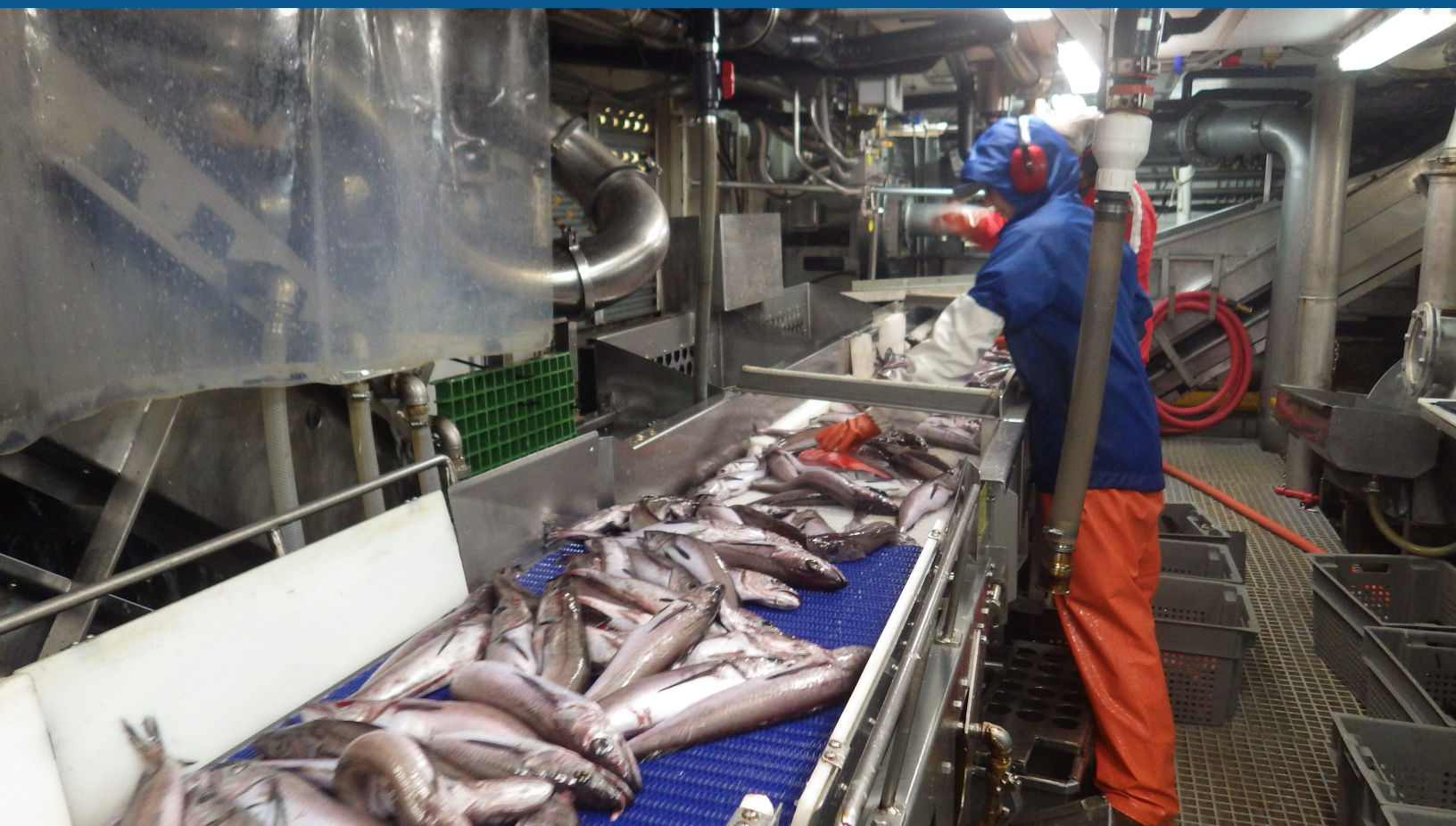




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At-Sea Hake Observer Program 2019 Sampling Manual

Paperwork Reduction Act Statement for the At-Sea Hake Observer Program

Information collected through the observer program is used to: (1) monitor catch and bycatch; (2) understand the population status and trends of fish stocks and protected species, as well as the interactions between them; (3) determine the quantity and distribution of net benefits derived from living marine resources; (4) predict the biological, ecological, and economic impacts of existing management actions and proposed management options; and (5) ensure that the observer programs can safely and efficiently collect the information required for the previous four uses. In particular, these biological and economic data collection programs contribute to legally mandated analyses required under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA), the National Environmental Policy Act (NEPA), the Regulatory Flexibility Act (RFA), Executive Order 12866 (EO 12866), and other applicable law. Most of the information collected by observers is obtained through "direct observation by an employee or agent of the sponsoring agency or through non-standardized oral communication in connection with such direct observations". Under the Paperwork Reduction Act (PRA) regulations at 5 C.F.R. 1320.3(h)(3), facts or opinions obtained through such observations and communications are not considered to be "information" subject to the PRA. The public reporting burden for responding to the questions that observers ask and that are subject to the PRA is estimated to average 20 minutes per trip, including the time for hearing and understanding the questions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to: At-sea Hake Observer Program, 2725 Montlake Blvd. East, Seattle, WA 98112. Providing information related to observer and vessel safety is mandatory under regulations at 50 C.F.R. 600.746. However, all other requested information is voluntary. Although you are under no legal obligation to answer non-safety related observer questions, we would appreciate your support as it ensures observer data can be used for its intended purpose. The information collected will be kept confidential as required under Section 402(b) of the MSA (18 U.S.C. 1881a(b)) and regulations at 50 C.F.R. Part 600, Subpart E. Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB Control Number. OMB Control No. 0648-0593

Cite this document as follows:

(NWFSC) Northwest Fisheries Science Center, At-Sea Hake Observer Program, 2019 Sampling Manual. Fishery Resource Analysis and Monitoring, At-Sea Hake Observer Program. NWFSC, 2725 Montlake Blvd. East, Seattle, Washington 98112.

Reference in this document to trade names does not imply endorsement by NOAA Fisheries.

FUN FACT: While intensive seabird monitoring was taking place in the fall of 2018, two juvenile short-tailed albatross were spotted following a hake vessel. Keep a sharp eye out – you might see one!

Sighting credit: Amanda Gladics

Table of Contents

OVERVIEW	4
Safety	4
Observer Regulations and Coverage	5
Hake Fishery Background and Information	5
Bycatch Limits and Coordinating with Vessel Crew	6
Vessel Regulations	8
Identification Verification and Signing Documents	10
SAMPLING AND BIOLOGICAL DATA	11
Observer Priorities	11
Priorities and Time Management	11
Observer Catch Reporting	12
Marine Mammals, Seabirds, and Sea Turtles	12
Observer Catch Estimates	14
Scale Testing	14
Ensuring Accurate Weights	15
Presorted Organisms	16
Length-to-Weight Tables for Large Organisms	16
Set Up a Random Sample Design	17
Species Composition Sampling	18
Sampling Options	19
Average Weight Samples	20
Subsampling For Two Predominant Species	21
Percent Retained and Estimated Discard Weight	23
Mothership Catcher Vessel Discard Accounting	25
Prohibited Species	26
Protected Fish Species Sampling	27
Salmon	27
Salmon Biospecimen Sampling	28
Coded-Wire Tag Sampling	28
Chinook and Coho Genetic Sampling	30
Using the Salmon Sampling Deck Form	32
Species ID Forms	32
Biospecimen Sampling	33
Biospecimen Sampling Protocols	34
Genetics	35
Spiny Dogfish Protocols	36
Fish Collection	37
Entering Specimen Data in ATLAS	37
Data Quality Control	38
Communication	39
Mid-Cruise	39
Debriefing and Specimen Turn-in	39
Gear Check-Out and Care	40
Gear Check-in Protocol	40
APPENDICES	41
Index	57



This manual is a supplement to the North Pacific Observer Program Manual, which is more detailed, particularly about safety. Please review Chapter 19 in the NPOP manual for an in-depth safety review.



Safety

Safety must be every observer's top priority. When you board your vessel, both observers need to physically locate each piece of equipment on the vessel safety checklist, fill out the checklist, and sign the form. Any observer who fails to complete the vessel safety checklist will receive an automatic zero as an evaluation score, because they failed to recognize safety as their number one priority. Out at sea, you must take responsibility for your own safety and do everything within your power to be aware of and avoid known dangerous situations.

Specific safety goals:

1. Create an emergency plan with your partner
2. Understand the vessel's evacuation plan – where will rafts be launched/boarded, how will crew immersion suits be distributed, how will information be communicated, etc.
3. Learn location of hydraulic shut-off(s) in observer sampling area; confirm that the sorter you work with knows hydraulic shut-off locations
4. Be aware of diverter board and conveyor belt pinch points
5. Use hearing protection in the factory
6. Be extra vigilant during at-sea transfers. Complete the "Transport Vessel Safety Profile" in your logbook for all at-sea transfers and skiff rides

Observer Regulations and Coverage

Regulations requiring 100% observer coverage for catcher-processors (C/Ps) and motherships went into effect in 2004, though observers have been deployed in the hake fishery since the late 1970s. Prior to 2001, observers on hake vessels were deployed by the North Pacific Observer Program. The At-Sea Hake Observer Program (A-SHOP) was created in 2001, at the same time as the West Coast Groundfish Observer Program, to manage observers deployed on the West Coast. Currently, the mothership and catcher processor sectors both operate under cooperative agreements (co-ops) which are part of the West Coast catch shares program, which increases vessel accountability.

Keep all observer information confidential. Observers may not post observer information on the internet, including but not limited to social networking sites and file sharing sites. Observer information is defined as: any information collected, observed, retrieved, or created by an observer, including fish harvest or processing observations, fish sampling or weighing data, vessel logbook data, vessel or processor specific information (including any safety, location, or operating condition observations), and video, audio, photographic, or written documents. While the A-SHOP has not moved in the direction of prohibiting the use of personal cameras, *photographs and videos taken while deployed as an A-SHOP observer may not be posted on the internet!*

Hake Fishery Background and Information

While the vessels and sampling situations will be familiar to most North Pacific observers, the regulations, management, and species encountered in the hake fishery are different from those in Alaska.

The at-sea Pacific hake (*Merluccius productus*) fishery dates back to 1966 when foreign vessels participated. The fishery evolved into a joint venture with U.S. catcher vessels delivering to foreign processing vessels in the 1980s. By 1991, the hake fishery was completely domesticated, allowing only U.S. vessels to catch and process fish.

The at-sea hake fishery consists of three sectors:

1. Motherships
2. Catcher/Processors
3. Tribal

The Total Allowable Catch (TAC) for hake is allocated to each sector as a percentage of the annual total. A portion of the U.S. TAC is allocated to the tribal sector and the remaining TAC is divided between the

C/P sector (34%), the MS sector (24%), and the shoreside sector (42%). Check out the “Whiting Report” at <http://pacfin.psmfc.org> for in-season sector data.

The hake tribal fishery is exclusive to the Makah, Quileute, Hoh, and Quinault tribes from the Washington coast. To date, only the Makah tribe has participated in the fishery. All hake fishing for the tribes takes place in each tribe’s Usual and Accustomed Areas (UAA) by tribal catcher vessels. Figure 1 shows the boundaries for the four tribe’s UAAs. The Makah area extends north of the area illustrated here, but is shown within the bounds of both the fishery management area and the U.S. exclusive economic zone (EEZ).

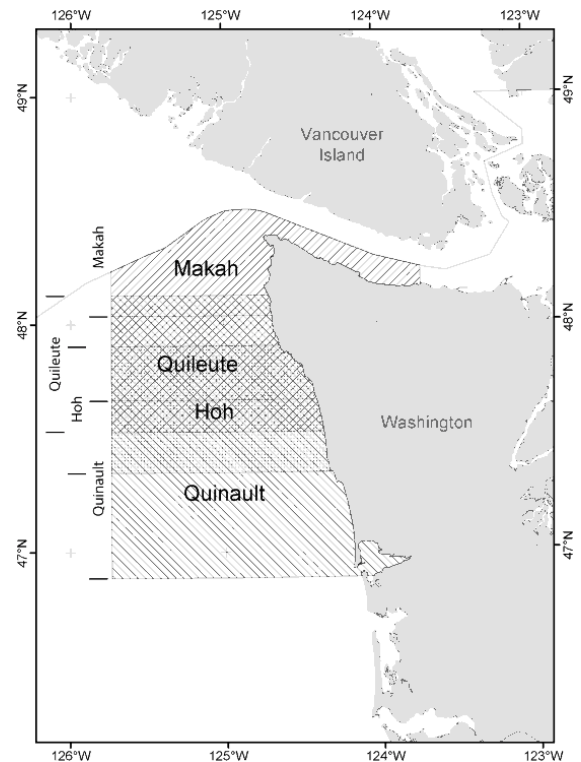


Figure 1. Tribal Usual & Accustomed Areas

In the tribal fishery, observers sample all hauls as usual. Enter a tribe-specific code in the “CDQ/Tribal code” column on the Vessel Haul Form (VHF), for each tribal haul. This does not mean it is a CDQ fishery, but simply designates the delivery as a tribal haul. M01 (M zero one) is the Makah tribal code. In the tribal fishery, there are no observers or electronic monitoring (EM) on the tribal catcher vessels delivering to the motherships, as there is in the mothership sector.

Bycatch Limits and Coordinating with Vessel Crew

Recently, the status of several species of rockfish has changed from overfished to rebuilt, which is welcome news for West Coast fisheries. This status change has helped relieve some of the pressure the hake fishery has felt for bycatch of POP, canary, darkblotched and widow rockfishes. However, given the historic high hake quotas of recent years, there are still challenges to utilize the full hake quota while staying within the set-aside amounts allowed for bycatch of particular species.

The term “**species of concern**” refers to any bycatch species that is potentially limiting to the fishery. This includes Chinook salmon and any species with potentially low set-asides (i.e. catch limits). Which species are considered “species of concern” can and does change, particularly as the season progresses.

The species listed above, as well as sablefish and at times, dogfish, could all potentially limit the fishery. Communicate with the captain about current species of concern.

In 2004, the at-sea hake fishery came close to catching the entire canary rockfish allocation in one haul. As a result, the vessels continue to be interested in working with the observers to maximize sample size when a species of concern is present in the haul.

Since 2006, several strategies have proven very effective and are outlined below. Please contact the Observer Program with any questions.

1. **Pre-cruise bycatch discussion:** When you board your vessel, it is a good idea to discuss sampling options and strategies with the captain and factory supervisor(s) before fishing begins. Refer to the '*Pre-Cruise Bycatch Discussion Outline*' in the appendix for topics to cover.
2. **Notification of species of concern:** If you are watching the codend dump and notice large amounts of species of concern, make sure the vessel is aware of the situation. This is a good time to indicate to the factory foreman, etc. that you may need help sampling.
3. **Help for the observer:** All vessels have demonstrated that they are willing to help the observers during hauls with high bycatch of species of concern. They may do this by designating **someone from the crew to assist the observer**. What this really means is there will be another pair of hands to help sort, lift, and carry. Full supervision is required at all times. You cannot leave this person unattended at the belt to sort while you measure lengths or weigh bycatch. This assistance is only available during hauls with high bycatch of species of concern, when you would otherwise be forced to collect smaller samples.

NOTE: In order to get assistance from the vessel, you must *ask for help*.

4. **Adjust the flow of fish:** To maintain a large sample size, try adjusting the flow of fish. This might mean slowing the belts down so you are able to collect every piece of bycatch, or speeding them up to thin out the layer of fish for easier sighting of bycatch. Ideally, this would allow you to obtain larger samples than would be possible without another person assisting. As the observer, you need to keep in mind that collecting the largest sample possible is a high priority, but you can only achieve that if every piece of bycatch can be collected. Ultimately, sample size is dictated by your ability to collect all bycatch in the sample. If you are unable to obtain a large sample for a haul with species of concern, you will need to explain to the captain and/or factory

manager what it was that prevented a larger sample from being collected and, if possible, work with them to prevent it from happening again.

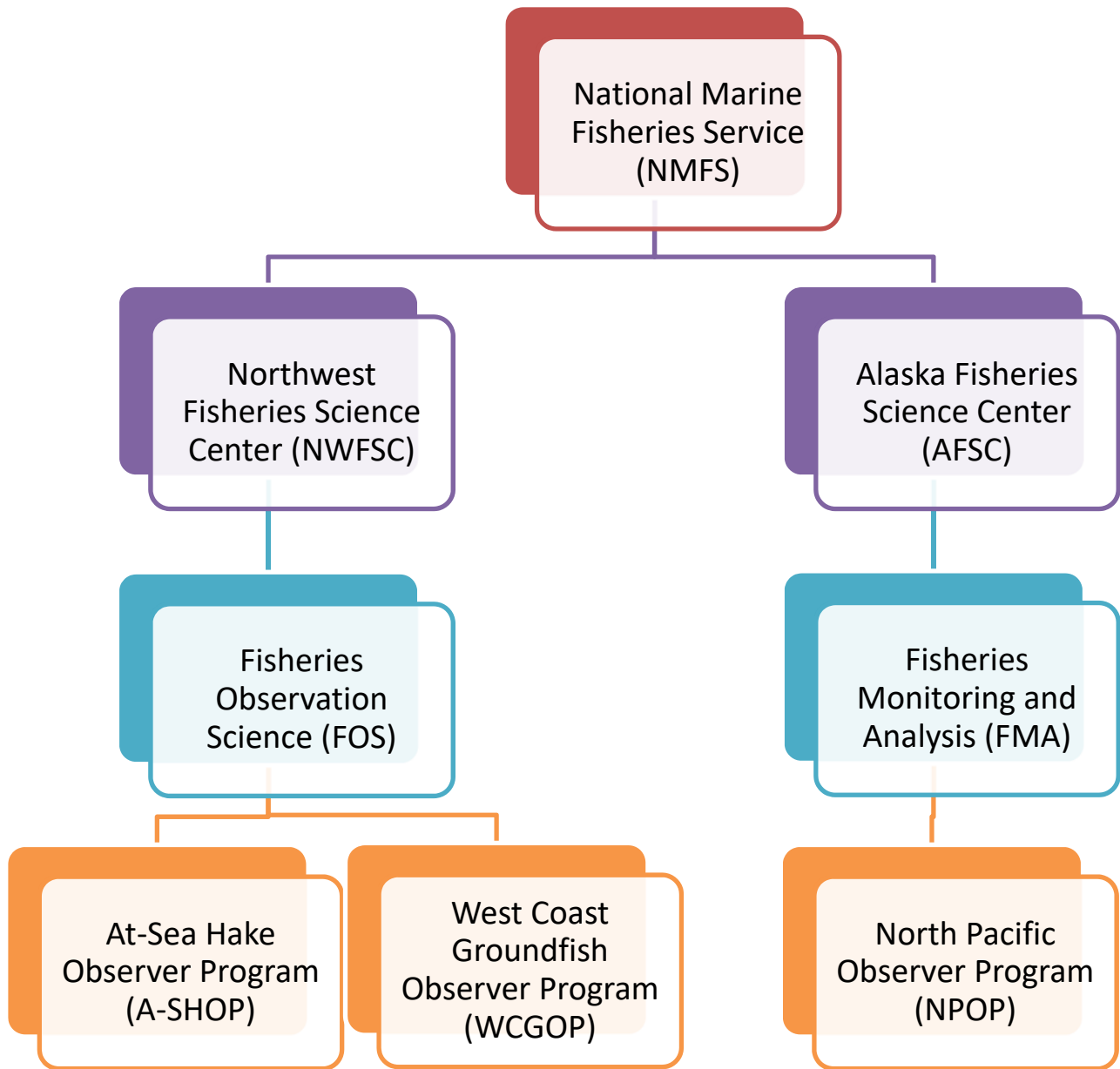


Figure 2. NOAA Fisheries Organization Chart

This chart shows the basic structure of the observer programs based in Seattle. The Northwest Fisheries Science Center (NWFSC) is located at 2725 Montlake Blvd. E (at the south end of the Montlake bridge, near the southern part of the UW campus). The Alaska Fisheries Science Center is located in Building 4, at the Sand Point NOAA facility.

Vessel Regulations

NMFS's West Coast Region does not currently issue vessel logbooks in the hake fishery. Instead, the captain will record haul information in a generic logbook, or an electronic logbook (ELB), from which you will get the VHF data. Please make photocopies or printouts of the vessel's haul information to turn in for debriefing. Double check for transcription errors between the vessel's haul information, the VHF, and ATLAS.

Ask the captain for the vessel's sample station certification letter and make a copy of it. **Verify sample station dimensions and record this in your observer logbook.** Measure and document actual sample station features to ensure compliance and document any corrections that need to be made.

Updated MARPOL regulations went into effect in 2013.

The discharge of all garbage, most importantly all forms of plastic, is prohibited into the navigable waters of the United States and into all other waters except as specifically allowed below. A person who violates these requirements is liable for civil and/or criminal penalties.		
Within 3 nautical miles of land	3 to 12 nautical miles from land	12 or more nautical miles from land
Discharge of all garbage is prohibited.	<u>Permitted</u> Ground food waste that is able to pass through a screen with openings no larger than 1 inch.	<u>Permitted</u> Food waste. Wash water. Cargo residues and cleaning agents may be discharged en route if not harmful to the marine environment.

*Observers record what they see, but interpreting regulations for the vessel is **not** part of observer duties.*

West Coast fishing regulations to note:

No processing zone: No at-sea processing is permitted south of 42.00 N (the California-Oregon border). Mothership catcher vessels may fish south of 42.00 N, but must return north to deliver the fish.

Retention: The vessel is entirely responsible for knowing which species they may or may not retain. If someone on the vessel asks you if they are allowed to retain something (e.g., a tasty-looking rockfish) do *not* try to interpret any rules; instead, direct them to the factory manager or captain. As an observer, you are not responsible for interpreting any regulations.

Mothership catcher vessels: Most catcher vessels are using camera systems, or electronic monitoring (EM) now, while a couple still carry observers. The observers and EM systems estimate any at-sea discards before the point of delivery and record any protected species interactions. Specific instructions for catcher vessel discard accounting are in the “Mothership Catcher Vessel Discard Accounting” section.

Identification Verification and Signing Documents

The U.S. Coast Guard is required to obtain information on all vessels that could transport foreign nationals into the country. Prior to entering a port, each vessel must submit the full name, date of birth, nationality, identification information, and position or duty on the vessel, as applicable, of each crew and passenger. The Real ID compliant identification you use to get your observer badge (Driver’s License, Enhanced Driver’s License (WA, MN, and NY) or U.S. passport) fulfills this requirement.

It is critical that you **do not sign any document related to your data collection or duties.**

You should sign the flow scale test record form to indicate you witnessed it, if your vessel is not using an ELB. You may also be asked to sign documents or forms *not* related to your data collection or duties, which may include safety or compliance issues, or video release forms. Contact your employer and the Observer Program for advice on how to proceed if this happens. Additionally, written statements should be prepared only for NMFS staff. If vessel personnel want more information, please have them contact the Observer Program.



Observer Priorities

1. Personal safety
2. Marine mammal, seabird, and sea turtle samples
3. Haul information and catch estimates
4. Species composition samples
5. Species ID forms + photos
6. Seabird cable strike project (*C/Ps only*)
7. Protected species samples (salmon & sturgeon)
8. Biospecimen samples
9. Monitor gear retrieval for marine mammals and seabirds
10. Special projects, as assigned
11. Fish collection and other tasks

Priorities and Time Management

Complete your observer duties in order of priority. There may be hauls where you are not able to complete every task due to time constraints. Refer to the priority list to complete tasks as time allows. Keep in mind that the first couple of days in a new fishery can be overwhelming. Once you become familiar with the vessel's operations and complete most of your species ID forms, you will have a better idea of how to manage your time. Your in-season advisor is a helpful resource for any questions or concerns about priorities and/or time management.

Observer Catch Reporting

Transmit your data via ATLAS at least once every day. If you are deployed on a mothership, please transmit data twice a day. Enter and transmit non-fishing day positions on days when no fish are retrieved or delivered. This includes every day from the first day you board the vessel until the day you disembark. Ask your in-season advisor any questions you have while deployed and inform them of significant events (e.g. hauls with large amounts of species of concern, non-fishing days due to the vessel needing repair, mola sightings, etc.).

Observer catch estimates and species composition data are used by both NMFS and the vessel to track the hake and bycatch quotas. Wait until you have the final flow scale weights before transmitting data. It is critical to ensure no data entry errors have been made by double-checking your work, and your partner's work.

Enter "HAK" in the purpose code field in ATLAS Haul Data to indicate the hake fishery. Observers on motherships need to record the ADFG number of the catcher boats that are making deliveries (see *Appendix D* for the list).

If ATLAS is not working, please contact **Glenn Campbell** as soon as possible at **206-526-4240**. For all other problems and questions, please contact the A-SHOP (see *Appendix C*).

Marine Mammals, Seabirds, and Sea Turtles

Mammals: *Sampling* marine mammals, seabirds, and sea turtles is your second highest priority. If one is caught in the gear, or ends up on deck, collecting the appropriate samples and information takes precedence over other sampling duties. **Clearly label all mammal and bird specimens** with the lead observer's cruise number, species name, and haul information. Please **thoroughly describe the interaction and characteristics** used to determine the species in the comments section. Use the A-SHOP issued digital camera to take photos of any marine mammal or seabird carcasses encountered.

Collect a small tissue sample from all pinniped and cetacean carcasses, label, and freeze. If you encounter a tagged or branded pinniped, please collect the entire snout (in addition to the tissue sample). This will allow researchers to use the vibrissae (whiskers) and canine teeth for aging and stable isotope studies. Do not record marine mammals in the species composition data, even if you discover it while sampling. Enter marine mammal data in the Marine Mammal Interaction and Specimen Form in ATLAS. **Refer to the A-SHOP Wet Manual** and Chapter 14 of your NPOP manual for more information on marine mammals, in particular on how to collect specimens.

If you or vessel personnel sight a **live entangled marine mammal**, please report the incident to the NOAA Marine Mammal Disentanglement Hotline at **1-877-SOS-WHAL(e)** (1-877-767-9425). See *Appendix J* for reporting instructions.

Seabirds: Albatross interactions are of particular interest in this fishery. Any sightings of **short-tailed albatross** are extremely valuable data and must be entered in ATLAS. Collect and freeze all seabird carcasses (*excluding gull species*), regardless of the condition. Enter species, count, and weight in the species composition data for birds that occur in your species composition sample. Complete the Bird

Short-tailed albatross
*are a species of interest,
and sightings off the West
Coast have increased in
recent years.*

Interaction, Activity and Species Form in ATLAS for all birds that interact with the vessel or gear, regardless of the outcome of the interaction. Observers on catcher-processors will enter the appropriate *Haulback Bird Obs Code* and *Shortwired* fields on the OHF. For mothership observers, the *Haulback Bird Obs Code* is always “0” for No Monitoring and *Shortwired* is always “U” for Unknown.

Record band data for **banded birds** and leave the bands intact with the carcass. Any information on live banded birds, including pictures, are also useful. Refer to Chapter 16 of your NPOP manual for detailed information on seabird sightings and interactions.

Observers on catcher processors will be participating in the **Seabird Cable Strike research project**. Please see the supplemental protocol sheets for information on how to monitor for and record relevant data.

Turtles: Encountering a sea turtle is highly unlikely. If one is caught by the vessel, refer to the sea turtle guide included in the A-SHOP species ID guide. Most importantly, take photos of the carapace and head before returning it to the water. Inform the Observer Program as soon as possible if a sea turtle is encountered.

Monitoring for marine mammals and seabirds is lower on the priority list and should be done when you are not sampling. For example, if you are sampling 50% of the haul, then the other 50% of the processing time could be used for monitoring gear retrieval and codend dumping for marine mammals and seabirds. Monitoring for mammals and seabirds must be done from the trawl deck and is recorded as either 0 or 100% on the OHF.

Observer Catch Estimates

All vessels are required by regulation to have flow scales and must test them once every day. Use the flow scale weight for the observer catch estimate, record a “W” on the OHF, and enter the flow scale weight in kilograms.

The flow scale is used by the vessel to record total catch weight for each haul. Keep track of which haul is running across the scale. Record the display weight at the end of each haul’s processing when you can. Request copies of the vessel’s flow scale printouts *daily* to verify catch estimates and turn them in for debriefing. (*see Appendix G: Flow Scale Documents for an example of the daily printout.*)

If part of a codend is spilled or fish escape through a blowout panel in the net, visually estimate the weight. Add the estimated weight to the flow scale weight for your total observer catch estimate, and to the discard for your total estimated discard weight. Also, adjust the percent retained accordingly. If an entire codend is lost, you or the captain should visually estimate the weight, and enter code 6 (codend lost) for gear performance on the VHF. Record this information in the Catch Estimate Calculations section of your logbook.

Scale Testing

Scale regulations may differ between Alaska and hake fisheries. Please refer to the following guidelines when observing in the hake fishery. **Each observer must test the motion compensated platform scale (MCP) during their shift.** Test the MCP scale using certified weights at 10, 25, and 50 kg. Record the results on the decksheet and in the “Daily Observer MCP Scale Test Log” section in your logbook. A $\pm 0.5\%$ variance is allowed to consider the MCP scale usable and accurate. The scale must pass this test in order for you to use it for your species composition sample, and for the flow scale test to be valid. If the MCP scale fails, try calibrating the scale, and then retesting.

Test the motion compensated platform (MCP) scale every shift. The flow scale must be tested each day.

The flow scale must be tested at least once each calendar day that it is used to weigh catch. Testing the flow scale is the vessel’s responsibility, but an observer must be present for the test to be valid. It is the vessel’s responsibility to conduct the test when the observer is able to be present. Work with the vessel so you can be present for the test at a time convenient to everyone. The crew will run 400+ kg of sand bags over the flow scale and then verify the weight of the same sand bags using the MCP scale. A $\pm 3\%$ variance is allowed. The vessel will complete a daily flow scale test record form. For an example of the “Record of Daily Scale Tests”, see Appendix G. There is a place for the observer who witnessed the

test to sign the form. This simply means you witnessed the test, not that the flow scale passed. When you witness the test, **check to see if the flow scale passed or failed**, so that you know if you can use it for sampling and catch estimates. Record the results in the ATLAS Flow Scale Test Form (see p. 18-7 in your NPOP manual for more details on entering this data in ATLAS). Some vessels may do “mini-flowscale tests” during the day. You are only required to be present for the daily 400kg test.

If the flow scale fails the test, it may be re-tested as many times as the crew wishes. The scale may *not* be relied on as a source for total catch weight until it has passed the daily test. ***If total catch is weighed on a flow scale that did not pass the test, do not use that weight as the Observer Estimate.*** Report only the vessel estimate, leave the observer estimate blank, and notify your in-season advisor. If the flow scale fails, the captain decides whether to continue fishing. If the vessel continues to fish, sample for species composition using the MCP scale (if it has passed its test). Your sample sizes will be limited by the fact that you must weigh the entire sample on the MCP scale. Notify your in-season advisor, and document the situation in your logbook. Do not refuse to sample, or tell the vessel they cannot fish, if the flow scale is not functioning. The flow scale display panel should be sealed. If you suspect the seal is broken, or that someone is tampering with the flow scale, talk to the captain, and document this fully in your logbook.



Ensuring Accurate Weights

Everything in the catch must pass over the flow scale to be weighed. Document all situations where not everything is weighed, such as large organisms removed on deck or organisms removed in the factory prior to the flow scale. Add these weights, or estimated weights, to the flow scale weight in order to calculate the correct catch estimate. Individuals of certain species, such as ragfish, may fit through the live tank doors and make it into the factory, but may be too large or bulky to go up the incline belt. Direct crewmembers to pull them off prior to the incline and place them on the belt that feeds to the flow scale so their weight is included in the total haul weight. If an organism is too large to go over the flow scale, cut it up into pieces and weigh it on the MCP scale, if possible. If you cannot weigh it on the MCP scale, record its length and estimated weight. Add the organism’s weight to your total sample weight and to the flow scale weight to get the total catch estimate. If this occurs during a non-sample period, add the estimated weight to the flow scale weight to obtain your catch estimate, but do not include it in your

species composition sample data, or discard estimate. Occasionally, weight will be added to the flow scale after all the fish have been run out of the tank (e.g., water sprayed over flow scale to clean it). If you sampled the second half and are confident all the fish were run out before you recorded the haul end weight, use the weight you recorded for your observer estimate.

Presorted Organisms

Although presorting is never legal, occasionally very large animals are sorted on deck to prevent them from entering the factory or live tanks. When a large organism (e.g. salmon shark) is presorted, the observer must be informed and allowed access to the organism for identification and sampling.

Documenting presorted organisms does not validate the illegal practice of presorting. Observers should remind the deck crew that medium-sized organisms, such as ragfish or skates, *should not be presorted on deck*.

If a very large organism is excluded on deck or removed from the live tank before your sample, it never had the chance to fall in your species composition sample. Record it as a presorted sample, enter the number of organisms and use the appropriate length/weight table, or estimate the weight. Measure and record the length and sex (leave halibut unsexed), if possible. Add the estimated weight to the flow scale weight to obtain the catch estimate for that haul and enter the catch estimate as the sample size for the presorted sample.



Length-to-Weight Tables for Large Organisms

Length-to-weight tables for **salmon sharks**, **Pacific sleeper sharks**, **Pacific halibut**, **big skates**, and **longnose skates** are in Appendix P-R in the NPOP manual. For salmon sharks and Pacific sleeper sharks, the length to weight tables use the total natural length – tip of snout to posterior margin of the upper caudal-fin lobe, with the fin in its natural position.



Set Up a Random Sample Design

1. Define the population: *every fish in the haul*
2. Define your sample units: *50% of the haul or smaller units for dirtier hauls*
3. Number all of the sample units
4. Randomly select units to sample: *use RNT, dice, etc.*

Random Number Table

Excerpted from NPOP manual: 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. Determine how many digits you will use in the row (e.g. if you need numbers between 1 and 25, use two digits in the row). Decide in which direction you will move through the table. Then proceed in any direction through the table (even diagonally), recording appropriate numbers and skipping numbers too high or repeated, until you have enough random numbers. You should decide on a direction and enter the table at a different random starting point every time you use it. *For example*, if you need to choose three numbers between 1 and 15, 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 15 (inclusive). 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 15; 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 have chosen all the numbers you need.

Random Sample Table

You and your partner should set up opposite work shifts and sample every haul. In the event that one observer gets sick or injured and is unable to sample, contact your in-season advisor and a decision will be made as to whether the random sample table should be used. Generally, if the sickness is expected to last only a day or two, then the well observer will continue to sample during their normal shift. If the sickness might last longer than two days, then the random sample table needs to be used so that the samples are not all coming from the same time period. Always notify your contractor and the A-SHOP of any injury or illness.

Species Composition Sampling

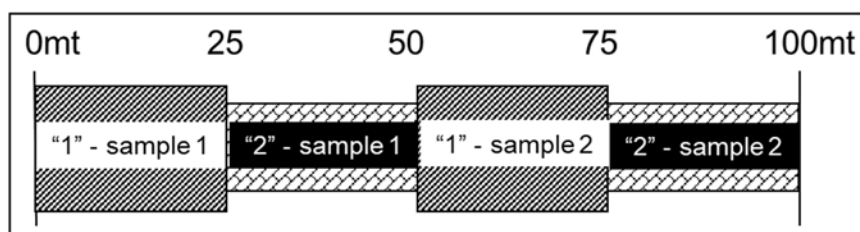
The hake fishery is managed using your observer data, therefore it is vital that the data be both randomly collected and of high quality. **Sampling 50% of the haul for species composition is the norm in the hake fishery, except for hauls with unusually high levels of species diversity.**

*The A-SHOP does **not** require three distinct samples from each haul, which is different from NPOP requirements.*

Implementing a random sample design is straightforward since all vessels have flow scales. Either estimate the size of the haul yourself, or ask the captain or factory manager for their estimate. For a typical low bycatch haul, divide the weight into two equal parts and randomly select which half to sample for species composition. Make sure your sample design allows all organisms in the haul an equal opportunity to be sampled. For smaller or very clean hauls, you may be able to census the haul.

If you are on a vessel that pulls up codends with large catches (>75 MT), consider employing a random systematic sample design to break up the sampling effort.

Example: 100 mt haul with little bycatch, break into four units of 25 mt, randomly choose 1 or 2 to systematically sample. If “1” chosen, sample from 0-25 mt, take off 25-50, sample from 50-75 mt, take off 75-100, if haul goes past 100mt, sample from 100-125 (or end of haul, whichever comes first). If “2” chosen, sample from 25-50 mt, take off 50-75, sample from 75-100 mt.



Keep in mind that your sample design is based on an estimate and your goal for a typical haul is 50%. If you are sampling the first half, start at the beginning of the haul and stop at the estimated halfway point. If you are sampling the second half, start at the estimated halfway point and sample until the end of the haul (i.e., all tanks are empty). Your sample weight is the weight you actually sampled. **To minimize incline belt bias, and maintain discrete start and stop points for your sample, have a crewmember close the live tank doors and run out all the fish on the belts prior to the flow scale at the start and end of your sample.**

The vessels are concerned with bycatch of species of concern and are interested in working closely with the observers to ensure that the largest and most accurate samples are taken. This requires cooperation between the observer, the person controlling the belts, and any sorters who might be assisting at the belt. Please do all you can to avoid small samples for hauls with species of concern. You must be able to account for every piece of bycatch for a sample to be valid.

If you cannot see and collect all species for which you are sampling, you must either reduce your sample size, or work with the vessel crew to achieve your sampling goal. If you find that you must reduce your sample size for species composition due to large amounts of bycatch, then systematically sample throughout your chosen half using equally sized units. *Keep sampling options in mind when setting up your sample design.*

Sampling Options

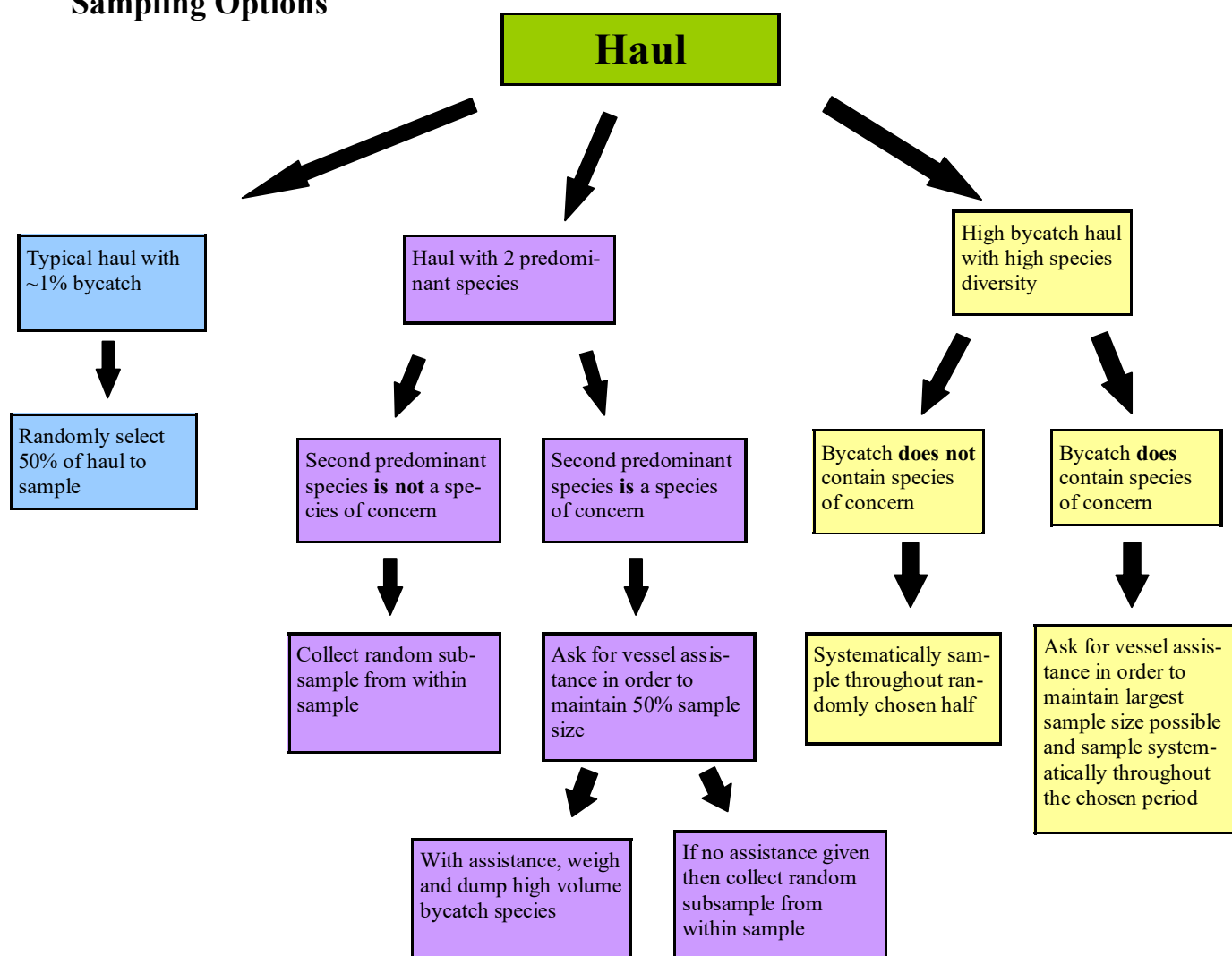


Figure 3. A-SHOP sampling flow chart

Example: Karen randomly selects the 2nd half of a 30 MT bag with lots of spiny dogfish, American shad, and jack mackerel visible during the dump. She coordinates with the back line crew to run fish slowly while she's sampling and decides she can sample systematically for 1 MT, then take 4 MT off to work up the sample. She breaks her sample into 5 MT units, chooses a random start point, and then samples systematically through the end of the haul (see Figure 4).

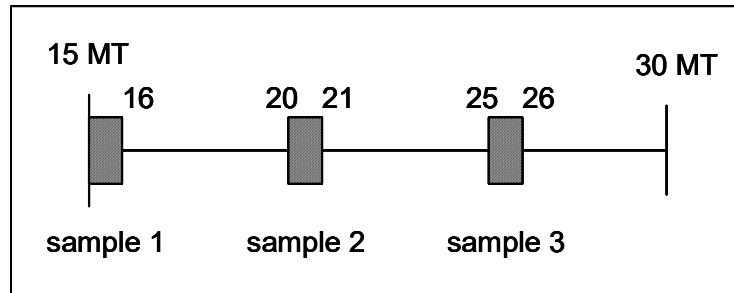


Figure 4. Systematic sample example

For a small haul with high species diversity for which you cannot sample 50%, it may be simpler to randomly pick your sample units from the *entire haul*.

Example: ~12 mt bag with high diversity, use a random systematic frame by breaking the 12 tons into 3 intervals of 4 tons, randomly choosing a ton in the first interval from which to collect 3-4 baskets, then repeating in the second and third intervals.

Refer to the priority list while sampling. For high bycatch hauls, it is acceptable to drop lower priority tasks (e.g. biospecimen samples) in order to maintain the 50% sample size.

Average Weight Samples (referred to as “subset samples” in the NPOP manual)

Randomly collect an **average weight sample of at least 50 hake from every haul**, and record the weight and count of fish. The average weight sample is a logical place to get your biospecimen fish. Use the unsorted basket of fish collected for hake average weights for your Flow Scale – MCP scale weight test.

Flow Scale-MCP weight test / average weight sample:

1. Stop the belts prior to the flow scale and record the flow scale weight
2. Run a basket's worth of fish over the flow scale and collect all of it
3. Record the flow scale weight again
4. Weigh on the MCP: unsorted for comparison test / only hake for average weight sample
5. Record weights in the Flow Scale – MCP Weight Comparison Form in ATLAS (see NPOP manual p. 18-10 for details)

Samples from a trawl fishery are weighed samples.

Every organism must have a weight.

Minimize your workload by collecting average weight samples for abundant bycatch species. **Count and weigh at least 50 randomly collected individuals.** Record the weight for the remaining individuals of that species with a 0 count (i.e. “weigh and dump”). Average weights are collected *once per haul*, not per sample. *For an illustration, see Appendix E1&2. Subsampling Decksheet Examples.*

Subsampling For Two Predominant Species

When there are two predominant species in a haul, subsampling is a good option to maintain large sample sizes and minimize workload. The size of your subsamples will depend upon the predominance of the two species. **Use random systematic subsampling** to capture an accurate ratio of the two species. Use either the flow scale or 2-3 baskets to **take subsamples from three parts of the species composition sample.**

Subsample Option 1: “*The flow scale is your friend*” / large (500 – 1,000 kg) subsamples using the flow scale

Example: Richard estimates the bag is ~48 MT and randomly selects the second half. He sees a fair amount of yellowtail rockfish during the dump. With the goal of 3 subsamples, he divides the sample size of 24 tons by 3 to get intervals of 8 tons. He randomly selects ‘4’ to be the start of his first subsample. During his sample, he lets the yellowtail and hake go by and collects all other bycatch. At 27 tons (the beginning of the 4th unit of his sample), he has the belts prior to the flow scale cleared of fish and records the flow scale weight. He starts the belts and pulls everything but hake off the sorting belt. After about a ton, he clears the belts again and records the flow scale weight to get his first subsample weight, then continues with his sample. The bag is actually 52 MT so he maintains his sample design until the end of the haul, collecting his ~1 MT subsamples at 35, 43 and 51 MT (*see Figure 5*). *For an illustration, see Appendix E1. Flow Scale Subsampling Decksheet Example.*

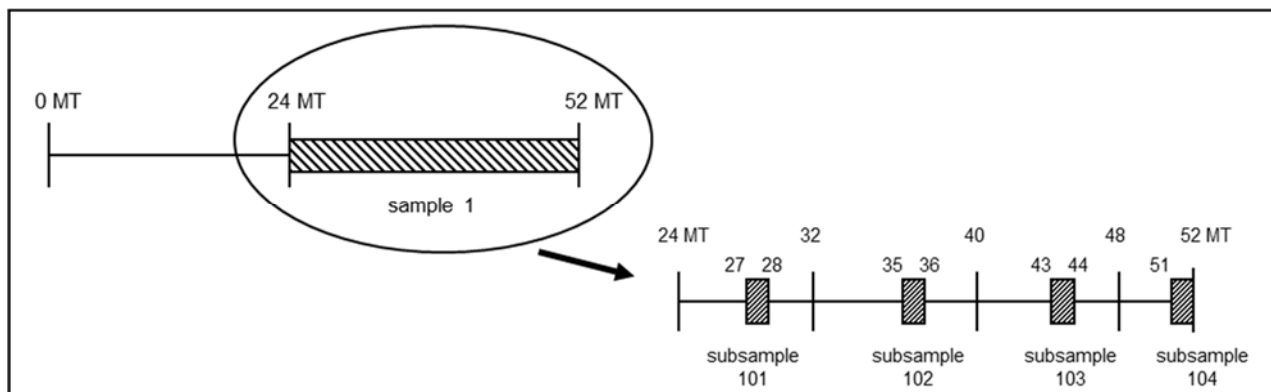


Figure 5. “The flow scale is your friend” subsampling example

Subsample Option 2: *Use baskets*

Example: Barbara estimates the bag is ~60 MT and randomly selects the first half. During the bag dump, she sees many spiny dogfish mixed in with the hake and little other bycatch. She breaks her 30-ton sample into 3 intervals of 10 tons and randomly selects ‘1’ to be the start of her first subsample. During her sample, she lets the dogfish and hake go by and collects all other bycatch. She collects 3 baskets each at ~0 tons (during the first ton), ~10 tons and ~20 tons for her 3 subsamples (see Figure 6). For an illustration, see Appendix E2. *Basket Subsampling Decksheet & Discard Calculation Example.*

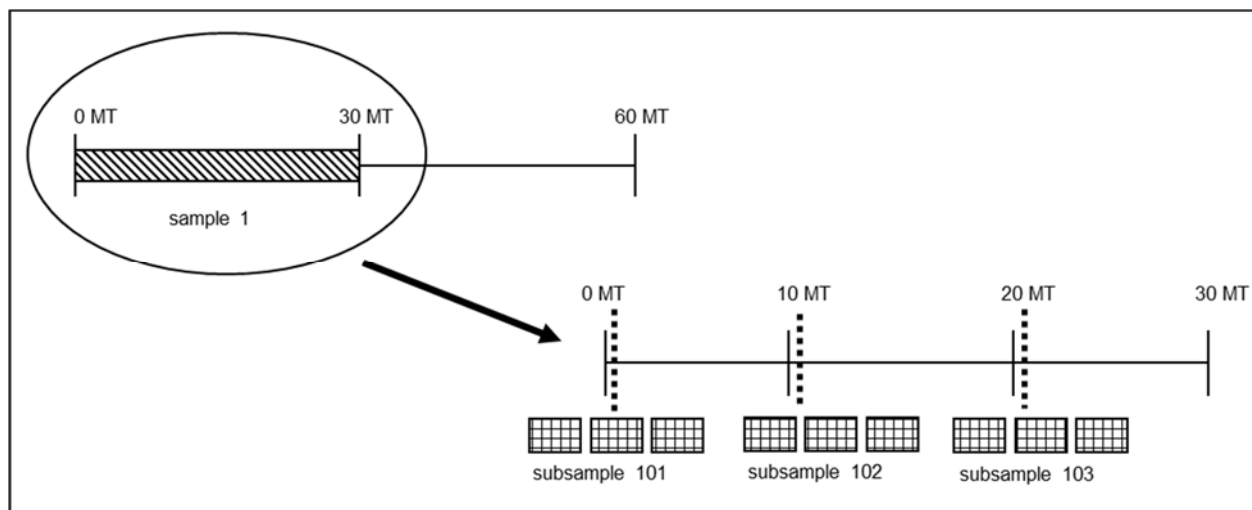


Figure 6. “Use baskets” subsample example

Percent Retained and Estimated Discard Weight

Estimate percent retained for each species in your species composition sample. These estimates should reflect what the vessel does, or intends to do. When disposing of your sample, mimic what the vessel does. Fish specimens that you collect should *not* be reflected in your estimate of percent retained. If necessary, ask for help getting your bycatch onto the correct belt. Estimated Discard Weight is a calculated value that includes the calculated weight of all discarded species for the haul (see options below). Record Estimated Discard Weight in kilograms on the OHF for each haul. **Percent retained and discard estimate data are important to resource managers and should be as accurate as possible.** Ask the vessel crew which belts are going to fish meal (retained) and which are going over-board (discard) so that you can accurately estimate and calculate these values.

How to Calculate Estimated Discard Weight:

1. **Typical haul:**

$$\left[\frac{\sum \text{Sample Discards}}{\text{Sample Size}} \right] \times \text{OCE} = \text{Estimated Discard Weight}$$

2. **For mothership hauls with catcher-vessel discards**

$$\left(\left[\frac{\sum \text{Sample Discards}}{\text{Sample Size}} \right] \times \text{Flow Scale Haul Weight} \right) + \text{Catcher Vessel Discards} \\ = \text{Estimated Discard Weight}$$

3. **For hauls with pre-sorted organisms**

$$\left(\left[\frac{\sum \text{Sample Discards}}{\text{Sample Size}} \right] \times \text{Flow Scale Haul Weight} \right) + \text{Weight of Pre - Sorted Organisms} \\ = \text{Estimated Discard Weight}$$

4. **For samples where not everything went over flow scale (e.g. large ragfish)**

$$\left(\left[\frac{\sum \text{Sample Discards}}{\text{Sample Size}} \right] \times \text{Flow Scale Haul Weight} \right) \\ + \text{Weight of Organisms That Did Not Go Over Flowscale} \\ = \text{Estimated Discard Weight}$$

5. **For hauls where fish spilled overboard (bag overflow, blowout, etc.)**

- a. Make a visual estimate of spilled amount and add to calculated value, using options above, to get a total Estimated Discard Weight

6. **When subsampling for 2 predominant species:**

- a. Calculate the discards for the subsample

$$\left[\frac{\sum \text{Discards of Only 2 Predominant Species}}{\sum \text{Weight of Subsamples}} \right] \times \text{OCE} = [\mathbf{A}] \text{ Subsample discard}$$

- b. Calculate the sample-level discards, using option 1-4 above (*including any non-predominant species that were collected in the subsamples*) = **[B]** Sample discard
- c. **[A] + [B] = Estimated Discard Weight**

For an illustration, see Appendix E2. Basket Subsampling Decksheet & Discard Calculation Example.

When calculating discards for subsampled hauls or hauls with multiple samples:

1. Sum all of the discards from the subsamples/samples
2. Sum all of the subsample/sample weights
3. Divide the summed discard weight by the summed subsample/sample weight
4. Multiply above number by the OCE.

Use percent retained in your discard calculations for species that are not entirely discarded.

Example: The galley kept most of the lingcod (36 kg) and yellowtail (70 kg) from Haul 54 so Oprah recorded them as 75% retained. Spiny dogfish (21 kg), ratfish (1 kg), and squid (64 kg) were all discarded. Sample size = 24700 kg and observer estimate = 49250 kg.

Discard calculation using option 1:

$$\frac{[(36 + 70) * 0.25] + 21 + 1 + 64}{24700} * 49250 = 224\text{kg}$$

Mothership Catcher Vessel Discard Accounting

Mothership Observer Catch Estimates and discard data must include catcher vessel (CV) discards.

Most catcher vessels are equipped with a camera system for electronic monitoring (EM), while a few will have a West Coast Groundfish Observer Program (WCGOP) observer onboard. The WCGOP observer will estimate discard amounts for each haul or on vessels using EM, the CV captain will estimate any discards. Either way, the *CV captain will send the mothership captain a discard estimate*, along with the haul information. Please use the following protocols to track and record catcher vessel discards. The transfer and recording of this data must happen in a systematic and careful way to ensure the data is accurate.

1. CV discard amounts recorded by the mothership observer **MUST MATCH** what the CV observer or captain has recorded, so that it will all match up at the end of the trip.
 - a. For vessels carrying WCGOP observers, the CV captain will transmit the discard estimates made by the CV observer, to the mothership captain.
 - b. For EM vessels, the CV captain will transmit their discard estimates (which are also recorded in their logbook) to the mothership captain.
2. The CV discard weights may be in pounds (lbs.), or kilograms (kg), or tons. **Check with the captain(s) to determine which units are being used.** To convert the discard weight to kg, use: 1 lb. = 0.4536 kg or 1 mt = 1000 kg.
3. Clearly document all Observer Catch Estimate and discard calculations in the “Mothership Catch Estimate and Discard Calculations” section of the logbook (*see Figure 7-1 for example*).
4. Add the CV discard weight:
 - a. To the flow scale weight to get the total *Observer Catch Estimate* on the OHF.
 - b. To the mothership discard weight to get the total *Estimated Discard Weight* on the OHF (see discard estimation option 2 for calculation).
5. Calculate the percent of catch delivered to determine if percent retained needs to be adjusted.
 - a. Determine the percent of catch delivered by **dividing the delivered catch weight** (*flow scale weight + large items = [B]*) **by the final observer estimate** (*[B] + CV discards = [F]*).
 - b. If the percent of catch delivered is <100%, adjust the percent retained for all species in the species composition sample on the decksheets and in ATLAS by multiplying the original percent retained by the percent of catch delivered (*see Figure 7-2 for example*).

Catcher vessel discard data will be reviewed and verified during debriefing.

Mothership Vessel Name

Starlord

Haul #	Catcher Vessel Name	Flowscale End - Start = Flowscale Weight (kg)	[A] + Large Items Not Weighed on Flowscale (kg)	CV discard estimate (lb)	CV discards (kg) = [C] x 0.4536 kg/lb	MS discards (kg)	record on OHF	record on OHF	% of catch delivered = ([B] / [F]) x 100
							Estimated Discard Weight (kg) = [D] + [E]	Observer Catch Estimate (kg) = [B] + [D]	
		[A]	[B]	[C]	[D]	[E]		[F]	
11	Poseidon	49075	49075	500	227	89	316	49302	100%
12	Groot	38468	38468	-	-	107	107	38468	100%
13	Amelia Marie	41357	41357	5000	2268	153	2421	43625	95%

Figure 7-1. Mothership Catch Estimate and Discard Calculations section of logbook

Sample #: 1	Sub-Sample #:	Sample Size: 20,786	Kgs Segments pots	# of Sampled Hooks:
Presorted <input type="radio"/>	Combined <input type="radio"/>	Unable to Follow Design <input type="radio"/>	No Fish in Sample <input type="radio"/>	
Species	Sex	#	Weight	% ret.
KEYPUNCH				
Hake		0	20629.70	100
Hake		59	29.42	100
Squid		89	38.90	0
Squid		67	25.75	0
Jack mack		14	23.99	50
Yellowtail		22	38.24	100

Length, viability, injury, specimen, tally data, measurements, bird observations, sample design, notes:

start: 20,571
end: 41,357
discards
 $64.65 + (23.99 \times 0.5) \times 41,357$
 $20,786$
 $= 152.50 \text{ kg}$

40MT
1 (2)

If you census a haul that has CV discards, please record the sample design as code 6.

Figure 7-2. Adjusted percent retained, due to CV discards, recorded on decksheet

Prohibited Species

SPECIES	PROHIBITED	TAKE LENGTHS
Salmonids (all species)	YES	YES
Pacific halibut	YES	YES + viability
Dungeness crab	YES	NO
Herring	NO	NO
Tanner crab	NO	NO
King Crab	NO	NO

All salmonids, Pacific halibut, and Dungeness crab are prohibited species in the hake fishery.

Herring, tanner crabs, and king crabs are *not* prohibited species.

Pacific Halibut is a prohibited species - collect viabilities at the point of discard.

California halibut is *not* a prohibited species. They look similar to Pacific halibut, but are in the left-eyed Bothidae family. This means they can be either left or right-eyed (~50% left, ~50% right), and pelvic fins

are asymmetrically placed at the abdominal ridge. It is very unlikely that you will see a California halibut.

Protected Fish Species Sampling

Some salmon, sturgeon, and eulachon populations on the West Coast are protected under the Endangered Species Act (ESA). When salmon or green sturgeon are encountered in your sample, additional biological sampling is required.

Salmon

Salmon is of particular concern in the hake fishery due to declining populations along the West Coast.

Salmon bycatch is managed by numbers of fish, not by weight.

The vessel may want haul-by-

haul salmon numbers from you so they can attempt to reduce incidental take. There is no Salmon Retention program in the hake fishery, so do not enter any data in that section of ATLAS.



Identify, weigh, and count every salmon in your species composition sample. If you are unable to do this, you must either ask for help to maintain your sample size or reduce your sample size. Because salmon bycatch is such a sensitive issue on the West Coast, the vessel should be willing to help you maintain your sample size, so ask for help!

In the hake fishery, you **do not record salmon by sex in your species composition sample.** Simply record count and weight by species, then set them aside for the biological sampling as outlined below.

Be careful with salmon identification. Salmon off the West Coast can be challenging to identify, and the typical characteristics for identification may be faint or absent. If you are uncertain of the identification, freeze that salmon and bring it back with you. Atlantic salmon and steelhead trout are rarely seen in this fishery; if you do encounter either, bring back the whole fish.

In lieu of collecting salmon scale samples for verifying species **you will collect 5 whole specimens of each species you see, from inside your species composition sample.** This is required for each individual observer. These specimens serve to verify observers' ability to identify salmon correctly, as well as providing the A-SHOP, WCGOP, and NPOP with salmon specimens for fish training. It is unlikely that each observer will have more than 10 specimens apiece. Hake vessels have ample freezer

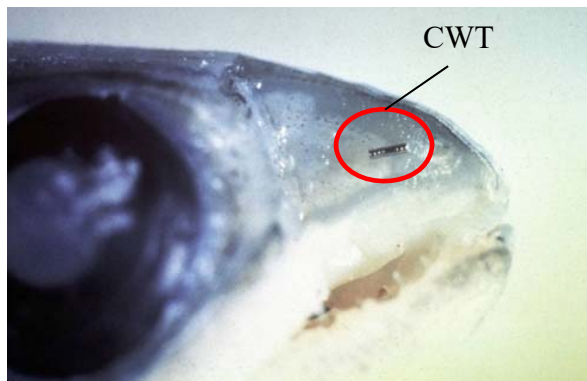
space and most of them come into Seattle for offloads, so the logistics of transporting the samples should not be difficult. As with all whole fish specimens, include a specimen collection label with the whole salmon. Large plastic bags are provided with your A-SHOP gear to facilitate salmon specimen collection.

Salmon Biospecimen Sampling

Salmon Sampling	Chinook	Coho	Pink	Chum	Sockeye
Sex/Length	X	X	X	X	X
Weight	X	X			
Adipose Fin	X	X			
Scan for CWT	X	X			
Fin Clip	X	X			
Freeze 5 Whole	X	X	X	X	X

Coded-Wire Tag Sampling

Some salmon are tagged with coded-wire tags (CWTs). These are tiny metal tags inserted into the snouts of juveniles. In the past, when a CWT was inserted, the adipose fin was clipped to indicate the presence of a tag. However, West Coast hatcheries now clip the adipose fin on all fish they release; therefore, electronic means must be used to determine if a tag is present. Additionally, both Chinook and coho sometimes have double index tags (DITs) which means they have CWTs, but the adipose fin has purposely *not* been clipped.



Each Chinook and coho scanned for a CWT must be recorded on the A-SHOP Salmon Sampling Deck Form, whether they have a CWT or not. This data allows us to calculate the mark-recapture rate and is reported to a regional database with all other CWT recoveries. One metal detecting wand is issued to each observer-pair to determine the presence of CWTs.

Sampling Details:

This project applies to Chinook and coho salmon.

1. **Scan all Chinook and coho** in the sample for the presence of CWTs.
 - Pass the wand, in direct contact with the fish, along the exterior of the entire upper snout (*see Figure 8*).
2. **Collect all tagged snouts.**
 - Cut straight down directly behind the eye, to collect the upper snout only.
 - Place the snout inside a barcoded zip-top bag (*see Figure 9*).
 - Record the barcode number in the ‘Snout barcode’ column on the A-SHOP Salmon Sampling Deck Form (*see Figure 10*).
 - Store the snouts in a clearly labeled bag in the freezer, to ensure that all return to debriefing with you.
 - If any of your first five salmon is CWT-tagged, collect the snout as described above and collect the whole specimen for ID verification.



Figure 8. Scanning salmon for presence of CWT



Figure 9. Salmon snout in barcoded zip-top bag

3. **Record data for every Chinook and coho scanned for CWTs, even those not tagged**, on the A-SHOP Salmon Sampling Deck Form (*see Figure 10*).

Notes about salmon wands:

- Beware of nearby metal that can set the wand off. Your wristwatch, belly button ring, or nearby metal in the factory may cause false positives.
- **These wands are very expensive. Please take good care of them.** The wand is water-resistant, not waterproof. Store it in a clean, dry, and safe location. If the wand is not functioning properly (i.e. weak or prolonged sounds), try changing the battery. There is a spare 9-volt battery in the wand case. Contact your in-season advisor if that does not solve the problem. *If the wand stops working, contact your in-season advisor immediately for directions on how to sample for CWTs without a wand.*

- Wands are assigned to observers, not to vessels. Bring it with you when you disembark a vessel, even if other observers are replacing you on that vessel.

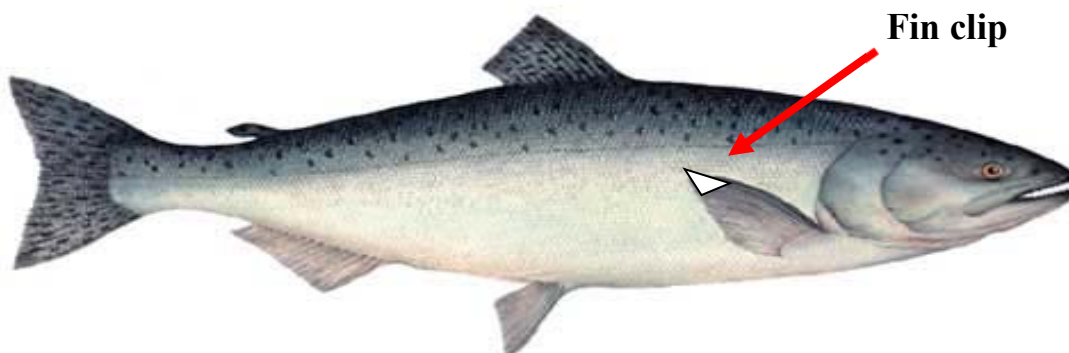
Chinook and Coho Genetic Sampling

The goal of this study is to obtain an accurate estimate of the genetic stock composition of Chinook and coho salmon bycatch and to understand the spatial and temporal distribution of these species. This information is intended to help managers evaluate the impacts on specific salmon stocks, including those listed as threatened or endangered under the Endangered Species Act.

Sampling Details:

This project applies to Chinook and coho salmon.

1. Collect genetic samples (fin clips) from **all Chinook and coho** salmon inside the sample.
 - Snip off a small piece of pectoral fin (about the size of your pinky fingernail) with scissors.



2. Place fin clip flat on paper, fold paper over to maintain a layer of paper between the fin clip and the envelope, and seal the envelope.



3. Record on envelope: Lead Cruise, Haul, and Snout Barcode, if CWT tagged. For coho samples, cross out “Chinook” and write “coho” on envelope.
4. Record all data on A-SHOP Salmon Sampling Deck Form.

Keep the envelopes clean. Slime or blood from other fish can contaminate samples. Rinse scissors and forceps in salt or fresh water between sample collections. Samples need to dry out as fast as possible. The longer they stay wet, the more the tissue breaks down.

Fin Clip Storage at the End of the Day

Do not put samples in plastic containers, as they will not dry. Store in large manila envelopes at room temperature, by species. Use the large manila envelopes issued with your A-SHOP gear.

Salmon Subsampling

The vast majority of salmon encountered in the hake fishery are Chinook salmon. *All Chinook in your species composition sample should be sampled for both CWTs and genetics.* If you are overwhelmed with Chinook salmon in a particular haul and are not able to sample all of them for both CWTs and genetics, select a random subsample with a goal of 25 samples per haul. **Chinook biological sampling includes both genetics and CWT sampling**, so the subsampled Chinook are sampled for both genetics and CWTs. Indicate that you subsampled on the Salmon Sampling deck form (circle “Yes” next to “Subsampled for Chinook genetics and CWTs?”) and describe your subsampling method. Sample all of the relatively few coho you may see for CWTs and genetics.

Example: 2 coho and 4 *baskets* of Chinook are in the species composition sample. Randomly select 3 of the 4 baskets of Chinook to subsample for both CWTs and genetics. Sample the 2 coho for CWTs and genetics. *Note: Hauls with this level of Chinook bycatch are rare.*



Using the Salmon Sampling Deck Form

Record all CWT and genetics data on the Salmon Sampling deck form, which is waterproof and designed for use in the factory.

A-SHOP SALMON Sampling Deck Form

Page 5 of ____

record species comp data on Deck Form
record all *Chinook and coho* SALMON SPECIMEN data here*

*it's waterproof for a reason

Lead Cruise	Permit	Haul	Sample	Vessel Name
97531	1098	17	1	Merluzzo

Subsampled for Chinook genetics and CWTs? NO Yes If Yes, method: _____

	Species	Sex	Length (cm)	ATLAS Specimen #	Weight (kg)	Genetics barcode	Snout barcode (if CWT-tagged)	Adipose present?
1	Chinook	F	47	174	1.73	1709337	—	Y
2	Chinook	M	53	175	1.98	1709338	—	Y
3	Chinook	F	52	176	1.87	1709339	809611	N
4	Chinook	F	61	177	2.83	1709340	—	N
5								
6	coho	M	49	178	1.82	1709341	—	Y

Figure 10. Example of A-SHOP Salmon Sampling Deck Form

Sturgeon

If you encounter a sturgeon, please follow the sampling protocol found in your species ID guide at the end of the Bony Fishes Key. The directions explain how to collect biological information and a genetic sample from each fish. Green sturgeons are quite rare in this fishery; only two have been caught in the last fifteen years.

Species ID Forms

Correct species identification is the cornerstone of observer data.

Species ID forms and photos are documents that verify to the program, and to the fishery participants, that each observer is able to correctly identify species. The A-SHOP will provide you with a list of the verified species ID forms you completed for the A-SHOP and the NPOP. **Each observer must complete a species ID form for every new species encountered during hake deployments.** Complete the form with sufficient detail to convey clearly that the species was identified correctly. Identify species only to the level to which you are confident. Photograph and collect any unknown fish and record as “fish unid” in the data.

Complete a species ID form for each new species you encounter in your sample, with the fish in hand, which you keyed out yourself.

A digital camera is issued to each pair of observers. Pictures are a required element to your species identification verification, so please take a picture of each new species you see and any rare and usual species. New for 2019, you no longer have to complete the drawing section on your species ID form, instead your photos will fulfill this requirement. Photos must be labeled and of sufficient quality (full body and not blurry) to easily determine it is the correct species. Please turn in an electronic folder labeled with your name, cruise number, and vessel name with individual photos properly labeled inside (e.g. folder name: Fiona Staples_79342_Saga / file names: Canary1, Canary2, POP, etc.).

Biospecimen Sampling

Additional biological data for hake and other managed species in the hake fishery are used by stock assessors and resource managers to evaluate and assess population dynamics. This biospecimen data includes sex, lengths, age structures, and genetics. **All biospecimen samples must be collected randomly, from inside the species composition sample.** For hake, the randomly selected average weight sample is a logical place to get your biospecimen sample. When subsampling for two predominant species, biospecimen fish can come from either the sample or the subsamples, as long as they are randomly selected. For a review of sample design and methods, refer to Chapter 13 of the NPOP

Remember! Record the individual weight of age-structure fish.

manual. If you are having difficulty coming up with a random method for collecting fish for biospecimen samples or if you are not sure if your method is truly random, contact your in-season advisor for help. It is acceptable to collect a single otolith and/or the two halves of an otolith with a single, clean break.

On the rare occasion that your average weight sample for hake is collected opportunistically (you must collect an average weight sample from every haul), do not collect hake biospecimen data from that haul.

The data collected from rockfish and other species in the hake fishery is invaluable to stock assessors. Biological data collected from the A-SHOP is used in 14 different stock assessments. Because these data are so important, **the goal is to collect biospecimen data from several species, according to your priority list.**

Biospecimen Sampling Protocols

Collect biospecimen data in order of species priority, as time allows.

The protocols are broken up into tiers, by importance of species. Tier 1 is the highest priority – collect biospecimen data from these species whenever they are present in the haul. Tier 2 species are the second highest priority and Tier 3 lower priority. **The goal is to collect biospecimen data for all species in Tier 1, the top 2 priority species in Tier 2, and the top species in Tier 3, time permitting.**

Refer to the “Wet Manual” for the specific protocols for all sampling priorities and biospecimen data collections.

Species	Sex-Lengths / Haul	Age Structures + Fin Clips / Haul
Tier 1		
Hake	15	3 every 3rd haul (+ 1 <i>fin clip</i> on odd hauls)
Bocaccio	20	10
Yelloweye	<i>collect the whole fish - up to 5 / observer</i>	
Tier 2		
Canary	20	10 + 1 fin clip
POP	20	1
Darkblotched	20	1
Rougheye	20	1 + 1 fin clip
Yellowtail	20	1
Widow	20	1
Tier 3		
Sablefish	10	n/a
Spiny Dogfish	10	1 [2 nd dorsal spine]

Predicting when and how many biospecimen sample species you will see is impossible. Ideally, you would set aside all that are in your sample and then randomly choose your biospecimen data fish.

However, this may be difficult if you have more than a few baskets of fish. In those cases, you will need to use other means of randomization. One method would be to break the haul into even units (fourths,

thirds, tons) and randomly choose a point within the sample to start the collection, collecting the next 10-20 individuals of that species as your biospecimen sample.

Example: You are sampling the first half of a 60MT haul with a fair number of POP, darkblotched, and widow. You break your 30MT sample into 3 units of 10MT and randomly select the third unit. Starting at 20MT, you set aside the first 20 POP and darkblotched for biospecimen sampling, since they are a higher priority than widow.

Keep otoliths organized during your deployment. Use the permanent marker and rubber bands in your hake gear. Labeling the vials with species and haul number (e.g. “RE H13” for a rougheye from Haul #13) will make for a smoother debriefing. In addition, the vials will *not* be hydrated during debriefing as they are shipped dry to age readers, therefore, it is important **otoliths are clean and dried at-sea.**



Genetics

As a tool to inform resource management, there is an increasing interest in genetic data from species that occur in the hake fishery. Pectoral fin clips (identical to Chinook and coho genetics fin clips) are collected from several species.

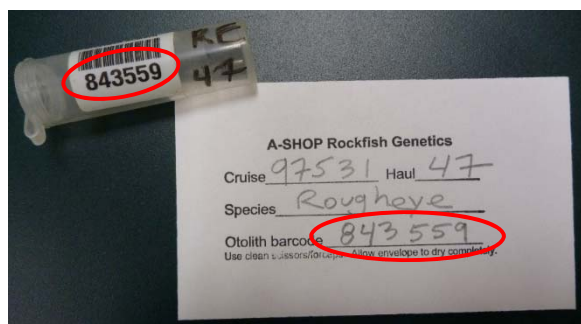


Figure 11. Genetics envelope with corresponding otolith vial

Randomly select an otolith fish to collect a pectoral fin clip from. White genetic collection envelopes are included with your hake gear. Record the lead cruise number, haul number, species, and *otolith barcode* number on the envelope (see Figure 11).

Lengths must have an associated sex to be useful for stock assessment. If you are unable to determine the sex of a specific individual, record it as “unknown”. **Rockfish and sablefish can be more difficult to sex than other round fish.** Information on how to sex fish is included in the Wet Manual. For sablefish, cut the fish all the way up the belly, move the organs aside and inspect the gonads which are up against the backbone. Females have a pair of single-lobed ovaries. Males have a pair of double-lobed testes. On immature fish, you have to look closely to determine if there are two lobes (female) or four lobes (male). Use your finger to spread the gonads to look for the lobes on small, immature fish.

Spiny Dogfish Protocols

Spiny dogfish are a common bycatch species in the hake fishery. Age data indicates that one dogfish spine collected from the hake fishery, from a 100 cm female, was 88 years old. The second dorsal spine on dogfish are used to determine the age. You will be issued 50 barcoded bags with your hake gear. Once the 50 bags have been used, continue to collect sex/lengths only.

To determine the sex of a shark, look for the presence of claspers around the cloaca. Male sharks have claspers, females do not (*see Figure 12*). For spiny dogfish, measure the fork length from tip of the snout to the fork in the tail (*see Figure 13*).

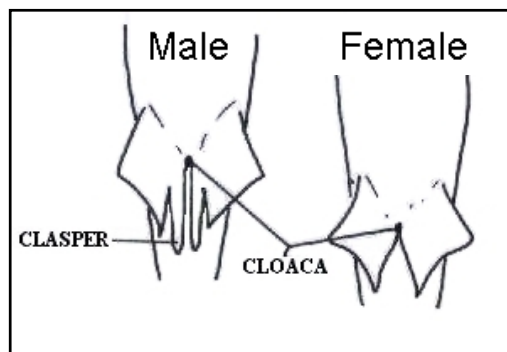


Figure 12. Ventral surface of sharks

For spiny dogfish spine collection, cut the entire **second** dorsal spine off making sure to include the base of the spine.

Cut down at an angle just in front of and behind the spine, making a wedge (*see Figure 13*). Leave the flesh attached, place the spine in a barcode-labeled bag, and freeze. Record the data on your deck sheet and enter the data into ATLAS as specimen code 6 (spine). Store the dogfish specimens together in a clearly labeled bag in the freezer, to ensure that they you are all turned in post-deployment.

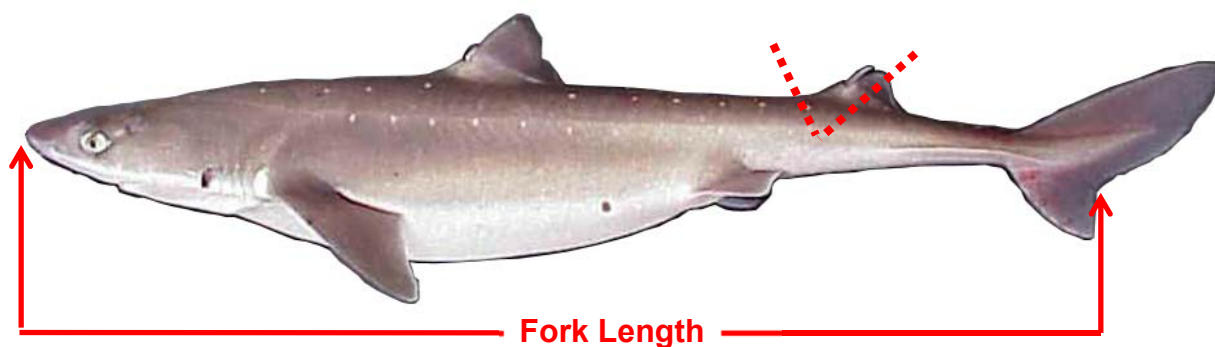


Figure 13. Spiny dogfish fork length and age structure collection

The “basket dump” method works for many species, however it does *not* work well for spiny dogfish, which have sandpaper-like skin and tend to clump and stick together. Use other methods to select your biospecimen fish randomly, such as choosing a random start point within your sample and setting aside the next 10 dogfish.

Example: Haul #27 has a fair amount of spiny dogfish, so Douglas decides to collect the first 10 dogfish after his hake average weight sample for his dogfish biospecimen sample.

Fish Collection

The observer program can always use frozen fish specimens of just about anything of reasonable size. Please **wrap fish individually and label clearly**. If you see a rare or uncommon fish, or a fish that is out of its listed geographic range, please bring it back. We always appreciate high quality fish and invertebrate pictures, especially of rare species.



Keep a freezer inventory to ensure all of your frozen specimens are turned in post-deployment.

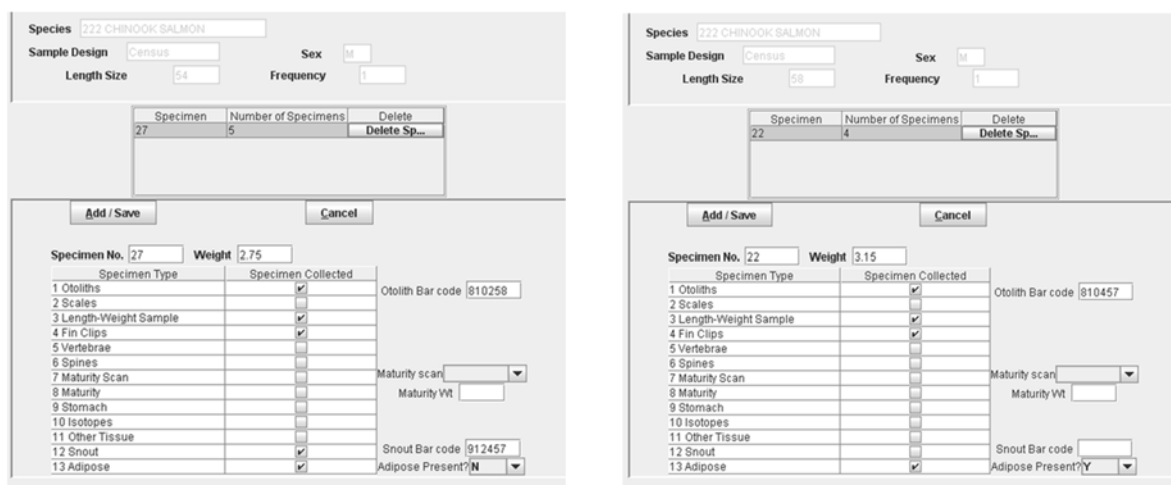
Entering Specimen Data in ATLAS

The ATLAS Specimen Form has additional fields for specimen data in the hake fishery, triggered by the “HAK” haul purpose code. **For all specimens, enter the unique specimen number you assign and the weight**, which will automatically check specimen type 3.

Salmon biospecimens:

Chinook and coho CWT and genetics data are entered into ATLAS specimen data (see Figure 14).

- **For Chinook and coho:**
 - Record the genetics barcode in the “Otolith Bar code” field, which will automatically check specimen type 1, and check the specimen type “4 Fin Clips” checkbox.
 - Record whether the adipose fin was present by selecting Y, N, or U from the “Adipose Present?” dropdown, which will automatically check specimen type 13.
 - If you collected the snout from a CWT-tagged specimen, enter the snout barcode in the “Snout Bar code” field, which will automatically check specimen type 12.



Specimen	Number of Specimens	Delete
27	5	Delete Sp...

Specimen Type	Specimen Collected
1 Otoliths	<input checked="" type="checkbox"/>
2 Scales	<input type="checkbox"/>
3 Length-Weight Sample	<input checked="" type="checkbox"/>
4 Fin Clips	<input checked="" type="checkbox"/>
5 Vertebrae	<input type="checkbox"/>
6 Spines	<input type="checkbox"/>
7 Maturity Scan	<input type="checkbox"/>
8 Maturity	<input type="checkbox"/>
9 Stomach	<input type="checkbox"/>
10 Isotopes	<input type="checkbox"/>
11 Other Tissue	<input type="checkbox"/>
12 Snout	<input checked="" type="checkbox"/>
13 Adipose	<input checked="" type="checkbox"/>

Specimen	Number of Specimens	Delete
22	4	Delete Sp...

Specimen Type	Specimen Collected
1 Otoliths	<input checked="" type="checkbox"/>
2 Scales	<input type="checkbox"/>
3 Length-Weight Sample	<input checked="" type="checkbox"/>
4 Fin Clips	<input checked="" type="checkbox"/>
5 Vertebrae	<input type="checkbox"/>
6 Spines	<input type="checkbox"/>
7 Maturity Scan	<input type="checkbox"/>
8 Maturity	<input type="checkbox"/>
9 Stomach	<input type="checkbox"/>
10 Isotopes	<input type="checkbox"/>
11 Other Tissue	<input type="checkbox"/>
12 Snout	<input type="checkbox"/>
13 Adipose	<input checked="" type="checkbox"/>

Figure 14. ATLAS entry for Chinook and coho genetics for CWT-tagged and non CWT-tagged specimens

Species: 307 ROUGH-EYE ROCKFISH

Sample Design: Census Sex: M

Length Size: 57 Frequency: 1

Specimen	Number of Specimens	Delete
12	3	Delete Sp...

Add / Save Cancel

Specimen No. 12 Weight 2.56

Specimen Type	Specimen Collected
1 Otoliths	<input checked="" type="checkbox"/>
2 Scales	<input type="checkbox"/>
3 Length-Weight Sample	<input checked="" type="checkbox"/>
4 Fin Clips	<input checked="" type="checkbox"/>
5 Vertebrae	<input type="checkbox"/>

Otolith Bar code: 804575

Figure 15. ATLAS entry for genetics specimen

Genetics:

For non-salmon genetic specimens, record the otolith barcode in the “Otolith barcode” field, which will automatically check specimen type 1, and check the specimen type “4 Fin Clips” checkbox (Figure 15).

Species: 66 SPINY DOGFISH SHARK

Sample Design: Simple Random Sex: F

Length Size: 45 Frequency: 1

Specimen	Number of Specimens	Delete
5	3	Delete Sp...

Add / Save Cancel

Specimen No. 5 Weight 0.85

Specimen Type	Specimen Collected
1 Otoliths	<input checked="" type="checkbox"/>
2 Scales	<input type="checkbox"/>
3 Length-Weight Sample	<input checked="" type="checkbox"/>
4 Fin Clips	<input type="checkbox"/>
5 Vertebrae	<input type="checkbox"/>
6 Spines	<input checked="" type="checkbox"/>

Otolith Bar code: 12345

Figure 16. ATLAS entry for spiny dogfish age structure specimen

Spiny dogfish age structures:

For spiny dogfish age structure specimens, record the age structure barcode in the “Otolith barcode” field, which will automatically check specimen type 1, and check the specimen type “6 Spines” checkbox (Figure 16).

Data Quality Control

Although all data is recorded under the lead observer’s cruise number, **both observers are equally responsible for accurate data collection and entry.** Check each other’s deck sheet calculations and entry into ATLAS on a daily basis. Develop a data-entry/data-check system to ensure all data is entered and checked for accuracy (e.g., checkmarks, date/time). Use the red pencil issued with your hake gear to help you track which data has been double-checked and entered into ATLAS. Each pair of observers is a team and will most likely debrief together. Please work together to collect the best data possible.

Communication

Please do not hesitate to bring any questions, concerns, and suggestions to program staff at any time. All hake vessels will have an in-season advisor. In addition to the manual, **your in-season advisor is a great resource for answering sampling questions and responding to any problems** that may arise. They will also let you know about any data errors found which can be fixed at sea, thereby speeding up your debriefing process. We encourage you to communicate directly with A-SHOP staff or with Jon McVeigh, Program Manager for the West Coast Observer Programs (see Appendix C for contact information). Following your debriefing, please fill out the anonymous exit survey, which provides us with valuable feedback about the program.

Mid-Cruise

Every observer will have a mid-cruise conducted via ATLAS message or by phone. After your first few days on board, you will be sent a list of questions asking about sampling methods to ensure that the protocols are clear and easy to follow. Answer the mid-cruise questions completely and promptly. If you or the observer program feels the interview should be done verbally, a time will be arranged so that it can be conducted over the phone.

Debriefing and Specimen Turn-in

Notify your contractor and in-season advisor of your estimated arrival time in port. When you return from your hake deployment, **come directly to the A-SHOP office** – Room 1156 in Building 4. You will need to debrief from your hake cruise as soon as you return, and before deploying to Alaska.

Turn in all of your data and specimens prior to debriefing.

Deliver salmon snouts, dogfish samples, and clearly labeled specimens to the hake section of the Building 4 wet lab freezer.

Use the Disembark Checklist in your logbook as a guide and check in with the A-SHOP staff upon arrival at Sand Point.

Contractors need to notify the A-SHOP to schedule a pre-debriefing appointment when their observers return from deployment. If an observer is *unable to arrive on time* for their scheduled appointment, the debriefer needs to be notified.

Vessel surveys may be completed before you arrive at Sandpoint or at your appointed check-in time. The vessel survey link is: <https://chum.afsc.noaa.gov:7104/apex/f?p=189>

Gear Check-Out and Care

Every observer pair will check out a set of gear that is specific to the sampling requirements for the hake fishery. The “A-SHOP Gear Sheet” in the front of the logbook lists the gear provided by the A-SHOP program. Store any extra gear (otolith vials, deck forms, Chinook genetics envelopes, etc.) in your stateroom. The CWT-detecting wand is an expensive and sensitive piece of scientific equipment; please find a dry area near the observer sampling station where you can store the wand and extra gear.

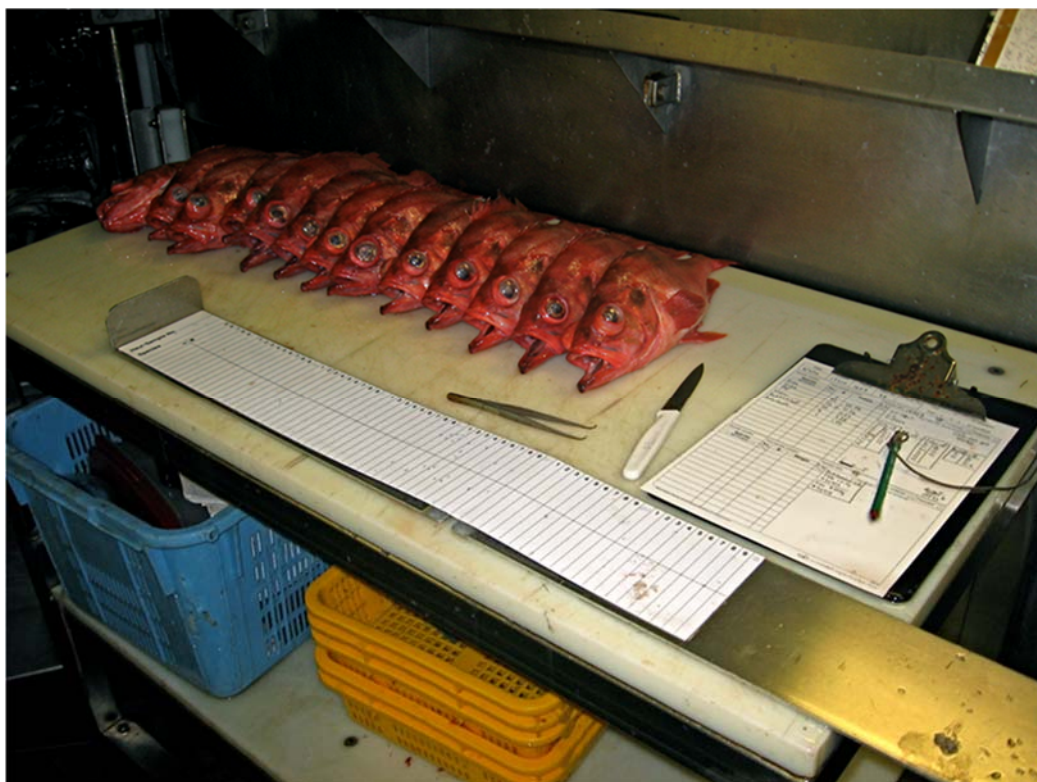
Gear Check-in Protocol

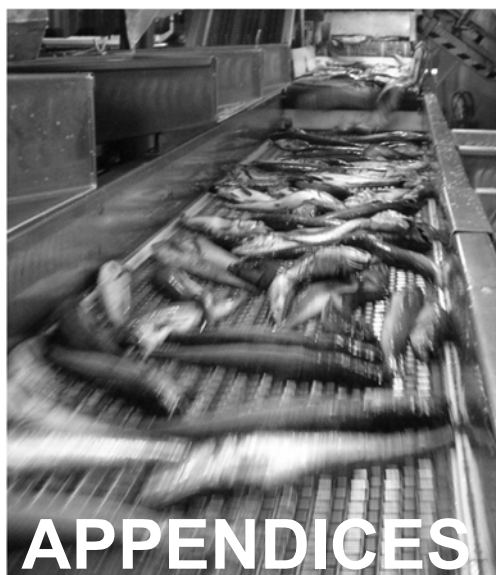
When you check-in with A-SHOP staff, you will turn in your PLB and use our observer check-in computer to make a gear check-in appointment and begin pre-debriefing tasks.

Photo Credits

Thanks to observers Lauren Ackein, John Bieraugel, Cassandra Dahl, Cassandra Donovan, Lauren Hartman, Roy Morse, Merri Strayer, and Mark Wormington for the photographs.

The A-SHOP really appreciates you sharing copies of photos taken during your deployment. We use observer photos in training materials, fish lectures, and scientific presentations. If you do not wish for your photos to be used for these purposes, please let us know when you give them to us.





Appendices Table of Contents

At-Sea Hake Observer Program (A-SHOP) Guidelines & Policies	App. A
Pre-Cruise Vessel Bycatch Meeting Outline	App. B
Observer Program Contact Information.....	App. C
Catcher Vessel ADFG Numbers.....	App. D
Flow Scale Subsampling Decksheet Example.....	App. E1
Basket Subsampling Decksheet & Discard Calculation Example.....	App. E2
Frequently Asked Questions.....	App. F
Flow Scale Documents	App. G
Contractor Information	App. H
Whale Entanglement Hotline.....	App. I

Appendix A. At-Sea Hake Observer Program (A-SHOP) Guidelines & Policies

Observer Eligibility and Training Requirements

Eligibility requirements:

- Observer is a currently certified North Pacific Observer Program (NPOP) observer.
- Observer has completed one or more satisfactory deployments (Deployment scores: 1 = satisfactory and 0 = unsatisfactory) with the NPOP.
- Observer has received satisfactory deployment scores for every vessel/plant from their most recent deployment.
- If an observer receives an unsatisfactory deployment score on an A-SHOP deployment, the observer must complete an A-SHOP 4-day training prior to deploying again in the hake fishery.

Training requirements:

- Observer must complete the safety training and meet any requirements for participating in drills and donning equipment, including donning an immersion suit in less than 60 seconds.
- Observer must pass the fish exam with an 80% or better.
- Observer must pass the written quiz with an 80% or better. This quiz is closed book.
- Observer must attend the full, 4-day A-SHOP training.
 - Arrive on time, at the beginning of each day and returning from breaks. Tardiness may result in being dropped from the class.
- Observer must successfully complete any homework or in-class exercises and make any corrections requested by the trainers.
- Use of electronic devices during fish lab and exam is prohibited.

Additionally, new trainees must be able to demonstrate to the trainer that they have the attitude and ability required to perform a difficult job independently, and to act professionally in stressful situations.

Observers who do not pass both the fish exam and the written quiz must take the full A-SHOP training again. In the spring, when back-to-back trainings are offered, observers in the first training may not repeat the training immediately afterwards, due to class size limits.

Training class size is limited to 25 observers unless the Program allows more, as deemed necessary.

Appendix B. Pre-Cruise Bycatch Discussion Outline

NOAA Fisheries At-Sea Hake Observer Program

Purpose of discussion: To stress cooperation and communication between observer and vessel personnel in order to maximize sample sizes for hauls with species of concern.

Who should attend: Observers, captain, factory manager/foreperson, backline operator

Outline:

1. Introductions

- a. Who is in attendance? Who is not at the meeting that needs to be in the loop (i.e. backline operator)?
- b. What is the preferred order of communication on the vessel? (e.g. foreperson → factory manager → captain)

2. Review bycatch limit - Discuss the species of concern in 2019

Suggested thresholds of action - If a species of concern might be present in the following amounts, the observer may require assistance to maintain large sample sizes

Hauls with >50 Chinook (individual fish)

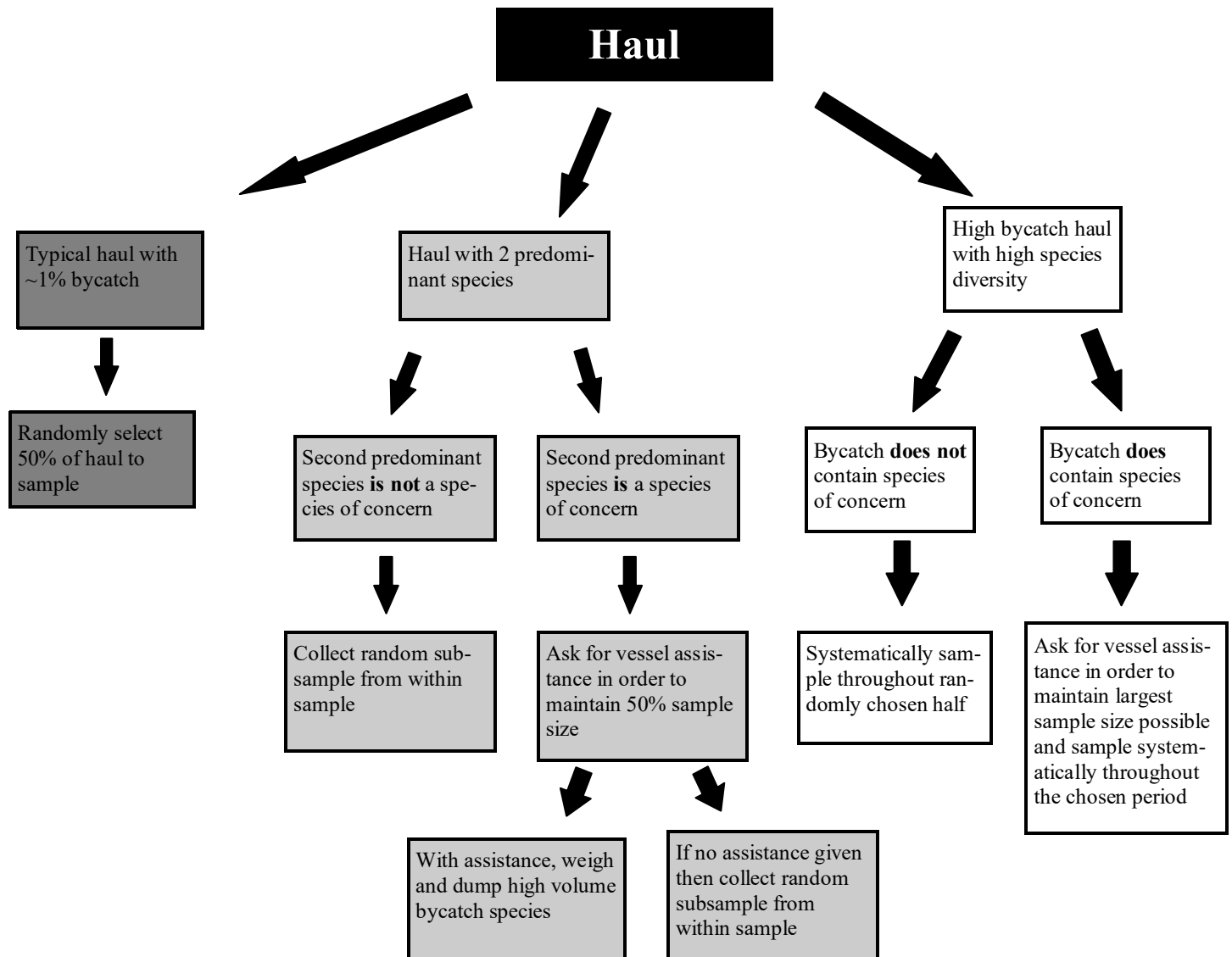
Hauls with >5 mt of darkblotched (~6000 fish)

Hauls with >2 mt of POP (~2400 Fish)

3. Sampling goals - Remind crew that the observer will collect 50% samples whenever possible. Use the flow chart below to go over the sampling options for tows with species of concern. Discuss the actions that can be taken to maximize sample size when the haul is dirty or when species of concern are an issue:

- A. Notifying observers of dirty hauls (making observer aware of bycatch if they were not present at the codend dump)
- B. Vessel providing help (assistance with sorting, lifting, dumping)
- C. Adjusting belt speed
- D. Collecting multiple small samples (with cooperation from bleeder and sorters)

A-SHOP Sampling Protocol Review



Species of concern may vary over time, but high levels of Chinook bycatch are always reason for maintaining a large samples size whenever possible.

Appendix C. Observer Program Contact Information

A-SHOP contacts

Office location: Sand Point, Building 4, Room 1156

Cassandra Donovan Phone: 206-526-6724
E-mail: Cassandra.Donovan@noaa.gov

Vanessa Tuttle Phone: 206-860-3479
E-mail: Vanessa.Tuttle@noaa.gov

Jon McVeigh Phone: 206-302-2423
E-mail: Jon.McVeigh@noaa.gov

Note: Please leave a message, including a phone number, if we do not answer. We are likely just away from our desks for a moment and will call you right back. Listen to what the voice mail message says. When one of us is out at sea, the message will say so, and you should contact the next person on this list.

ATLAS questions or problems

Glenn Campbell (AFSC): Phone: 206-526-4240
Email: Glenn.Campbell@noaa.gov

Enforcement

For emergencies: Hot line: 1-800-853-1964

Non-emergency:

Special Agent Mitch Kiyotakitsune Phone: 541-351-5106
Email: mitchel.kiyotakitsune@noaa.gov

King County Sexual Assault Resource Center (KCSARC)
24 hours a day at 1-888-99-VOICE (1-888-998-6423), www.kcsarc.org

If you or the vessel sight an **entangled marine mammal**, please report the incident to the NOAA Marine Mammal Disentanglement Hotline at **1-877-SOS-WHAL(e)** (1-877-767-9425).

Appendix D. Catcher Vessel ADFG numbers

Catcher Vessel	ADFG #
Alyeska	45
Arctic Fury	68869
Bay Islander	49618
Blue Fox	62892
Caitlin Ann	59779
California Horizon	33697
Collier Brothers	54648
Crysan	575942
Leslie Lee	56119
Lisa-Melinda	41520
Marathon	49617
Mar-Gun	12110
Mark I	6440
Messiah	66196
Miss Berdie	59123
Miss Sarah	64109
Miss Sue	580055
Misty Dawn	68858
Muir Milach	41021
Neahkahnne	32858
New Life	21845
Nordic Fury	200
Nordic Star	961

Catcher Vessel	ADFG #
Pacific Challenger	6931
Pacific Fury	33
Pacific Prince	61450
Pacific Ram	61792
Papado II	55512
Pegasus	57149
Perseverance	12668
Predator	33744
Raven	56395
Sea Clipper	62
Sea Storm	40969
Sea Dawn	77
Seeker	59476
Starward	39197
Traveler	58821
Western Dawn	22294
Winona J	43383

A-SHOP Deck Form

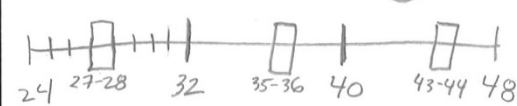
Sample #	Subsample #	Sample Size	Presorted?
1		29340 kgs	Y (N)

[illegible]

~48 MT 1 (2) lots of
~1 MT subsamples yellowtail

FS end: 53387

FS start: 24047

$$RNT = 4/8$$


↑
have arg wt
RNT = 1/3

POP

F	M	
42	39	F 45-.84-510 847
45	47	M 39-.52-510 848
	48	M 47-.98-510 849

Sample #	Subsample #	Sample Size	Presorted?
	101	1121 kgs	Y <u>N</u>

Species	#	Weight	% ret.
-----Keypunch-----	111	1121.00	X
Hake	0	1013.78	100
Hake	57	24.12	100
Yellowtail	24	39.20	100
Yellowtail	26	42.85	100
Am shad	1	0.15	100
squid und	3	0.90	0

hake

F	M
32	29
34	33
36	35
37	36
40	38
42	

FS end: 28114

FS start: 26993

sample wt 1121.00

- have aug - 24.12

- bycatch -83.10

1.1.1 = 1013 78

A-SHOP Deck Form

Date	Lead Cruise	Permit	Haul #	Sampled by
5/27/16	13579	9876	42	13579

Page 51 of _____ for Vessel
Page 3 of 5 for Haul

Sample #	Subsample #	Sample Size	Presorted?
	102	1078 kgs	Y <input checked="" type="radio"/> N

Species	#	Weight	% ret.
-----Keypunch-----	46	1078.00	X
Hake	8	1001.70	100
Yellowtail	25	41.08	100

Sample design, sex, lengths, specimens, viabilities, mammals, birds, notes:

sample wt 1078.00
-bycatch -76.30
hake wt = 1001.70

FS end: 36097

A-SHOP Deck Form

Date	Lead Cruise	Permit	Haul #	Sampled by
5/27/16	13579	9876	42	13579

Page 52 of _____ for Vessel
Page 4 of 5 for Haul

Sample #	Subsample #	Sample Size	Presorted?
	103	1076 kgs	Y <input checked="" type="radio"/> N

Species	#	Weight	% ret.
-----Keypunch-----	56	1076.00	X
Hake	8	986.46	100
Yellowtail	33	53.78	100
Yellowtail	20	32.64	100
Squid unid	2	0.20	0
Parake	1	2.92	100

Sample design, sex, lengths, specimens, viabilities, mammals, birds, notes:

sample wt 1076.00
-bycatch -89.54
hake wt = 986.46

FS end: 44047

FS start: 42971

oto: genetics

RE F 51-2.92 510850

Date	Lead Cruise	Permit	Haul #	Sampled by
5/27/16	13579	9876	42	13579

Page 53 of _____ for Vessel
Page 5 of 5 for Haul

Sample #	Subsample #	Sample Size	Presorted?
	104	944 kgs	Y <input checked="" type="radio"/> N

Species	#	Weight	% ret.
-----Keypunch-----	66	944.00	X
Hake	8	845.17	100
Yellowtail	29	47.80	100
Yellowtail	32	50.08	100
Squid unid	5	0.95	0

Sample design, sex, lengths, specimens, viabilities, mammals, birds, notes:

sample wt 944.00
-bycatch -98.83
hake wt = 845.17

FS end: 52051

FS start: 51107

Appendix E2. Basket Subsampling Decksheet & Discard Calculation Example

A-SHOP Deck Form

Date	Lead Cruise	Permit	Haul #	Sampled by
5/28/16	13580	9867	44	13580

Page 55 of _____ for Vessel

Page 1 of 5 for Haul

Sample #	Subsample #	Sample Size	Presorted?
1		29668 kgs	Y <input checked="" type="radio"/> N

Species	#	Weight	% ret.																
-----Key punch-----	27	17.77	X																
Hake	0	0	100																
Spiny dog	0	0	0																
Widow	3	1.98	0																
Yellowtail	6	9.64	0																
Lamprey mTH	1	0.02	0																
Squid unid	17	6.13	0																
Sample design, sex-lengths, specimens, viabilities, mammals, birds, notes:																			
RNT 1/2 ①2 ~ 60 mt																			
Lots of dogfish!																			
FS end: 29668																			
FS start: 0																			
29668																			
Will sample 2-predom using baskets.																			
Sample ~ 30 mt,																			
3 subsamples 0-10																			
R# 1																			
0-30 mt / baskets @ 0, 10, 20																			
Take average wt sample F.S.-mcp																			
<table border="0"> <tr> <td>Widow</td> <td>Yellowtail</td> </tr> <tr> <td>M F</td> <td>M F</td> </tr> <tr> <td>36 37</td> <td>41 42</td> </tr> <tr> <td>41</td> <td>43</td> </tr> <tr> <td></td> <td>45</td> </tr> <tr> <td>Otos</td> <td>Otos</td> </tr> <tr> <td>731511 m 36, 0.70</td> <td>731513 F 43, 1.18</td> </tr> <tr> <td>731512 F 37, 0.76</td> <td>731514 F 45, 1.26</td> </tr> </table>				Widow	Yellowtail	M F	M F	36 37	41 42	41	43		45	Otos	Otos	731511 m 36, 0.70	731513 F 43, 1.18	731512 F 37, 0.76	731514 F 45, 1.26
Widow	Yellowtail																		
M F	M F																		
36 37	41 42																		
41	43																		
	45																		
Otos	Otos																		
731511 m 36, 0.70	731513 F 43, 1.18																		
731512 F 37, 0.76	731514 F 45, 1.26																		
Discard calcs																			
sub discard																			
$18.12 + 15.14 + 17.28$ $99.23 + 101.06 + 108.60$ $= \frac{50.54}{308.89} \times 62148 = 10,168.54 \text{ kg}$																			
sample discard																			
$1.98 + 9.64 + .02 + 6.13 + 1.78 + .02$ 29668 $= \frac{19.57}{29668} \times 62148 = 40.99 \text{ kg}$																			
<table border="0"> <tr> <td>sub</td> <td>sample</td> </tr> <tr> <td>(total discard)</td> <td>$10,168.54 + 40.99$</td> </tr> <tr> <td>pre-sort</td> <td>$+ 129.85 =$</td> </tr> <tr> <td></td> <td>$10,339.38 \text{ kg}$</td> </tr> </table>				sub	sample	(total discard)	$10,168.54 + 40.99$	pre-sort	$+ 129.85 =$		$10,339.38 \text{ kg}$								
sub	sample																		
(total discard)	$10,168.54 + 40.99$																		
pre-sort	$+ 129.85 =$																		
	$10,339.38 \text{ kg}$																		

Discards from only 2 predominant species

Include discards non-predominant species from subsamples

At-Sea Hake Observer Program, ver 2016

A-SHOP Deck Form

Date	Lead Cruise	Permit	Haul #	Sampled by
5/28/16	13580	9867	44	13580

Page 56 of _____ for Vessel

Page 2 of 5 for Haul

Sample #	Subsample #	Sample Size	Presorted?
	101	99.23 kgs	Y <u>(N)</u>

Species	#	Weight	% ret.	Sample design, sex-lengths, specimens, viabilities, mammals, birds, notes: 3 Baskets @ 10
-----Keypunch-----	56	99.23	X	
Hake	0	28.41	100	
Hake	0	26.98	100	
Hake	0	25.72	100	
Spiny dog	56	18.12	0	

FS end:

FS start:

A-SHOP Deck Form

Date	Lead Cruise	Permit	Haul #	Sampled by
5/28/16	13580	9876	44	13580

Page 57 of _____ for Vessel

Page 3 of 5 for Haul

Sample #	Subsample #	Sample Size	Presorted?
	102	101.06 kgs	Y <u>(N)</u>

Sample design, sex-lengths, specimens, viabilities, mammals, birds, notes:

Species	#	Weight	% ret.
-----Keypunch-----	165	102.84	X
Hake	49	31.64	100
↓	40	29.02	100
Hake	32	25.26	100
Spiny dog	41	15.14	0
squid unid	3	1.78	0

A-SHOP Deck Form

Date	Lead Cruise	Permit	Haul #	Sampled by
5/28/16	13580	9876	44	13580

Page 58 of _____ for Vessel

Page 4 of 5 for Haul

Sample #	Subsample #	Sample Size	Presorted?
	103	108.60 kgs	Y <input checked="" type="radio"/> N

Species	#	Weight	% ret.	Sample design, sex-lengths, specimens, viabilities, mammals, birds, notes: 3 bKts @ 20 FS end: FS start:
-----Keypunch-----	45	108.60	X	
Hake	0	32.16	100	
↓	0	28.72	100	
Hake	0	30.42	100	
Spiny dog	44	17.28	0	
Lamprey in ID	1	0.02	0	

A-SHOP Deck Form

Date	Lead Cruise	Permit	Haul #	Sampled by
5/28/16	13580	9876	44	13580

Page 59 of _____ for Vessel

Page 5 of 5 for Haul

Sample #	Subsample #	Sample Size	Presorted?
2		62277.85 kgs	<input checked="" type="radio"/> Y <input type="radio"/> N

Species	#	Weight	% ret.	Sample design, sex-lengths, specimens, viabilities, mammals, birds, notes: Shark + 129.85 FS end: 62148 FS start: 62277.85 Cut shark into 3 pieces #1 45.96 #2 42.18 #3 41.71 129.85 kg Shark total l = 215cm Fork l = 201cm
-----Keypunch-----	1	129.85	X	
Salmon shark	1	129.85	0	

Appendix F. Frequently Asked Questions

- 1. I cannot log into ATLAS or I cannot transmit, what do I do?**
Contact Glen Campbell. His contact information is in Appendix C.
- 2. Which estimate do I use as the vessel estimate on the OHF? The estimate given when the bag is hauled up or the one recorded in the logbook?**
Use the vessel estimate recorded in the logbook.
- 3. For “Estimated Discard Weight” on the OHF, do I use the actual weighed discards from my sample or should I extrapolate it up to the haul level?**
Extrapolate discards up to the haul level. See “How to Calculate Estimated Discard Weight” on page 23 for discard estimation options.
- 4. How do I calculate percent retained?**
Percent retained is an estimate. Visually estimate how much of each species is being retained by the vessel. Ask vessel crew which belts are going over-board (discard) and which are going to fishmeal (retained) so that your percent retained estimates are as accurate as possible.
- 5. I am on a mothership and the captain is recording catcher vessel discards in the vessel logbook. How do I account for these discards in my data?**
Use the protocols in the “Mothership Catcher Vessel Discard Accounting” on page 25 for how to track and record catcher vessel discards.
- 6. I am on a mothership and the captain has not received any discard info from one of the catcher vessels. What do I do?**
Ask the mothership captain to obtain the catcher vessel’s discard amounts from the catcher vessel captain. Catcher vessel discard data will be reviewed and verified during debriefing.
- 7. What changes if the vessel is participating in the tribal fishery?**
You will enter a tribal code in the CDQ/Tribal code column for each haul. Each tribe has its own code. Contact the A-SHOP for the appropriate code. The vessel you are on will receive catch from tribal catcher vessels, so “Vessel Type” is code 2 (mothership) and the ADFG numbers for the catcher vessels need to be recorded on the OHF. Tribal vessels do not carry observers or EM so there will not be CV discard data. All other sampling and data protocols remain the same.
- 8. What are the haulback notification guidelines for hake?**
The vessel is required to notify you 15 minutes prior to haulback. Regardless of this requirement, it is your responsibility to know what is going on during your shift. Never assume the crew is going to inform you - it is not their job to search the boat for you. It is reasonable to say that you will be either in the factory, the galley or the wheelhouse. If reasonable notification efforts are not made, discuss the situation with the captain,

document it in your logbook, and inform your in-season advisor.

9. Whose cruise number goes on the deck forms and genetic envelopes?

The lead observer's cruise number goes on both, regardless of who collected the data.

10. I subsampled for two predominant species and randomly collected my hake average weight sample from outside a subsample. How do I enter it in ATLAS?

You cannot enter a count and weight for a species in a sample that is also recorded as 0 count/0 weight in the same sample. Record your hake average weight sample as a separate small sample (e.g. sample #104 – hake: 57 count / 29.54kg weight).

11. I have 10 spiny dogfish sharks and 1 spiny dogfish shark headless body in my species comp sample. I took sex/lengths from all 10 whole fish - do I use sample design code 10 (census) or another code?

Include the weight of the shark part in with the weight of the 10 whole sharks and record the lengths as census - code 10.

12. For sex/lengths, when do I use sample design code 10?

Sample design codes are recorded at both the haul level, for species comp samples, and at the sex/length sample level - they are independent of each other. For example, if you sampled half of a haul, by randomly choosing the first or second half, your haul sample design code would be 6 - simple random. If you took sex/lengths from all the rougheye rockfish in your species comp sample, your length sample design would be 10 - census.

13. What do we do if it is time to change shift and the observer whose shift is ending is in the middle of a sample?

The usual protocol for shift-crossing samples is for the observer coming on shift to come to the factory, check-in with the observer currently sampling about haul specifics (size, diversity, average weight sample coming up, etc.) or check the decksheet where all this is written and then say something along the lines of 'OK, I got it from here, have a good off shift, don't eat too much ice cream,' and then take over sampling the haul.

14. What if I need to drop off frozen specimens on a Saturday, Sunday or federal holiday?

Access to the NOAA Sand Point campus is allowed from 6am – 6pm, Monday-Friday (excluding federal holidays). Most hake boats remain in port for several days at the end of hake deployments so if you disembark on the weekend, you should be able to return on Monday to pick up your frozen specimens and bring them to the NOAA campus. If the boat will be leaving port before Monday morning, inform the A-SHOP as soon as possible and arrangements can be made.

Appendix G. Flow Scale Documents

Revised 4/10/13

OMB Control No. 0648-0330
Expiration Date: 11/30/2015



RECORD OF DAILY SCALE TESTS

Vessel Name: _____ Date: _____

Time test started: _____

I. TEST PLATFORM SCALE

10kg _____
(9.95-10.05kg)

25kg _____
(24.88-25.13kg)

50kg _____
(49.75-50.25kg)

II. 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		8		15		21	
2		9		16		22	
3		10		17		23	
4		11		18		24	
5		12		19		25	
6		13		20		26	
7		14		Total weight all fish+baskets		0.00	

III. CALCULATE PERCENT ERROR OF FLOW SCALE

Scale Indicator

Begin Test: _____ kg

End Test: _____ kg

TOTAL WEIGHT FISH AND BASKETS (kg)	-	WEIGHT OF BASKET	=	PLATFORM SCALE WEIGHT OF FISH (kg)	WEIGHT OF FISH ON FLOW SCALE (kg)	ERROR (B) - (A)	% ERROR = (C) ÷ (A) X 100
				(A)	(B)	(C)	

IV. SEA CONDITIONS (BEAUFORT SCALE) AT TIME OF SCALE TEST (CHECK 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

Daily Flow Scale printout example

Marel M2200 X02 Haul Report

=== HAULS ===

Date and Time.....: 2016-11-20 14:00:38

Device name.....: Marel M2200 X02

Vessel.....: Boaty McBoatFace

Vessel Permit #....:

Accumulated Total.: 46927218 kg

CAL/CON/MARCAL....: 15/13/461

Total Hauls/Tests.: 46840621 kg / 86598 kg

Haul #	Date	Time	Weight	Totalizer	ReLoads
-> 1281	2016-11-18	23:43:02	14438.2 kg	46912780.0 kg	0
1282	2016-11-18	19:03:38	0.0 kg	46912364.0 kg	0
1280	2016-11-18	11:47:30	12962.0 kg	46899403.0 kg	0
1279	2016-11-18	02:50:55	29790.0 kg	46869613.0 kg	0
1278	2016-11-17	22:25:28	17146.0 kg	46852468.0 kg	0
1277	2016-11-17	17:25:08	42671.0 kg	46809796.0 kg	0
1276	2016-11-17	10:28:07	59858.0 kg	46749525.0 kg	0

Appendix H. Contractor Information

Alaskan Observers, Inc. (AOI)

130 Nickerson, Suite 206

Seattle, WA 98109

Phone: (206) 283-7310

Fax: (206) 283-6519

E-mail: aoistaff@alaskanobservers.com

www.alaskanobservers.com

Saltwater, Inc. (SWI)

733 N. Street

Anchorage, AK 99501

Phone: (907) 276-3241

Fax: (907) 258-5999

E-mail: stacey.hansen@saltwaterinc.com

E-mail: joann.alvarez@saltwaterinc.com

www.saltwaterinc.com

TechSea International Inc.

6823 Oswego PL NE, STE 1

Seattle, WA 98115

Phone: (206) 285-1408

Fax: (206) 285-1535

E-mail: Troy@techsea.com

www.TechSea.com

Appendix I How to Report an Entangled Whale

The public plays an important role in saving distressed whales, like those that become entangled. Prompt reporting and monitoring of the animal are the best ways to help.

You can report large whales in distress to either:

**The 24/7 reporting hotline:
1-877-SOS-WHALE (767-9425)**

or

**The United States Coast
Guard on VHF CH-16**

Entangled whales are unpredictable and potentially dangerous. Please keep a safe distance and do not approach the animal. You can continue to monitor the animal's condition and document the encounter while waiting for a response team to arrive.

What to include in your Report

1. Location of the animal;
2. A detailed description of the color and gauge of rope;
3. Location of gear on the whale;
4. Color and size of buoys;
5. Direction of the whale's movement, including whether it is solitary or with a group;
6. Behavior of the whale, including whether it is surfacing or diving, and the length of dive times;
7. Species of whale; and
8. Size and condition of the whale.

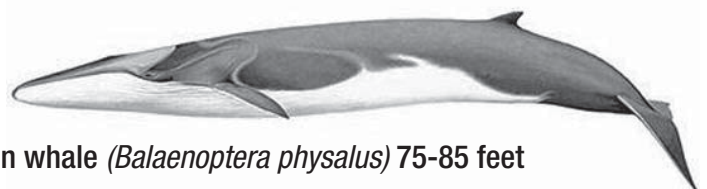
Documentation in the form of photos and videos of the entangled whale can provide valuable information to the responders and resource managers. The information from each whale entanglement contributes to our larger knowledge-base and can be a valuable tool in helping to prevent future entanglements.



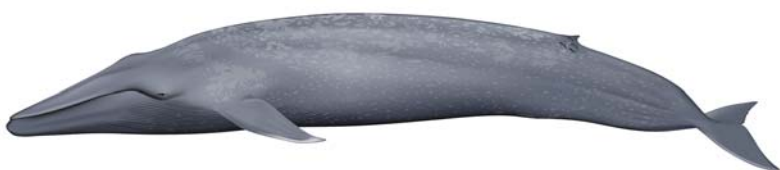
Gray Whale (*Eschrichtius robustus*) 39-46 feet



Humpback whale (*Megaptera Novaeangliae*) 40-60 feet



Fin whale (*Balaenoptera physalus*) 75-85 feet



Blue whale (*Balaenoptera musculus*) 88-108 feet



**NOAA
FISHERIES**

Index

Adipose fin.....	28	Genetics.....	34, 35
Alaskan Observers, Inc. (AOI)	See	Guidelines & Policies , A-SHOP ..	Appendix
Contractor information		A	
Albatross	13	gull	13
ATLAS.....	9, 12, 36, 38, 45	Hoh.....	See Tribal fishery
ATLAS specimen data.....	37	In-season advisor	15, 17, 33, 39
At-sea transfers	4	Length to weight tables.....	16
Average weight decksheet example.....		Lengths.....	7, 11, 33, 35, 36
Appendix E		Makah	See Tribal fishery
Average weight samples	20	Marine Mammal Interaction and Specimen	
Biospecimen Sampling	33	Form.....	12
Biospecimen Sampling Protocols	34	Marine mammals	11, 12, 13
Bird Interaction, Activity and Species Form		MARPOL	9
.....	13	Mid-cruise	39
Bycatch	6, 7, 12, 19, 20, 27, 36	Mothership Catcher Vessel Discard	
Bycatch limits	6	Accounting.....	25
California halibut	26	Motion compensated platform scale (MCP)	
Canary rockfish.....	7	14, 15
CATCHER VESSEL ADFG NUMBERS.....	12,	non-fishing day	12
Appendix D		noon position.....	See non-fishing day
Catcher vessels.....	5	Observer Catch Estimates	14, 15, 16
Chinook genetics.....	30	Observer catch reporting.....	12
Coded wire tags. See CWT - coded wire tags		Observer program contact information....	See
Communication.....	39	Contact information	
Confidentiality	5	Organization chart, NOAA	8
Contact information	Appendix C	Otoliths.....	33, 35
Contractor information.....	Appendix I	Pectoral fin clip	See Chinook genetics
CWT - coded wire tags	28	Percent Retained	23
Data quality control.....	38	photos.....	33
Debriefing	39	Pre-cruise meetings.....	7
Discard Estimates.....	23	Pre-Cruise Vessel Bycatch Meeting Outline	
Discards, Mothership Catcher Vessels	25	Appendix B	
Disembark Checklist.....	39	Presorted Organisms	16
Dumping, codend.....	14	Priority list	4, 7, 11, 12, 13, 20, 33, 34, 35
EM – electronic monitoring.....	10, 25	Prohibited species	26
Enforcement.....	See Contact information	Protected Species	27
Estimated Discard Weight	23	Purpose code, VHF	12
Fish specimens	37	Quileute.....	See Tribal fishery
Flow scale	14, 15, 16	Quinault.....	See Tribal fishery
Flow Scale – MCP scale weight test.....	20	Random sample table.....	17
Flow scale test.....	15	Record of Daily Flow Scale Tests	Appendix
Frequently Asked Questions	Appendix G	H	
Gear.....	40	Regulations, fishing	9

Regulations, observer.....	5	Seabirds.....	12, 13
Regulations, vessel.....	9	Signing Documents.....	10
RNT, random number table	17	Species ID forms.....	32
Rockfish	7, 9, 33	Species of concern	7
Rockfish, sexing.....	35	Spiny Dogfish Protocols	36
Sablefish, sexing	35	Sturgeon	32
Safety	4	Subsampling Decksheet Example. Appendix E	
Salmon	27	Subsampling For Two Predominant Species	21
Salmon Biospecimen Sampling	28	Subset Sampling..... See Average weight samples	
Salmon retention	27	TechSea International Inc. See Contractor information	
Salmon Sampling Deck Form.....	29, 32	Time management.....	11
Salmon Subsampling	31	Tribal fishery.....	6
Saltwater, Inc. (SWI)	See Contractor information	Turtle, sea.....	13
Sampling	1, 5, 7, 8, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 27, 28, 29, 31, 39	vessel logbooks	9
Sampling for large sharks	16	Vessel safety checklist.....	4
Sampling options		Wand, CWT sampling	28, 29, 40
high bycatch sampling options.....	19	Wet Manual.....	34
Sampling, Species Composition	18	whale entanglement	13
Scale Testing	14		
sea turtles	12		