International Pacific Halibut Commission

Manual for Sampling Directed Commercial Landings (2026)

DISTRIBUTION:
IPHC Secretariat

BIBLIOGRAPHIC ENTRY
IPHC 2026. IPHC manual for sampling directed commercial landings (2026) *IPHC–2026–PSM01, 32 pp.*

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DEFINITIONS

A set of working definitions are provided in the IPHC Glossary of Terms and abbreviations: https://www.iphc.int/the-commission/glossary-of-terms-and-abbreviations

SAMPLING DIRECTED COMMERCIAL LANDINGS

The IPHC Secretariat collect otoliths, tissue samples, and associated length-weight data from Pacific halibut directed commercial landings within the IPHC convention area (Figure 1.1). The samples collected are known as Market Samples.

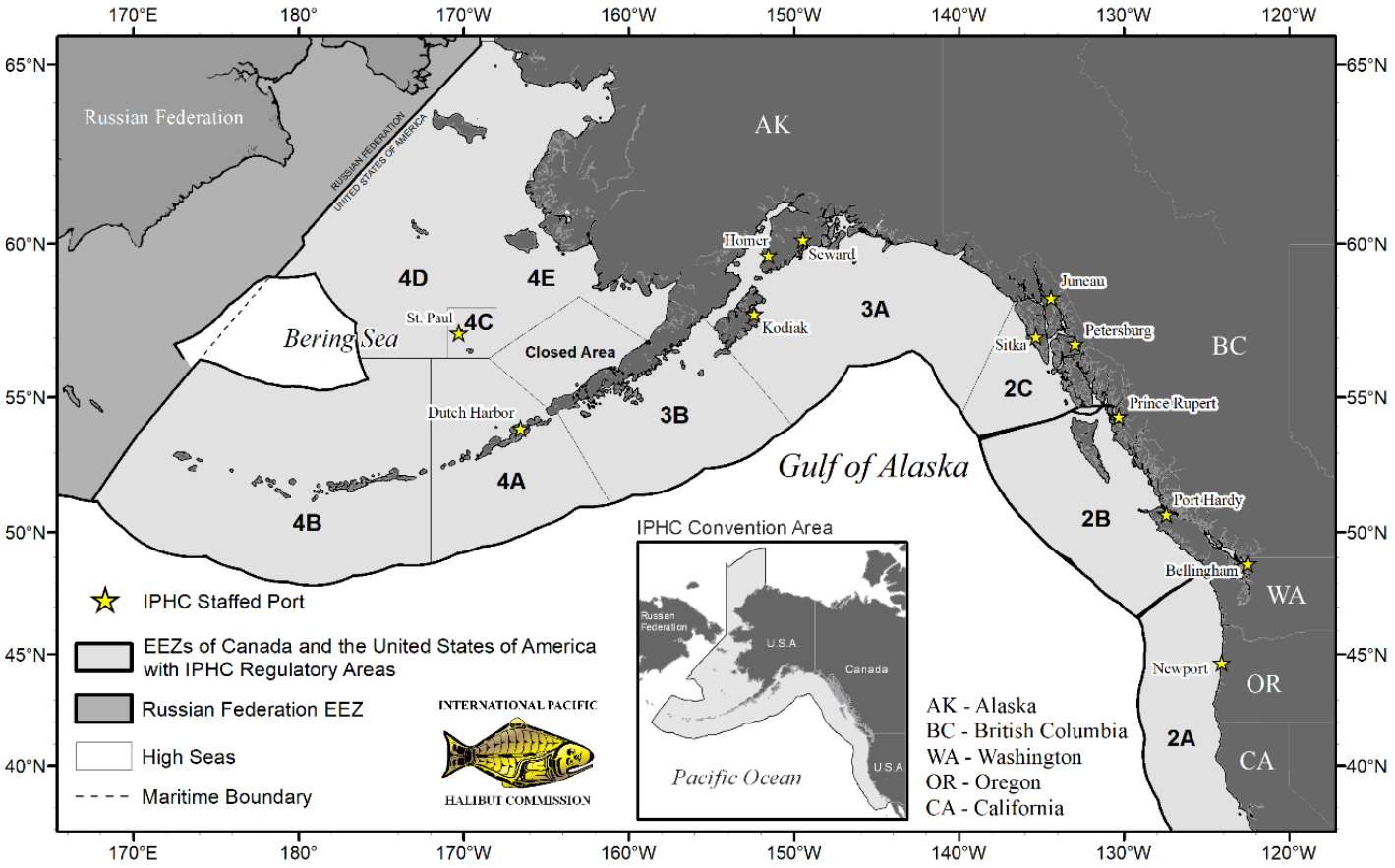


Figure 1.1. IPHC Convention Area and Regulatory Areas.

1.2 Canadian Landings

Canada's directed Pacific halibut fishery operates under an individual vessel quota (IVQ) system, where each licensed vessel is allocated a percentage of the IPHC Regulatory Area 2B fishery limit to harvest at any time over the fishing season. IVQ fish may be landed at any time however, IPHC secretariat are on call from 0600 to 1800 PST/PDT to sample Pacific halibut landings. Vessels are required to hail-out before fishing and hail-in to port before landing Pacific halibut and are encouraged to hail-in 24 hours in advance of landing to ensure there is an Archipelago Marine Research (AMR) dockside observer available to validate the catch. Hailed landings are reported to the IPHC by the Canadian Department of Fisheries and Oceans (DFO) via the Fishery Operations System (FOS). IPHC Secretariat use the FOS system to track Pacific halibut landings.

IPHC FDS(F) must build a good working relationship with plant personnel and AMR supervisors and validators (dockside observers). Good relationships with plant and AMR staff ensure FDS(F) obtain timely notifications of Pacific halibut landings. IPHC FDS(F) should be at the dock for the landing and ask the captain if commercial Pacific halibut will be landed. This is especially important if you are unsure a landing contains Pacific halibut.

1.3 U.S.A. Landings

1.3.1 IPHC Regulatory Area 2C, 3A, 3B, 4A, 4B and 4CDE/closed Landings

Alaskan vessels fish under an Individual Fishing Quota (IFQ) system. Vessel operators in Alaska are required to notify National Oceanic and Atmospheric Administration (NOAA) Office of Law Enforcement (OLE) three hours prior to unloading by completing a Prior Notice of Landing (PNOL). The landing must then occur within two hours of the time of landing given on the PNOL. IPHC Secretariat are notified via email regarding pending landings.

The NOAA OLE may grant waivers allowing vessels to unload sooner than the required three hours. If waivers occur which prevent landings from being sampled, IPHC FDS(F) should inform the IPHC Port Operations Coordinator.

Unloading of IFQ fish in Alaska may only occur between 0600 and 1800 AKST/AKDT, under IFQ regulations. IPHC Secretariat are on call from 0600 and 1800 AKST/AKDT to sample Pacific halibut landings, and variable hours in St. Paul. Contact a RAM Data clerk if landing information is not available ((800)304-4846)

1.3.2 IPHC Regulatory Area 2A

Vessels in IPHC Regulatory Area 2A are not required to provide prior notice when landing Pacific halibut. The IPHC Secretariat work with plant personnel, Pacific halibut buyers and vessel captains to determine when landings might occur.

1.4 Random Sampling

All sample designs must follow random sampling protocols. A random sampling procedure is one for which every unit in a sampling frame has an equal chance of appearing in the sample. Random sampling is critical because it guards against biases. Biased samples would provide a distorted understanding of the stock. There should be nothing that makes one day or landing or fish more likely to appear in the sample than any other day, landing, or fish.

The IPHC port sampling program uses random sampling to prevent biased samples. Sampling days are randomly selected to prevent biased samples due to the timing of landings. In some ports, one day per week is randomly selected to prioritize the sampling of small landings to prevent biased samples due to landings size. Individual fish from each sampled landing are randomly selected to prevent biased samples.

1.5 Sampling Objectives and Targets

IPHC FDS(F) are required to follow all sampling procedures in this manual and report their sampling procedures and any deviations from procedure to the Port Operations Coordinator (or other IPHC headquarters staff).

1.5.1 Sampling Objectives

FDS(F) should sample:

1. as many landings as possible on designated sampling days throughout the season.
2. at the prescribed sampling rate for the Regulatory Area. This ensures an equal proportion of samples throughout the fishing season.
3. at an equal proportion from week to week; if a sample day is missed it should be made up in that same week if possible. **Any changes to the sampling schedule must be approved by the Port Operations Coordinator.**

1.5.2 Sampling Targets

The IPHC Secretariat determines minimum sampling targets for otoliths, tissue samples and length-weighed individuals by IPHC Regulatory Area to ensure there are sufficient data for accurate stock estimation and assessment. The minimum requirements are as follows:

1. 1,500 otoliths, tissue samples and length-weighed fish from each of the IPHC Regulatory Areas 2B, 2C, 3A, 3B, 4A, 4B, and 4CDE/Closed
2. 650 otoliths, tissue samples and length-weighed fish from IPHC Regulatory Area 2A Tribal Commercial landings
3. 350 otoliths, tissue samples and length-weighed fish from IPHC Regulatory Area 2A Non-tribal Directed Commercial landings
4. 100 otoliths and associated biological data for the Clean Otolith Archive Collection from each of Areas 4A, 4B and 4CDE/Closed.

1.6 Sampling Rates

Sampling rates are calculated to ensure the samples are evenly distributed over the landings from ports where sampling occurs. To reach the targeted number of otolith and tissues samples, a percentage of the total weight landed is sampled. Sampling rates can also be calculated as 1 in X fish, for example, a 2% sampling rate is 1 in 50 fish (100/2 or 1/.02).

Table 1.1. Sampling rates displayed as percentages.

Port/Fishery	2A	2B	2C	3A	3B	4A	4B	4CD
Dutch Harbor		2.5	5	2	3	7.5	7.5	7.5
Homer		2.5	5	2	3	7.5	7.5	7.5
Juneau		2.5	5	2	3	7.5	7.5	7.5
Kodiak		2.5	5	1.5	3	7.5	7.5	7.5
Petersburg		2.5	4	2	3	7.5	7.5	7.5
Port Hardy		2.5	5	2	3	7.5	7.5	7.5
Prince Rupert		2.5	5	2	3	7.5	7.5	7.5
Seward		2.5	5	1.5	3	7.5	7.5	7.5
Sitka		2.5	5	2	3	7.5	7.5	7.5
St. Paul		2.5	5	2	3	7.5	7.5	10
Bellingham	5	2.5	5	5	3	7.5	7.5	7.5
Vancouver		2.5	5	2	3	7.5	7.5	7.5
Newport and other 2A Ports	10							
Yakutat		2.5	5	10	3	7.5	7.5	7.5

Table 1.2. Average Pacific halibut gross weight by IPHC Regulatory Area

IPHC Regulatory Area	Average Gross Weight (kg)	Average Gross Weight (lb)
2A	7.6	17
2B	11.4	25
2C	15.9	35
3A	10.8	24
3B	10.3	23
4A	10.6	23
4B	10.8	24
4C	11.3	25
4D	11.0	24

1.7 Landings with Pacific halibut from more than one IPHC Regulatory Area

If Pacific halibut are retained from more than one IPHC Regulatory Area during a single trip, FDS(F) must sample each IPHC Regulatory Area separately at the prescribed rate (Table 1.1). IPHC Fishery Regulations require Pacific halibut to be separated by IPHC Regulatory Area in the hold (either physically, by storing fish in separate pens in the hold, or by marking the fish in some way, e.g., rubber banding the tail to distinguish fish from different areas). Confirm with the captain and unloading crew how individual fish are identified by Regulatory Area, and how much of the landing is from each Regulatory Area. If fish from different Regulatory Areas are not separated, do not sample the landing unless from IPHC Regulatory Area 4CDE which is considered one area for management purposes.

For example, a vessel lands 18.1 t (40,000 lb) of Pacific halibut from IPHC Regulatory Area 3A and 3B in Homer. After querying the captain, you determine the landing contains 11.3 t (25,000 lb) from IPHC Regulatory Area 3A and 6.8 t (15,000 lb) from IPHC Regulatory Area 3B. They have stored the fish in separated holds by IPHC Regulatory Area. You would sample this vessel as two landings.

1.8 Selection of Days When Sampling Occurs

Days (Monday – Saturday; Sundays are excluded) on which sampling occur are randomly selected so as not to bias the sampling of landings. FDS(F) are on call from 0600 to 1800 (local time) during five randomly selected days per week (excluding Sundays). St. Paul FDS(F) are on call at differing hours due to landing times in that area. **Any deviations from the predetermined port-specific calendar of randomly selected days must be approved by the Port Operations Coordinator.**

1.8.1 When to Sample Small Landings

Small landings are defined to be those under 0.907 t (2,000 lb) in Bellingham, Juneau, Petersburg, Sitka and Homer, and under 454 kg (1,000 lb) in all other ports.

- Small landings are to be sampled in all ports when they are the largest landing of any regular sampling day.
- Small landings take priority over larger landings on designated small landing days, specified in the sampling calendars. In ports with a high frequency of small landings (Table 1.3), a single sampling day per week is randomly selected for sampling small landings. The ports that have designated small landing days are: St. Paul, Juneau, Petersburg, and Sitka

Table 1.3. Proportions of small landings by port (2021-2025).

Port	IPHC Regulatory Area	2021	2022	2023	2024	2025
Port Hardy	2B	1.3	1.0	1.4	1.2	1.4
Prince Rupert	2B	0.5	0.3	0.4	0.4	0.2
Dutch Harbor	4A	0.6	1.6	1.7	1.3	1.4
Petersburg	2C	13.4	12.8	16.6	13.8	13.0
	3A	5.9	6.1	6.8	1.1	3.7
Sitka	2C	21.4	17.6	21.3	18.5	17.0
	3A	5.3	5.3	6.7	5.7	9.2
Juneau	2C	6.3	9.7	8.1	9.5	7.8
	3A	3.1	2.0	4.8	1.2	5.8
Seward	3A	2.0	1.8	2.9	1.9	2.5
Homer	3A	3.3	4.4	3.9	4.6	5.4
	3B	0.6	1.3	0.8	0.5	1.2
Kodiak	3A	3.2	3.1	4.2	4.1	5.0
	3B	0.9	0.6	1.1	1.5	0.6
St. Paul	4C	-	-	-	16.9	11.6

1.9 Sampling Priorities

Use priorities to choose which offload(s) to sample when more than one vessel lands at the same time.

NOTE: If possible, sample Area 4B on non-sampling days, discuss with supervisor to switch days off.

1. First, use IPHC Regulatory Areas to determine which offload(s) are a higher priority.

   In Canada, the sampling priorities by IPHC Regulatory Area are:

   a. Area 4B
   b. Area 4CD
   c. Area 4A
   d. Areas 2A, 2B & 2C
   e. Areas 3A & 3B

   In U.S.A., the sampling priorities by IPHC Regulatory Area are:

   a. Area 2A
   b. Area 4B
   c. Area 4CD
   d. Area 4A
   e. Area 2C
   f. Area 3B
   g. Area 3A

2. After accounting for the IPHC Regulatory Area, sample the larger landing(s) except on small landing days.

    a. On small landing days, after accounting for the IPHC Regulatory Area, small landings take priority. You would still sample the larger of two small landings if there were multiple small landings occurring at the same time. When there are no small landings, sample large landings.

3. Make sure to account for travel time between plants when determining which landings conflict and which landings should take priority.

Example 1: The following Pacific halibut landings are scheduled for Sitka, Alaska on the day scheduled for sampling small landings. According to the priorities listed above, you would sample vessel 2. If you can travel to plant 1 in time (i.e., you will not miss the start of the offload) you would then travel to plant 1 to sample vessel 4. If time allows (again, you won't miss the start of offload) you travel back to plant 2 to sample vessel 5. If, on the other hand, time does **not** allow you to travel back to plant 1 to sample the entire offload of vessel 4, then remain at plant 2 and sample vessel 5 after sampling vessel 2.

1. Vessel 1 plans to offload 3,000lb from IPHC Regulatory Area 4B at 0630 at plant 1.
2. Vessel 2 plans to offload 1,000lb from IPHC Regulatory Area 4B at 0600 at plant 2.
3. Vessel 3 plans to offload 1,500lb from IPHC Regulatory Area 3A at 0600 at plant 1.
4. Vessel 4 plans to offload 1,000lb from IPHC Regulatory Area 4A at 0800 at plant 1.
5. Vessel 5 plans to offload 1,500lb from IPHC Regulatory Area 3A at 1500 at plant 2.
6. Vessel 6 plans to offload 10,000lb from IPHC Regulatory Area 3A at 1500 at plant 1.

Example 2: It is a regular sampling day, and the landings expected are the same as in Example 1. You would sample vessel 1 and then vessel 6.

1.10 Sampling Procedures

Commercial catch sampling follows random sampling protocols in order to obtain representative samples of the catch. A random sampling procedure is one for which every fish in a sampled landing has an equal chance of appearing in the sample. There should be nothing that makes one fish more likely to appear in the sample than another fish. There should be no opportunity whatsoever for choosing fish arbitrarily.

Each year, the sampling procedures for each landing site in each port are thoroughly documented by IPHC Secretariat in the field and then reviewed, revised, and approved by IPHC HQ Secretariat.

Follow this sampling outline, and proceed to the subsections for landing site specific guidance:

1. Prior to each landing, ask the captain of the vessel for the best estimated weight (hail weight). Note that it is very helpful to know the captain's name before arriving at a new vessel. https://www.cfec.state.ak.us/plook/#vessels
2. Collect a fishing log for each sampled landing. (You should collect all logs with Pacific halibut information, not only sampled logs)
3. Convert the hail weight from net weight to gross (head-on) weight, using the following formula:
    a. hail weight ×1.1 = gross weight of fish being landed
4. Apply the applicable sampling rate(s) to the gross weight to arrive at the weight of fish to sample, using the following formula:
    a. gross weight of fish being landed × sampling rate = target sample weight

5. Find the sampling frequency (n) to be used to randomly collect fish for sampling. The sampling frequency will differ depending on the sampling situation. The most common sampling situations are covered in sections 1.10.1-1.10.3
6. Collect an otolith and tissue sample and the associated weight-length data from each Pacific halibut chosen for sampling (each n^{th} fish).
7. To determine when the sample is complete
    a. For tote sampling, sample until you reach the end of the tote.
    b. For all other sampling, stop sampling when your total weight of fish is within half the average weight of a Pacific halibut for that IPHC Regulatory Area (Table 1.2) from your target sample weight.
        i. Use a running total of weight of fish in your samples rounded to the nearest whole pound. A good practice is to add up the fish weight in each column of four fish. Then sum the weights across columns as columns are filled.
        ii. For example, if your target sample size is 209 kg (462 lb) for a landing from IPHC Regulatory Area 2B you would stop sampling when you reach 204 kg (450 lb) because 6 kg (13 lb) is half of the average weight of a Pacific halibut in that IPHC Regulatory Area.
    c. If you cannot obtain a weight for any of your sampled Pacific halibut (e.g.; your scale malfunctions or a fish is too large and the plant cannot help you), do not include that fish in determining when you have reached the target sample weight.

1.10.1 Sampling off the Line

The preferred method for sampling individual fish is to stand near or at a point where all the fish pass by singly and can be counted in order. A conveyor belt on the way to the header is ideal, but a plant worker feeding fish to the header or to boxes or totes could also be watched to count fish as they come off the vessel.

1. Calculate your sampling frequency; every n^{th} fish that will ensure that fish are sampled throughout the entire offload from start to finish.
    a. Find a starting sample frequency (n) as 1÷ (sampling rate in Table 1.1).
        i. For a sample rate of 2%=0.02, you sample 1 in every 50 fish (n = 50; 1÷.02).
    b. When you actively sample a fish, you will need to lower the starting frequency (n) to account for fish that pass by while you are actively sampling. For example, if about 10 fish go by while you are sampling at an initial sampling rate of 2%, then you would adjust your n from 50 to 40. The amount you adjust will depend on the speed of the offload.
    c. You should become adept at choosing an appropriate n such that reaching the end of the landing and obtaining the required target weight occur at the same time. Things that can affect the speed of the offload include amount of ice in the hold, number of people working in the hold and on the line etc.
    d. **In IPHC Regulatory Area 2A**, you might have a partner, and in this case, you will not need to adjust the n as they will be able to count Pacific halibut that go by and collect them as needed while you are sampling.
2. For each landing, randomly choose a starting fish from the numbers between one and n inclusively. For example, if your n is 50, choose a random starting number from 1 to 50. **NOTE:** This should be the n you calculated, not the adjusted n, see example at the end of this section.

a. **For IPHC Regulatory Area 2A**, the landings are small and might consist of fewer than ten fish. Therefore, choose a starting fish at the start of the season and maintain a tally of the fish from every sampled landing, sampling your *n*th fish throughout the season until you are done with sampling for the season.

3. Sample this *n*th fish by removing the otolith and obtaining a fin clip, fork length, and weight.
4. Return the sampled fish to the line.
5. Count the passing fish until you reach your adjusted *n* and sample this fish. Note, that you do not count the fish passing while you are sampling your previously selected fish.
6. Repeat steps 4-5 until you have completed the sample (Step 7 in Section 1.10).

For Example: If the sampling rate is 1.5%, giving a frequency of 1/.015 = 67 (1 in 67 fish is sampled). After calculating *n,* a deduction of 20 accounts for fish that move by on the line during a sample. The first fish sampled is a random number between 0 and 66 (or 1 and 67). Thereafter, every 47th fish (*n*-20) is sampled, until the target weight is reached.

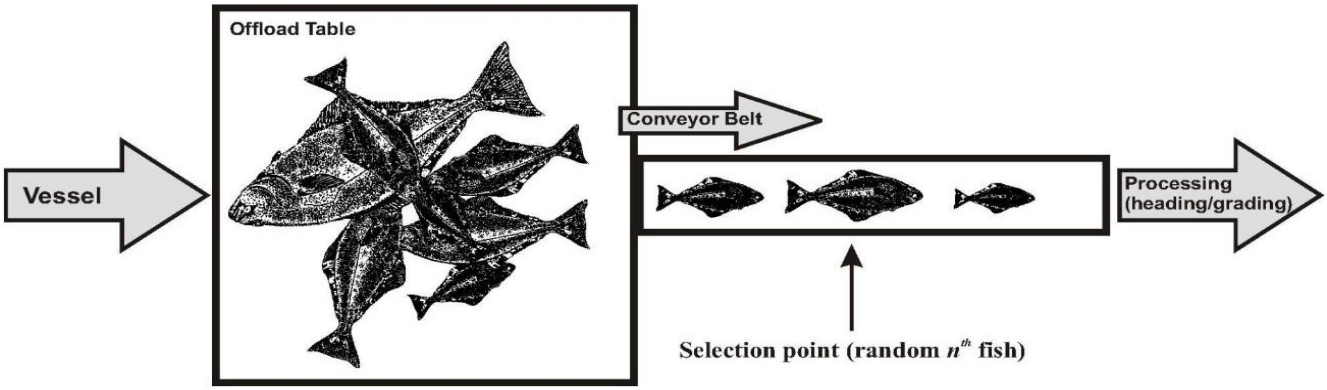


Figure 1.2. Depiction of line sampling.

1.10.2 Sampling off the table

If individual fish cannot be counted in order, then the sample must be drawn from the table when the fish are dumped.

Typically, fish will be unloaded from the vessel in slings, and larger fish will be unloaded one at a time with straps. Sample fish from each sling or strap at the same rate until the required sample weight is obtained (Step 7 in Section 1.10).

1.10.2.1 Sling fish

1. Determine the number of fish to be sampled from each sling using the following formulas:
   a. Weight of a sling / Average weight if a fish listed in Table 1.2 = Number of fish in a sling.
   b. Number of fish in a sling * Sampling rate = Number of fish to sample in each sling (*n*))
2. For each sling, pick a random point using a random *X* and *Y* coordinate on the table and select the *n* fish to be sampled whose noses are closest to the chosen point.

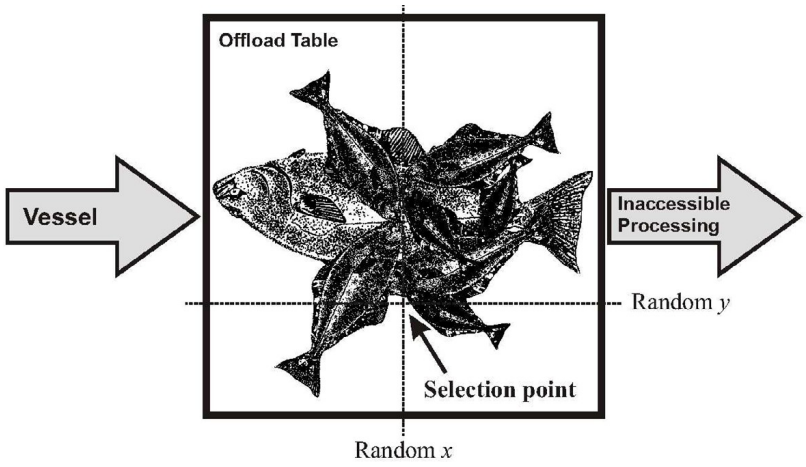


Figure 1.3. Depiction of table sampling

1.10.2.2 Strap Fish

One drawback to sampling off the table is that a variable and unpredictable proportion of large fish is unloaded with straps rather than in slings. It is very important to sample strap fish at the same rate as sling fish.

1. Estimate the numerical sampling rate, 1 in n_{strap} fish for sling fish and take a systematic sample of strap fish at the same rate.

For example, if at a particular plant a sling holds about 454 kg (1,000 lb) and you are selecting 2 fish averaging 13.4 kg (30 lb) from each sling, the numerical sampling rate for sling fish is 2 fish out of every 33 (1,000 lb ÷ 30 lb) or about 1 in 16; in this case $n_{strap} = 16$.

2. Sample strap fish at the numerical sampling rate.
    a. Keep a running tally of the number of strap fish unloaded.
    b. Pick a random number between 1 and n_{strap} (between 1 and 16 in the above example).
    c. Select the corresponding strap fish and every n_{strap}^{th} fish thereafter.
3. Continue sampling both sling and strap fish until the required sample weight has been obtained.

Figure 1.4. Strap fish

1.10.3 Sampling from Totes

At some plants, slings are emptied into single totes or an array of totes, and the totes are trucked to the processing line. In these cases, totes could serve as the sampling unit. If sampling totes, FDS(F) staff must work closely with the plant manager and forklift driver to obtain the randomly selected tote. Only sample the totes that you randomly selected; totes haphazardly selected by the forklift driver should not be included in your sample.

1. Obtain the average weight of a tote. This can be obtained by asking the plant manager or other plant personnel to get a good first estimate of the weight of a tote. Some adjustment of this initial weight of a tote might be necessary. If plant staff give you a range of weights, use the average of the range for your calculations to ensure you don't the bias the sample to the beginning or end of the offload. As you gain experience, adjust your estimates of average tote weight to ensure you are sampling totes from the start to the finish of the offload.
2. Determine the number of totes in the landing using the following method:
    a. Gross weight of landing = net hail weight × 1.1
    b. Gross weight of landing / Weight of an average tote = Number of totes in the landing.
3. Determine the number of totes to sample.
    a. Number of totes in the landing * sampling rate = Number of totes to sample.
4. Determine the sampling frequency (*n*)
    a. Number of totes in the landing / Number of totes to sample rounded to the nearest whole number = sampling frequency (*n*).
5. Randomly choose a starting tote from the numbers between one and *n* inclusively.

For example, the landing is ~10 totes, and you need to sample 1.9 totes, choose a random number between one and five inclusively, because the sampling frequency (*n*) = 1.9/10 ~ 2/10 = 1/5.

6. Obtain and sample every n^{th} tote until you have sampled the entire landing, or the total target weight has been sampled.

1.10.3.1 Sampling Less than a Full Tote or Sling

1. When less than a full tote is needed to get the desired poundage or number of fish for the sample, a method for selecting sampled fish is needed.
2. Estimate the gross weight of Pacific halibut, in the randomly selected tote.
3. Determine the proportion of fish in the tote or sling needed for the sample. For example, if a tote holds 454 kg (1,000 lb) but only 136 kg (300 lb) are needed for the sample, you will need to sample 1 in every 3 fish (300/1000 = 3/10 ~ 1/3).
4. Use the Watch Method to select fish.
    a. Divide the seconds on a watch into the proportion of fish needed for the sample.
    b. Line up that number of fish and number each fish.
    c. Look at the watch and select the fish that corresponds to the section where the seconds hand falls.

    For example, if 1/3 of a tote is needed, count three fish from the top of the tote. Then look at the watch, if the seconds hand falls between 1-20 seconds, select that fish to sample. The remaining two fish are not sampled.

5. Continue using the Watch Method to select fish throughout the entire tote to ensure all fish have an equal chance of being included in the sample.

   NOTE: If more than one tote is required for a sample and one of those totes will be only partially sampled, you must randomly select which tote will be the partial tote.

   Example: If you need 2.5 totes, generate a random number from 1–3. The number you draw determines which tote will be sampled at half volume.

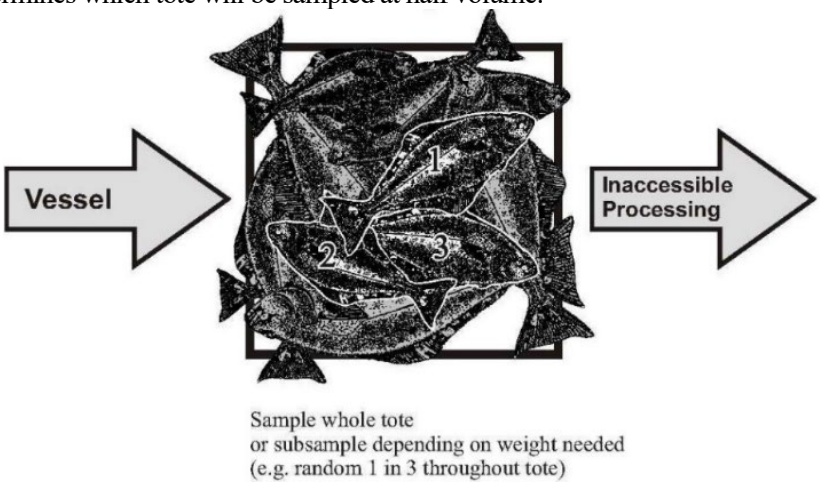


Figure 1.5. Depiction of tote sampling.

1.11 Pooling Offloads for Sampling

To create a more practical sampling schedule, the requirement of sampling as many individual landings as possible **might** be modified using pooling. When pooling, one landing may be sampled to represent several landings. Minimum pooled landing weights are a function of the ability to collect the target sample weight for that pooled threshold. Maximum pooled weights are a function of landing frequency as well as the composition of landing sizes.

Table 1.4. Ports where pooling is allowed in 2026 with landing weights excluded from pool by location.

Port	Pooling Exclusion Weight Range
Seward (3A)	<0.5 t and ≥ 6.8 t (<1000 lb and ≥ 20000 lb)
Seward (3B)	<0.5 t and ≥ 6.8 t (<1000 lb and ≥ 10000 lb)
Homer	<0.9 t and ≥ 6.8 t (<2000 lb and ≥ 15000 lb)
Kodiak	<0.5 t and ≥ 6.8 t (<1000 lb and ≥ 17000 lb)
Petersburg	<0.9 t and ≥ 6.8 t (<2000 lb and ≥ 6000 lb)
Sitka	<0.9 t and ≥ 6.8 t (<2000 lb and ≥ 5000 lb)

***IPHC Regulatory Area 2A, 4A, 4B and 4CDE landings cannot be pooled.**

***All other areas can be pooled to a threshold equal to the maximum offload size included in the pool.**

1.11.1 Pooling Procedures

1. Pooling must be done throughout the year, or not at all as all landings must have an equal

opportunity of being sampled.

2. Keep running tally (pool) of vessels that fit the port and IPHC Regulatory Area's specific pooling weight range (Table 1.4)
    a. **Only include vessels that could have been sampled** in your pooling scheme.
    b. **DO NOT** include vessels that:
        i. unloaded at a facility where sampling is physically impossible.
        ii. you would not be able to sample due to a scheduling conflict
        iii. unloaded on days that you did not work.
3. Keep a separate running tally (pool) for each IPHC Regulatory Area.
4. Sample the vessel that brings the total weight of landings from the pooled vessels over that port's prescribed threshold for pooling (Table 1.4).

Example of pooled vessels for IPHC Regulatory Area 3A in Homer, Alaska

Date/Time	Vessel Name	Hail
11 Apr / 0600	Misty Sea	2.3 t (3,000 lb)
11 Apr / 1400	Stormy	4.5 t (10,000 lb)
13 Apr / 0800	Lucky	3.6 t (8,000 lb)

Above example: Gross pooled hail: total hail weight for all vessels in pool multiple by the conversion factor. Above example: 9.5 t (21,000 lb) × 1.1 = 10.5 t (23,100 lb)

Sample weight: apply sample rate for the IPHC Regulatory Area to the **gross pooled hail**.

Above example: 10.5 t × 0.02 = 0.21 t = 210 kg (23,100 lb × 0.02 = 462 lb)

In this example, sample 210 kg (462 lb) from the fish landed by FV Lucky on 13 Apr following the approved sampling methods for that plant/landing facility.

1.12 Sampling Small Landings

Small landings are defined to be those under 0.9 t (2,000 lb) in Bellingham, Juneau, Petersburg, Sitka and Homer, and under 454 kg (1,000 lb) in all other ports. Small landings should be sampled as follows.

1. If the target weight is ≥50% of the average weight of a fish from that IPHC Regulatory Area (Table 1.2), randomly sample 10% of the fish from the landing.
2. If the target weight is <50% of the average weight of a fish, determine your ***probability of sampling one fish from the landing*** using the following formula:
    a. Probability of sampling one (1) fish = target weight /average weight of a fish for that IPHC Regulatory Area.
    b. For example, you have landing of 40 lb from 2C. The sampling rate is 10%, so you need 4 lb (40*0.10 = 4). The average weight of a fish for 2C is 37 lb (Table 1.2). To determine the probability of sampling one fish from this landing, divide the target weight (4 lb) by the average weight of a fish (37 lb), so 4/38 = 0.1. Therefore, your probability of sampling a single fish is 0.1 or, a 1 in 10 chance of sampling one fish.
        i. In this example, you should use the random number table to choose a number 0-9. If the number is 1, sample a fish; if it is greater than 1, or is zero, do not sample.

3. If the exact number of fish is known (i.e., the captain tells you how many fish he caught), multiply the number of fish, N, by the 10% sampling rate, giving sample size n = N*0.1. If n <0.5, sample with probability = n, otherwise round to nearest whole number and sample that many fish (with 0.5 going to 1, 1.5 to 2 etc).

    a. For example, if the captain catches 15 fish, you would sample 2 fish because 1.5 rounds up to 2 fish (15 *10% = 1.5). If the captain catches 1 fish, you would have 0.1 probability of sampling a fish (1*10% = 0.1) so you would choose a number between 1 and 10 and if that number was 1 you would sample the fish and if not, you would not sample.

1.12.1 Sampling Small Landings from Totes

Sampling one or two fish from a full tote can be challenging. To do this, use line sampling methods and count individual fish in order as they come out of the tote or go into the tote. This can either be done as the fish are loaded into the brailer, on the vessel, or as the fish are taken out of the tote to be funneled down the processing line.

1.13 Biological Sample Collection and Preparation

Before randomly selecting your fish, prepare your workstation. Set up your sampling table and scale, knife, forceps, fin clippers, chromatography paper, plastic slate, and pillboxes. Best practice is to have field pillbox(s) to place fin clips and otoliths while sampling, and later at your office, transfer those otoliths and fin clips into/onto clean pillboxes/chromatography forms when you are done sampling for the day.

For each randomly selected Pacific halibut, collect:

a) an otolith

b) a fin clip

c) a fork length

d) a weight

Pillboxes are used to store the otolith samples. The box consists of an outer housing with removable, sliding cell covers, and a removable an inner 28-cell tray. The inner trays have numbers embossed into the bottom of each cell. **Check to make sure the embossed number 1s on the inner tray are at the top when inserted into the outer plastic tray**. It is not necessary to disassemble the box when taking your sample. Simply pull the clear plastic cover for the row you are working on and place the otolith in the appropriate cell. The clear plastic cover for each column can be opened by pressing the colored button on the upper right side (near SAT 7AM-9AM) and pulling down simultaneously for the blue and green pillboxes.

Figure 1.6. Otolith sampling "pillbox".

1.14 Otolith Cutting Procedure

1. Only take the blind side otolith
2. Cut the top off the auditory capsule with a knife, being careful not to cut so deeply that the otolith is broken or knocked out of reach.
3. Use forceps to remove the otolith and insert it in the appropriate pillbox cell.

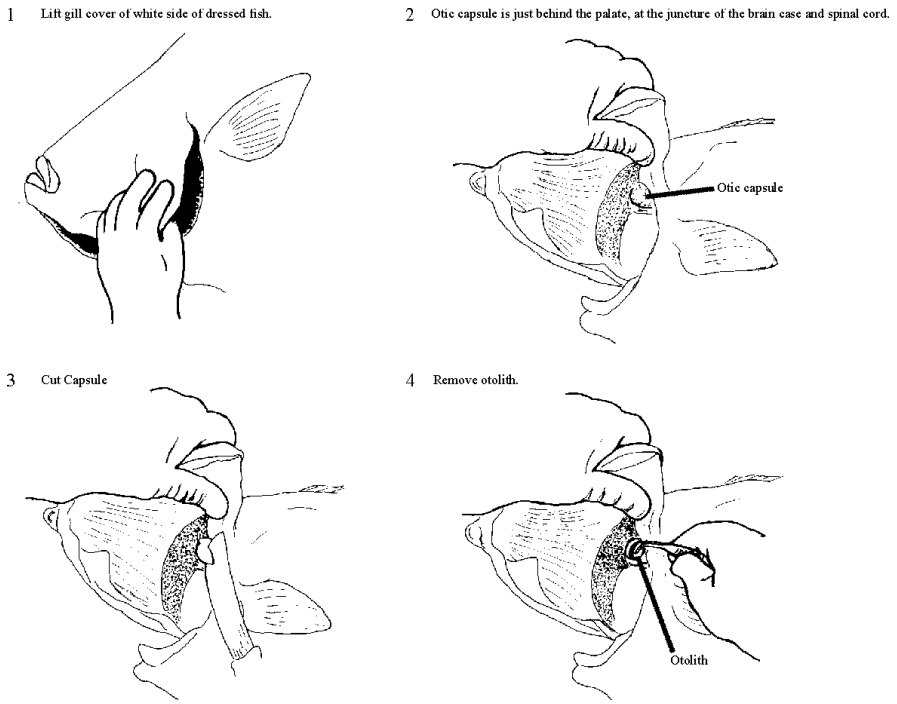


Figure 1.7. Removing a Pacific halibut otolith.

1.15 Filling, Storing, and Shipping Sample Otolith Boxes

1. After the otolith is extracted, **remove any attached membrane from the otolith** by wiping it on the back of your gloved hand or rinsing in a cup of clean water.
2. Place the otolith in the appropriate cell in the box. Boxes are filled top to bottom, left to right, starting at the top left (Sunday morning). Do not leave empty cells between samples.
3. When a row of cells is filled, cover the cells with the clear plastic strip. It is important to cover the cells before opening the next row in case the box tips or is knocked and the otoliths are either lost or dislodged.
4. Fill all 28 cells and continue the sample in a new pillbox if needed. Keep samples in consecutive order.
5. Best practice is to rinse and transfer the otoliths to a clean box at the end of the day. Whether you transfer the otoliths to a different box, or only replace the outer box, make sure the inner tray is in the correct orientation, with the embossed "1" in the upper left corner.
6. As soon as possible, put a few drops of 50% glycerin-water solution on each otolith, just enough to cover the otolith completely.

7. Store filled boxes somewhere dry prior to shipping. **Mold can grow on moist boxes that are sealed in bags or stacked in a box for several weeks.**
8. Prior to shipping to the IPHC Headquarters office
    a. Cover the otoliths with just enough cotton to soak up the excess glycerin and keep the otoliths from rattling around in the cells. DO NOT over-stuff with cotton. This makes it difficult to remove the lid without the otoliths flying out, as the cotton expands.
    b. Place the Length/Weight data form (Figure 1.13) on top of the corresponding box and secure with rubber bands.
    c. Place the boxes into Ziplock bags.
9. In the unfortunate event that a full pillbox spills and the contents are mixed, we can still use the ages independently from the lengths and weights though this is not ideal. Just note which cells are mixed.
10. Ship otoliths and tissue samples to the IPHC headquarters in Seattle with accompanying logs to meet required deadlines. Send complete samples, even if it means sending a partially empty otolith box! **Double-check your data** and submit the Market Sample and OWL reports prior to mailing the otoliths and tissue samples.

1.16 Otolith Issues

Depending on your sampling method, you may need to adjust ("make up") for lost otoliths.

1. **Line-sampling**: If a selected fish has a crystallized, shattered, or missing otolith, or the fish is tagged, do not include its weight in your cumulative sample. Instead, select the next fish in line and continue sampling every *n*th fish until the target weight is reached.
2. **Sling or tote sampling**, **Do not** replace fish with damaged or missing otoliths if there are only a few**.** If an unusually large number of fish in a sling/tote have crystallized or lost otoliths, start fresh with a new sling/tote and discard previously collected otoliths from the unusual sling/tote. High otolith loss can occur if sand fleas consume the surrounding tissue and the otoliths disappear into the head, or if frozen fluid makes the otoliths more prone to shattering or impossible to extract.
3. If you have already collected fin tissue and length-weight data before realizing the otolith is crystallized or the otolith is lost, keep the crystallized otolith or leave an empty cell as a place holder so that the Length/Weight form and fin clip form match the corresponding cells of the pillbox. In the PowerApp (OWL section), record status as 'C' for crystallized otoliths or 'N' (not collected) for lost/shattered otoliths and add a market sample comment with box/cell number(s) and "Crystallized" or "lost".

Note: Structures separating right and left otoliths may be destroyed by sand flea predation or heavy stunning. **Right-side otoliths collected by mistake cannot be used and should not be counted as part of your sample.** Refer to the appendix for images to identify crystallized or right-side otoliths.

1.17 Tissue Sample (fin clip) Collection

A tissue sample must be obtained from each randomly sampled fish. Tissue samples are placed on chromatography paper forms and dried. The fin clip forms are printed with a 28-cell grid that matches the pillbox and Length/Weight form. Many FDS(F) staff find that it is more efficient to place the tissue samples in the field pillbox in the same cell as the corresponding otolith. Once the sample is complete for the vessel, the tissue samples can be transferred to the chromatography paper.

1. Record your Staff ID in the header section as you prepare to use each sheet, along with the box #, port code, and year.

Tissue samples must be taken from a fin; preferably the tip of the pectoral fin (see Figure 1.8). Try to take clips that are about 1 x 1 cm in size. This size ensures that clips fit inside the printed cells of the tissue sample form and provides enough tissue for multiple genetic tests from each clip. Try not to allow the tissue samples to dry out or the tissue sample will not stick to the paper. When transferring it to the chromatography paper, place the tissue samples in the same order as the otoliths, Make sure the tissue samples are laid flat on the paper. This maximizes adherence to the paper and speeds drying. Use forceps to spread the tissue sample as it is being transferred.

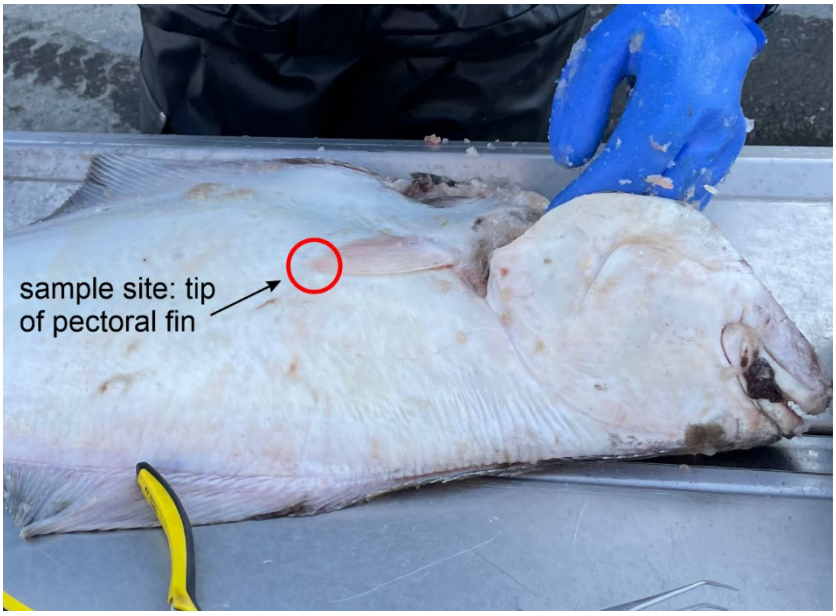


Figure 1.8. Convenient tissue collection location.

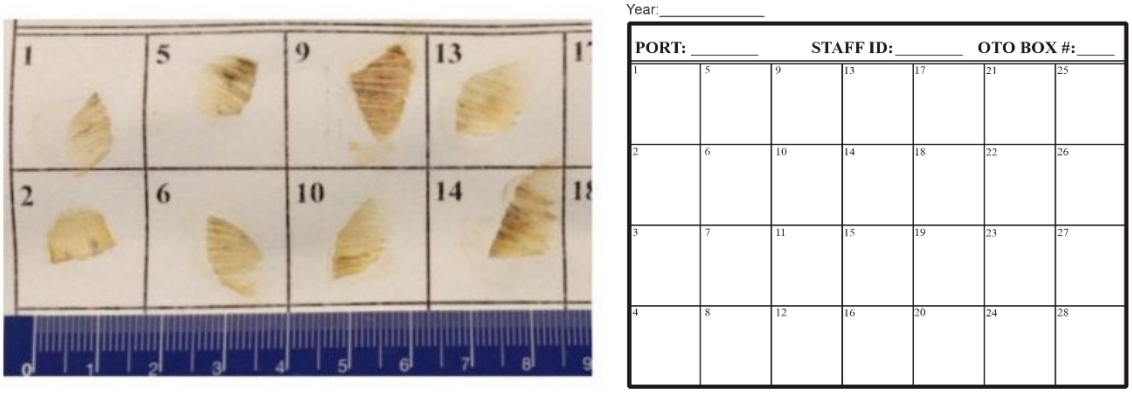


Figure 1.9. Tissue samples on paper (Left) Tissue sample (fin clip) form (Right)

1.18 Storing and Shipping Tissue Samples

After each sampling day, let chromatography sheets with tissue samples dry completely. If you add more samples later, allow sheets to dry again.

Mark unused cells with an "X" (pencil) before shipping so staff can distinguish unused cells from cells with lost samples.

For mailing:

1. Place the fully dried sheet in a heavy plastic bag
    a. Use the large (8" x 10") bags for four-grid forms and the small (5" x 8") bags for single-grid forms. **Do not use these heavy bags for pillboxes** lighter Ziploc bags are provided for those.
2. Add **one color-indicating** and **one non-color-indicating** silica packet **on the back side** of the sheet to prevent fin clips from dislodging.
3. Seal tightly.

Note: If a tissue dries out before transfer, attach it to the correct cell with a small strip of Scotch tape. If a sample comes loose after drying, tape it back only if you are certain of its original cell. Do not use duct tape.

1.19 Pacific Halibut Lengths

The fork length of Pacific halibut is measured to the nearest centimetre, from the snout to the fork of the tail. In most cases, measurements are taken on the IPHC sampling cradle, but in some cases (such as a fish too large to move to the sampling cradle) a tape measure and bookends are used.

1.19.1 *Length Measurement with the IPHC Sampling Cradle*

Measure the Pacific halibut to the full cm mark that appears first to the right of the tail. For example, for a fish measuring 122 cm, the reading would be taken between 121 and 122 cm as it appears on the IPHC sampling cradle.

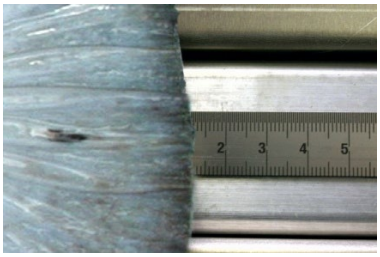


Figure 1.10. Fish measuring 122 cm.

1.19.2 Length Measurement with the Bookend

Make sure the fish is on a flat, level surface and that the fish is positioned in a straight line. Ensure that the bookends are not bent and are perpendicular to the surface and that the measuring tape is in a straight line.

In this case, different from the cradle, measure the Pacific halibut to the ½ cm mark and round to the nearest whole number. For example, for a fish measuring 88 cm, the reading would be taken between 87.5cm and 88.5 cm.

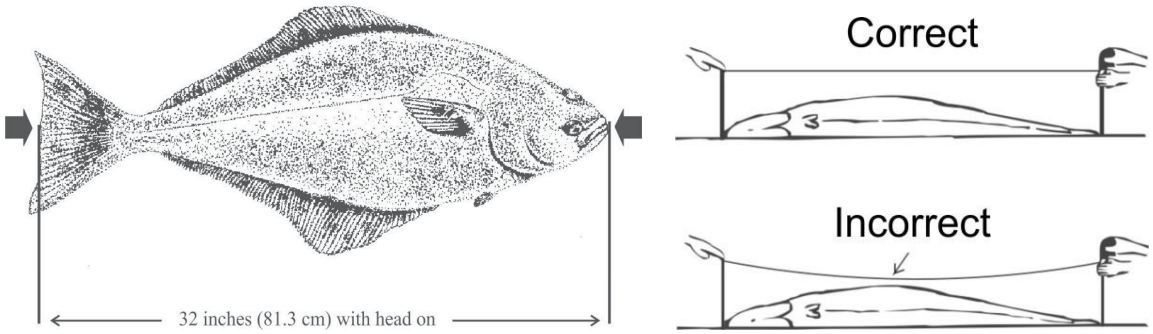


Figure 1.11. Sample Fork Length -- Total length between black arrows.

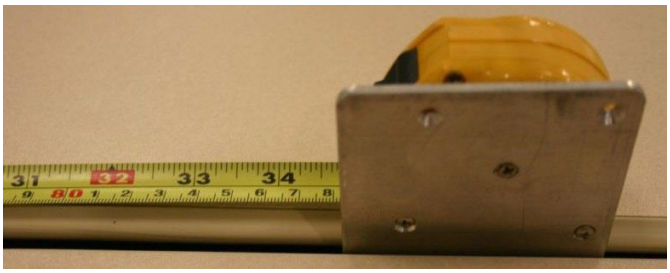


Figure 1.12. Tape measure used with bookend.

Note: it is very important to match the Pacific halibut length, weight(s), and tissue sample with the corresponding otolith.

1.20 Pacific Halibut Weights

Each sampled fish will have its weight (head-on) recorded. **Head-on weights should be obtained both before and after washing when possible**. The nature of the processing operation in each plant will determine whether a fish is weighed washed or unwashed.

1. Weights must be taken to the **nearest one tenth of a pound**. When weighing the larger fish (i.e., >120 cm), weights to the whole pound are acceptable when using a plant's scale that does not have precision to one tenth of a pound. If weights are taken with a scale other than the IPHC provided scale, record the make and model of the scale used for each weight.
2. When more than one condition weight can be obtained for a single fish (i.e., unwashed and washed), it is imperative to match each initial weight to any subsequent weight for a given fish (i.e., all the data from one fish is recorded together and doesn't get mixed up).

If you are having difficulties obtaining weights for any large fish, contact the Port Operations Coordinator or the IPHC headquarters immediately to discuss options.

1.21 Recording Length/Weight Data

Record lengths and weights in the field directly onto the Length-Weight Data Form (Figure 1.13)., which is printed on waterproof, erasable Duracopy paper (**Please use pencil only! Pen or Sharpie will smear**) This way HQ staff can more easily resolve potential transcription errors in the length/weight data entered by FDS(F**). If you are not recording raw data on the data form, contact the Port Operations Coordinator to discuss options**. The Length/Weight data forms are sent to HQ along with the pillboxes.

Fill out all the fields on the Length-Weight data form as shown in the example and defined below.

1. Port: Port name – Port code
2. Staff: Initial – ID
3. Box #
4. **When you begin a new box or a new sample**, in the upper portion of each cell, fill out the last three digits of the sample number (sample 001 and 002 in the example).
5. L: Fork Length
6. W: Washed Gross Weight
7. UW: Unwashed Gross Weight
8. The back side or margins of the data form can be used for any notes related to the market sample(s). This form will be rubber-banded to the top of the pillbox
9. If both unwashed and washed weights are obtained, you may find it easier to use two Length/Weight forms; one for each weight type. Make sure to match the box number on the Length/Weight form to the corresponding otolith pillbox number and note the weight condition (unwashed or washed) on the Length/Weight form. New Forms have been distributed in 2026 which have space for both weight types as well as the year field (Figure 1.13).

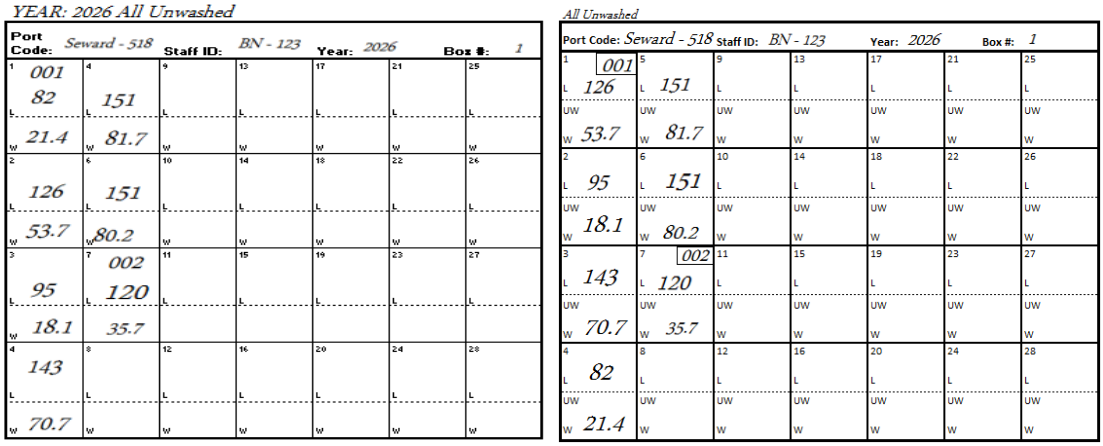


Figure 1.13. Old Length/Weight Data Form (left). New Length/Weight Data Form (Right).

1.22 Clean Otolith Archive

1.22.1 Background

The IPHC otolith collection consists primarily of structures collected and used for age determination for the stock assessment. After being aged, otoliths collected by the IPHC are stored in glycerin/thymol solution (to maintain readability) and archived. The glycerin solution renders otoliths unusable for research involving isotopic and elemental analyses. Therefore, the IPHC maintains a separate Clean Otolith Archive Collection (COAC) which consists of otoliths that are not used for age determination, and are dried and stored whole for future analysis. COAC samples will be collected from commercial landings only for Regulatory Areas 4A, 4B, and 4CD in 2026. COAC samples for other Regulatory Areas will be collected during the IPHC fishery-independent setline survey (FISS).

1.22.2 COAC Sampling Procedures – Area 4A, 4B, 4CD Only

COAC otoliths are collected in conjunction with the 'regular' market sample from Regulatory Area 4ABCD commercial landings. While most Area 4 deliveries occur in Dutch Harbor and St. Paul, COAC samples

should be taken from Area 4 deliveries in all ports, as the sampling rate has been calculated to accommodate a target of 100 otolith pairs from each of Areas 4A and 4B, and from Areas 4C/D combined for the COAC. Regular market samples and COAC samples will be collected from the same delivery**.** The otolith pair from each 10th sample fish should be prepared for the COAC as described below.

1. **Be sure to keep market samples and COAC samples in separate boxes**
    a. Use the standard pillbox to collect COAC samples and identify this pillbox (**Clean Otolith Archive: No Oto Juice**) to ensure that market sample otoliths are not confused with COAC otoliths. Different pillboxes are provided to be used for shipping the COAC samples (Figure 1.14).
2. Collect both eyed and blind side otoliths from every 10th fish identified for sampling and place the pair in the same cell of the pillbox
    a. Minimize the time the otoliths are in contact with metal. Some contact is unavoidable, because knives and forceps are metal.
    b. Both otoliths of the pair must be "normal" – neither otolith can be crystalized or broken, if this happens, discard all data (Length, Weight, and Fin clip included).
    c. Remove membranes and wipe blood/slime/moisture tfrom otoliths using paper towels or a clean dry cloth. Do not use water or any other liquid to clean otoliths and do not expose to glycerin solution.
3. Collect all standard data (length, weight, fin clip, and both otoliths).
4. When done sampling, transfer otolith pairs to the corresponding cells of the COAC "shipping" box.
5. Allow COAC otoliths to completely dry before adding cotton.
6. Store the COAC otolith boxes in a stable environment until shipping (i.e., indoors at room temperature; no extreme temperature or humidity fluctuations)
7. When a COAC box is FULL, ship with other samples and data. Double-bag COAC boxes in two Ziplocs before shipping; keep them in separate bags from regular market sample boxes.

Record each COAC sample:

1. For landings with COAC samples Record **both sample numbers on the log**.
2. Complete both a Market Sample and OWL report in the PowerApp.
3. **The COAC Market Sample series will begin with XXX501** (XXX = three-digit port code)
4. **The COAC box number series will begin with 501**. It is important that COAC otoliths are kept in separate box(es) from regular Market Sample otoliths.
5. In the Market Sample report, choose sample type "A" for Archival and **record the number of fish sampled in the # otoliths field rather than the actual number of otoliths**. (e.g., 5 pairs from 5 fish = record "5").

Figure 1.14. COAC "shipping" box. The inner trays are numbered to prevent mixing if more than one is removed at a time.

2. TAG RECOVERY

Recovery of tagged Pacific halibut provides information on seasonal migration, rates of growth, and estimates of fishing and natural mortality rates. Asking whether any tagged Pacific halibut were caught is often an easy way to begin an interview with a captain. All IPHC external tags are clearly marked with the letters 'IPHC'.

Make sure you get an email or mailing address for the person who found the tag. IPHC will send a letter with release information and tag reward (if not redeemed in the field) to the recipient as a gesture of appreciation for returning the tag. The reward for all tag types is $10 or a hat. You will be issued both baseball-style caps and knit beanies, each embroidered with the IPHC logo and "Tag Reward". If the finder requests a hat as reward, please try to issue it at the time you receive the tag. If the tag reward is not redeemed in the field, it is especially important to get a physical mailing address. The $10 rewards will be issued by check from Seattle HQ. Most IPHC tags are plastic-coated wire tags that are located on the dark side operculum (Figure 2.1, Table 2.1). Occasionally, tags from other individuals or groups who have tagged Pacific halibut without permission from the IPHC will be found and returned to FDS(F). Collect the associated data and tag from these non-IPHC tags, indicating the tag is a non-IPHC tag. The IPHC does not give rewards for non-IPHC tags released without IPHC permission.

> **2025 IPHC Fishery Regulations allow ANY vessel at ANY time to retain IPHC-tagged Pacific halibut IF the Pacific halibut with the tag still attached is reported at the time of landing and made available for examination by an authorized representative of the Commission or by an authorized officer.** This includes recreational, subsistence or non-directed commercial vessels in other fisheries that are not targeting Pacific halibut (e.g., trawl).
>
> In addition, any Pacific halibut that bears a Commission external tag will not count against commercial fishing period limits, Individual Vessel Quota (IVQ), Individual Transferable Quota (ITQ), Community Development Quota (CDQ), or Individual Fishing Quota (IFQ), and are not subject to size limits in these regulations, but should still be recorded in the landing record.

2.1 Tag Types

2.1.1 Plastic-coated Wire Tags

Plastic-coated wire tags have been used alone (wire-only) or along with other external and internal tag types (double-tag experiments). Figure 2.1 provides examples of the wire tag types.

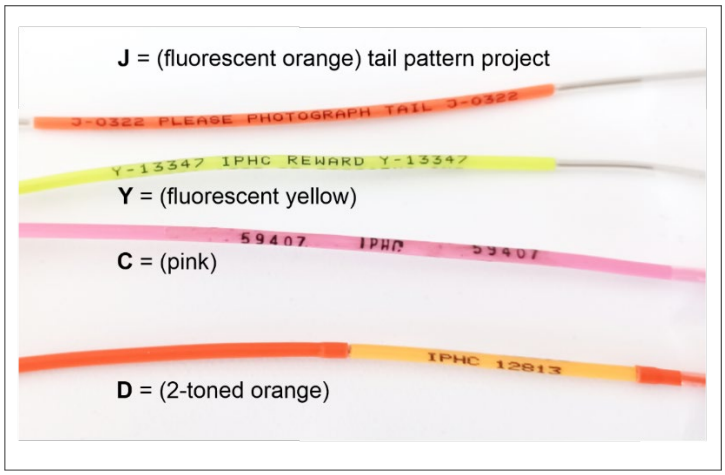


Figure 2.1. Wire tag types

2.1.2 Satellite Tags

The IPHC has released several hundred pop-up satellite transmitting archival tags (PAT tags). The tag body is released from the leader at a pre-programmed date, but the leader remains attached by dart to the dorsal region of the fish. The tag bodies may also be found washed ashore—PAT tag bodies from earlier experiments may be printed with text offering a $500 reward for their return, but the current reward amount is either $10 or a hat.

Figure 2.2. Pop-up satellite transmitting archival (PAT) tag

2.2 Removal from the fish

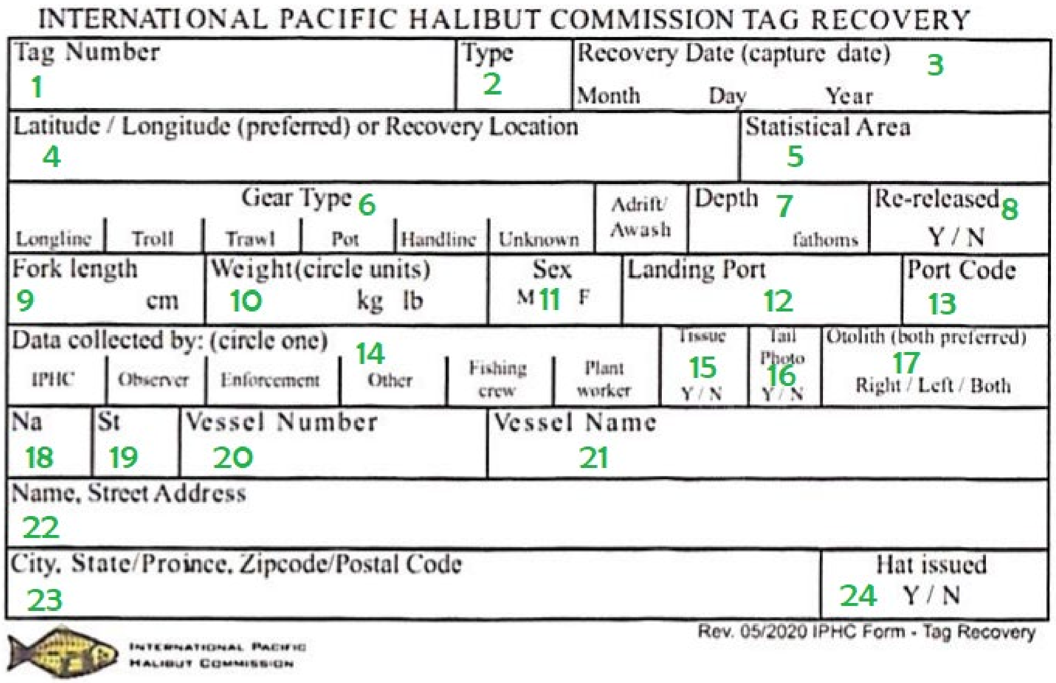
Wire spaghetti tags are twisted into the operculum cover of the cheek on the dark side and can be untwisted or cut out of the cheek of the Pacific halibut. Stainless steel and plastic tipped dart tags must be cut out of the fish.

Figure 2.3. Pacific halibut with wire spaghetti tag.

2.3 Data Collection from Tagged Fish

The numbered items, in this section, refer to items on the tag redemption envelope (see Figure 2.4).Fill out

the numbered fields on the envelope and please write neatly.



INTERNATIONAL PACIFIC HALIBUT COMMISSION TAG RECOVERY

Tag Number 1 | Type 2 | Recovery Date (capture date) 3 Month Day Year

Latitude / Longitude (preferred) or Recovery Location 4 | Statistical Area 5

Gear Type 6: Longline | Troll | Trawl | Pot | Handline | Unknown | Adrift/Awash | Depth 7 fathoms | Re-released 8 Y / N

Fork length 9 cm | Weight (circle units) 10 kg lb | Sex M 11 F | Landing Port 12 | Port Code 13

Data collected by: (circle one) 14 IPHC | Observer | Enforcement | Other | Fishing crew | Plant worker | Tissue 15 Y / N | Tail Photo 16 Y / N | Otolith (both preferred) 17 Right / Left / Both

Na 18 | St 19 | Vessel Number 20 | Vessel Name 21

Name, Street Address 22

City, State/Proince, Zipcode/Postal Code 23 | Hat issued 24 Y / N

Rev. 05/2020 IPHC Form - Tag Recovery

INTERNATIONAL PACIFIC HALIBUT COMMISSION

Figure 2.4. Tag redemption envelope

1. **TAG NUMBER**: Number printed on the tag.
2. **TAG TYPE:** Single character code. See Table 2.1.

Table 2.1. Tag types.

Description	Type	Year Used
Pink wire	C	2017 setline survey and NOAA trawl survey U32 tagging
Two-tone orange wire	D	2017-present U32 tagging 2021 recreational discard mortality
Fluorescent orange wire	J	2018-present (tail pattern recognition project)
Archival tag	R	2018
Pop-up Satellite Transmitting Tag	S	2002-2021
Neon yellow wire	Y	2015-present U32 tagging

3. **RECOVERY DATE:** Date the fish was **caught** (day/month/year) not the day the vessel delivered. If no date is specified, use mid-date of the fishing trip.
4. **LATITUDE/LONGITUDE or RECOVERY LOCATION:** Lat/long where fish was caught as degrees, decimal minutes if available.

   If told the tagged fish was caught somewhere in a series of sets or when a range of locations are given, assign the tag recovery to the string where the most fish was caught (assumption is the tagged fish had the greatest probability of being caught in the set with the most fish).

5. **STATISTICAL AREA:** IPHC statistical area where fish was caught (from plasticized charts or from the TagApp). ***Stat Area is one of the fields often left blank. Please complete if you have a recovery location!***

6. **GEAR TYPE:** Most vessels recovering Pacific halibut tags will have longline gear. Some tags will be from other types of fisheries. Check the appropriate box. **If you know specifically what longline gear was used, write the appropriate gear code in the box (e.g., FH, SS, SN)**. If not, write UL = unspecified longline. If the tag recovery came from a trawl gear fishery, try and find out what type and write that beside the gear type (i.e., Bottom Trawl=BT, Shrimp Trawl= ST, Mid-water Trawl=MT).

7. **DEPTH:** Depth the fish was caught in fathoms.

8. **RE-RELEASED:** Circle "Y" for yes, "N" for no. Used to indicate whether fish was re-released with or without the tag. (NOTE: if finder has re-released fish, please remind them that IPHC-tagged Pacific halibut of any size and from any fishery or time of year may be retained and the information they provide is very valuable.)

9. **FORK LENGTH:** Length from snout to fork of tail (see section 1.20)

10. **WEIGHT:** Weight of the fish. Circle units of weight.

11. **SEX:** Circle "M" for male, "F" for female, if known.

12. **LANDING PORT:** Port where the tagged fish was landed by the vessel (may be different than the port where tag is redeemed).

13. **PORT CODE**: The 3-digit port code for the port where the tagged fish was landed.

14. **DATA COLLECTED BY:** If tagged fish was collected by Secretariat, circle "IPHC" and note initials in or next to the box. If the tagged fish was collected by someone from another agency (i.e., NOAA Enforcement, ADF&G, WDFW, ODFW, CDFW, or DFO, etc) or by fishing crew or plant worker, circle the appropriate category. If the person who collected the data falls outside of these categories, circle "other" and describe on the back of the envelope.

15. **TISSUE:** Circle "Y" for yes, "N" for no to indicate whether a tissue sample (fin clip) was collected.

    A tissue sample should be collected and dried on chromatography paper. Blank strips of chromatography paper are provided and can be cut into smaller pieces for this purpose. Record the tag number and type on the paper beside the fin clip. As soon as possible allow the envelope and chromatography paper with the fin clip to completely dry out. Place the clip on the paper in the envelope when dry.

16. **TAIL PHOTO:** Circle "Y" for yes, "N" for no to indicate whether a tail photo was taken.

    A photo of the **white side** of the tail must be taken for recovered fish bearing Type J wire tags imprinted with the text "Please Photograph Tail" (see Tail Photograph for Recovered Type J Tags).

17. **OTOLITH:** Circle RIGHT, LEFT, or BOTH where two, one or no otolith(s) were collected.

18. **NATION:** Nation where the vessel is licensed (1=U.S.A., 2=Canada).

19. **STATE:** State where the vessel is licensed (AK=1, BC=2, WA=3, OR=4, CA=5).

20. **VESSEL NUMBER:** The VRN for Canadian vessels or the state number for U.S.A. vessels.

21. **VESSEL NAME:** The full name of the vessel from which the tagged fish came (capitalized).

22. **NAME, STREET ADDRESS:** Name of person to receive release data and their street address.

You can record the finder's email address in this section

23. **CITY, STATE/PROVINCE, AND ZIP/POSTAL CODE:** Mailing address of person to receive reward and release data. Use the finder's mailing address**. NOTE: addresses need postal or zip codes.**
24. **HAT ISSUED:** Hat rewards should be issued in the field when the tag is collected. Note whether a reward hat was issued by circling 'Y' for yes and 'N' for no. If finder wants $10 instead of a hat, please make not on the envelope.

2.4 Tail Photograph for Recovered Type J Tags

Since 2018, a subset of U32 Pacific halibut were tagged with bright orange wire tags ("J" tags) with the text "PLEASE PHOTOGRAPH TAIL" (see Figure 2.5) as part of a study investigating whether pigmentation patterns on the white side of the tail persist through life and can therefore be used as a natural tag. The IPHC would like captains recovering J-tagged fish to provide the whole fish with tag still attached to the Secretariat.

Upon receiving a whole animal with a tag requesting a picture of the tail:

1. Use the blue craft mat provided as a backdrop for photographing the white side of the tail. When the tail photos are analyzed, the blue background enhances the ability of the pattern recognition software to segment the image into 'tail' and 'non-tail' components. Using the lined side of the mat will help, as we can use it for scaling.
2. Spread the tail fin rays wide.
3. Wipe any excess ice/slime/blood off the tail.
4. Include the tag number (written on a slip of paper) in the image.

See the example of a tail photo in Figure 2.6. Generally, an image that fills most of the view and is taken directly over the tail is best. To achieve an image that fills the field of view, the distance between the camera and the tail is usually around 30cm, but most important is that you focus the camera (e.g., if using a cell phone camera, tap the image before taking the photo). Images from cell phones or most standard digital cameras will suffice, just be sure when emailing or texting the messages to the office, that you send the highest quality version you have (some email and texting programs lower the quality of the image to save on data transmission time and rates).

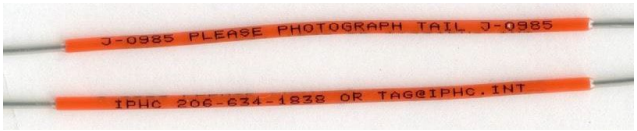


Figure 2.5. "J" type tags used for tail pattern project

Figure 2.6. Example of image of white side Pacific halibut tail

2.5 Reporting Pacific halibut tag data

Record your tag data from the Tag Envelope in the IPHC Tag Portal "TagApp" (https://apps.iphc.int/TagApp) and write "RDE" on the Tag Envelope.

After submission, you can download a PDF confirmation letter. Please double-check to ensure all the data on the PDF appears correctly. If you have the finder's email address, please forward the downloaded letter to them. If letter was emailed, note this on the envelope beside "RDE", by writing "PDF emailed".

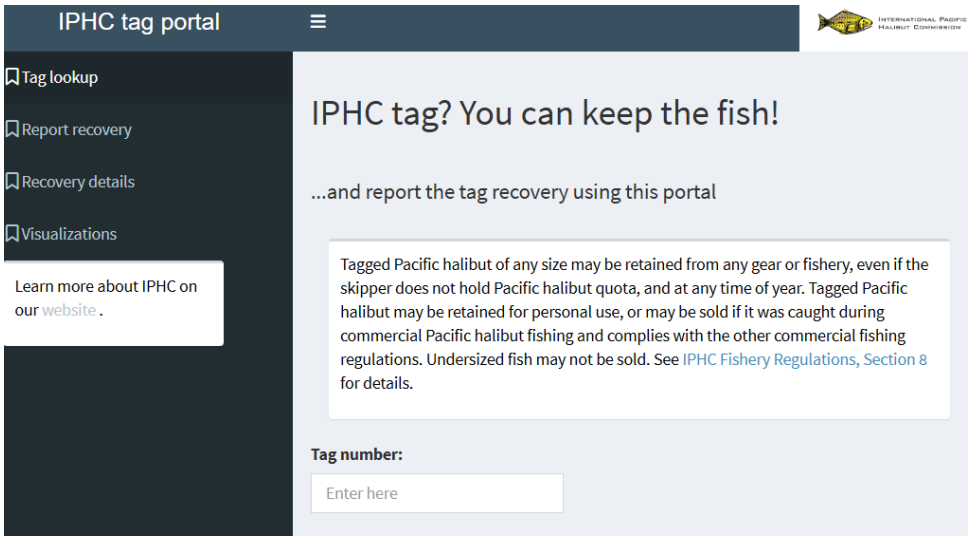
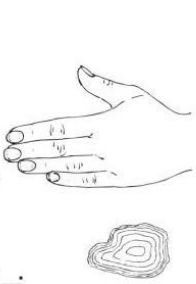
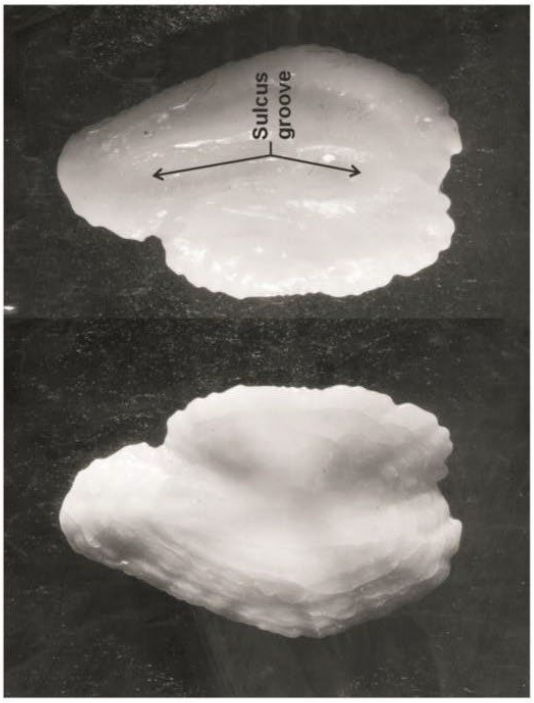


Figure 2.7. IPHC Tag Portal "TagApp".

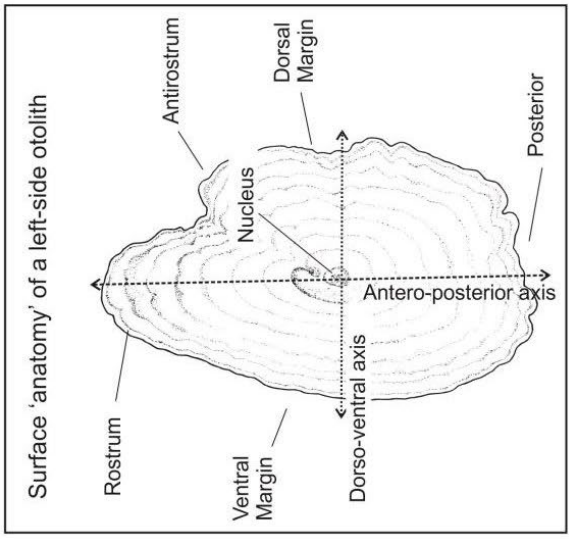
APPENDIX I: OTOLITH GUIDES

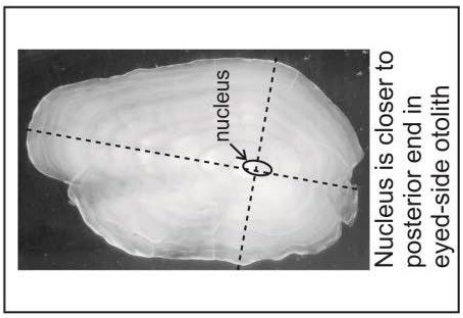
The blind (left-side) otolith is the one used for age determination and is the one to collect for the market sample. The shape of the left-side otolith viewed from the ringed (*"distal"*) surface looks like the shape of the back of your left hand.



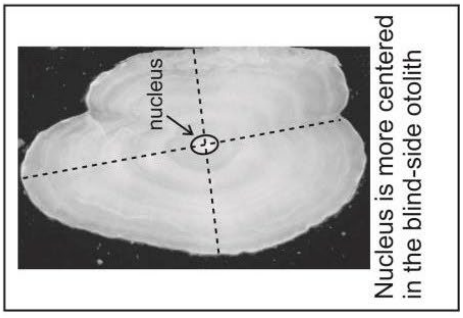


Above left is a blind-side (left) otolith viewed from the distal surface (rings are visible). This is the surface to look at when comparing the shape of the otolith to the back of your left hand. On the right is the same otolith viewed from the proximal side--this side has a deep groove and rings are usually not as visible.



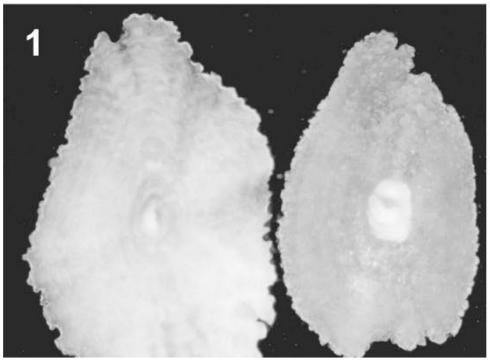


Nucleus is closer to posterior end in eyed-side otolith

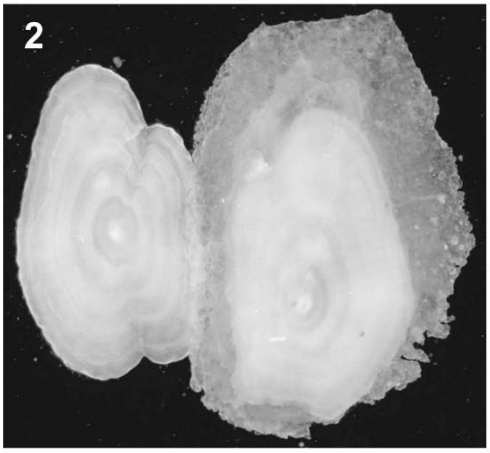


Nucleus is more centered in the blind-side otolith

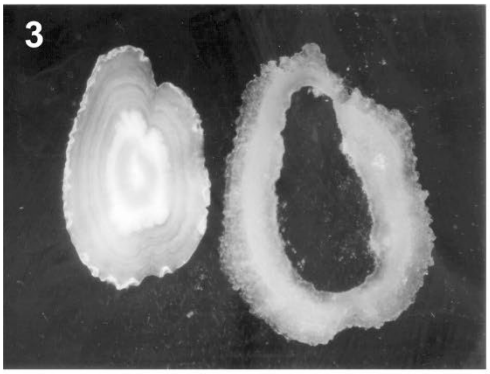
Recognizing Crystallized Otoliths: Otoliths are composed of calcium carbonate that can take one of two different crystalline forms. The form found in 'normal' otoliths is *aragonite* while in crystallized otoliths, the form is *vaterite*.



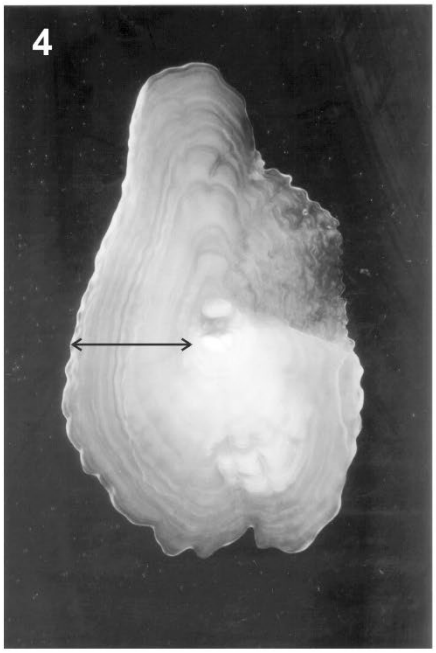
1. Fully crystallized: opaque form (left) and translucent form (right). These otoliths cannot be aged.



2. Pair of otoliths that began depositing vaterite after 6th year. Crystallized ring has broken off the left-side otolith. The left otolith was probably unusually small for the size of the fish. This otolith would not be aged.



3. Left-side otolitih with crystallized ring that broke off. This otolith cannot be aged.



4. Partially crystallized: this otolith could be aged because there is 'normal' growth from the nucleus to one edge (see arrow).

5. Partially crystallized. This otolith cannot be aged.

APPENDIX II: RANDOM NUMBER TABLE

Choose one random number and progress through the table to select new numbers as needed (top to bottom or left to right).

0	9	5	5	2	5	7	2	6	2	2	8	5	4	8
4	9	4	7	0	0	9	9	1	2	7	1	6	9	1
4	3	1	6	6	7	5	7	7	8	7	3	8	2	0
2	8	5	6	4	3	1	7	6	7	6	9	7	8	0
0	3	0	4	6	2	8	5	1	7	7	4	7	2	0
2	7	6	1	1	6	4	9	5	4	5	6	7	8	0
9	3	9	9	3	3	3	0	5	3	7	7	0	9	1
1	8	7	1	2	1	8	9	1	6	4	8	2	5	0
0	8	3	9	8	3	5	3	4	5	4	5	6	6	9
2	9	6	5	2	8	8	1	7	7	2	4	4	7	9
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9	6	9	4	2	2	4	4	2	2	1	3	0	0	6
4	4	6	6	4	8	0	9	9	7	1	4	6	8	7
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8	6	1	3	5	7	0	8	6	1	0	0	3	3	9
5	0	0	2	7	2	0	6	7	1	4	5	4	7	0
8	5	0	2	4	3	0	1	5	9	1	0	2	9	1
6	4	8	5	5	2	1	7	3	9	9	8	3	5	1
0	9	9	4	2	1	0	5	3	7	6	7	8	2	5
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8	3	9	0	4	8	5	2	1	8	2	1	7	0	7
0	6	8	6	2	3	0	7	4	5	6	4	6	2	0
2	1	5	0	6	8	7	2	6	5	8	7	5	9	4
5	3	0	6	4	5	3	2	4	5	5	3	0	6	3
4	1	8	7	9	9	4	3	6	1	1	8	5	5	8
2	5	8	9	9	5	9	8	2	1	1	4	6	3	1
0	8	1	3	5	9	5	4	6	8	3	5	2	4	2
5	1	9	3	3	5	4	3	5	3	1	8	1	3	0
7	5	9	1	7	7	2	7	1	7	6	1	2	5	6
0	7	0	7	5	2	2	1	0	5	9	1	1	8	2
8	1	4	1	4	7	1	0	6	3	6	7	5	5	8
6	9	0	9	8	0	5	2	5	0	3	0	4	8	5
2	9	7	8	0	1	9	2	8	0	4	2	2	1	8
4	4	2	7	6	9	9	2	1	7	6	2	1	5	9