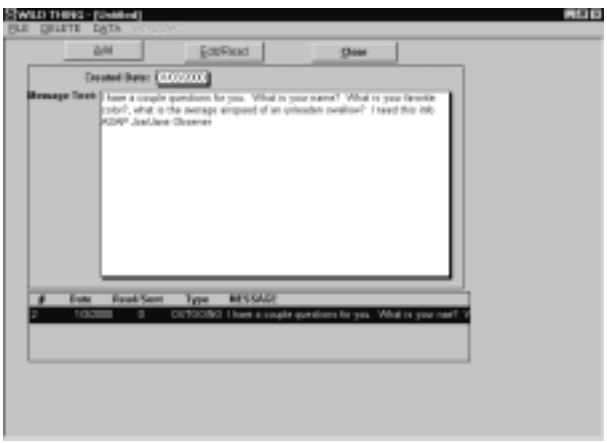


Figure 15-22: “Add” Button (text messages)

Printing Incoming Text Messages

To print incoming messages use the mouse to point and click on the “Print Message” button on the bottom left of the Text window. The message will print on the Window’s default printer.

Transmitting Data from Vessels Using INMARSAT A, B, or Mini-M Communications

Most vessels that have the ATLAS program installed, use INMARSAT A, B, or Mini-M communications to send data via satellite to their home offices. The ATLAS program uses the same communications system to send data to the NMFS offices in Seattle.

Transmit Data Command Buttons Page

Select the “Tran<u>n</u>smit” command button, a screen such as the one in Figure 15-23 will appear. The Transmit Menu form lists the options for transmitting data. .

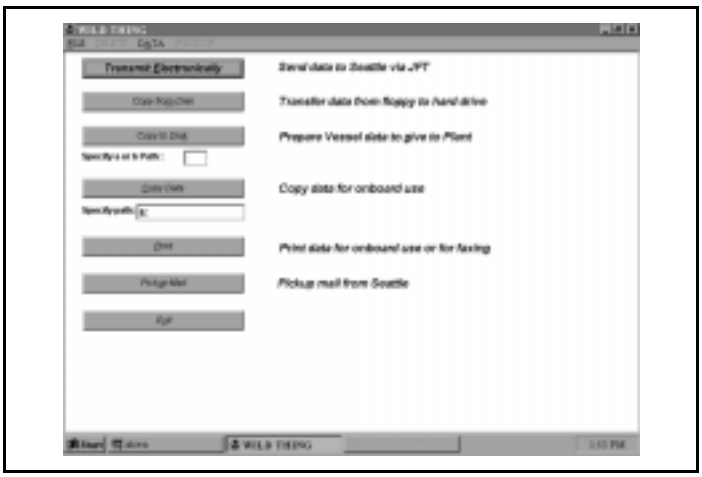


Figure 15-23: Transmit Option Screen

Transmit Electronically:	Transmits data from your vessel to and receives messages from Seattle. This option is for vessels that have the satellite communications capabilities to use Just File Transfer (JFT) software.
Copy from Disk:	This option is used by a Plant Observer to copy data off a floppy disk that contains shoreside vessel data. The data is copied off the floppy to the plant's computer that will be used for transmitting the data.
Copy to Disk For Plants:	Copies data to a floppy disk. This option will be used in combination with the Copy from Disk option. On a vessel without the capabilities to send data from at sea, 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:\.]
Copy Data:	Copies data (for use on the vessel) to a specified path, this could be to either the hard drive or a directory. 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.

Table 15-1: Data Preparation and Transmission Options

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 such as the one below. There are three windows and five command buttons

Windows:

Option 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 into the database and have not yet transmitted. It will also send any data you have edited since you last prepared data.

2. Send Previously Transmitted Data, allows you to resend any data you have already sent. When this option is chosen the Data Selection window will appear.

Data Selection Window: This window allows you to select which dates or hauls/sets/deliveries 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.

2. In the *Haul Range* data fields, you may enter the range of hauls/ sets/deliveries, *Start* to *End*, you wish to send. To send a single haul enter the same number in both fields.

Select Data to Prepare Window: This window allows you to select the type of data you wish to send to NMFS. A ☑ means that these data forms are to be sent. A ☐ means that these data forms will not be sent. Text data will always sent.

You may place or remove a ✓ from the boxes by using either;

1. the mouse pointer to select the field, then click on it to add or remove a ✓, or

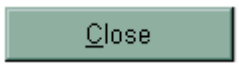
2. the <Tab> key or <Shift>+<Tab> key combination to select the field, and press the <space bar> key to add or remove a ✓.

Command Buttons:

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 Table 15-1).

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. Once you hit Transmit, you will see two boxes appear at the bottom of the screen, titled “Files to be Transmitted,” and “Files that Failed Transmission.” If file names appear in the Failed Transmission box, you may need to try transmitting again, as all files didn’t go through. If one or more files are not transmitted after multiple tries on different days, send a text message explaining this to NMFS.

Figure 15-24: Atlas transmit screen

5. Press the <Alt> key and the <Tab> key simultaneously **after** you see the JFT icon flash on the screen

. The JFT Communications Window will then appear. This window allows you to monitor the transmission process.

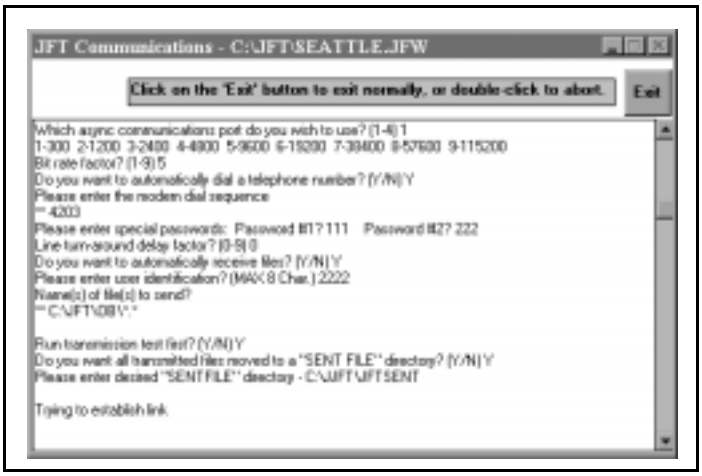


Figure 15-25: "JFT Communications" Screen

6. Wait for the transmission to be complete then press <Enter>. You will be informed if there are any incoming messages (see "Text Messages" on page 15-32). 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.

Transmitting Data from Standard C Communications Vessels

Some vessels that have been installed with the Atlas program do not have the capability to transmit Atlas data directly to Observer Program. These vessel lack the necessary hardware to transmit data via a modem to modem connection. Instead of transmitting your Atlas data via the phone system you will e-mail your Atlas data via the ships communication software called Mobile Communications Controller or MCC. This section will cover how to prepare your ATLAS data to a disk then e-mail the file to the Observer Program.

Preparing Atlas Data to a Disk

You must now Copy the data to a disk. These instructions can be found on page 15-34 of this manual.

Sending ATLAS Data via MCC Software

1. Find the computer that has the MCC software on it and place the disk in the disk drive. If the computer you are using for ATLAS also has the MCC software then do not remove the disk.

2. If you are using Windows 95 or 98 there may be on MCC Icon on the desktop of the computer. If so, double click on the MCC Icon. If there is no Icon, select the “Start” button, then the “Programs” button. Find the program group called MCC and click on the MCC icon.

3. If you are using Windows 3.1, find and click on the group icon called MCC, then double click on the MCC Icon.

4. From Menu use the arrow keys and select the Messaging option.

5. Hit the <Tab> key to get down to the Transmit Messages window

6. Select “Options” using the arrow keys then select “Import”

7. Using the <Backspace> key backspace over the file name and enter a:\

8. Press the <F3> key

9. Using the arrow keys highlight the ATLAS file then press the <enter> key 3 times

10. Select Send then Address Book

11. Using arrow keys select our address which is Atlas.Mail@noaa.gov then hit the <enter> key

12. You will now be asked several questions regarding queuing messages. You can use the arrow keys to navigate to the “Yes” and “Ok” buttons. Once you have answered all questions the message will be sent.

13. Delete the AtSea (ATLAS) data off disk when you are finished.

Backing Up Data

What is Backing Up Data Anyway?

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 day.** Backing up your data may require more than one disc to capture all the data. Alternate between the two sets of disks each day. One or two disks should be used Mon, Wed, Fri and Sun and the another one or two for Tue, Thu, and Sat. 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 previous backup files on the disk.
2. Click on the “Backup Database” button in the Main Window (see Figure 15-26).

Figure 15-26: “Backup Database” Button

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.

   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.

4. If the 3.5" floppy drive is drive B, click on the “No” button. This automatically chooses the B drive.

Figure 15-27: Steps for Backing Up Database

5. The computer will “blink” and a 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 your 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 your 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 (see Figure 15-28).

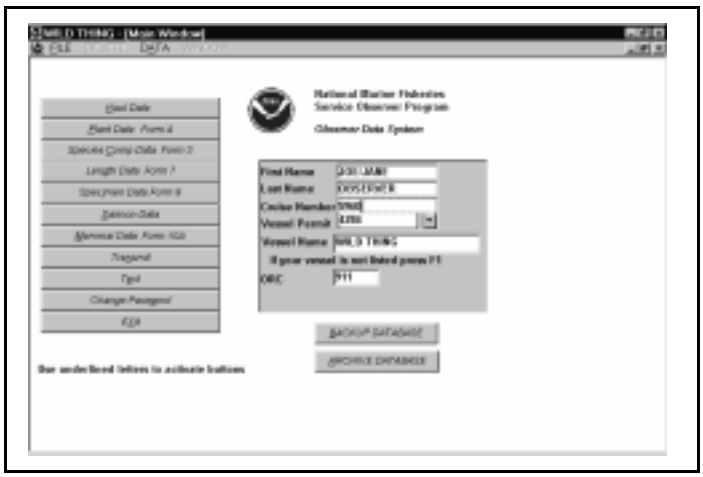


Figure 15-28: “Archive Database” Button

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.

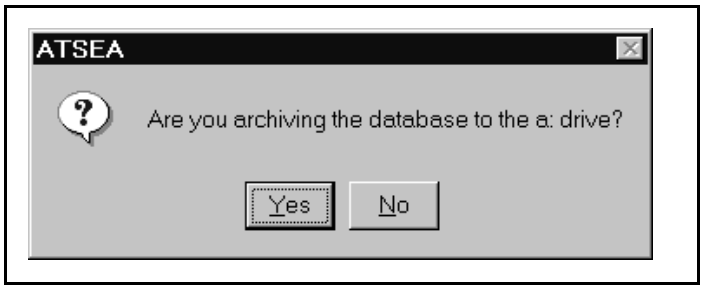


Figure 15-29: Archiving Database

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 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 95

To update the version of ATLAS AtSea in Windows 95 you must click on the Start button on the bottom left of the screen (see Figure 15-30). 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 15-31). 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 15-30: “Start” Button

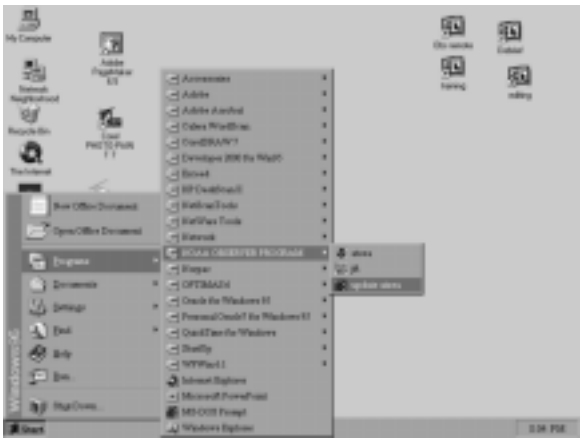


Figure 15-31: “NOAA Observer Program” Button

For Windows 3.1

On the Program Manager window for Windows 3.1 you may have noticed an icon named “Update Atlas”. 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.

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 Vessel and Observer Haul and/or Plant Delivery forms, 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.

The very first thing you will need to do upon boarding a new vessel is to check for the US Coast Guard Commercial Fishing Vessel Safety Examination Decal (see page 17-2). You may not board a vessel that does not have a current decal. If the vessel does not have a current decal, inform the captain that you are not able to board the vessel without one and immediately inform your contractor. Document the decal information in your logbook. (*Please note that the mothership Ocean Phoenix is not required to have this safety decal.)

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 ATLAS 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 17-3). 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.

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.

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. Questions you should ask yourself when considering an adequate sampling station are:

- 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:

- If your vessel will be using a flow scale, talk to the skipper to determine who will be responsible for testing the scale and how you can obtain haul by haul scale weights.

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

Fishing operations are much simpler aboard a catcher-only vessel, 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

By regulation Title CFR§ 679.50, reasonable assistance should be provided to enable Observers to carry out their duties.

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 a processing 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, (see“SHORESIDE PLANTS AND FLOATING PROCESSORS” on page 8-1).

- 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 extra baskets or portable totes from the field offices.

- 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 on longline vessels are different from trawl vessels. 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 on pot vessels are similar to those on 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 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 of the pots, 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 Haul

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

Your own safety is always your top priority when working on a vessel. In this chapter, you will find:

- 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 are carried 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. No matter how cautious the crew is, it is your responsibility to keep yourself safe and know how to react in all emergency situation.

Before You Board

Prior to boarding any vessel, check for the US Coast Guard Commercial Fishing Vessel Safety Examination Decal (see page 17-2). You may not board a vessel that does not have a current decal. If the vessel does not have a current decal, inform the captain that you are not able to board the vessel without one and immediately inform your contractor. Document both valid and invalid decal information in your logbook. (*Please note that the mothership Ocean Phoenix is not required to have the safety decal.

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 17-1).

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 USCG Commercial Fishing Vessel Safety Examination decal or ask for documentation. These decals are valid for two years from the month issued, indicated with the hole punch.

2. Find the station billet (commonly called 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?

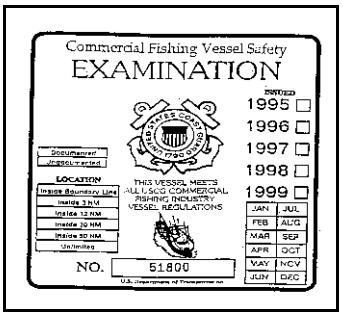
11. Are there emergency instructions for, and did the skipper ensure that you were given, a safety orientation explaining the following?

    - 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 17-1: 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.



Commercial Vessel Fishing Safety Decal

Prior to boarding a vessel for the first time, you must check the vessel for compliance with Coast Guard regulations. Check the major safety items identified in Figure 17-1. 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. Remember, the vessel must have a valid safety decal in order for you to board. The NMFS requires that the vessel owner or operator 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 by a moving boat

All baggage should be secured with lines and transferred via rope lines or cargo nets. Observer baskets and luggage 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. Always be cautious, 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 quickly.

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 tally samples, 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.

- Beware of trawl cables under strain, they have given way and 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.

- Watch for moving pots and, if possible, and face the direction of the pot launcher while you work. Stay away from the bouy line when the crew is launching pots. Crewmen have been caught in a loop, or the “bite,” of the line and pulled overboard.

- Wear eye protection on longliners if you are near the moving hooks. Use a gaff to collect fish to protect your hands and keep your body further away from the line.

Working in Factories

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.

When you are collecting your samples off of conveyor belts, do not try to pry out fish caught between two connecting belts, or grab for fish caught under a diverter board. Your finger or hand may get mangled in the machinery. If you need to retrieve these fish, make sure you stop the belt first.

Just walking around the factory can be dangerous. Beware of factory offal wash out around the scuppers and bilges, rushing water can affect your balance. Lastly, watch for low beams, belts, hoses, and other equipment, Observers frequently hit their heads in unfamiliar factories.

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 leeward side 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 spines, 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 upmost 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 may have established a working rapport 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, or
- 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.

“Unalaskans Against Sexual Assault & Family Violence” is a support service in Dutch Harbor. If you need to speak to someone confidentially about a harassment case, they can be contacted at 1-800-47U-SAFV.

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.

Please report any cases of harassment to the Observer Program or NMFS Enforcement as soon as possible. The agency is unable to help you with problems they are unaware of.

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.

6. 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

You must contact the NMFS each day an illness or injury prevents you from sampling for a whole day. Additionally, you must contact your contractor if an illness or injury prevents you from sampling for more than three days!

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. 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 compressions, 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, s/he may be revived by this technique (see CPR Chart, page A-61).

Fire

A fire needs heat, fuel and oxygen. Remove any one of these components to stop a 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—especially 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 inappropriate:

   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. Activate EPIRB & commence 7 Steps to Survival

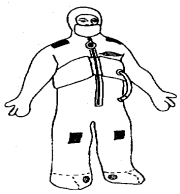
Figure 17-2: Abandon Ship Placard

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 17-3). 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 17-3: 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 17-5).

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
Deckhand	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 17-4: Example of a Station Bill

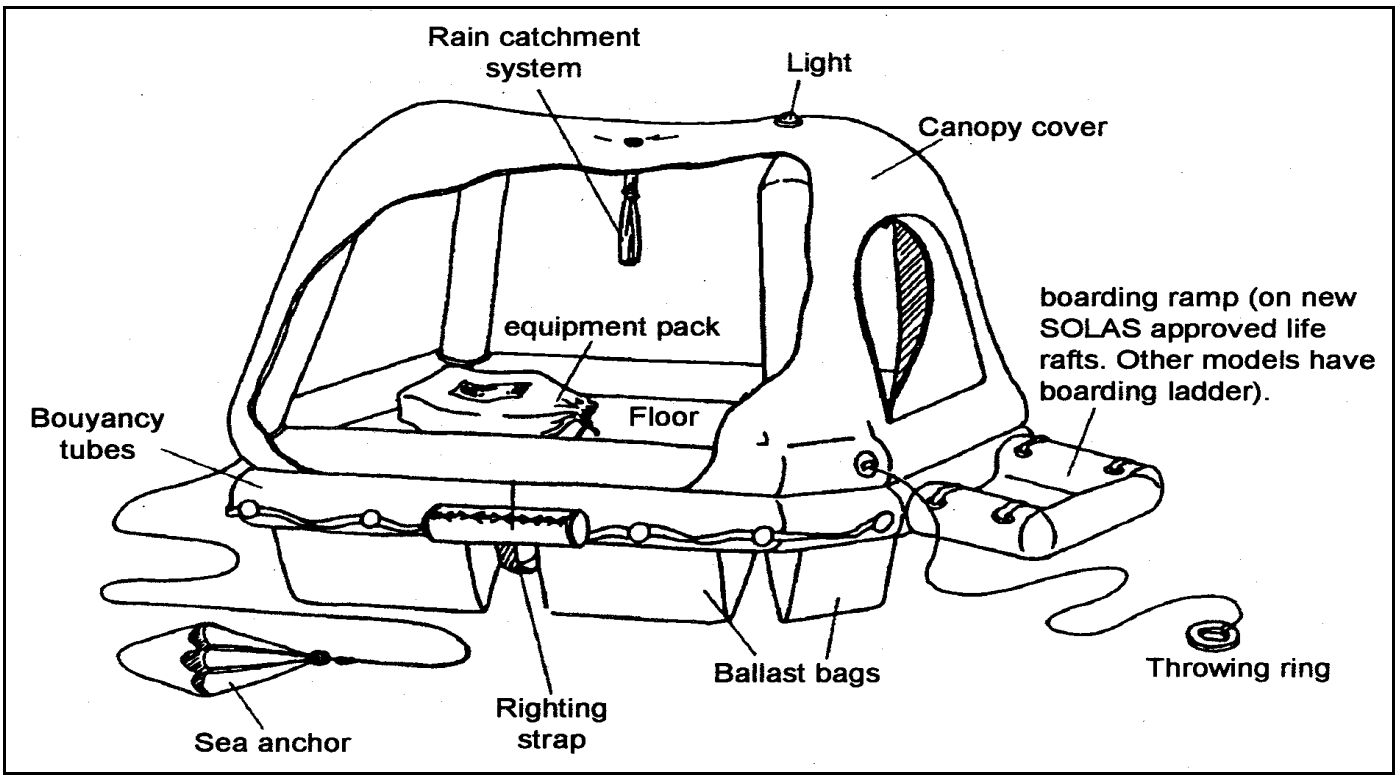


Figure 17-5: Life Raft and Equipment

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.

1. 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.

2. 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.

3. 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.

4. 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. Anything that makes you bigger, brighter, or different from your surroundings is a signal, so an attempt to gather items which float from a sinking ship should be made. In a shore survival situation, three of anything (fires, buoys, immersions suits on the beach) is an internationally recognized distress signal.

5. 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, so 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.

6. 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.

7. 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 among 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. • Each 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 seaworthiness of the vessel such as; fire, flooding, or the failure or damage to fixed fire extinguishing systems, lifesaving equipment, 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 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 18-8).

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 17-21 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 18-31.

Marine pollution regulations refer to “Marine Pollution (Marpol) Regulations” on page 18-36.

Regulations related to protected and endangered species, refer to “BIRD SIGHTINGS AND INTERACTIONS” on page 13-1 and “MARINE MAMMAL INTERACTIONS AND SIGHTINGS” on 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.

Document
Suspected 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 Record keeping 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 the "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 vessel 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.

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. (Vessel operators may see all of their vessel’s data, except your logbook.)

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

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

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.

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.

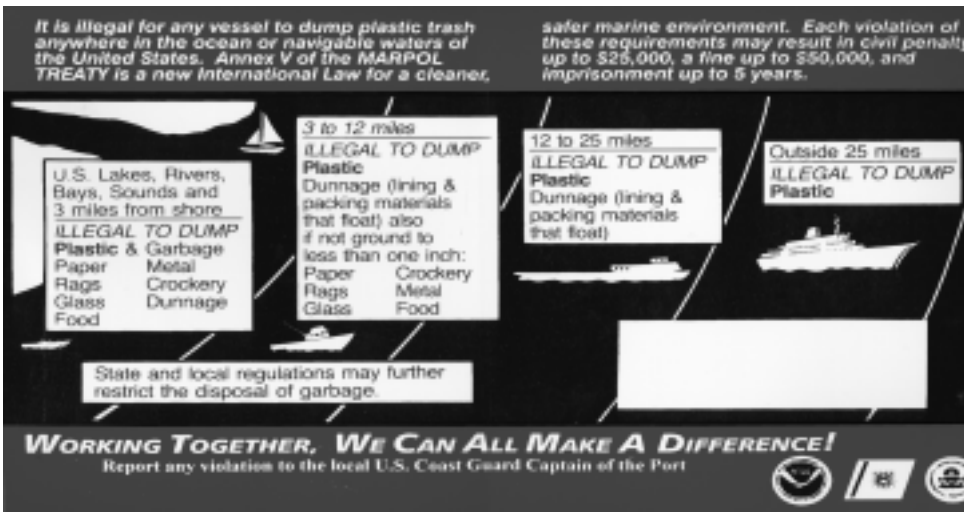

Figure 18-1: Marpol Placard

THE MID-CRUISE AND FINAL DEBRIEFING

List of Priorities

- 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 provides 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 with our training, and the data collected are sound, NMFS requires that Observers participate in both a 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 of the data will improve the quality of the data and expedite this process.

Mid-cruise

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 during off 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, any Observer who had problems on a previous contract may be required to have a mid-cruise. 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 a mid-cruise debriefing is necessary, ask your contractor or stop in to the field station 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 a short time spent in the field office 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 a last resort, the following questions are to be answered and faxed to one of the field offices or the main office in Seattle (see "Contact Addresses and Numbers" on page A-46).

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 18-3 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 **paper** forms needed by vessel type:

Trawler Observers

- Vessel Haul Form
- Observer Haul Form
- Form 3US Species Composition
- Form 7 Length Frequency of Measured Species
- Form 9US Biological Sampling Form
- Species I.D. Forms
- Special Project Forms, Tagged Fish Forms
- Marine Mammal Forms(10A,10B and/or 11US)

Longline Observers

- Vessel Haul Form
- Observer Haul Form
- Form 3US Species Composition
- Form 7 Length Frequency of Measured Species
- Form 9US Biological Sampling Form
- Species I.D. Forms
- Special Project Forms, Tagged Fish Forms
- Marine Mammal Forms(10A,10B and/or 11US)

ATLAS Vessel Observers

- Vessel Haul Form
- Observer Haul Form
- ATLAS Deck Form (trawler or longliner)
- Species I.D. Forms
- Special Project Forms, Tagged Fish Forms
- Form 11US Marine Mammal Sighting Form

ATLAS Plant Observers

- Form A Plant Delivery Form

Non- ATLAS Plant Observers

- Form A Plant Delivery Form
- Weekly Work Report
- Form 7 Length Frequency of Measured Species
- Form 9US Biological Sampling Form

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 Vessel Haul Form and Observer Haul Form).
- All decimals already printed on the forms are to have numbers listed to two decimal places.
- 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.

Observer and Vessel Haul Form

- 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.
- No duplicate haul/set numbers.
- All haul/set numbers in consecutive order.
- No decimals other than those already printed on the page.
- For longliners, "# of hooks per segment" and total hooks in a set must be a whole number.

Vessel Haul Form

- A position must be recorded for all hauls/sets. If unavailable, interpolate from the previous position.
- No minutes greater than 59.
- For trawlers, no overlapping of gear deployment and gear retrieval 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.
- Mothership Observers, complete “Full name of catcher boat,” and “ADF&G #” box at top of page.
- Mothership Observers, a “Catcherboat’s ADF&G#” column complete for each delivery by a catcher vessel.
- A “Y” or “N” must be recorded in the IFQ column.
- All CDQ numbers must be recorded with the letter “C” followed by the last two digits of the CDQ permit number (found in the vessel logbook).

Observer Haul Form

- Catcher vessels, check the following
  - “Plant/Processor name, “location,” and “Processor permit #” box at the top of the page;
  - “Processor permit” for each haul; and the
  - “Date fishing began for delivery” completed for every haul.

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 Vessel and Observer Haul Form.
- Species names are to match species codes.
- No species code can be listed twice except for different sexes of prohibited species. A species may be listed twice if one is recorded with a “X” sample type and the other with a “B” or “P” sample type.
- 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 Observer Haul 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 7

- 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.
- No duplicate lengths for the same cruise, vessel date, haul, species, sex code, and eggs code.
- 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” for trawl or pot vessels, and injury codes of “1,” “2,” “3,” “4,” or “9” for longline vessels. All other species must have a sex code of “F”, “M”, or “U”.
- Date listed for haul must match corresponding date on the Vessel and Observer Haul Form. Dates must 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.
- All specimens have a date, 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.
- All entries on the 9US must have a corresponding entry on the Form 7 (Form 7? column must always be “Y.”)

Form 10

- 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 10A.
- If you are turning in a photo or have specimen data, there must an entry on the 10B.
    - 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, a debriefing interview, gear check-in, a data check, correction of errors, filling out Observer Questionnaire, and a final check out. The time to complete this process is variable. Beginning with the debriefing interview, Observers should expect to spend approximately three to five days to complete the debriefng process. 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 an 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. 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. Each Observer can help expedite this process by being prepared for debriefing and keeping their contractor and NMFS informed of any difficulties in attending and completing the debriefing process. 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 of the your deployment and serves 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 will be scheduled 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 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. 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.

The procedure for debriefing differs between Observers on ATLAS and non-ATLAS vessels. 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 Vessel and Observer Haul 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 Form 7 and 9US data will be sent to a contractor to be keypunched into electronic format. Please keep in mind that the keypunchers have no idea what these data are or how they are used. This dictates that each form be clear and complete. 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. 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 their performance on future cruises.

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 protocols in terms of collection of data were followed. However, Observers who receive a score of 1 may also receive a letter identifying some problem areas. This letter is designed to be a tool to help Observers correct misconceptions, improve performance and increase data quality.

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 must attend a briefing before each subsequent deployment. Depending on the work and performance of the Observer the previous contract, briefings are assigned are either 1 or 4 days in length. Each Observer must attend an annual (one) 4- day briefing previous to the first contract in each calendar year. In addition, Observers who have subsequently 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 - unident.	
833	Coral, Red Tree	Primnoa willeyi
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.

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
391	Greenling, Whitespotted	Hexagrammos stelleri
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
101	Halibut, Pacific	Hippoglossus stenolepis
611	Herring, Pacific	Clupea harengus pallasi

Code	Common Name	Scientific Name
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
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

Code	Common Name	Scientific Name
563	Ribbonfish - unident.	Trachipteridae
300	Rockfish - unident.	Scorpaenidae
334	Rockfish, Aurora	Sebastes aurora
337	Rockfish, Bank	Sebastes rufus
306	Rockfish, Black	Sebastes melanops
319	Rockfish, Blackgill	Sebastes melanostomus
316	Rockfish, Blue	Sebastes mystinus
302	Rockfish, Bocaccio	Sebastes paucispinis
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
317	Rockfish, Gray	Sebastes glaucus
339	Rockfish, Greenspotted	Sebastes chlorostictus
313	Rockfish, Greenstriped	Sebastes elongatus
323	Rockfish, Harlequin	Sebastes variegatus
350	Rockfish, Idiot Fish	Sebastolobus alascanus
352	Rockfish, Longspine Thornyhead	Sebastolobus altivelis
303	Rockfish, Northern	Sebastes polyspinis
301	Rockfish, Pacific Ocean Perch	Sebastes alutus
335	Rockfish, Pygmy	Sebastes wilsoni
343	Rockfish, Quillback	Sebastes maliger
322	Rockfish, Rasphead	Sebastes ruberrimus
308	Rockfish, Red Banded	Sebastes babcocki
324	Rockfish, Redstripe	Sebastes proriger
309	Rockfish, Rosethorn	Sebastes helvomaculatus
312	Rockfish, Rosy	Sebastes rosaceus
307	Rockfish, Rougheye	Sebastes aleutianus
304	Rockfish, Sharpchin	Sebastes zacentrus
318	Rockfish, Shortbelly	Sebastes jordani
326	Rockfish, Shortraker	Sebastes borealis
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

Code	Common Name	Scientific Name
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
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

Code	Common Name	Scientific Name
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
159	Skate -soft nosed	Bathyraja spp
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
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

Code	Common Name	Scientific Name
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
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	Species Name
852	Albatross, Black-footed	Phoebastria nigripes
851	Albatross, Laysan	Phoebastria immutabilis
850	Albatross, Short-tailed *	Phoebastria albatrus
849	Albatross - Unident	*Diomedeidae* spp.
883	Alcid -unident.	*Alcidae* spp.
893	Auklet/Murrel et - 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-wing ed	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/Shearw ater - 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.

Code	Common Name	Species 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	Species 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
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
		(NE indicates no equivalent)
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

Code	Common Name	Species Name
BA	Minke whale	Balaenoptera acutorostrata
BX	Bryde whale	Balaenoptera edeni
BB	Sei whale	Balaenoptera borealis
BP	Fin whale	Balaenoptera physalus
BL	Blue whale	Balaenoptera musculus
BG	Black right whale	Balaena glacialis
BM	Bowhead whale	Balaena mysticetus
MM	Narwhal	Monodon monoceros
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	NE

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 = 2.540 cm 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 = 1.829 m 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

Area, 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

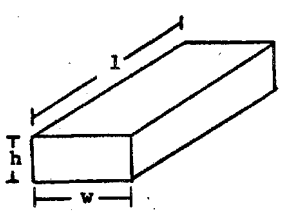
Area of a circle = πr^2 Circumference = $2\pi r$ ($\pi = 3.1416$)
Area of a square or rectangle = length × width
Area of a triangle = $1/2 \times$ base $\times$ height

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

Volume of a Sphere = $\frac{4}{3} \times \pi \times r^3$

Length of the triangle hypotenuse "c" where a and b equal the length of the opposite two sides:

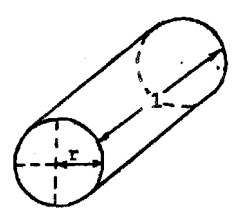
$$a^2 + b^2 = c^2 \ and \sqrt{c^2} = c$$



Rectangle solid

Volume= height $\times$ width $\times$ length

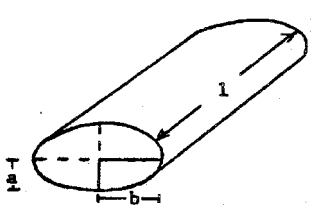
V = hwl



Cylinder

Volume = $\pi \times$ radius^2 $\times$ length

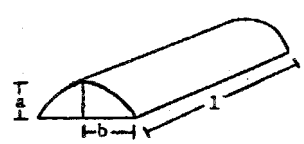
$V = \pi r^2 l$



Ellipsoidal solid

Volume = $\pi \times$ short radius $\times$ long radius $\times$ length

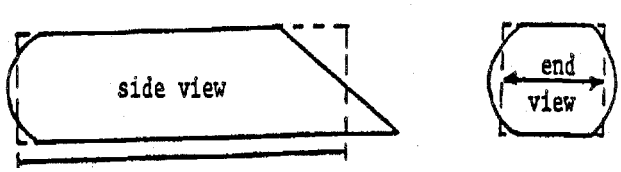
V = πabl



Semi -ellipsoidal solid

Volume= $1/2 \times \pi \times$ short radius $\times$ long radius $\times$ 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 Tables

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

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	8 8 9 6 0	1 0 1 1 7	4 4 4 6 2	6 3 5 0 0	3 6 6 7 5	1 4 4 8 2	7 8 2 1 4	9 7 3 6 5	5 4 5 8 1	7 4 2 6 7
2	9 5 3 0 7	4 0 0 9 7	6 4 3 6 6	1 0 9 5 9	6 0 2 1 3	4 7 5 8 2	1 3 1 8 1	1 3 0 8 0	6 6 4 6 8	5 3 5 9 2
3	2 4 6 6 0	1 1 3 8 8	3 2 1 6 8	2 3 9 6 6	3 2 4 6 3	0 7 6 2 9	5 6 1 1 9	1 2 4 3 2	0 4 5 2 4	9 7 6 6 5
4	5 6 2 2 7	4 7 4 1 3	7 7 2 4 6	4 6 9 0 8	5 5 4 9 0	6 3 3 6 4	9 9 4 7 3	0 2 2 0 3	9 4 4 1 3	9 3 5 1 0
5	2 6 5 3 0	1 5 4 8 9	4 5 4 3 2	1 7 6 9 5	3 7 5 9 5	4 6 7 5 5	9 4 9 0 8	4 3 0 7 7	8 8 1 6 9	2 2 6 9 5
6	0 0 2 0 3	5 6 5 6 3	4 0 3 7 7	8 8 8 9 2	2 7 4 0 8	2 6 2 7 9	0 7 1 3 1	8 3 2 0 0	8 4 1 8 8	6 1 6 3 5
7	2 8 5 3 6	6 7 4 5 5	8 4 3 5 2	9 3 5 3 0	5 5 6 1 5	9 4 1 4 9	3 8 9 8 3	2 8 2 9 3	5 4 3 1 7	4 8 7 8 4
8	9 0 2 8 9	3 8 1 5 7	8 3 2 5 1	9 6 7 5 1	7 5 4 9 0	5 2 6 5 1	5 0 3 0 4	8 0 9 5 3	8 5 5 6 4	6 0 6 4 9
9	7 4 3 0 1	1 3 7 8 7	5 8 6 7 6	8 7 6 4 4	5 3 7 7 6	3 3 6 7 2	4 7 7 2 0	8 2 8 4 3	1 6 0 5 7	1 0 0 0 7
10	5 9 1 8 2	4 2 1 2 2	3 0 7 1 3	5 6 4 7 4	6 6 3 1 8	4 5 4 8 5	4 8 3 6 9	6 6 4 6 1	0 3 7 6 5	8 7 8 5 4
11	1 5 1 4 2	5 4 2 9 6	6 7 3 7 9	6 3 0 4 6	7 8 7 2 9	0 4 5 6 5	2 1 5 8 7	0 3 0 1 8	4 3 3 9 7	3 4 2 3 2
12	3 9 4 3 0	5 3 9 6 6	3 1 9 1 6	2 7 9 1 0	3 0 5 4 7	6 7 6 5 7	9 6 0 1 5	3 3 7 4 5	7 9 6 2 1	2 6 2 2 4
13	8 4 3 8 4	1 6 1 4 5	5 7 1 9 3	3 7 3 4 1	3 4 7 1 9	6 7 6 0 7	8 6 3 0 5	0 1 9 0 6	0 4 3 4 7	2 2 3 7 4
14	1 3 5 7 4	1 6 2 2 3	6 0 8 9 8	4 4 6 8 6	5 9 3 1 0	3 0 5 2 9	9 0 1 0 3	6 8 2 9 3	5 7 8 6 7	4 9 8 8 4
15	4 7 3 0 9	7 8 5 4 8	6 7 1 0 4	4 0 2 4 5	4 4 1 2 3	6 9 1 8 9	1 7 7 6 8	8 7 5 6 0	6 8 8 4 7	7 2 0 9 7
16	3 4 8 0 8	3 6 0 2 1	0 2 0 1 8	6 8 1 5 2	5 1 6 3 4	4 4 2 6 7	7 3 3 0 5	8 0 2 9 6	8 0 9 5 2	3 2 7 4 7
17	8 5 5 4 2	7 6 4 6 6	8 0 2 2 6	8 5 8 7 0	5 7 5 3 4	2 2 5 4 5	3 1 5 1 4	9 9 6 3 8	2 6 0 1 7	0 0 9 7 5
18	6 7 0 2 7	5 1 7 1 9	1 4 1 2 2	6 8 4 7 2	7 6 6 9 5	4 6 2 3 9	3 6 4 4 4	4 3 8 3 1	6 0 2 5 3	3 0 8 6 0
19	6 4 5 9 2	3 8 8 7 2	3 2 8 4 7	5 1 3 6 9	3 4 1 2 5	1 3 7 8 8	0 6 2 9 8	2 4 0 0 4	8 8 7 9 7	7 6 6 5 3
20	7 2 0 9 7	6 4 6 6 2	5 8 6 6 8	8 5 2 2 2	8 0 7 8 8	3 2 1 4 8	6 3 0 6 2	0 1 1 7 0	8 2 1 2 4	1 9 3 8 3
21	1 2 7 9 9	8 9 6 3 2	7 3 3 9 7	4 4 0 3 7	0 3 4 8 9	8 3 3 0 0	7 2 1 9 9	4 7 6 8 8	2 0 7 7 1	7 2 0 4 7
22	1 0 4 2 0	8 2 2 3 3	0 7 3 2 9	8 8 7 2 7	6 1 4 5 0	2 2 9 6 9	1 1 5 9 4	6 4 5 0 8	5 2 2 8 5	0 5 4 9 7
23	8 5 8 4 3	2 8 6 9 5	3 4 8 3 3	4 9 4 1 5	4 4 2 8 5	2 1 9 7 4	0 5 9 5 6	3 2 4 1 0	4 1 8 1 6	3 2 7 8 4
24	8 4 6 5 8	8 6 4 4 7	6 4 0 5 7	2 9 0 4 8	8 7 8 6 9	9 0 9 9 9	4 8 2 6 3	1 6 6 8 1	9 1 4 9 0	0 9 4 0 6
25	9 0 3 0 8	9 7 8 8 0	6 8 8 5 0	1 7 5 8 7	2 9 7 6 0	0 0 3 5 4	2 6 8 5 5	3 2 2 0 1	3 7 5 1 3	1 0 7 9 7
26	8 8 1 7 7	4 2 8 8 3	7 6 7 4 1	7 4 9 3 2	6 6 4 6 5	0 3 7 0 5	8 7 4 1 7	2 3 6 4 5	9 9 2 6 6	4 0 9 2 5
27	6 8 9 4 0	3 6 5 5 4	3 4 6 2 0	6 2 0 5 0	2 0 6 6 0	8 1 8 7 0	4 6 9 3 6	2 3 7 8 3	4 3 7 0 9	7 7 2 5 2
28	1 5 9 8 2	6 0 7 6 8	8 1 5 2 2	8 3 3 9 0	3 3 1 0 6	8 3 6 2 6	2 4 8 2 6	5 4 7 3 6	4 7 1 0 5	8 7 5 1 2
29	8 8 5 6 4	7 0 5 0 9	8 1 5 7 2	1 1 2 4 1	4 9 3 1 3	8 3 7 8 3	4 0 2 3 3	3 5 4 9 2	8 2 8 6 5	6 1 6 9 0
30	4 0 5 0 4	9 9 7 9 8	6 7 6 4 1	2 8 7 1 1	5 6 4 0 5	9 3 0 1 8	8 8 1 1 1	4 3 1 2 2	2 5 8 4 6	4 3 6 2 4
31	1 3 0 2 9	8 4 4 5 0	8 4 4 5 5	4 8 6 2 3	2 1 4 7 5	4 4 2 9 2	8 0 6 3 8	4 5 6 0 3	8 7 0 0 5	5 9 7 8 0
32	2 2 3 7 9	9 2 6 8 0	3 6 3 5 6	2 9 0 2 9	4 9 5 6 3	4 3 7 1 7	2 1 2 7 7	6 3 0 7 8	0 2 0 0 7	7 9 4 5 1
33	5 0 5 7 0	8 2 4 5 8	3 9 8 9 7	6 3 6 2 1	0 8 1 9 6	2 8 1 9 9	6 4 8 1 1	1 7 7 2 3	5 0 9 1 3	6 2 9 5 6
34	1 0 6 7 2	3 3 8 4 9	4 1 9 3 2	6 7 5 2 7	0 1 2 2 1	0 1 1 6 8	5 5 7 3 2	1 7 6 0 9	7 4 6 8 0	4 7 0 6 7
35	4 9 6 7 6	0 8 0 9 2	3 5 3 8 8	0 0 2 3 4	0 6 9 1 4	3 8 1 2 5	7 5 4 3 2	5 9 3 7 4	8 0 7 0 7	5 3 3 4 2
36	9 2 6 1 7	4 6 1 2 0	5 2 7 6 5	5 1 0 9 0	4 6 0 2 2	0 0 7 5 2	6 1 7 8 8	2 4 6 4 5	9 1 6 8 7	4 4 6 7 3
37	2 3 6 9 6	3 4 4 7 6	8 3 9 7 6	5 1 6 2 7	3 7 2 1 9	1 4 9 8 5	2 9 8 9 6	5 4 2 5 1	0 6 6 1 4	2 4 9 5 6
38	0 7 8 7 6	7 5 3 9 5	1 8 6 5 7	9 8 3 1 5	9 0 9 4 7	0 7 6 7 8	4 7 0 0 0	1 7 6 8 5	5 6 0 3 5	0 7 0 3 1
39	8 1 1 5 9	6 9 2 8 4	5 1 0 4 6	8 4 0 3 3	2 1 5 1 5	8 1 9 9 4	4 1 2 0 0	5 2 2 4 8	1 6 8 0 7	1 0 4 5 4
40	2 6 3 9 0	1 8 7 6 0	3 4 7 3 9	5 4 1 0 9	1 9 5 2 8	1 1 1 0 5	3 7 5 2 6	0 1 7 8 7	8 0 0 2 0	9 9 9 7 5
41	6 0 8 1 8	9 8 1 6 7	6 7 7 9 0	6 1 1 3 6	5 2 6 4 8	7 2 9 4 1	4 9 7 2 9	2 0 9 0 2	4 9 6 0 6	3 3 9 2 4
42	0 8 8 3 5	0 3 0 8 3	3 2 5 6 5	7 2 9 9 2	8 0 4 5 3	4 1 2 4 7	0 6 6 3 8	2 8 7 4 2	6 1 9 6 8	0 0 2 7 8
43	0 6 0 5 1	5 9 2 7 3	2 3 3 6 0	6 9 3 7 6	8 6 9 2 0	2 1 3 6 2	8 4 4 8 5	0 5 9 7 8	0 1 3 3 7	6 7 2 3 1
44	1 2 0 4 8	7 7 1 1 2	2 5 7 4 5	0 6 1 2 1	8 9 7 5 3	4 8 2 2 9	9 8 5 0 3	2 2 5 2 7	5 5 8 0 2	4 5 3 3 1
45	6 6 9 9 1	2 8 3 0 2	9 5 5 5 5	9 0 5 2 7	1 3 4 2 4	6 9 8 8 9	4 2 2 7 8	6 3 9 0 1	2 2 8 6 9	6 6 9 2 4
46	5 3 8 1 0	4 7 0 9 6	8 8 3 4 4	4 7 2 4 9	9 1 4 5 0	9 6 5 5 0	5 8 3 2 1	9 2 1 8 3	2 5 7 3 5	3 6 8 4 4
47	8 5 5 1 9	3 7 9 1 2	6 0 1 5 5	6 3 8 2 5	1 8 4 2 9	2 3 1 5 6	7 5 0 5 9	1 5 5 1 3	6 9 4 3 7	7 7 4 4 8
48	2 9 8 6 0	0 1 9 0 7	6 6 2 5 7	2 8 6 5 0	9 1 4 1 9	3 5 6 2 8	1 6 9 1 0	4 1 8 1 4	2 3 3 7 3	9 9 8 0 7
49	5 4 2 3 9	6 5 9 9 4	6 4 5 9 5	4 8 5 6 3	5 3 4 8 5	2 9 1 3 1	8 0 1 7 0	6 1 4 3 9	8 0 2 7 1	1 6 8 6 3
50	1 6 2 7 8	2 0 1 0 0	5 1 0 7 6	1 0 2 6 6	0 7 5 3 9	7 8 2 9 2	8 8 6 4 9	2 6 0 9 0	5 7 3 4 9	1 9 5 8 4

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 l, or 62% recovery, while fish frozen whole would have a recovery ratio of l.00 to l, or l00% 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 l by the conversion factor).

Product Codes (from Appendix G)

NMFS Report Group Codes (from Appendix H)	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

Report Codes	Mgmt Areas	Species Common Names
110	All	Pacific cod
118	GOA	Deep water flatfish (rex sole, Dover sole, Greenland turbot)
119	GOA	Shallow water flatfish (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
510, 511, 516	All	Smelt, eulachon, capelin
689,700	All	Sharks, skates
710	All	Sablefish
875	All	Squid

Appendix I. Processor Code List

Processor code	Processor	Location
F05470	10th & M Seafoods	Anchorage
F06374	Adak Seafoods	Adak
M04285	Alaska Challenge	
F05504	Alaska Custom Seafoods Inc.	Homer
F05343	Alaska Fresh Seafoods Inc.	Kodiak
F05388	Alaska General Processors	Ketchikan
F05945	Alaska Glacier Seafood Co.	Juneau
M03794	Alaska Ocean	
F05342	Alaska Pacific Seafood	Kodiak
M03230	Alaska Packer	
F05429	Alaska Seafood Co. Inc.	Juneau
M04598	Alaskan Leader	
F05528	Alaskan Leader Fisheries	Kodiak
F05797	Alaskan Premier Seafoods	Anchorage
F06372	Alaskan Premium Cod Association/Harbor Fish	Kodiak
M02018	Alaskan Rose	
F05334	Aleutian Dragon Fisheries	Chignik
M02924	Alliance	
F05320	Alyeska Seafoods Inc.	Unalaska
M03681	American Dynasty	
M02760	American Enterprise	
M01879	American No. 1	
M04055	American Triumph	
F05394	Annette Island Packing Co. Cold Storage	Metlakatla
F05397	Aquatech	Anchorage
M05314	Arctic Enterprise	
M03396	Arctic Fjord	
F06247	Arctic Salmon Inc.	Bethel
M03381	Arctic Sea	
M02943	Arctic Storm	
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
F03531	Bering Star	
F05415	Big Dipper Seafoods Inc.	Valdez
M05361	Blue Wave	
F05380	Bornstein Seafoods Inc.	Bellingham
F05935	Buy N Pack Seafoods	Hoonah
F05463	Cannery Row Inc.	Cordova

Processor code	Processor	Location
M02110	Cape Horn	
F05444	Carlson Seafoods	Anchorage
F05327	Chignik Pride Fisheries	Chignik
M03242	Clipper Endeavor	
M04463	Clipper Epic	
M02718	Clipper Surprise	
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
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
F05373	Glacier Village Supermarket Inc. Jerry's Meats	Juneau
F05372	Glacier Village Supermarket Inc. - Super Bear	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
F05638	Horst Seafood Inc.	Juneau
F05565	Howsers Supermarket Ltd.	Haines
F05332	Icicle Seafoodsinc	Homer
F05407	Icicle Seafoodsinc.	Bellingham

Processor code	Processor	Location
F05490	Icy Straits Seafoods Inc.	Juneau
M03259	Independence	
F05466	Inlet Fish Producers Inc.	Kenai
F05419	Inlet Salmon	Kenai
F05392	International Seafoods Of Alaska Inc.	Kodiak
F05405	Int'l Seafoods of Alaska Inc.	Kodiak
M03870	Island Enterprise	
F05631	Island Seafoods	Kodiak
F05462	J&r Fisheries	Seward
F05602	J.r. Fish Co Inc.	Wrangell
F05476	Jon-k Seafoods Inc.	Juneau
F05302	Kachemak Bay Seafood	Homer
F05398	Kachemak Fish Packers	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
M03671	Kodiak Enterprise	
F05535	Kodiak Smoking & Processing	Kodiak
M03367	Legacy	
M07021	M/V New West	
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	
M00661	Northern Glacier	
M04063	Northern Hawk	
M03896	Northern Jaeger	
F04078	Northern Victor	
F05420	Northport Fisheries Inc.	Everett
M05294	Norton Sound	
F05370	Ocean Beauty Seafoods Inc.	Kodiak
F05518	Ocean Beauty Seafoods Inc.	Seattle
F05369	Ocean Beauty Seafoods Inc.	Cordova
F05431	Ocean Beauty Seafoods Inc.	Petersburg
F05443	Ocean Beauty Seafoods Inc.	Naknek

Processor code	Processor	Location
M02134	Ocean Peace	
M03703	Ocean Phoenix	
M03442	Ocean Rover	
M05119	Omnisea	
F05349	Osterman Fish	Dutch Harbor
F05543	Pacific Choice Seafoods Co.	Charleston
M03357	Pacific Glacier	
F04686	Pacific Producers	
F05344	Pacific Salmon Company Inc.	Seattle
F05442	Pacific Star Seafoods Inc.	Kenai
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
F05333	Prime Alaska Seafoods Inc.	Unalaska
F05423	Prime Select Seafood Inc.	Cordova
F05827	Pristine Seafood Co.	Sitka
M03629	Provider	
M01190	Pursuit	
F05925	R & J Seafoods	Kasilof
F05438	Resurrection Bay Seafoods L.l.c.	Seward
F05313	Royal Aleutian Seafoods Inc.	Dutch Harbor
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
M03231	Sea Alaska	
F06232	Sea Catch Inc.	Seattle
F05950	Sea Hawk Seafoods Inc.	Valdez
M02757	Sea Legend	
F05523	Sea Level Seafoods Inc.	Wrangell
F05955	Sea World Fisheries Ltd.	Ketchikan
F05371	Seafood Producer Cold Storage Inc.	Sitka
F05432	Seafood Producers Cooperative	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

Processor code	Processor	Location
F07124	Snug Harbor Seafoods	Seward
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
M03229	Tempest	
M04650	Tenacity	
F06053	The Auction Block	Homer
F05436	The Salmon River Smokehouse	Gustavus
M04616	T-mike	
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
M03796	Vin Ce	
F05414	Wards Cove Packing Co.	Kodiak Island
F05409	Wards Cove Packing Co.	Excursion Inlet
F05376	Wards Cove Packing Co. Dba E.c. Phillips & Son	Ketchikan
F05560	Wards Cove Packing Company	Elfin Cove
F05348	Wards Cove Packing Company - Alitak	Kodiak
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

Processor code	Processor	Location
M04152	Woodbine (floater) Alaska Fish Company	Dutch Harbor
F05600	Woodbine (shoreside plant) Alaska Fish Company	Dutch Harbor
F05308	Wrangell Fisheries Inc.	Wrangell
F06258	Wrangell Seafoods Inc.	Wrangell
F05315	Yamaya Seafoods	Anchorage
M03116	Yardarm Knot	
F05891	Yki Fisheries Inc.	Yakutat

Appendix J. Vessel/Plant Codes, Names, Vessel Lengths, USCG and NMFS Permit Numbers

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
A585	ALASKA SPIRIT (Longline/Pot)	98	605674	4105
A117	ALASKA SPIRIT (Trawl)	221	554913	3819
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
A662	ALEUTIAN NO. 1	118	611139	3687

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
A391	ALEUTIAN ROVER	128	517272	5282
A627	ALEUTIAN SPRAY	98	522870	427
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
A050	ARCTIC ALASKA	297	517242	2733
A505	ARCTIC DAWN	96	634806	4676
A303	ARCTIC EAGLE	126	967106	4555

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
P060	ARCTIC ENTERPRISE	339	248169	5314
A055	ARCTIC EXPLORER	155	936302	3388
A069	ARCTIC FJORD	275	940866	3396
A002	ARCTIC II	115	678235	3008
A633	ARCTIC LADY	122	604215	2841
A447	ARCTIC MARINER	125	618374	4582
A555	ARCTIC ORION	155	596653	3686
A506	ARCTIC ROSE	103	931446	4650
A569	ARCTIC SEA	135	596137	3381
A054	ARCTIC STORM	334	903511	2943
A477	ARCTIC V I	124	988598	4993
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
A630	AURIGA (Pot)	156	298691	4585
A044	AURIGA (Trawler)	193	639547	2889
A048	AURORA	193	636919	2888
A674	AUTUMN DAWN	112	259779	4619
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
A364	BERING PROWLER*	124	973006	4540
A285	BERING ROSE	111	624325	515
A502	BERING SEA	114	554126	3380
P065	BERING STAR (Plant)	199	597734	3531
A437	BERING STAR (Pot)	108	593310	4658
A530	BETTY LEE	65	595427	2336
A515	BIG BLUE	77	601825	1907
A518	BIG VALLEY	92	515719	2412
A548	BILLIKIN	135	550190	277

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
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
P066	BLUE WAVE	200	509280	5361
A463	BOLD CONTENDER	66	620497	617
A432	BOUNTIFUL	165	593404	278
A484	BOUNTY HUNTER	113	982587	4961
A006	BRISTOL EXPLORER	180	647985	3007
A660	BRISTOL LEADER	167	1060513	6323
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
A327	CAITLIN ANN	103	960836	3800
A472	CALIFORNIA HORIZON	90	590758	412
A393	CAPE CROSS (LL)	46	257536	4690
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
A663	CAPTAIN BANJO	88	602316	6343
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
A395	C-LADY	65	509980	1185
A036	CLAYMORE SEA	227	935475	3362
A057	CLIPPER ENDEAVOR	124	633593	3242
A580	CLIPPER EPIC	172	619796	4463
A227	CLIPPER EXPRESS	142	236979	3385
A153	CLIPPER SURPRISE	124	628555	2718

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
P068	COASTAL STAR	311	594619	5293
A101	COHO	71	622773	1230
A125	COLLIER BROTHERS	89	593809	2791
A168	COLUMBIA (LL/Pot)	81	223578	2741
A279	COLUMBIA (Trawl)	123	615729	1228
A150	COMMODORE	133	914214	2657
A371	CONFIDENCE	49	623838	1990
A666	CONFIDENCE	90	523762	4980
A616	CONSTELLATION (Pot)	127	604998	5781
A283	CONSTELLATION (Trawler)	150	640364	4092
A269	CONSTITUTION	73	211928	302
A641	CONTROLLER BAY	88	942350	5530
P028	COOK INLET PROC.-KODIAK			5321
P062	COOK INLET -SEWARD			
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
A670	DECEPTION	126	640956	5031
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
A408	DESTINATION (Pot)	109	632374	5329
A288	DESTINATION (Trawler)	180	571879	3988
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
A254	DONA MARTITA	152	651751	2047
P058	DORY SFDS			5517
A672	DR. K	99	615699	7113

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
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.			
A669	EARLY DAWN	108	591603	4571
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
A217	EVENING STAR (Longline)	65	248539	200
P071	EVENING STAR (Plant)	166	570891	3530
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
P072	FORT YUKON			368
A334	FORUM STAR	97	925863	4245
A553	FRONTIER EXPLORER	135	975015	4450
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
A083	GLADIATOR	124	598380	1318
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

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A671	GOLDEN SABLE	100	625096	5001
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
A552	HI SEAS I	84	599405	3891
A040	HICKORY WIND	81	594154	993
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
A544	HORIZON	148	586183	1301
A308	HUSKY	132	586918	3375
A529	HUSTLER	72	606821	4238
A542	ICELANDER	100	563421	2730
P014	ICICLE SFDS -HOMER			5332
P045	ICICLE SFDS SEWARD			5299
P034	ICICLE SFDS-PBURG			5300
A451	ICY POINT	105	554355	4996
A320	ILSE	58	298563	3415
A242	IMMIGRANT	61	509415	3541
P073	INDEPENDENCE (Floater)	356	237743	3259
A221	INDEPENDENCE (Longline/Pot)	78	552513	792
P025	INT'L SFDS OF ALASKA, INC.			5392
P017	INT'L SFDS-MARINE WAY(CLOSED)			5405
A447	INTREPID EXPLORER		988598	4993
A143	IRENE H	82	520337	2899

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
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
A664	KARIN LYNN	127	592291	5384
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
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

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
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
A632	LINDY	77	227167	357
A397	LIN-J	80	538018	1705
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 I I	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
A476	MARATHON	87	596156	1191
A158	MARCY J	97	517024	2142
A010	MARGARET LYN	123	615563	723
A637	MAR-GUN	113	525608	524
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 RENEE	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

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
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
A112	MS. AMY	90	920936	2904
A568	MS. JULIET	75	550828	1698
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
A003	NORDIC EXPLORER	115	678234	3009
A455	NORDIC FURY	110	542651	1094
A655	NORDIC MARINER	106	591077	6191
A087	NORDIC STAR	123	584684	428
P061	NORQUEST (SILVER LINING)			5336
P094	NORQUEST SEAFOODS- ADAK			6374
P095	NORQUEST SEAFOODS			6238
P090	NORQUEST SEAFOODS INC.			5338
A533	NORSKA	70	629262	1734
A209	NORTH	62	223635	68
A427	NORTH AMERICAN	110	566067	4091
A132	NORTH CAPE	123	950038	3692
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

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
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
A133	NORTHERN PATRIOT	152	637744	2769
A634	NORTHERN PRINCE	53	563437	5912
A329	NORTHERN SPIRIT	90	613825	3736
P059	NORTHERN VICTOR	379	248959	4078
A007	NORTHWEST EXPLORER	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
A673	NOTORIOUS	120	291882	4185
A390	NOWITNA	135	608699	2222
A635	NUKA ISLAND	105	604208	1959
A491	NUNIVAK	86	264094	506
A403	OBSESSION	107	603285	2212
A629	OCEAN (Longline) HARVESTER	72	524908	649
A240	OCEAN (Pot/Trawl) HARVESTER	108	549892	5130
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 EXPLORER	155	678236	3011
A417	OCEAN FURY	124	586441	5368
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

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
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
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 EXPLORER (FORMERLY 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
A570	PACIFIC MAIDEN	69	598959	1520
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
A658	PACIFIC SOJOURN	72	664245	751
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
A419	PANDAD	70	512414	270
A235	PARAGON I I	110		371
A576	PATHFINDER	180	591678	4306

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A277	PAVLOF	166	597532	3406
A399	PEGASUS (LL/Pot)	72	567048	952
A191	PEGASUS(Trawler)	96	565120	1265
A011	PEGGY JO	99	502779	979
A435	PEGGY ROSE	68	614537	304
P035	PELICAN SEAFOODS, INC.			5385
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
A665	POLAR LADY	105	609940	5123
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.			
P093	PRIME ALASKA SFDS			5333
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
A193	RAVEN	92	629499	1236
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
A208	RESOLUTE (LL)	72	223688	46
A098	RESOLUTE (Trawl)	240	553631	3702

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
A560	RESPONSE	125	561289	4209
P051	RESURRECTION BAY SFDS			5438
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
A370	SEA ERN	112	504144	4652
A667	SEA FISHER	148	296512	20
A131	SEA MAC	87	525516	1043
A458	SEA QUAIL	82	248228	2734
A676	SEA ROVER	108	546728	7133
A482	SEA STAR	104	521201	439
A123	SEA STORM	123	628959	420
A166	SEA VALLEY I I	66	625137	2853
A628	SEA VENTURE (Pot)	104	525572	2122
A556	SEA VENTURE (Trawler)	65	531117	4539
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

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
A172	SEYMOUR	82	210939	283
A644	SHAMAN	110	558637	602
A496	SHELIKOF	150	597967	3705
A429	SHELLFISH	94	506986	290
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
P083	SNOPAC			3592
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
A145	SOVEREIGNTY	152	651752	2770
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			

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
A540	TAMAR	80	617170	4665
A400	TANI RAE	90	542076	5158
A251	TARKA I I	60	557686	444
A668	TEMPEST	83	506261	3479
A461	TERRIER	78	667475	4827
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
A228	TRIDENT (LL)	64	622186	662
P001	TRIDENT SFDS-AKUTAN			5306
P038	TRIDENT SFDS-SAND POINT			5305
P092	TRIDENT SFDS-ST PAUL			5307
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	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

Vessel Code	Vessel or Plant Name	Len. Ft.	Coast Guard#	NMFS Permit #
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
A196	WESTERLY	72	507754	1286
P022	WESTERN AK FISHERIES			5347
A128	WESTERN DAWN	113	524423	134
A274	WESTERN ENTERPRISE	166	629826	3268
A675	WESTERN QUEEN	166	284906	2647
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

* Note the following year 2000-2001 vessel and plant name changes. You may need to look up vessel profiles by the former name.

Clipper Express formerly the Hessafjord

Bristol Explorer fomerly the Arctic III

Intrepid Explorer formerly the Arctic VI

Nordic Explorer formerly the Arctic I

Arctic Explorer formerly the Arctic IV

Northern Patriot formerly the Dona Paulita

Northwest Explorer formerly the Northwest Enterprise

Ocean Explorer formerly the Ocean Enterprise

Sovereignty formerly the Dona Liliana

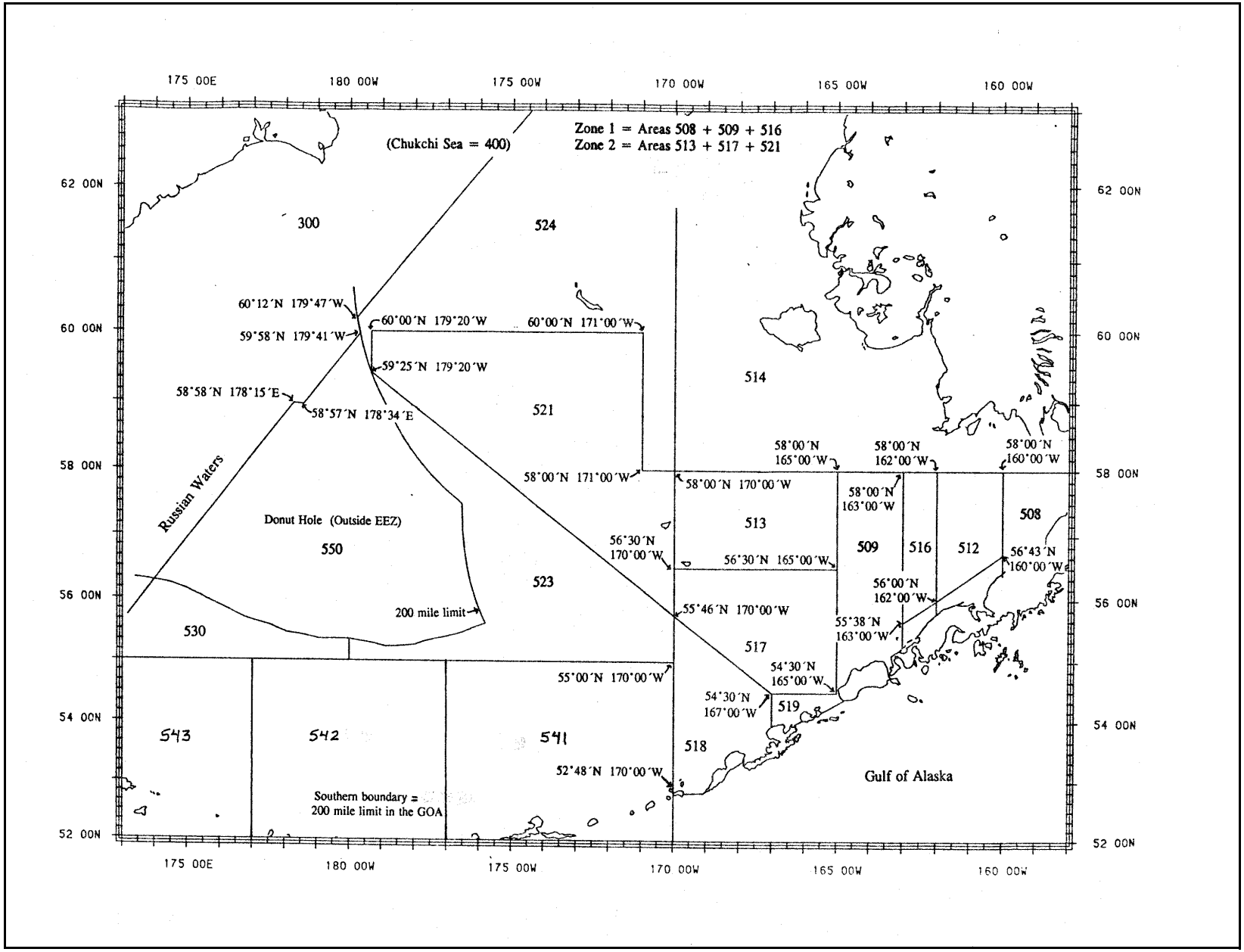
Gladiator formerly the Flying Cloud

Pacific Explorer formerly the Pacific Enterprise

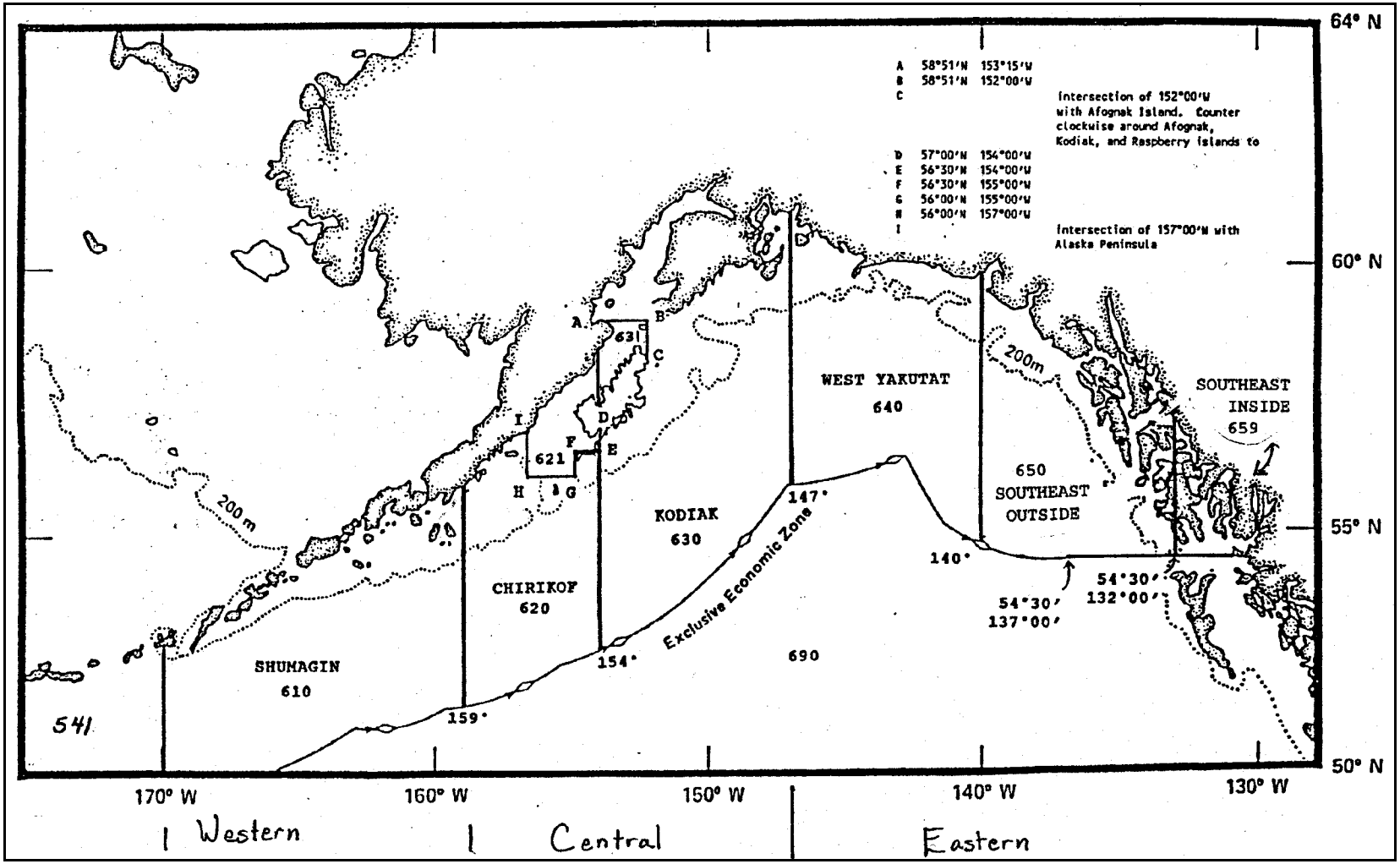
Tyson Seafoods- Kodiak formerly Trident Seafoods

Norquest Seafood- Adak formerly Adak Seafoods

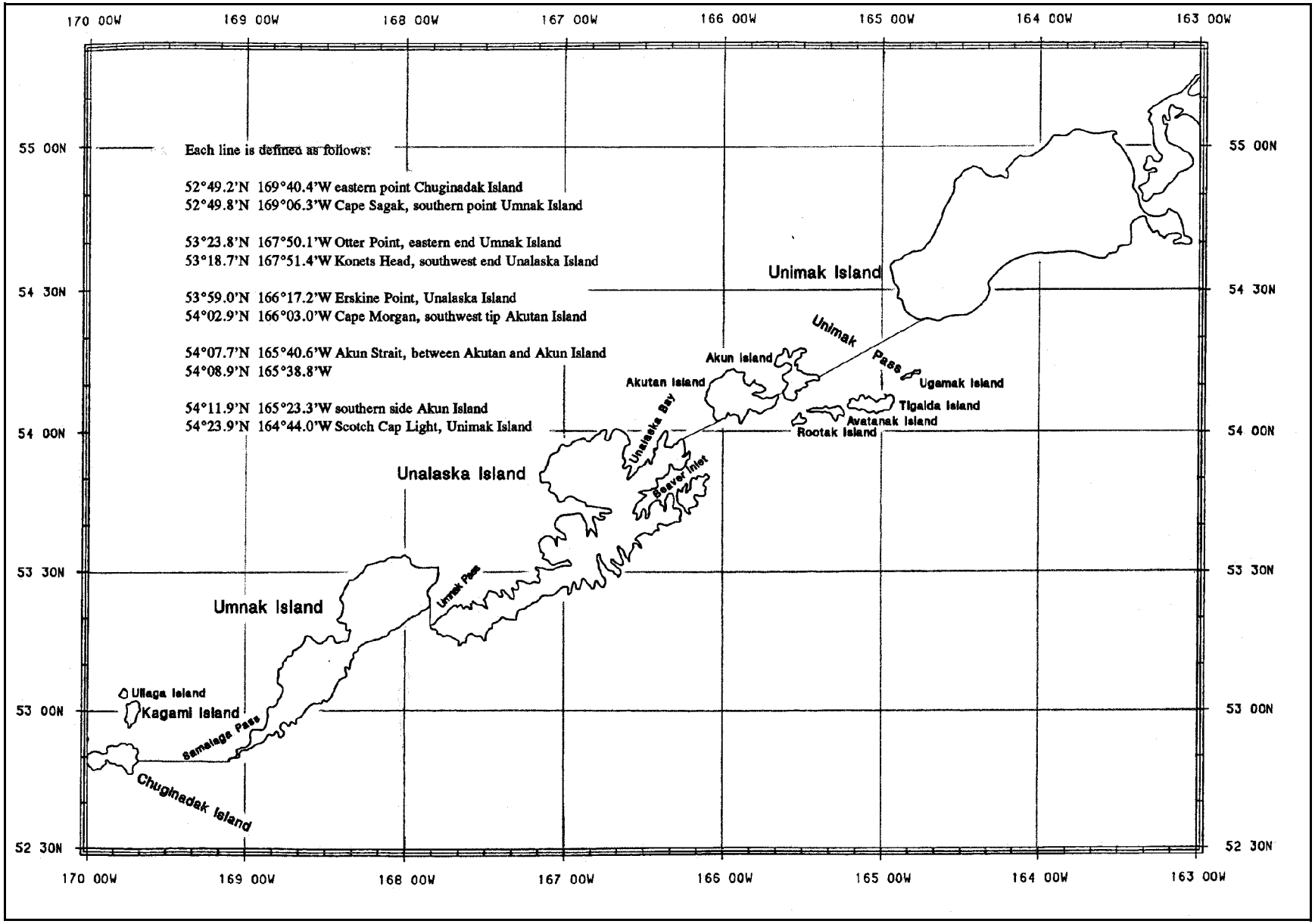
Appendix K. Regulatory and Reporting Areas of the Bering Sea



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	53	1.62	96	11.07
11	.01	54	1.72	97	11.45
12	.01	55	1.82	98	11.83
13	.02	56	1.93	99	12.23
14	.02	57	2.05	100	12.64
15	.03	58	2.16	101	13.05
16	.03	59	2.29	102	13.47
17	.04	60	2.41	103	13.91
18	.05	61	2.55	104	14.35
19	.06	62	2.69	105	14.80
20	.07	63	2.83	106	15.26
21	.08	64	2.98	107	15.73
22	.09	65	3.13	108	16.21
23	.11	66	3.29	109	16.71
24	.12	67	3.45	110	17.21
25	.14	68	3.62	111	17.72
26	.16	69	3.80	112	18.24
27	.18	70	3.98	113	18.77
28	.21	71	4.17	114	19.32
29	.23	72	4.36	115	19.87
30	.26	73	4.56	116	20.44
31	.28	74	4.76	117	21.01
32	.32	75	4.98	118	21.60
33	.35	76	5.19	119	22.20
34	.38	77	5.42	120	22.81
35	.42	78	5.65	121	23.43
36	.46	79	5.89	122	24.07
37	.50	80	6.13	123	24.71
38	.55	81	6.38	124	25.37
39	.60	82	6.64	125	26.04
40	.65	83	6.91	126	26.72
41	.72	84	7.18	127	27.41
42	.76	85	7.46	128	28.12
43	.82	86	7.75	129	28.83
44	.88	87	8.05	130	29.56
45	.95	88	8.35	131	30.31
46	1.02	89	8.66	132	31.06
47	1.10	90	8.98	133	31.83
48	1.17	91	9.31	134	32.61
49	1.25	92	9.64	135	33.41
50	1.34	93	9.99	136	34.22
51	1.43	94	10.34	137	35.04
52	1.52	95	10.70	138	35.87

Appendix N. Halibut Length/Weight Table (continued)

(CM)	Kilograms	(CM)	Kilograms	(CM)	Kilograms
139	36.72	184	91.11	229	185.11
140	37.59	185	92.73	230	187.75
141	38.46	186	94.36	231	190.40
142	39.35	187	96.01	232	193.09
143	40.26	188	97.39	233	195.80
144	41.18	189	99.11	234	198.53
145	42.11	190	101.10	235	201.29
146	43.06	191	102.83	236	204.08
147	44.02	192	104.58	237	206.90
148	45.00	193	106.36	238	209.74
149	45.99	194	108.16	239	212.61
150	47.00	195	109.97	240	215.50
151	48.02	196	111.81	241	218.43
152	49.06	197	113.67	242	221.38
153	50.12	198	116.00	243	224.35
154	51.18	199	117.45	244	227.36
155	52.27	200	119.37	245	230.39
156	53.37	201	121.32	246	233.45
157	54.49	202	123.28	247	236.54
158	55.62	203	125.27	248	239.66
159	56.77	204	127.28	249	242.80
160	57.93	205	129.32	250	245.98
161	59.11	206	131.37		
162	60.31	207	133.45		
163	61.53	208	135.55		
164	62.76	209	137.67		
165	64.01	210	139.82		
166	65.27	211	141.99		
167	66.55	212	144.18		
168	67.83	213	146.39		
169	69.17	214	148.63		
170	70.51	215	150.89		
171	71.86	216	153.18		
172	73.23	217	155.49		
173	74.62	218	157.82		
174	76.02	219	160.18		
175	77.45	220	162.56		
176	78.89	221	164.97		
177	80.35	222	167.40		
178	81.83	223	169.85		
179	83.33	224	172.33		
180	84.85	225	174.84		
181	86.39	226	177.37		
182	87.94	227	179.93		
183	89.52	228	182.51		

Appendix O. Viability Key and Criteria for Trawl Caught Pacific Halibut

Key to Trawl Condition Codes for Pacific Halibut

Codes : Excellent = E, Poor = P, Dead = D, Unknown = U

1a. Fish is alive..... Go to 2a

1b. Fish is dead when sorted from the catch.....Code DEAD
Fish is in rigor and lifeless, even if no apparent injuries. Gills appear washed out, i.e., dull red, pink, or white in color. Mouth may contain sediment.

2a. Body of fish appears uninjured, or has only minor injuries... Go to 3a

2b. Injuries to fish are significant and obvious .....Code DEAD
Body cavity is ripped open, exposing internal organs. Body tissue may be torn or ripped in a rough, ragged manner. Red hemorrhaging observed on 25% or more of the white side of fish.

3a. Fish is able to close operculum when stimulated..... Go to 4a
Operculum is closed strongly or weakly, but pressure is evident. Operculum may not stay closed for long, though pressure may last up to 5 seconds or longer.

3b. Fish cannot close operculum, even when stimulated .....Code DEAD

4a. Fish displays activity and has muscle tone..... Go to 5a
Fish displays a minimal amount of activity, especially when stimulated. May be able to clench jaw tightly.

4b. Fish exhibits no muscle tone .....Code DEAD

5a. Fish is not bleeding, or only slightly bleeding, if at all ..... Go to 6a

5b. Blood is flowing freely and continuously in large quantity (profusely).....Code DEAD
Bleeding is coming from a torn or severed gill arch, or a body injury.

6a. Body injuries are minimal, perhaps difficult to find..... Go to 7a
May consist of superficial nicks or cuts on body. Less than 10% of dorsal and anal fin area is frayed.

6b. Body injuries are readily apparent.....Code POOR
Skin is damaged with abrasions. Cuts and lacerations in body extend through the skin and just barely into the flesh (not deeply). Dorsal and anal fin area is frayed between 10-50%. Fin edges may be bleeding. Roughly 10-25% of the white side of fish shows red hemorrhaging.

7a. Operculum pressure is strong and sustained ..... Go to 8a

7b. Operculum pressure is weak and not sustained.....Code POOR

8a. Fish is strong and lively, displaying good muscle tone..... Go to 9a
Fish is flopping around the deck, hard to control. Jaw may be tightly clenched, difficult to open.

8b. Fish appears weak.....Code POOR
Movement is intermittent, perhaps occurring when provoked or stimulated. Body is limp.

9a. Fish is bleeding from gills.....Code POOR
Blood is flowing continuously, slow and steadily, but not profusely. Gills are deep to bright red in color.

9b. No bleeding observed ..... Code EXCELLENT
Gills are deep red in color.

HALIBUT CONDITION CRITERIA FOR TRAWL BYCATCH

The criteria are listed in order of importance

Excellent: Fish is alive, showing no stress, and injuries, if any, are slight.

1. External injuries.
   - Superficial nicks or cuts on body.
   - Little (<10% of fin area) or no fraying of dorsal and anal fin.
   - Hemorrhaging (redness) of skin on white side limited to 5-10% of surface area.

2. Operculum pressure.
   - Fish is able to close operculum tightly for at least 5-10 seconds.
   - Muscle tone and physical activity.
   - Strong and lively, perhaps flopping around on deck if provoked.
   - Fish can tightly clench its jaw.

3. Bleeding.
   - No bleeding observed.

4. Gills and gill color.
   - Deep red in color.

Poor: Fish is alive, but showing signs of stress.

1. Injuries are apparent.
   - Body abrasions have damaged the skin but skin is still present, not missing.
   - Cuts and lacerations in body extend through skin just into flesh and are not deep.
   - Between 10 and 50% of dorsal and anal fins are frayed.
   - Slight bleeding from fin edges.
   - Approximately 10-25% of skin on white side of fish shows hemorrhaging.

2. Operculum pressure.
   - Fish closes operculum weakly and not sustained.

3. Muscle tone or physical activity.
   - Weak, intermittent movement. May respond if stimulated or provoked.
   - Body is limp, but not in rigor mortis.

4. Bleeding.
   - Blood is continually flowing from gills, but not profusely.

5. Gills and gill color.
   - Deep to bright red in color.

Dead: No sign of life or, if alive, likely to die from severe injuries or suffocation.

1. Injuries are apparent.
   - Body cavity ripped open.
   - Internal organs exposed and damaged.
   - Cuts and lacerations in body extend deeply into the flesh.
   - Sediment in mouth.
   - Hemorrhaging in skin on 25% or more of white side.

2. Operculum pressure.
   - Fish does not close operculum.

3. Muscle tone and physical activity.
   - No sign of muscle tone (limp) or fish is in rigor (stiff).
   - Physical activity absent or limited to fin ripples or twitches.
   - Little, if any, response to stimuli.
   - Jaw is hanging open.

4. Bleeding.
   - Blood is flowing freely and continuously in large quantity from a torn or severed gill arch, or a body injury.

5. Gills and gill color.
   - Gills appear washed out, e.g., dull red, pink, or white in color.

Appendix P. Viability Key and Criteria for Pot Caught Pacific Halibut

Key to Pot Condition Codes for Pacific Halibut

Codes : Excellent = E, Poor = P, Dead = D, Unknown = U

1a. Fish is alive..... Go to 2a

1b. Fish is dead when sorted from the catch .....Code DEAD
Fish is in rigor and lifeless, even if no apparent injuries. Gills appear washed out, i.e., dull red, pink, or white in color.

2a. No penetration of the body or head by sand fleas.....Go to 3a
Membranes surrounding eyes and anus are intact, without any holes from sand fleas. A few sand fleas may be seen on body and can be wiped off with your hand. Typically, no penetration has occurred when only a few (e.g., <10) sand fleas are found on the body.

2b. Sand fleas have penetrated the body via the eyes, fins, or anus..... Code DEAD
Membrane surrounding eye may be partially or completely missing. Dorsal and/or anal fin membranes may be eaten away, leaving fin rays exposed. Skin on the body is separated from tissue where sand fleas have eaten.

3a. No predation of the fish's body by crabs in the pot is noted ..... Go to 4a

3b. Predation by crabs has occurred ..... CODE DEAD
Crabs in the pot may have attacked and eaten the fish.

4a. Body of fish appears uninjured, or has only minor injuries..... Go to 5a

4b. Injuries to fish are obvious and significant.....Code DEAD
Body cavity is ripped open, exposing internal organs. Body tissue may be torn or ripped in a rough, ragged manner. Red hemorrhaging observed on 25% or more of the white side of fish.

5a. Fish is able to close operculum when stimulated ..... Go to 6a
Operculum is closed strongly or weakly, but pressure is evident. Operculum may not stay closed for long, though pressure may last up to 5 seconds or longer.

5b. Fish cannot close operculum, even when stimulated.....Code DEAD

6a. Fish displays activity and has muscle tone ..... Go to 7a
Fish displays a minimal amount of activity, especially when stimulated. May be able to clench jaw, perhaps tightly.

6b. Fish exhibits no muscle tone .....Code DEAD
Physical activity absent or limited to fin ripples or twitches. Little, if any, response to stimuli. Jaw is hanging open and is slack.

7a. Fish is not bleeding, or only slightly bleeding, if at all .....Go to 8a

7b. Blood is flowing freely and continuously in large quantity (profusely) .....Code DEAD
Bleeding is coming from fin edges or a body injury.

8a. Body injuries are minimal, perhaps difficult to find .....Go to 9a
May consist of superficial nicks or cuts on body. Less than 10% of dorsal and anal fin area is frayed. Hemorrhaging of skin on white side limited to ≤10% of surface area.

8b. Body injuries are readily apparent..... Code POOR
Skin is damaged with abrasions. Cuts and lacerations in body extend through the skin and just barely into the flesh (not deeply). Dorsal and anal fin area is frayed between 10-50%. Fin edges may be bleeding slightly. Roughly 10-25% of the white side of fish shows red hemorrhaging.

9a. Operculum pressure is strong and sustained .....Go to 10a
Fish should be able to close operculum for at least 5-10 seconds.

9b. Operculum pressure is weak and not sustained..... Code POOR

10a. Fish is strong and lively, displaying good muscle tone.....Go to 11a
Fish is flopping around the deck, hard to control. Jaw may be tightly clenched, difficult to open.

10b. Fish appears weak ..... Code POOR
Movement is intermittent and of short duration, perhaps occurring when provoked or stimulated. Body appears limp, not in rigor mortis.

11a. Fish is bleeding from fin edges or body ..... Code POOR
Blood is oozing continuously from fin edges or body wounds. Gills are deep to bright red in color.

11b. No bleeding observed.....Code EXCELLENT
Gills are deep red in color. Fins are not bleeding.

HALIBUT CONDITION CRITERIA FOR GROUNDFISH POT BYCATCH

The criteria are listed in order of importance

Excellent: Fish is alive, showing no stress, and injuries, if any, are slight.

1. External injuries.
   - Superficial nicks or cuts on body.
   - Little (<10% of fin area)or no fraying of dorsal and anal fins.
   - Hemorrhaging (redness) of skin on white side limited to 5-10% of surface area.

2. Operculum pressure.
   - Fish is able to close operculum tightly for at least 5-10 seconds.

3. Muscle tone and physical activity.
   - Strong and lively, perhaps flopping around on deck if stimulated.
   - Fish can tightly clench its jaw.

4. Bleeding.
   - No bleeding from gills, body, or fins observed.

5. Gills and gill color.
   - Deep red in color.

6. No penetration of the body or head by sand fleas. No predation by crabs.
   - Membranes surrounding eyes and anus are intact, without any holes from sand fleas.
   - A few sand fleas may be seen on body, but can be wiped off with your hand. Typically, no penetration has occurred when only a few (e.g., <10) sand fleas are found on the body.

Poor: Fish is alive, but displaying physical injuries and signs of stress.

1. External injuries are apparent.

   Body abrasions have damaged the skin but skin is still present, not missing.
   - Cuts and lacerations in body extend through skin just into flesh and are not deep.
   - Between 10 and 50% of dorsal and anal fins are frayed.
   - Slight bleeding from fin edges.
   - Approximately 10-25% of skin on white side of fish shows hemorrhaging.

2. Operculum pressure.
   - Fish closes operculum weakly and not sustained.

3. Muscle tone or physical activity is weak.
   - Intermittent body movement. May respond if stimulated.
   - Body appears limp, but not in rigor mortis.

4. Bleeding.
   - Blood is not flowing profusely, but is oozing continuously from fin edges or body wounds.

5. Gills and gill color.
   - Gills are deep to bright red.

6. No penetration of the body or head by sand fleas. No crab predation.
   - Membranes surrounding eyes and anus are intact, without any holes from sand fleas.
   - A few sand fleas may be seen on body, but can be wiped off with your hand. Typically, no penetration has occurred when only a few (e.g., <10) sand fleas are found on the body.
   - No damage to the fish from crabs, if any, in the pot.

Dead/Fleas: No sign of life or, if alive, likely to die from injuries or predation.

1. External and internal injuries.
   - Body cavity may be ripped open.
   - Internal organs may be exposed and damaged.
   - Body tissue may be torn or ripped in a rough, ragged manner.
   - Hemorrhaging in skin on 25% or more of white side.

2. Operculum pressure.
   - Fish does not close operculum.

3. Muscle tone and physical activity.
   - No sign of muscle tone (limp) or fish is in rigor (stiff)
   - Physical activity absent or limited to fin ripples or twitches.
   - Little, if any, response to stimuli.
   - Jaw may be open and slack.

4. Bleeding.
   - Blood is flowing profusely from fin edges or body.

5. Gills and gill color.
   - Gills appear washed out, e.g., dull red, pink, or white in color.

6. Sand fleas have penetrated the body via the eyes, fins, or anus. Crab predation may also occur.
   - Membrane surrounding eye may be partially or completely eaten by sand fleas.
   - Dorsal and/or anal fin membranes may be eaten away, leaving fin rays exposed. Skin on the body is separated from tissue where sand fleas have eaten.
   - Crabs in the pot may also have attacked and eaten the “dead” fish.

Appendix Q. Injury Criteria and Injury Key for Hook & Line Caught Pacific Halibut

Key to Longline Injury Codes for Pacific Halibut

Codes : 1 = Minor, 2 = Moderate, 3 = Severe, 4 = Dead/Sand Fleas/Bleeding, 9 = Unknown

1a. Fish is alive..... Go to 2a

1b. Fish is dead when brought to the surface on the gear.....Code DEAD
Fish is in rigor and lifeless, even if no apparent injuries. Gills appear completely devoid of blood (light pink or white in color).

2a. Body shows no signs of marine mammal predation..... Go to 3a
Fish's body is intact. Flesh may be torn, but no missing tissue.

2b. Body is missing pieces of flesh.....Code DEAD
Pieces of tissue are missing from predation by marine mammals. Missing pieces are typical of bites from sea lions or other large marine mammals.

3a. No penetration of the body or head by sand fleas.....Go to 4a
Membranes surrounding eyes and anus are intact, without any holes from sand fleas. A few sand fleas may be seen on body and can be wiped off with your hand. Typically, no penetration occurs when only a few (e.g., <10) sand fleas are found on the body.

3b. Sand fleas have penetrated the body via the eyes, fins, or anus..... Code DEAD
Membrane surrounding eye may be partially or completely missing. Dorsal and/or anal fin membranes may be eaten away, leaving fin rays exposed. Skin on the body is separated from tissue where sand fleas have eaten.

4a. No wounds of any kind to abdominal organs. Abdominal wall not punctured..... Go to 5a

4b. Abdominal organs are damaged, possibly by a gaff..... Code DEAD
Abdominal cavity wall is punctured or torn. Viscera are visible and exposed, and may be protruding.

5a. Fish is not bleeding from gills (but may be bleeding from elsewhere)..... Go to 6a

5b. Fish is bleeding from gills.....Code DEAD
Bleeding is occurring from a torn or severed gill arch.

6a. Fish is not bleeding at all, or bleeding is minor to moderate (not from gills)..... Go to 7a
Blood may be seen around mouth and/or jaw. Blood may be oozing continuously, or bleeding may be continuing very slowly a few drops at a time, or bleeding may have stopped.

6b. Bleeding is severe..... Code DEAD
Blood from any source is flowing freely and continuously in large quantity.

7a. Injuries to head and/or jaw are minor to moderate, but no structures are missing .....Go to 8a

7b. Major injuries to head and jaw, resulting in missing pieces..... Code SEVERE
Side of the head, possibly including the jaw, has been torn loose and missing from the fish, and/or lower jaw has been torn away and is missing.

8a. Wounds to the head (forward of preopercle and above cheek and jaw) are only surface scratches on the skin.....Go to 9a

8b. Skin on head (forward of preopercle) is ripped and torn deeply.....Code SEVERE
Internal organs are likely exposed.

9a. Eye or eye socket is not punctured.....Go to 10a

9b. Eye or eye socket is punctured..... Code MODERATE

10a. No wounds to the body are evident.....Go to 11a

10b. Wounds in body consist of puncture holes in skin, with possibly a flesh tear..... Code MODERATE

11a. Lower jaw is significantly damaged..... Code MODERATE
Lower jaw may be broken into 2 pieces at the snout, but each is still attached at the base of the jaw. Jaw may be torn on one side or the other, possibly extending through the cheek.

11b. Damage to lower jaw, if any, is slight.....Code MINOR
Injuries include the hook entrance/exit hole around the jaw or in the cheek, or a tear in the cheek. A piece of the lip may be torn and hanging from the jaw. If gangion was cut, the hook and some length of residual gangion may be hanging from the mouth.

HALIBUT INJURY CRITERIA FOR HOOK & LINE BYCATCH

The criteria are listed in order of importance

Minor injuries: Injuries, if any, are slight and inconsequential to health of the fish.

1. Injuries around the mouth from the hook and hook removal are slight.
   - A hook entrance/exit hole around the jaw or in the cheek.
   - The lip (skin covering the external portion of the jaw) may be torn and hanging.
   - The hook and some length of residual gangion may be hanging from the mouth if the gangion was cut.

2. Very little bleeding, if any.
   - Bleeding is seen only in the area surrounding the jaw.
   - Bleeding may have stopped, or may be continuing very slowly a few drops at a time.

3. No penetration of the body or head by sand fleas.
   - Membranes surrounding eyes and anus are intact, without any holes from sand fleas.
   - A few sand fleas may be seen on body and can be wiped off with your hand. Typically, no penetration has occurred when only a few (e.g., <10) sand fleas are found on the body.

Moderate injuries: Injuries are present, but are not severe.

1. Injuries may have been inflicted to the jaw, cheek, eye, or body.
   - Lower jaw may be broken into 2 pieces at the snout, but each is still attached at the base of the jaw.
   - Jaw is torn on one side or the other, possibly extending through the cheek.
   - Hook may have punctured the eye or eye socket.
   - Wounds on head and abdomen limited to surface scratches on skin.
   - No wounds of any kind to abdominal organs. Abdominal cavity wall not punctured.
   - Wounds in body consist of puncture holes in skin, with possibly a flesh tear.

2. Bleeding is occurring but not from gills.
   - Blood may be seen around mouth and jaw.
   - Blood is not flowing profusely, but is oozing continuously.

3. No penetration of the body or head by sand fleas.
   - Membranes surrounding eyes and anus are intact, without any holes from sand fleas.
   - A few sand fleas may be seen on body and can be wiped off with your hand. Typically, no penetration has occurred when only a few (e.g., <10) sand fleas are found on the body.

Severe injuries: Severe life-threatening injuries can be seen.

1. Injuries to the head and/or jaw have occurred. Any of the following will be present, individually or in combination:
   - Skin on head (forward of preopercle) is ripped and torn deeply, exposing tissue and internal organs.
   - Side of the head, possibly including the jaw, has been torn loose and missing from the fish.
   - Lower jaw has been torn away and is missing.
   - No wounds of any kind to abdominal organs. Abdominal cavity wall not punctured.

2. No penetration of the body or head by sand fleas.
   - Membranes surrounding eyes and anus are intact, without any holes from sand fleas.
   - A few sand fleas may be seen on body and can be wiped off with your hand. Typically, no penetration has occurred when only a few (e.g., <10) sand fleas are found on the body.

Dead/Fleas/Bleeding: Fish is lifeless, sand flea predation, severe bleeding.

1. Fish is already dead when brought to the surface on the gear
   - Fish is in rigor and lifeless, even if no apparent injuries.
   - Gills appear completely devoid of blood (light pink or white in color).

2. Marine mammals have taken bites out of the fish
   - Usually taken out of the back of the fish or from the abdominal cavity.

3. Sand fleas have penetrated the body via the eyes, fins, or anus.
   - Membrane surrounding eye may be partially or completely missing.
   - Dorsal and/or anal fin membranes may be eaten away, leaving fin rays exposed. Skin on the body is separated from tissue where sand fleas have eaten.

4. Bleeding is severe, especially from the gills.
   - Blood is flowing freely and continuously in large quantity.
   - Bleeding is occurring from a torn or severed gill arch.

5. Internal organs are damaged, possibly by a gaff.
   - Abdominal cavity wall is punctured or torn.
   - Viscera are visible and exposed, and may be protruding.

Appendix R. Contact Addresses and Numbers

North Pacific Groundfish Observer Program, Seattle

Address

NMFS Observer Program,
F/AKC2 ,
7600 Sand Point Way NE
BIN C15700
Seattle, WA 98115-0070

Fax: (206) 526-4066 or 526-4207
Standard A, B or mini-M for Atlas (206) 525-4121
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

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

NMFS Observer Program
301 Research Court
Kodiak, AK 99615

Allison Barns

Phone: (907) 481-1770
Fax: (907) 481-1771

Dutch Harbor Field Office

Address	Troy Martin
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	
Groundfish Observer Program Federal Building Annex 222 W. 8th Ave, Rm. A41 Anchorage, AK 99513	Phone (907) 271-1313 Todd Loomis (907) 271-1314 Pete Risse Fax (907) 271- 1315 NMFS Enforcement Office (907) 271-3031 Kevin Heck

Observer Training Center (OTC), Anchorage

Address	
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 Kevin Heck with NMFS Enforcement in Anchorage at (907) 581-271-3031. He is the primary enforcement officer for Observer reported issues.

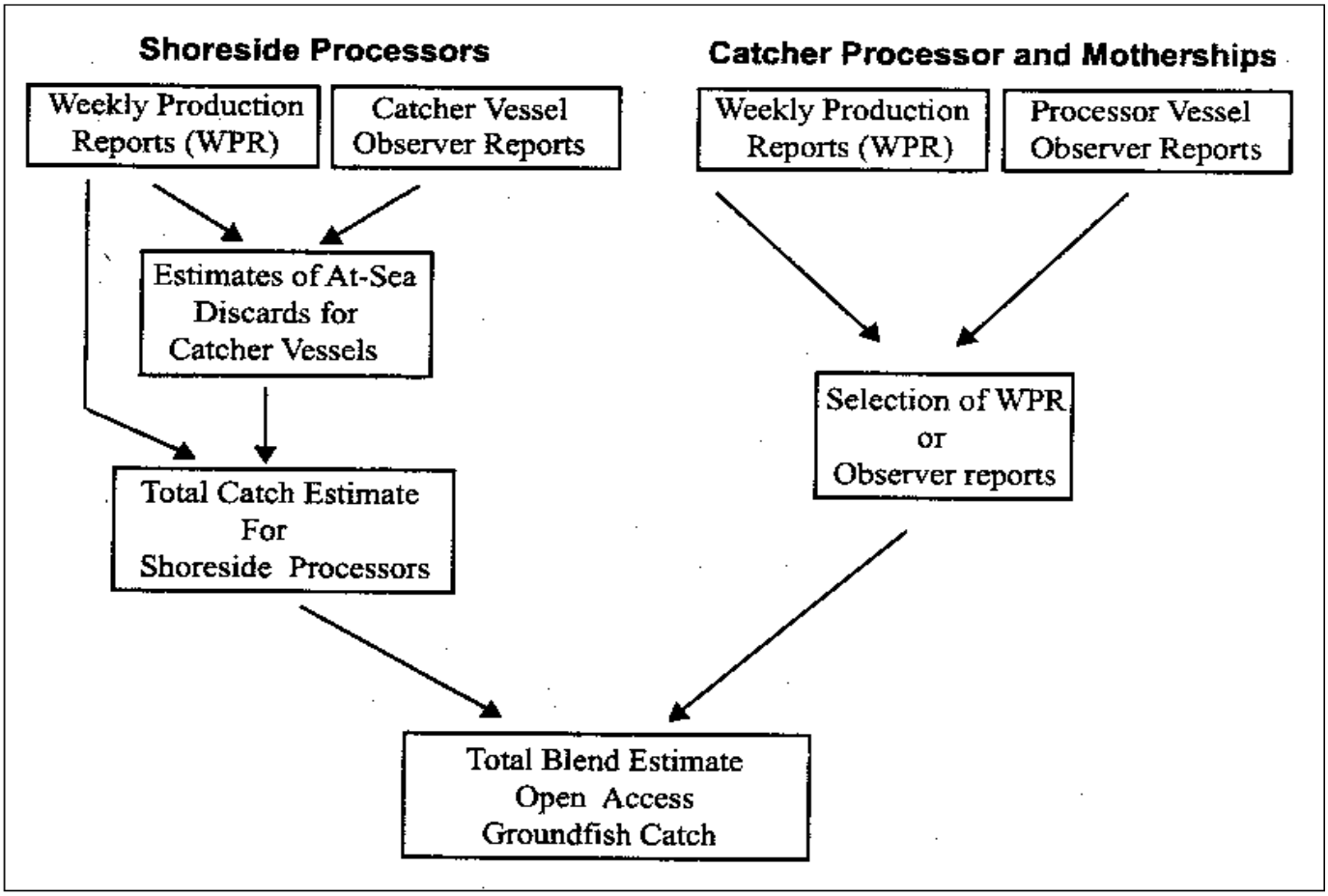
There is also a Kodiak Enforcement Office which can be reached at (907) 486-3298 and a Dutch Harbor Enforcement Office which can be reached at (907) 581-2061

U.S. Coast Guard

Anchorage	Charlie Medlicott	(907) 271-6725
Kodiak	Lt. Matt Jones	(907) 487-5750
Unalaska (Dutch Harbor)	LCDR Steve McCleary	(907) 581-3466

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 (WPR) for Shoreside Processors: These reports include 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: This estimate 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 (WPR) for catcher processors and motherships: These reports include 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-and rescue (SAR) communications with ships and aircraft of the U.S. Coast Guard, and vessel movement reporting within ports and inland waterways. This channel must not be used for non-safety communications.

Channel 16 (156.800 MHz) is the International Distress, Safety, and Calling Channel (Intership and 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.

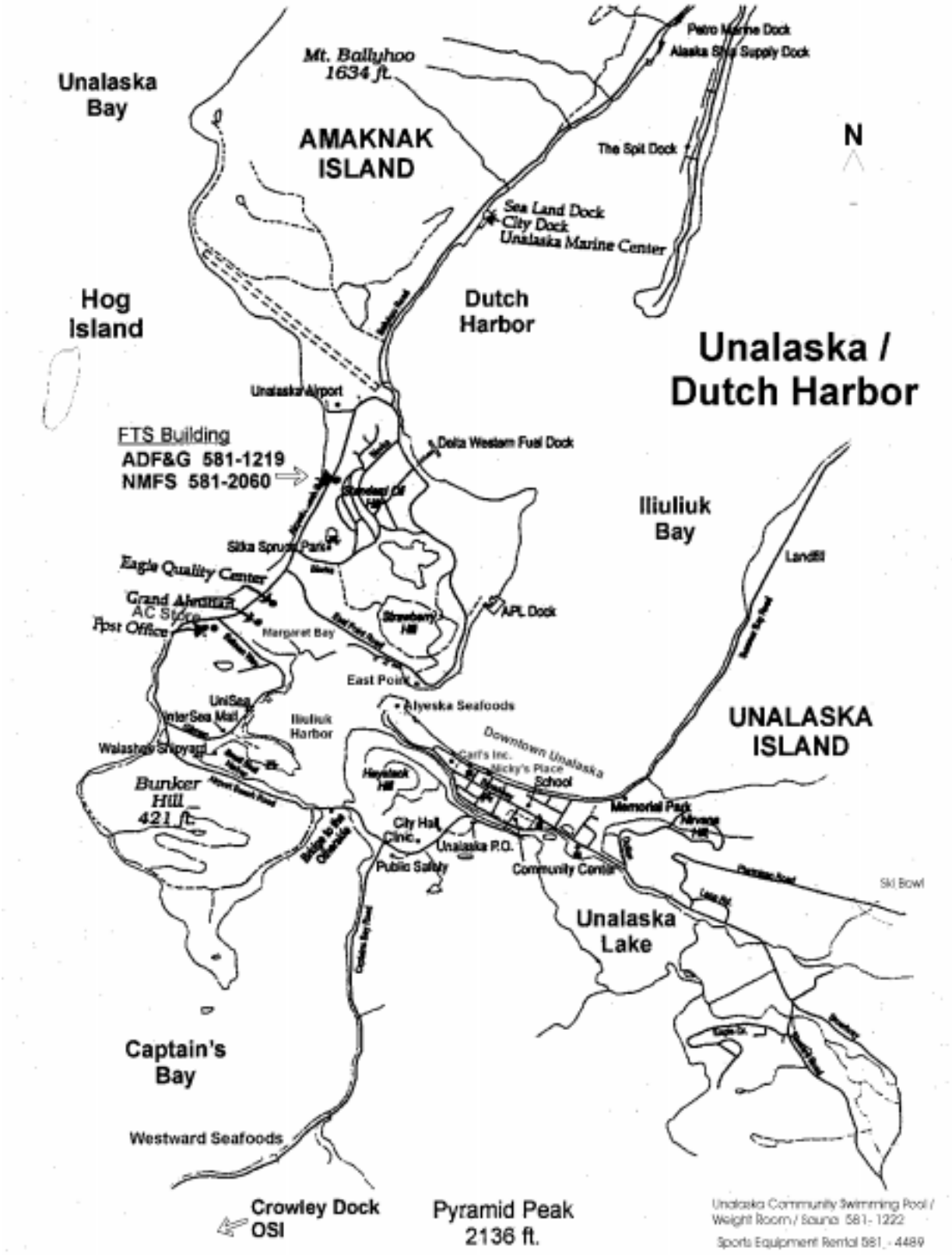
  C.G.: *Fishing vessel Starry Flounder, this is Coast Guard Station Kodiak send your traffic, over.*

  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. "

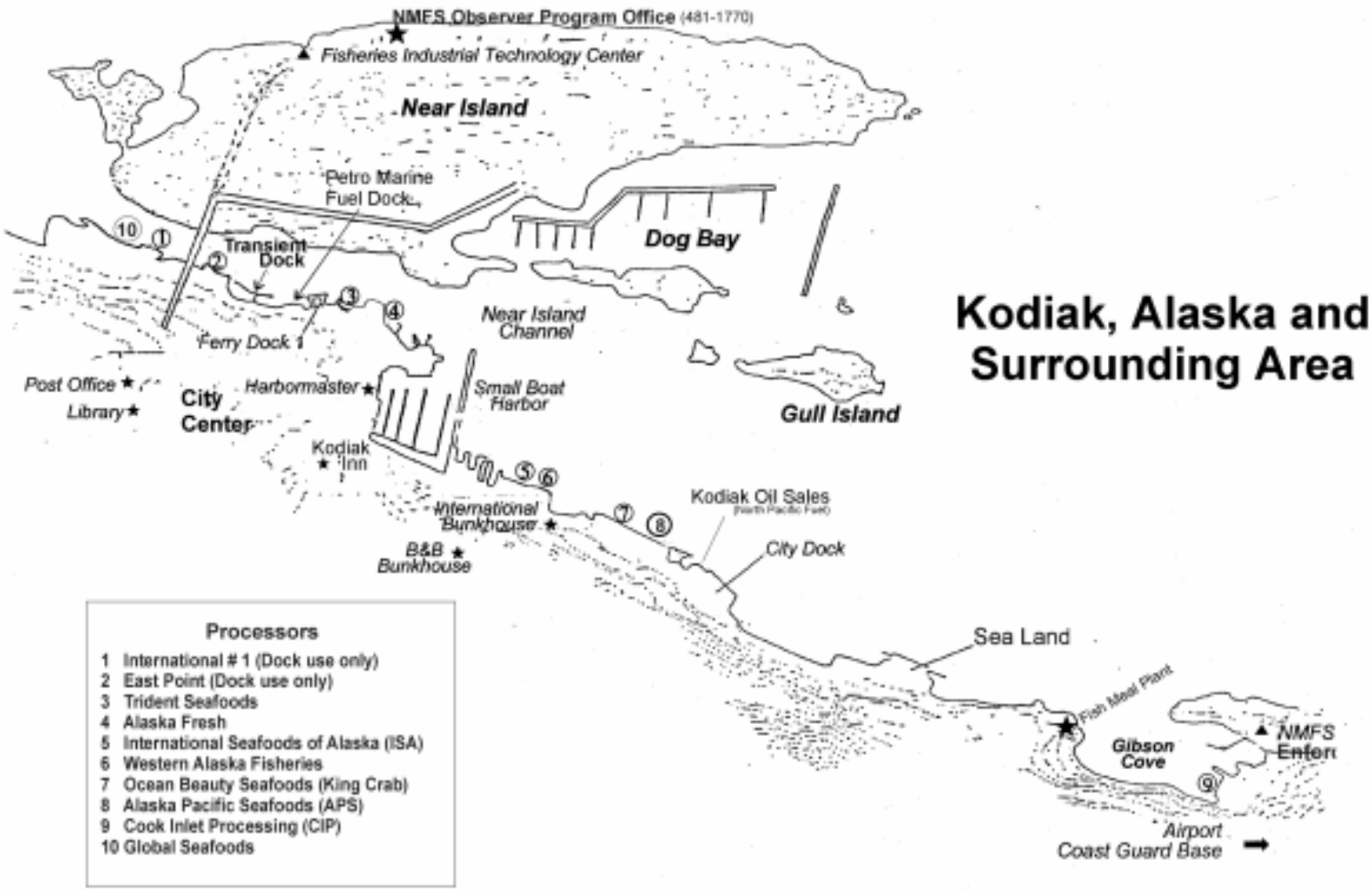
  C.G.: *Vessel Starry Flounder, this is Kodiak. Affirmative. What is your current position? Over. "*

  You: Kodiak this is the Starry Flounder. Position is fifty-five degrees fifty 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. Chattilon Flatbed Scale Care and Maintenance

Chattilon flatbed scales are available at the Kodiak and Dutch Harbor field stations. They are particularly helpful on small vessels that have no convenient place to hang a 50 kg. Salter scale. Although useful, the Chattilon scale will only perform for the length of your deployment only if you properly lubricate and maintain it.

Before You Use the Scale

Prior to taking the scale from the field station, you should familiarize yourself with how to use it. Additionally, you will need to ensure the scale is properly lubricated and tested. Record the serial number and the test results in your logbook.

Lubricating the Scale.

The bars on the bottom of the scale form an "X" shape. The platform floats on the tips of this "X," and there is a flex point where the bars cross. Each of these five points must be liberally lubricated. Generally, the flex points will be lubricated with a thick grease prior to issue. However, if this grease washes off during your deployment, ask the boat's engineer for thick engine grease to lubricate these points.

The two bars on the front of the scale, on which the weights slide, also need to be lubricated. You may use a WD-40 type oil, or the food grade lubricant oil issued as part of your normal observer gear. **Check all lubrication points often.** The weight bars should be oiled daily, and the points on the "X" bars beneath the platform need to be re-greased at least every few days.

Using the Scale

Whenever you are not using the scale, lock the platform in place using the black lever on the right side of the scale. Turn the lever forward to unlock the platform, and back to re-lock the platform.

Checking the Scale for Accuracy and Recalibrating

Weigh an object on the platform scale prior to using it at sea. Record the weight of this object, and use it periodically to check your scale. If the scale no longer reads the correct weight, you will need to recalibrate the scale.

The small, rectangular bar on the upper left of the weight bar has a screw head on the far left hand side, with a nut on the other end. Inside this rectangular bar is a small weight that will move when you turn the screw head. The nut on the other end will also move; this is normal.

Put an object of a known weight on the scale and place the weights on the weight bar to show the known weight. If the scale is unbalanced where the known weight appears too light, turn the screw to the left until the scale balances on the correct weight. If the scale is unbalanced where the known weight appears too heavy, turn the screw to the right until the scale balances on the correct weight.

Returning the Scale

Prior to bringing the scale back to NMFS, rinse it with fresh water and let it dry. Remove any rust on the five pivot points on the bottom of the scale, and on the sliding weight bars. Lubricate the scale and transport it to NMFS with the platform in the locked position.

Test the scale and record the results in your logbook. If the scale does not test out within the approved NMFS accuracy range, please alert your debriefer when you return for your final debriefing.

Appendix X. Bins with Nomograms

Some live tanks have been measured and marked by contracted marine engineers. It is possible to get very accurate volumes using these charts, but only if they are read and interpreted correctly. The volume of these bins are meant to be calculated using a nomogram. A nomogram is the engineer's sounding chart which allows a weighted average to be taken from the actual height readings. The vessel should maintain a copy of a bin diagram and nomogram, and provide you with a copy. The bin diagram will have each of the measurement locations listed, and will also show a "centroid axis." This centroid axis does not represent a measurement that you take, but rather allows you to decipher the average of your bin height readings. The numbered increments posted in the tank may not represent centimeters or bin volumes, nor any other unit you could actually measure, so they cannot be averaged without using the centroid axis. The calibrated marks are devised by the engineer to segment the tank into units. Following is the method for obtaining volumes of fish in certified bins or tanks:

1. Find all of the marks visible from the viewing window(s).

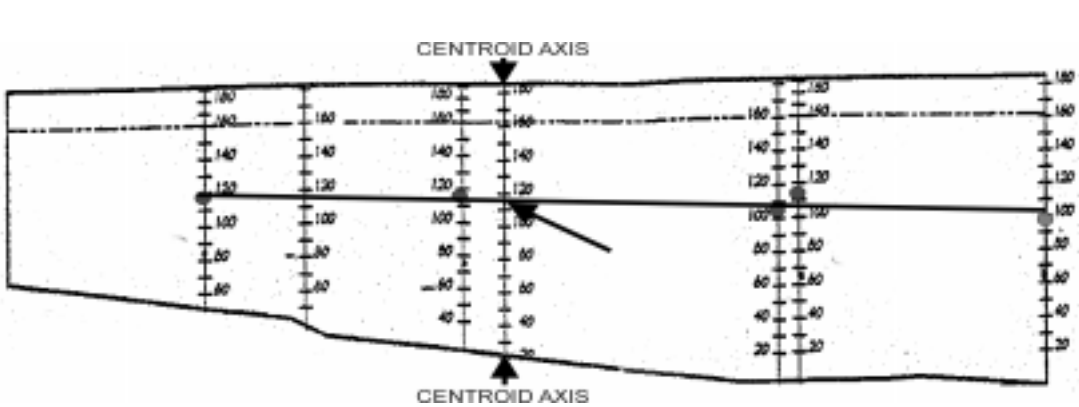
2. Judge the average fish height near each of the walls where visible marks are installed/painted (the median between the highest and lowest height of fish in each bin quadrant near a visible mark) and compare it to the numbered increments on the wall.

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. The centroid axis is the calculated center point of the bin, and will not be represented by actual measuring strip in the bin. The centroid axis appears only on the nomogram.

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. Use this volume to calculate the weight of the catch.



SOUNDING (CM)	VOLUME (CU. METERS)
0	0.000
10	0.239
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

Bin Nomogram

If your best fit line crosses the centroid axis at a number that does not appear on the sounding chart, you will need to calculate the volume for that reading. In the example in Figure A-, the best fit line falls at 118. Since 118 is not listed on the ullage chart, you must interpolate the corresponding volume. 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. To interpolate a volume:

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

Appendix Y. CPR Instructions

Cardiopulmonary Resuscitation (CPR)

SHAKE OR SHOUT TO DETERMINE UNCONSCIOUSNESS

Airway

If no response:

TILT head and **LIFT** chin to clear airway of tongue.
LOOK, LISTEN, and **FEEL.**
Look to see if chest is rising and falling.
Listen and Feel at mouth with your ear to determine breathing.

Breathing

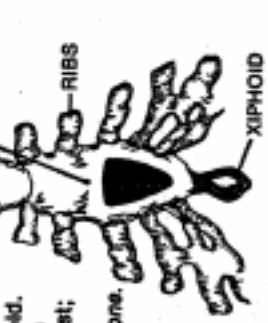
If no breathing:

PINCH nostrils.
OPEN your mouth.
TAKE a deep breath.
SEAL patient's mouth with yours.
BLOW four quick, full breaths.
CHECK neck pulse on the side nearest you.
If pulse is present, continue breathing 12 times per minute (1 each 5 seconds).
Child/Infant rate - 20 times per minute
(1 each 3 seconds)

Circulation

If no pulse:

REMOVE obstructive clothing from chest.
FEEL for lower end of breastbone with 2 or 3 fingers on xiphoid.
PLACE heel of one hand just above fingers so that you are on lower one-half of breastbone, **PLACE** other hand on top of first; **KEEP** arms straight.
Small child — use heel of one hand at midpoint of breastbone.
Infant — use 2 fingers at midpoint of breast bone.
COMPRESS breastbone straight down 1½ to 2 inches . . .
Child — ¾ to 1½ inches
Infant — ½ to ¾ inch
. . . at a **RATE** of 60-80 times per minute.
Child/Infant 80-100 times per minute.
ONE PERSON — give 2 BREATHS after 15 CHEST COMPRESSIONS. Chest compressions are done at a rate of 80 times per minute.
TWO PERSONS — Give **1 BREATH** during the upstroke of each **5th CHEST COMPRESSION.** Chest compressions are done at a rate of 60 times per minute.



Call for Help.

Appendix Z. Flatfish Species Description Form

SPECIES COMMON NAME: _____

DATE: _____

HAUL NUMBER: _____

FORK 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 <u>MAKE THE FOLLOWING GILL RAKER COUNTS</u>:

GILL RAKERS ON THE 1ST ARCH:

Total: _____

Upper arm: _____

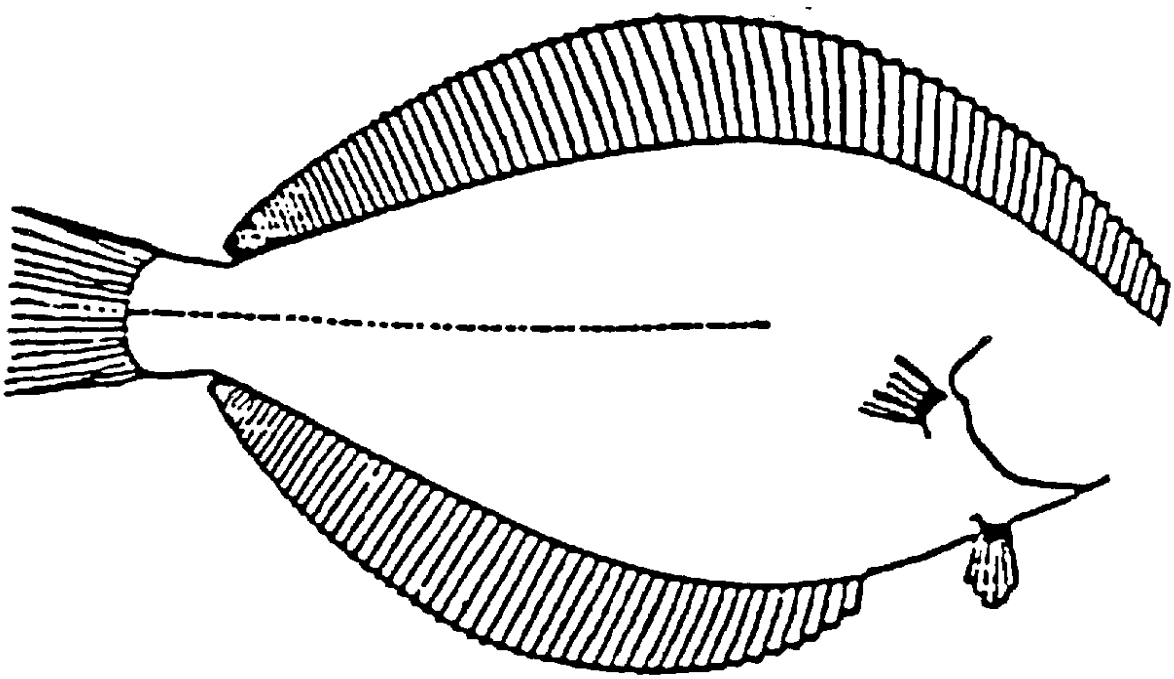
Lower arm: ____

GILL RAKERS ON THE 2ND ARCH:

Upper arm: ____

In the diagram below, draw in the characters of your fish. DRAW:

1. **the mouth, showing the size**
2. **preoperculum and tail shape**
3. **lateral line curve**
4. **ADB size**
5. **any markings**



Appendix AA. Rockfish Species Description Form

SPECIES COMMON NAME:_____

DATE:_____

HAUL NUMBER:_____

FORK 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**

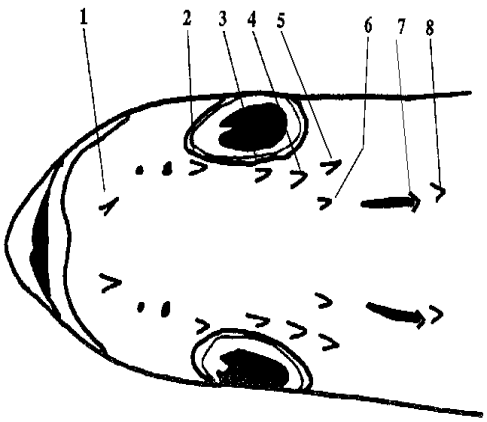
PERITONEUM COLOR = _____

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

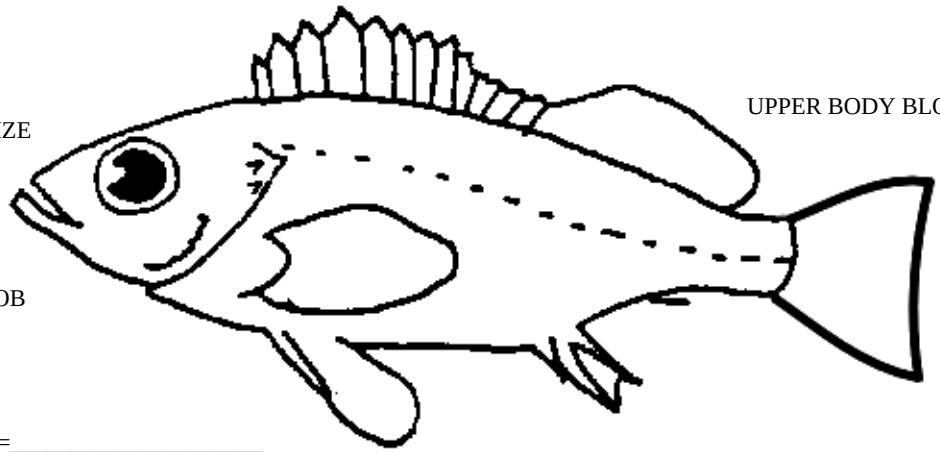
NUMBER OF SPINES UNDER THE EYE - 0 1-2 >2

DRAW THE FISH CHARACTERISTICS ON THIS DIAGRAM -

BODY BACKGROUND COLOR =_____

UPPER BODY BLOTCHES/SPOTS/

MAXILLA SIZE



SYMPHYSEAL KNOB

VENTRAL COLOR =_____

ANAL FIN SLANT

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 - _____

Appendix AB. 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.

Appendix AC. Material Safety Data Sheet for DMSO

SUPELCO -- 1,6-HDI DERIVATIVE, 1X1ML, DMSO, 1000 UG-ML, 48146
MATERIAL SAFETY DATA SHEET
NSN: 663000N063233
Manufacturer's CAGE: 54968
Part No. Indicator: A
Part Number/Trade Name: 1,6-HDI DERIVATIVE, 1X1ML, DMSO, 1000 UG/ML, 48146

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General Information

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Company's Name: SUPELCO INC
Company's Street: SUPELCO PARK
Company's City: BELLEFONTE
Company's State: PA
Company's Country: US
Company's Zip Code: 16823-0048
Company's Emerg Ph #: 814-359-3441
Company's Info Ph #: 814-359-3441
Record No. For Safety Entry: 001
Tot Safety Entries This Stk#: 001
Status: SMJ
Date MSDS Prepared: 03MAR93
Safety Data Review Date: 05SEP95
MSDS Serial Number: BZBLB

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Ingredients/Identity Information

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Proprietary: NO
Ingredient: N,N-1,6-HEXANEDIYLBIS(4-(2-PYRIDINYL)-1-PIPERAZINE-CARBOXAMIDE; (1,6-HDI DERIVATIVE)
Ingredient Sequence Number: 01
Percent: 0.1
NIOSH (RTECS) Number: 1013299NN
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

Proprietary: NO
Ingredient: METHANE,SULFINYLBIS-; (DIMETHYL SULFOXIDE)
Ingredient Sequence Number: 02
Percent: 99-100
NIOSH (RTECS) Number: PV6210000
CAS Number: 67-68-5
OSHA PEL: N/K (FP N)
ACGIH TLV: N/K (FP N)

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Physical/Chemical Characteristics

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Appearance And Odor: CLEAR, COLORLESS LIQUID WITH A FAINT ODOR.
Boiling Point: 372F,189C
Melting Point: 64.4F,18.0C
Vapor Pressure (MM Hg/70 F): 0.37 MM
Vapor Density (Air=1): 2.69C
Specific Gravity: 1.100 G/ML
Evaporation Rate And Ref: NOT APPLICABLE
Solubility In Water: 100

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Fire and Explosion Hazard Data

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Flash Point: 203F,95C
Lower Explosive Limit: 63.0%
Extinguishing Media: CO*2, DRY CHEMICAL, ALCOHOL FOAM.
Special Fire Fighting Proc: WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire And Expl Hazrds: THE FOLLOWING TOXIC VAPORS ARE FORMED WHEN THIS MATERIAL IS HEATED TO DECOMPOSITION:OXIDES OF SULFUR, OXIDES OF NITROGEN.

Reactivity Data

Stability: YES
Cond To Avoid (Stability): NOT APPLICABLE.
Materials To Avoid: NOT APPLICABLE.
Hazardous Decomp Products: OXIDES OF SULFUR, OXIDES OF NITROGEN.
Hazardous Poly Occur: NO
Conditions To Avoid (Poly): NOT RELEVANT

Health Hazard Data

LD50-LC50 Mixture: LD50(ORAL, RAT):1700 MG/KG
Route Of Entry - Inhalation: NO
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: NO
Health Haz Acute And Chronic: ABSORBED RAPIDLY THROUGH SKIN. HARMFUL IF ABSORBED THROUGH SKIN. CAN PENETRATE SKIN READILY AND CAN CARRY OTHER COMPOUNDS THROUGH THE SKIN.
Carcinogenicity - NTP: NO
Carcinogenicity - IARC: NO
Carcinogenicity - OSHA: NO
Explanation Carcinogenicity: NOT RELEVANT
Signs/Symptoms Of Overexp: SEE HEALTH HAZARDS.
Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.
Emergency/First Aid Proc: EYES:FLUSH WITH WATER FOR AT LEAST 15 MINUTES. SKIN:FLUSH WITH LARGE VOLUMES OF WATER. REMOVE CONTAMINATED CLOTHING. CONTACT A PHYSICIAN. INHALATION:IMMEDIATELY REMOVE TO FRESH AIR. INGESTION:NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. NEVER TRY TO MAKE AN UNCONSCIOUS PERSON VOMIT.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: CLEAN AREA WITH SOAP AND WATER. TAKE UP WITH ABSORBENT MATERIAL. VENTILATE AREA. ELIMINATE ALL IGNITION SOURCES.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: COMPLY WITH ALL APPLICABLE FEDERAL, STATE OR LOCAL REGULATIONS.
Precautions-Handling/Storing: REFRIGERATE IN SEALED CONTAINER. KEEP AWAY FROM MOISTURE.
Other Precautions: AVOID EYE OR SKIN CONTACT. AVOID BREATHING VAPORS.

Control Measures

Respiratory Protection: USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N). NOT APPLICABLE.
Ventilation: USE ONLY IN WELL VENTILATED AREAS.
Protective Gloves: WEAR RUBBER GLOVES.
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).
Other Protective Equipment: NOT APPLICABLE.
Work Hygienic Practices: NONE SPECIFIED BY MANUFACTURER.
Suppl. Safety & Health Data: NONE SPECIFIED BY MANUFACTURER.

Transportation Data

Disposal Data

Label Data

Label Required: YES
Technical Review Date: 05SEP95
Label Status: G
Common Name: 1,6-HDI DERIVATIVE, 1X1ML, DMSO, 1000 UG/ML, 48146

Chronic Hazard: NO
Signal Word: CAUTION!
Acute Health Hazard-Slight: X
Contact Hazard-Slight: X
Fire Hazard-Slight: X
Reactivity Hazard-None: X
Special Hazard Precautions: COMBUSTIBLE. ACUTE:ABSORBED RAPIDLY THROUGH SKIN. HARMFUL IF ABSORBED THROUGH SKIN. CAN PENETRATE SKIN READILY AND CAN CARRY OTHER COMPOUNDS THROUGH THE SKIN. CHRONIC:NONE LISTED BY MANUFACTURER.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: SUPELCO INC
Label Street: SUPELCO PARK
Label City: BELLEFONTE
Label State: PA
Label Zip Code: 16823-0048
Label Country: US
Label Emergency Number: 814-359-3441

Appendix AD. Material Safety Data Sheets for 100% Formalin

J T BAKER CHEMICAL -- FORMALDEHYDE, 37% SOLUTION - FORMALDEHYDE SOLUTION,ACS
MATERIAL SAFETY DATA SHEET
NSN: 6810002423643
Manufacturer's CAGE: 70829
Part No. Indicator: A
Part Number/Trade Name: FORMALDEHYDE, 37% SOLUTION

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General Information

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Item Name: FORMALDEHYDE SOLUTION,ACS
Company's Name: J.T.BAKER CHEMICAL CO
Company's Street: 222 RED SCHOOL LANE
Company's City: PHILLIPSBURG
Company's State: NJ
Company's Country: US
Company's Zip Code: 08865
Company's Emerg Ph #: 201-859-2151/800-424-9300(CHEMTR)
Company's Info Ph #: 800-JTBAKER
Record No. For Safety Entry: 009
Tot Safety Entries This Stk#: 009
Status: SE
Date MSDS Prepared: 22MAY90
Safety Data Review Date: 20MAY94
Supply Item Manager: CX
MSDS Serial Number: BDMSK
Specification Number: O-C-265
Spec Type, Grade, Class: TYPE II
Hazard Characteristic Code: T4
Unit Of Issue: PT
Unit Of Issue Container Qty: 500 ML
Type Of Container: GLASS BOTTLE
Net Unit Weight: 1.2 LBS

==========

Ingredients/Identity Information

==========

Proprietary: NO
Ingredient: FORMALDEHYDE (SARA III)
Ingredient Sequence Number: 01
Percent: 37
NIOSH (RTECS) Number: LP8925000
CAS Number: 50-00-0
OSHA PEL: SEE 1910.1048
ACGIH TLV: C 0.3 PPM; A2; 9293
Other Recommended Limit: NONE SPECIFIED

Proprietary: NO
Ingredient: METHYL ALCOHOL (METHANOL) (SARA III)
Ingredient Sequence Number: 02
Percent: 10-15
NIOSH (RTECS) Number: PC1400000
CAS Number: 67-56-1
OSHA PEL: S,200PPM/250STEL
ACGIH TLV: S,200PPM/250STEL; 93
Other Recommended Limit: NONE SPECIFIED

Proprietary: NO
Ingredient: WATER.
Ingredient Sequence Number: 03
Percent: 47-53
NIOSH (RTECS) Number: ZC0110000
CAS Number: 7732-18-5

==========

Physical/Chemical Characteristics

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Appearance And Odor: CLEAR COLORLESS LIQUID,PUNGENT ODOR

Boiling Point: 204F,96C
Vapor Pressure (MM Hg/70 F): 1.3
Vapor Density (Air=1): 1.0
Specific Gravity: 1.08
Decomposition Temperature: UNKNOWN
Evaporation Rate And Ref: UNKNOWN
Solubility In Water: COMPLETE
Percent Volatiles By Volume: 100
pH: 2.8
Corrosion Rate (IPY): UNKNOWN
Autoignition Temperature: 858F

==========

Fire and Explosion Hazard Data

==========

Flash Point: 140F,60C
Lower Explosive Limit: 7.0%
Upper Explosive Limit: 73.0%
Extinguishing Media: ALCOHOL FOAM, DRY CHEMICALS, CARBON DIOXIDE, WATER SPRAY.
Special Fire Fighting Proc: FIRE FIGHTERS SHOULD WEAR PROTECTIVE CLOTHING AND SELF-CONTAINED BREATHING APPARATUS.
Unusual Fire And Expl Hazrds: VAPORS ARE HEAVIER THAN AIR, MAY SETTLE AT LOW AREAS OR TRAVEL SOME DISTANCE ALONG THE GROUND TO IGNITION SOURCES WHERE THEY MAY IGNITE & FLASH BACK.

==========

Reactivity Data

==========

Stability: YES
Cond To Avoid (Stability): HIGH TEMPERATURES, SPARKS, AND OPEN FLAMES
Materials To Avoid: STRONG OXIDIZERS, STRONG ALKALIES AND ACIDS, ALKALI METALS, AMINES AND AMMONIA, PHENOL AND REDUCING AGENTS.
Hazardous Decomp Products: FORMALDEHYDE AND CARBON MONOXIDE AND CARBON DIOXIDE.
Hazardous Poly Occur: YES
Conditions To Avoid (Poly): TRIOXYMETHYLENE PRECIPITATE CAN BE FORMED ON LONG STANDING AT VERY LOW TEMP. NONHAZARDOUS PARAFORMALDEHYDE AT LOW TEMP.

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Health Hazard Data

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LD50-LC50 Mixture: LD50(ORAL RAT) IS 800 MG/KG-FORMALDEHYDE
Route Of Entry - Inhalation: YES
Route Of Entry - Skin: YES
Route Of Entry - Ingestion: YES
Health Haz Acute And Chronic: ACUTE-EYE:VAPORS CAUSE IRRITATION. SPLASHES MAY CAUSE IRREVERSIBLE DAMAGE. SKIN:MAY CAUSE BURNS, SEVERE IRRITATION. INHALATION:IRRITATION OF RESPIRATORY TRACT. INGESTION:MAY BE FATAL. MAY CAUSE GI IRRITATION, BURNS TO MOUTH AND THROAT. CHRONIC-KIDNEY AND LIVER DAMAGE, SKIN SENSITIZATION.
Carcinogenicity - NTP: YES
Carcinogenicity - IARC: YES
Carcinogenicity - OSHA: YES
Explanation Carcinogenicity: CONTAINS Formaldehyde [50-00-0] WHICH IS LISTED BY NTP AND IARC AND REGULATED BY OSHA AS A CARCINOGEN.
Signs/Symptoms Of Overexp: EYE:TEARING, SEVERE EYE IRRITATION & BURN. SKIN:DRYING, CRACKING OF SKIN. INHALATION:HEADACHE, NAUSEA, VOMITING, DIZZINESS, VOMITING, DROWSINESS. INGESTION:NAUDEA, VOMTING, SEVERE STOMACH PAIN, SEVERE IRRITATION AND INFLAMMATION OF MOUTH, THROAT AND STOMACH. BLINDNESS OR DEATH MAY OCCUR.
Med Cond Aggravated By Exp: EYE, SKIN, LIVER, KIDNEY AND RESPIRATORY DISORDERS MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF THE SUBSTANCE.
Emergency/First Aid Proc: INHALATION:REMOVE TO FRESH AIR, PROVIDE CPR/ OXYGEN IF NEEDED. EYE CONTACT:FLUSH WITH WATER FOR 15 MINUTES. GET MEDICAL HELP. SKIN CONTACT:WASH WITH SOAP AND WATER. GET MED ATTENTION IF SYMPTOMS PERSIST. INGESTION:INDUCE VOMITING, DRINK 1-2 GLASSES OF WATER. GET MEDICAL HELP IMMEDIATELY.

Precautions for Safe Handling and Use

Steps If Matl Released/Spill: VENTILATE AREA.REMOVE ALL SOURCES OF IGNITION.WEAR PROTECTIVE CLOTHING & RESPIRATOR.DO NOT FLUSH TO SEWER OR SURFACE WATERS. ABSORB WITH INERT MATERIAL AND PLACE INTO CONTAINERS FOR LATER DISPOSAL.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Method: DISPOSE OF IN AN APPROPRIATE DISPOSAL FACILITY IN COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS. EPA HAZ WASTE # U122(TOXIC WASTE). IF SPILL IS IN EXCESS OF EPA REPORTABLE QUANTITY, NOTIFY THE NATIONAL RESPONSE CENTER (800-424-8802).
Precautions-Handling/Storing: STORAGE-STORE IN A DRY, WELL VENTILATED AREA ABOVE 15C. STORE WITH FLAMMABLE LIQUIDS.
Other Precautions: PROTECT CONTAINER FROM FREEZING AND PHYSICAL DAMAGE. STORAGE AND USE AREAS SHOULD BE NO SMOKING AREAS.WEAR SPECIAL PROTECTIVE EQUIPMENT FOR MAINTENANCE BREAK-IN.

Control Measures

Respiratory Protection: USE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS IF TLV IS EXCEEDED OR WHEN USING IN CONFINED SPACES.
Ventilation: LOCAL OR GENERAL EXHAUST IS RECOMMENDED TO KEEP EMPLOYEE EXPOSURES BELOW THE AIRBORNE EXPOSURE LIMITS.
Protective Gloves: CHEMICAL RESISTANT GLOVES
Eye Protection: CHEMICAL SAFETY GOGGLES/FULL FACE SHIELD
Other Protective Equipment: EYEWASH STATION AND SAFETY SHOWER.WEAR IMPERVIOUS CLOTHING,INCLUDING BOOTS,GLOVES,LAB COAT,APRON OR COVERALLS.
Work Hygienic Practices: OBSERVE GOOD PERSONAL HYGIENE PRACTICES AND RECOMMENDED PROCEDURES. DO NOT WEAR CONTAMINATED CLOTHING OR FOOTWEAR.
Suppl. Safety & Health Data: THE PERCEPTION OF FORMALDEHYDE BY ODOR AND EYE IRRITATION BECOMES LESS SENSITIVE WITH TIME AS ONE ADAPTS TO FORMALDEHYDE. THIS CAN LEAD TO OVEREXPOSURE IF A WORKER IS RELYING ON SMELL TO ALERT HIM OR HER TO THE POTENTIAL FOR EXPOSURE.

Transportation Data

Trans Data Review Date: 94140
DOT PSN Code: GNJ
DOT Proper Shipping Name: FORMALDEHYDE, SOLUTIONS
DOT Class: 3
DOT ID Number: UN1198
DOT Pack Group: III
DOT Label: FLAMMABLE LIQUID, CORROSIVE
IMO PSN Code: HMH
IMO Proper Shipping Name: FORMALIN SOLUTION, FLAMMABLE
IMO Regulations Page Number: SEE 3347
IMO UN Number: 1198
IMO UN Class: 3.3
IMO Subsidiary Risk Label: CORROSIVE
IATA PSN Code: MKR
IATA UN ID Number: 1198
IATA Proper Shipping Name: FORMALDEHYDE SOLUTION, FLAMMABLE
IATA UN Class: 3
IATA Subsidiary Risk Class: 8
IATA Label: FLAMMABLE LIQUID & CORROSIVE
AFI PSN Code: MKR
AFI Prop. Shipping Name: FORMALDEHYDE SOLUTIONS
AFI Class: 3
AFI ID Number: UN1198
AFI Pack Group: III
AFI Label: 8
AFI Basic Pac Ref: 7-7
Additional Trans Data: ALSO CONTAINS METHANOL(10-15%). DOT RQ (FORMALDEHYDE) :1,000 LBS/454KG.

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Disposal Data

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Label Data

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Label Required: YES
Technical Review Date: 20MAY94
MFR Label Number: UNKNOWN
Label Status: F
Common Name: FORMALDEHYDE, 37% SOLUTION
Chronic Hazard: YES
Signal Word: DANGER!
Acute Health Hazard-Severe: X
Contact Hazard-Severe: X
Fire Hazard-Slight: X
Reactivity Hazard-None: X
Special Hazard Precautions: POISON! DANGER! COMBUSTIBLE. MAY BE FATAL IF SWALLOWED OR INHALADE. LISTED AS A SUSPECT CARCINOGEN. CHRONIC-KIDNEY AND LIVER DAMAGE, SKIN SENSITIZATION. TARGET ORGANS:KIDNEY, KIVER, LUNGS, SKIN. STORAGE-STORE IN A DRY, WELL VENTILATED AREA ABOVE 15C. STORE WITH FLAMMABLE LIQUIDS. FIRST AID: INHALATION:REMOVE TO FRESH AIR, PROVIDE CPR/ OXYGEN IF NEEDED. EYE CONTACT:FLUSH WITH WATER FOR 15 MINUTES. GET MEDICAL HELP. SKIN CONTACT:WASH WITH SOAP AND WATER. GET MED ATTENTION IF SYMPTOMS PERSIST. INGESTION:INDUCE VOMITING, DRINK 1-2 GLASSES OF WATER. GET MEDICAL HELP IMMEDIATELY.
Protect Eye: Y
Protect Skin: Y
Protect Respiratory: Y
Label Name: J.T.BAKER CHEMICAL CO
Label Street: 222 RED SCHOOL LANE
Label City: PHILLIPSBURG
Label State: NJ
Label Zip Code: 08865
Label Country: US
Label Emergency Number: 201-859-2151/800-424-9300(CHEMTR)
Year Procured: 1992

Appendix AE. Material Safety Data Sheets for 10% Formalin

CORNELL PDC

Material Safety Data Sheets

Planning Design & Construction

DOD Hazardous Material Information
July, 1998
For Cornell University Convenience Only

FORMALIN,10% V/V SOLUTION,NEUTRALIZED

FSC: 6810
NIIN: 011563605
NSN: 68100115636057
MANUFACTURERS CAGE: 70829
PART NO INDICATOR: A
PART NUMBER TRADE NAME: FORMALIN,10% V/V SOLUTION,NEUTRALIZED

General Information

ITEM NAME:
MANUFACTURERS NAME: J.T. BAKER CHEMICAL CO.
MANUFACTURERS STREET: 222 RED SCHOOL LANE
MANUFACTURERS P O BOX: N/K
MANUFACTURERS CITY: PHILIPSBURG
MANUFACTURERS STATE: NJ
MANUFACTURERS COUNTRY: US
MANUFACTURERS ZIP CODE: 08865-2219
MANUFACTURERS EMERG PH: 201-859-2151
MANUFACTURERS INFO PH: 201-859-2151
DISTRIBUTOR VENDOR 1: J & H BERGE INC
DISTRIBUTOR VENDOR 1 CAGE: 25518
DISTRIBUTOR VENDOR 2:
DISTRIBUTOR VENDOR 2 CAGE:
DISTRIBUTOR VENDOR 3:
DISTRIBUTOR VENDOR 3 CAGE:
DISTRIBUTOR VENDOR 4:
DISTRIBUTOR VENDOR 4 CAGE:
SAFETY DATA ACTION CODE:
SAFETY FOCAL POINT: D
RECORD NO FOR SAFETY ENTRY: 001
TOT SAFETY ENTRIES THIS STK: 001
STATUS: SE

DATE MSDS PREPARED: 22MAY90
SAFETY DATA REVIEW DATE: 24JUN92
SUPPLY ITEM MANAGER: CX
MSDS PREPARERS NAME:
PREPARERS COMPANY:
PREPARERS ST OR P O BOX:
PREPARERS CITY:
PREPARERS STATE:
PREPARERS ZIP CODE:
OTHER MSDS NUMBER:
MSDS SERIAL NUMBER: BMZZK
SPECIFICATION NUMBER:
SPEC TYPE GRADE CLASS:
HAZARD CHARACTERISTIC CODE: F8
UNIT OF ISSUE: NK
UNIT OF ISSUE CONTAINER QTY: N/K
TYPE OF CONTAINER: N/K
NET UNIT WEIGHT: N/K
NRC STATE LICENSE NUMBER: N/R
NET EXPLOSIVE WEIGHT:
NET PROPELLANT WEIGHT AMMO: N/R
COAST GUARD AMMUNITION CODE:

Physical & Chemical Characteristics

APPEARANCE AND ODOR: CLEAR, COLORLESS LIQUID WITH PUNGENT ODOR.
BOILING POINT: N/K
MELTING POINT: N/K
VAPOR PRESSURE MM HG 70 F: N/K
VAPOR DENSITY AIR 1: N/K
SPECIFIC GRAVITY: 1.09
DECOMPOSITION TEMPERATURE: N/K
EVAPORATION RATE AND REF: N/K
SOLUBILITY IN WATER: COMPLETE
PERCENT VOLATILES BY VOLUME: 100
VISCOSITY:
PH: N/K
RADIOACTIVITY:
FORM RADIOACTIVE MATL:
MAGNETISM MILLIGAUSS: N/P
CORROSION RATE IPY: N/K
AUTOIGNITION TEMPERATURE: N/K

Fire and Explosion Hazard Data

FLASH POINT: 185F,85C
FLASH POINT METHOD: CC
LOWER EXPLOSIVE LIMIT: 7.0

UPPER EXPLOSIVE LIMIT: 73.0
EXTINGUISHING MEDIA: USE SUITABLE MEDIA FOR SURROUNDING FIRE.
SPECIAL FIRE FIGHTING PROC: WEAR FULL PROTECTIVE CLOTHING AND NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN THE POSITIVE PRESSURE MODE.
UNUSUAL FIRE AND EXPL HAZRDS: NONE IDENTIFIED.

Reactivity Data

STABILITY: YES
COND TO AVOID (STABILITY): HEAT, FLAME
MATERIALS TO AVOID: STRONG OXIDIZING AGENTS, STRONG REDUCING AGENTS, STRONG ACIDS, STRONG BASES, ALKALI METALS, AMINES, PHENOL AND AMMONIA
HAZARDOUS DECOMP PRODUCTS: FORMALDEHYDE, CARBON MONOXIDE AND CARBON DIOXIDE
HAZARDOUS POLY OCCUR: YES
CONDITIONS TO AVOID POLY: N/K

Health Hazard Data

LD50 LC50 MIXTURE: LD50 (ORAL, RAT) IS 800 MG/KG
ROUTE OF ENTRY INHALATION: YES
ROUTE OF ENTRY SKIN: YES
ROUTE OF ENTRY INGESTION: YES
HEALTH HAZ ACUTE AND CHRONIC: ACUTE-INHALE:HARMFUL & MAY BE FATAL.CAUSES HEADACHE,NAUSEA,VOMITING,DIZZINESS,DROWSINESS,IRRITATION & UNCONSCIOUSNESS. EYE/SKIN:SEVERE IRRITATION/BURNS.PROLONGED SKIN CONTACT MAY CAUSE SENSITIZATION.RAPID ABSORPTION.ORAL:GI IRRITATION,NAUSEA,VOMITING,BURNS TO MOUTH & THROAT.MAY BE FATAL.CHRONIC-KIDNEY & LIVER DAMAGE.
CARCINOGENICITY NTP: YES
CARCINOGENICITY IARC: YES
CARCINOGENICITY OSHA: YES
EXPLANATION CARCINOGENICITY: SUSPECTED CARCINOGEN.
SIGNS SYMPTOMS OF OVEREXP: INHALATION IS HARMFUL & MAY BE FATAL. CAUSES HEADACHE, NAUSEA, VOMITING, DIZZINESS, DROWSINESS, IRRITATION & UNCONSCIOUSNESS. SEVERE EYE AND SKIN IRRITATION OR BURNS. PROLONGED SKIN CONTACT MAY CAUSE SENSITIZATION. CAN BE ABSORBED RAPIDLY THROUGH SKIN. ORALLY CAUSES GI IRRITATION, NAUSEA, VOMITING & MOUTH & THROAT BURN
MED COND AGGRAVATED BY EXP: NONE IDENTIFIED.
EMERGENCY FIRST AID PROC: GET MEDICAL ATTENTION IF SYMPTOMS PERSIST. EYE/SKIN:FLUSH WITH WATER FOR 15 MINUTES.HOLD EYELIDS OPEN.INHALED:REMOVE TO FRESH AIR & PROVIDE OXYGEN/CPR IF NEEDED.ORAL:IF CONSCIOUS,DRINK LARGE AMOUNT OF WATER.INDUCE VOMITING.GET MEDICAL ATTENTION.

Precautions for Safe Handling and Use

STEPS IF MATL RELEASED SPILL: WEAR SELF-CONTAINED BREATHING APPARATUS & FULL PROTECTIVE CLOTHING. STOP LEAK IF POSSIBLE. USE WATER SPRAY TO REDUCE VAPORS. TAKE UP WITH SAND OR OTHER NON-COMBUSTIBLE ABSORBENT MATERIALS & PLACE INTO CONTAINER. FLUSH SPILL AREA WITH WATER.
NEUTRALIZING AGENT: N/R
WASTE DISPOSAL METHOD: DISPOSE OF COLLECTED MATERIAL IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. REPORTABLE QUANTITY (RQ) IS 1000 LBS.
PRECAUTIONS HANDLING STORING: STORAGE-STORE IN TIGHTLY CLOSED CONTAINER IN SECURE POISON AREA AWAY FROM INCOMPATIBLE MATERIALS.
OTHER PRECAUTIONS: KEEP THIS AND ALL CHEMICALS OUT OF REACH OF CHILDREN. THIS PRODUCT FOR INDUSTRIAL USE ONLY. DO NOT USE IN CLOSED SPACE. AVOID BREATHING VAPORS OR MISTS. DO NOT GET IN EYES, ON SKIN OR ON CLOTHING. WASH THOROUGHLY AFTER HANDLING.

Control Measures

RESPIRATORY PROTECTION: AT CONCENTRATIONS UP TO 50 PPM, WEAR A NIOSH-APPROVED CHEMICAL CARTRIDGE RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE. ABOVE THIS LEVEL, A NIOSH-APPROVED SELF CONTAINED BREATHING APPARATUS IS RECOMMENDED.
VENTILATION: LOCAL EXHAUST/GENERAL TO MAINTAIN TLV/PEL BELOW THE LIMITS.
PROTECTIVE GLOVES: NEOPRENE.
EYE PROTECTION: SAFETY GOGGLES AND FACE SHIELD.
OTHER PROTECTIVE EQUIPMENT: PROPER PROTECTION FOR SKIN AND EYES;EYE-WASH, UNIFORM.
WORK HYGIENIC PRACTICES: OBSERVE GOOD PERSONAL HYGIENE PRACTICES AND RECOMMENDED PROCEDURES. DO NOT WEAR CONTAMINATED CLOTHING OR FOOTWEAR.
SUPPL SAFETY HEALTH DATA: THE NSN 6810-01-156-3605 IS CANCELLED WITHOUT REPLACEMENT. EFFECTIVE DATE IS 92032.

Transportation Data

TRANSPORTATION ACTION CODE:
TRANSPORTATION FOCAL POINT: D
TRANS DATA REVIEW DATE: 92176
DOT PSN CODE: GNF
DOT SYMBOL:
DOT PROPER SHIPPING NAME: FORMALDEHYDE, SOLUTIONS
DOT CLASS: 8
DOT ID NUMBER: UN2209
DOT PACK GROUP: III
DOT LABEL: CORROSIVE
DOT DOD EXEMPTION NUMBER:
IMO PSN CODE: HLZ
IMO PROPER SHIPPING NAME: FORMALDEHYDE SOLUTION,
IMO REG PAGE NUMBER: 8176-1
IMO UN NUMBER: 2209

IMO UN CLASS: 8
IMO SUBSID RISK LABEL: -
IATA PSN CODE: MKH
IATA UN ID NUMBER: 2209
IATA PROPER SHIP NAME: FORMALDEHYDE SOLUTION
IATA UN CLASS: 8
IATA SUBSID RISK CLASS:
IATA LABEL: CORROSIVE
AFI PSN CODE: MKH
AFI SYMBOLS:
AFI PROP SHIPPING NAME: FORMALDEHYDE, SOLUTIONS
AFI CLASS: 8
AFI ID NUMBER: UN2209
AFI PACK GROUP: III
AFI LABEL:
AFI SPECIAL PROV:
AFI BASIC PAC REF: 12-5
MMAC CODE:
N O S SHIPPING NAME:
ADDITIONAL TRANS DATA: FORMALDEHYDE WITH A FLASH POINT ABOVE 141 F IN CONTAINERS EXCEEDING 110 GALLONS ARE CLASSIFIED AS A COMBUSTIBLE WITH UN2209. SEE 49 CFR 172.101.

Disposal Data

DISPOSAL DATA ACTION CODE:
DISPOSAL DATA FOCAL POINT:
DISPOSAL DATA REVIEW DATE:
RECNUM FOR THIS DISP ENTR:
TOT DISP ENTRIES PER NSN:
LANDFILL BAN ITEM:
DISPOSAL SUPPLEMENTAL DAT:
EPAHAZWST 1ST CODE NEW:
EPAHAZWST 1ST NAME NEW:
EPAHAZWST 1ST CHAR NEW:
EPAACUTEHAZARD 1ST NEW:
EPAHAZWST 2ND CODE NEW:
EPAHAZWST 2ND NAME NEW:
EPAHAZWST 2ND CHAR NEW:
EPAACUTEHAZARD 2ND NEW:
EPAHAZWST 3RD CODE NEW:
EPAHAZWST 3RD NAME NEW:
EPAHAZWST 3RD CHAR NEW:
EPAACUTE 3RD HAZARD NEW:

Label Data

LABEL REQUIRED: YES

TECHNICAL REVIEW DATE: 24JUN92
LABEL DATE:
MFR NUMBER: UNKNOWN
LABEL STATUS: F
COMMON NAME: FORMALIN,10% V/V SOLUTION,NEUTRALIZED
CHRONIC HAZARD: N/P
SIGNAL WORD: DANGER!
ACUTE HEALTH HAZARD NONE:
ACUTE HEALTH HAZARD SLIGHT:
ACUTE HEALTH HAZARD MODERATE:
ACUTE HEALTH HAZARD SEVERE: X
CONTACT HAZARD NONE:
CONTACT HAZARD SLIGHT:
CONTACT HAZARD MODERATE:
CONTACT HAZARD SEVERE: X
FIRE HAZARD NONE:
FIRE HAZARD SLIGHT:
FIRE HAZARD MODERATE: X
FIRE HAZARD SEVERE:
REACTIVITY HAZARD NONE: X
REACTIVITY HAZARD SLIGHT:
REACTIVITY HAZARD MODERATE:
REACTIVITY HAZARD SEVERE:
SPECIAL HAZARD PRECAUTIONS: ACUTE-INHALE:HARMFUL & MAY BE FATAL.CAUSES HEADACHE,NAUSEA,VOMITING,DIZZINESS,DROWSINESS,IRRITATION & UNCONSCIOUSNESS. EYE/SKIN:SEVERE IRRITATION/BURNS.PROLONGED SKIN CONTACT MAY CAUSE SENSITIZATION.RAPID ABSORPTION.ORAL:GI IRRITATION,NAUSEA,VOMITING,BURNS TO MOUTH & THROAT.MAY BE FATAL.CHRONIC-KIDNEY & LIVER DAMAGE.STORAGE-STORE IN TIGHTLY CLOSED CONTAINER IN SECURE POISON AREA AWAY FROM INCOMPATIBLES. FIRST AID-GET MEDICAL ATTENTION IF SYMPTOMS PERSIST.EYE/SKIN:FLUSH WITH WATER FOR 15 MINUTES.HOLD EYELIDS OPEN.INHALED:REMOVE TO FRESH AIR & PROVIDE OXYGEN/CPR IF NEEDED.ORAL:IF CONSCIOUS,DRINK LARGE AMOUNT OF WATER. INDUCE VOMITING.CALL DOCTO
PROTECT EYE: Y
PROTECT SKIN: Y
PROTECT RESPIRATORY: Y
LABEL NAME: J.T. BAKER CHEMICAL CO.
LABEL STREET: 222 RED SCHOOL LANE
LABEL P O BOX: N/K
LABEL CITY: PHILIPSBURG
LABEL STATE: NJ
LABEL ZIP CODE: 08865-2219
LABEL COUNTRY: US
LABEL EMERGENCY NUMBER: 201-859-2151
YEAR PROCURED:

Appendix AF. NMFS Certified Contractors for the North Pacific Groundfish Observer Program

Alaskan Observers, Inc. (AOI)
130 Nickerson, Suite 206
Seattle, WA 98109
Phone: (206) 283-7310
Fax: (206) 283-6519

Data Contractors, Inc. (DCI)
4606 Garfield Street
Anchorage, AK 99503-6973
Phone: (907) 561-2210
Fax: (907) 563-7817

Frank Orth & Associates (FOA)
10900 N.E. 4th St., Suite 930
Bellevue, WA 98004
Phone: (425) 455-9693
Fax: (425) 646-9582

NWO, Inc.
100 2nd Ave., Suite 190
Edmonds, WA 98020
Phone: (425) 673-6445
Fax: (425) 673-5995

Saltwater, Inc. (SWI)
540 L Street, Suite 202
Anchorage, AK 99501
Phone: (907) 276-3241
Fax: (907) 258-5999

TechSea International
2360 W. Commodore Way
Seattle, WA 98199
Phone: (206) 285-1408
Fax: (206) 285-1535

GLOSSARY

A - B

ABC - “Acceptable Biological Catch” - the annual harvest level for each species based only on biological considerations

Aft - towards the stern or back end of a vessel

Amidships - midway between the bow and stern of a ship, or on the centerline

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

Athwart ships - side-to-side across a ship, perpendicular to the centerline

Autobaiters - A piece of machinery that cuts bait into strips and places the strips on the hooks as the groundline is being set.

Bag - the codend or another name for a buoy.

Bait bags/jars - Containers filled with ground bait that are hung inside pots to attract fish.

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

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.

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.

Bleeder/Sorter - Crewman assigned to sort bycatch out of the catch, and to cut the “throat”of the cod.

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

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

Bowline - a type of knot used to form an eye in the end of a rope

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

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- 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.

C

Capstan (gypsy) - an upright, spool-shaped, power rotational cylinder around which cables or hawsers are wound

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 products

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

Chopper - Machine used to grind frozen herring or squid for bait or the person assigned this duty.

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 the snout of fishes for later identification

Codend - the end "bag" of a trawl net where the majority of the fish are collected and held

Coiler - Person or machine that is designated to coil line as it is retrieved by the block.

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

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 - being in accordance with the fishing regulations

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

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. Used on non-pelagic trawl gear.

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

D - E

Demersal - dwelling at or near the bottom

Directed fishing - targeting or fishing for a species quota

Disembark - to get off a vessel

Diver/Trailer buoys - A small buoy attached to the main buoy with a length of line. The diver buoy “trails” behind the main buoy and allows a larger target for grappling.

Dogs - Metal hooks that are hydraulically controlled to secure a pot to a launcher.

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

Drop-off - Those organisms that fall or are knocked off of a hook prior to their being landed.

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” - the term for the 200 mile jurisdiction zone, in which a nation has exclusive fishing rights, 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

F

Fathom - a measure of length or depth equal to six feet

Fingers/Triggers - Small plastic strips located in the tunnel of a pot which allow fish to enter a pot but not exit.

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

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

Flatfish - fish which are laterally compressed and 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 - on a non-pelagic net, 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" - a designation given to bycatch species whose quota has been taken while other directed fisheries are permitted to continue. Fully Utilized Species must be discarded from the catch like prohibited species.

G

Galley - ship's kitchen and/or mess hall

Gallows - structure from which trawl blocks are hung; separate units port and starboard

Gangion - The length of line that connects the hook to the groundline. It is often only two to three feet long.

Gantry - a frame structure, usually at the aft of a vessel, which supports pulleys (blocks) used in setting and retrieving trawl nets

Gas bladder - a sac filled with air or similar gases in the body cavity of a fish. May or may not be attached to the throat by a duct.

G-hook - a piece of cut or cast iron hardware in the shape of a "G", used with a flatlink where wires must be connected and disconnected frequently

Gill rakers - bony 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

Groundline/Mainline - The length of line to which all of the hooks are attached. This line is the "backbone" of the gear

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

Halibut excluder - A divider located in the tunnel of a pot that restricts the size of the opening.

Hatch - an opening in a deck or bulkhead of a ship

Haul - a catch of fish from one tow of a net or longline

Haulback - when the vessel lifts the net out of the fishing depth

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

Hook - Usually a three pronged grappling hook used to snag the trailer buoy line.

Hook Counts - The average number of hooks per segment of gear.

Horn Off - To knock organisms off of a hook using the butt of a gaff.

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

Launcher - Hydraulic lift, usually located on the port side of a vessel, used to “launch” pots over the side of the vessel and to adjust the angle of the pot when it is being emptied.

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

Live Tanks - tanks or bins on factory trawler vessels where the catch is dumped prior to sorting or processing

Lobby - another name for a fish bin on a catcher/processor

Magazine - (Mag) A term used to describe a segment of gear within a set containing up to as many as ten thousand hooks. The length of this segment of gear is dictated by the length of the magazine rack on which the hooks and groundline are hung.

Magazine rack - (Mag rack or Rails) A piece of equipment onto 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.

Main Wires - the two large cables used to connect the trawl net to the vessel while fishing

Master - fishing master and/or captain

Mothership - a processing vessel at-sea (under way) whose fish come from catcher boat's deliveries

Motion Compensated Flow Scale - a scale built into a conveyor belt; the scale maintains a running tally of weight moving across the belt, in addition to comparing it to a constant weight in order to compensate for vessel movement

Motion Compensated Platform Scale - an electronic flatbed scale with a constant weight load cell which allows for compensation of the vessel's movement

MSY - "Maximum Sustainable Yield" - 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.

Mustang suit - Insulated and waterproof coveralls worn in the cold months while sampling on deck.

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

Otterboard - another name for a trawl door

OY - "Optimum Yield" - a range within which summed Total Allowable Catches must fall

P

Panel - Mesh netting attached to a square metal frame. Two large panels and four smaller panels are attached to a heavy steel frame box to form the six sides of a pot.

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 - a sharp-ended pole which is used to skewer fish and toss them to another location

Pick/"Running the hook" - Hook connected to the end of the boom which is attached to the bridle and is used to lift a pot onto the launcher as the pot is being retrieved.

Plotter - Electronic mapping device that displays the local area and the vessel's position on it. The plotter allows skippers to record the area of a string and also the number of pots in a string on a digital map display.

Pod - a school of marine mammals; such as seals, whales or dolphins

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.

Porthole - a window in the hull or the outside bulkhead of a ship

Pot Tie - A short piece of line used to tie pots together when they are stacked on deck.

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 an Observer is collecting a sample

Prohibited species or prohibited species groups - 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.

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” - a harvest limit usually placed on halibut, salmon, 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.

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.

Regenerated scale - a fish scale which has grown in to replace one that was lost. Regenerated scales are useless for aging a salmon, but can be used to identify it to species.

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

Roller - A device made up of one or more metal pins that spin allowing the groundline to be pulled up and over the rail of a vessel during retrieval such that tension and friction on the line is reduced.

Roller station/pit - Term used to describe the area where fishermen stand while retrieving the line and gaffing fish coming in over the roller.

Rollerman - A crewman who stands in the roller station and monitors the retrieval of the gear. The rollerman lands any commercially valuable fish and excludes any non-commercially valuable fish from being landed.

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 and whole 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

RSW Tanks - holding tanks or bins that use refrigerated sea water to keep fish fresh until delivery

“Run pots” - A phrase used interchangeably with “retrieve pots”. It is the phrase used in the vessel logbook to indicate the number of pots that have been retrieved from a string.

S

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.

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.

Scupper - a hole in the bulwarks which allows water to drain from the deck

Segment of Gear - In this manual a segment of gear refers to the standard unit the vessel uses for measuring gear. This could refer to a mag, skate, tub, or coil of gear.

Set - The entire length of groundline from the first hook to the last hook, also referred to as a “string” of gear.

Sheave - a wheel with a grooved rim, such as is mounted in a pulley block to guide the rope or cable

Shot - A pre-measured length of buoy line, usually 10 to 20 fathoms long. Normally there are two set lengths, a “Long” shot and a “Short” shot. When setting a string, the skipper will tell the crew how many shots to tie to a pot for various bottom depths.

Skate - a length of longline gear, usually 100 fathoms or 600 feet long

Skate bottom - a fabric square with lines on the corners to tie it into a bundle once a longline "skate" has been coiled onto it

Skate or Mag markers - Markers in the groundline that separate the sections of gear. These may be flourescent tape woven onto the line, knots, line splices, carabineers, or magazine (mag) clips.

Skates/Tubs/Coils - Terms used to describe the smaller segments of gear within a set or a magazine.

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.

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

Stack - This term is used on pot vessels to refer to pots stacked on the back deck.

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.

String - Pots deployed individually and are not attached to one another in any way. This term refers to pots set at a similar time in a similar area and depth. What a skipper calls a string varies considerably between vessels. Strings are analogous to sets.

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

Table - Some vessels have a sorting table on the back deck that pivots on one axis. The contents of a pot are dumped onto the table, and the table is swung out of the way to re-launch the pot.

TAC - “Total Allowable Catch” - 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 - 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 Alaska Region 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.

Trawl - a cone shaped net, towed through the water to catch fish

Trawl Alley - the central passage on a trawl vessel where the codend is placed after haulback

Trawl Doors - often referred to as "doors," these are two metal plates, each attached to a main wire, designed to keep the mouth of the net open while fishing

Trip - the time period from when the vessel leaves harbor until it returns to harbor to offload product or catch

Tuning/Overhauling gear - Term used to describe the work involved in straightening hooks, replacing gangions, or splicing the damaged groundlines.

Tunnel - Short mesh-lined openings on two or three sides of a pot. These are the entrances to the trap. Fish and crab are able to swim in but are unable to make their way back out due to the fingers/triggers.

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

Winch - a hydraulic machine with one or more drums on which to coil rope, chain, or cable for hauling or hoisting

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 and dry. Fish blood and slime are more easily washed out from these than from shirt sleeves.

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