

Chapter
6




Fixed Gear Sampling on Small Boats

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I. Introduction

Some fixed gear fisheries that are observed on the West Coast are conducted on very small vessels which present unique sampling situations. These situations are most often encountered in nearshore fisheries, such as live rockfish and cabezon, although they may also occur on small boats targeting sablefish or other deepwater fish.

Although some adaptations may be necessary to collect required data on small boats, the same basic sampling protocols are followed for all fixed gear vessels. For general instructions on data collection on fixed gear vessels, refer to Chapter 5, “Fixed Gear Sampling”. Chapter 6, “Fixed Gear Sampling on Small Boats” will address specific challenges and data collection techniques for smaller fixed gear vessels.

II. Fixed Gear Types Encountered on Small Boats

Fixed gear types encountered on small boats have the following WCGOP Gear Type Codes and each gear type is reviewed in the following section.

- 7 - Vertical Hook and Line
- 8 - Pole
- 9 - Other Hook and Line Gear
- 10 - Fish Pot
- 15 - All Troll Gear
- 16 - All Other Miscellaneous Gear
- 19 - Longline (Fixed hooks)
- 20 - Longline (Snap-on hooks)

Gear Type 7-Vertical Hook and Line

Vertical hook and line (also known as vertical longline or portuguese set) is a type of hook and line gear that consists of a single line weighted at the bottom and buoyed at the surface, with 30 to 300 hooks suspended in the water

column to fish vertically. Baited hooks are tied to the mainline (See Figure 6-1)



Figure 6-1: Vertical Hook and Line Gear

Wind and waves jiggle the buoy, which wiggles the line and hooks to attract fish. Vertical longline gear is typically used to target rockfish.

Gear Type 8 - Pole (Commercial) / Rod and Reel Gear

Rod-and-reel fishers use traditional fishing poles, usually with two or more hooks per pole (See Figure 6-3). Bait, flashers and a variety of lures may be used to attract fish to the hooks. Two common types of fishing lures are large plastic worms called “scampies” and plastic lures that resemble squid called “hoochies”. Lines are weighted with lead sinkers of different shapes and sizes. When multiple hooks are fished, each hook may be fished from a “dropper” line, or gangion, attached to the main fishing line. Weighted lines with hooks are cast into the water and allowed to descend to the desired depth, typically on or near the sea floor. Lines may be cast while the vessel is at anchor or drifting, or lines may be actively trolled while the vessel is under-way.

For data entry purposes, we only use the term “rod-and-reel” to describe fishing that occurs while a vessel is at anchor or drifting. If the vessel is trolling (moving by

power) and using rod-and-reel gear, we classify the gear type as “15 - troll gear”. (Refer to description of troll gear.) Rod-and-reel gear is commonly used to target rockfish, sheephead, lingcod, greenling, cabezon and sanddabs.



Figure 6-2: Rod-and-Reel Gear and Catch

Gear Type 9 - Other Hook and Line Gear

Stick, Pipe, and Cable Gear

Stick gear, also called pipe gear, is usually constructed of a piece of rebar (metal stake) or a weighted PVC tube and line attached along the full length of the stick and connected to a buoy (See Figure 6-3). Some fishers use a flexible plastic-coated cable with a lead weight attached instead of a hard stick, referred to as “cable gear”. The sticks may vary from 3 to 15 ft in length, and the number of hooks per stick or cable may vary from 3 to 10. Hooks are attached directly to the line by a lighter piece of line or monofilament and are typically baited with squid, mackerel, or bonita. There is usually just one stick per buoy line, but multiple sticks can be connected together by a groundline. This gear is typically used on shallow reefs, rock piles, or kelp and surf grass beds at depths of 0 to 40 feet, but is occasionally fished at depths of 100 feet or more. Stick, pipe and cable gear are primarily

used to target nearshore rockfish, lingcod, greenling and cabezon.



Figure 6-3: Stick Gear

Handlines and Jigging

Jigging – A method of fishing where fishing line is mechanically or manually manipulated. The movement of the line creates a bouncing of the lure within the water column or along the substrate.

Handline and **jig** fisheries use vertical, weighted monofilament lines with baited hooks attached at intervals with swivels. The hooks are dressed up with colorful segments of rubber surgical tubing, “hoochies”, or bait (squid, herring or other fish). The jig is dropped to the bottom either by hand or with mechanical gear. Then the line is usually lifted a short distance off the bottom and jigged vertically up and down to lure the fish to bite the bait or hoochies.

Mechanical jigs are automated to let out and reel in line as programmed. They can be programmed to sense when the gear hits the seabed and automatically pull in enough line so that the hooks stay a few feet above the bottom to avoid snagging. When the pre-set weight of fish has been hooked, the jigger can automatically reel in the line. Mechanical jiggers will generally utilize between six and sixteen hooks on separate gangions, and many lines can be actively jigged. Handlines and jigs are commonly used to harvest lingcod, greenling, cabezon and rockfish.

For data collection purposes, this type of gear could be classified in a couple of different categories. If the vessel is stationary or drifting and using fishing poles, then this

should be recorded as “8-Pole/Rod and Reel”. If the vessel is under way, this would be considered “15-Troll Gear”. (See descriptions below) If the fishing activity cannot be described by “rod-and-reel” or “troll gear”, it should be recorded as “9-Other Hook and Line”.

Gear Type - 10 Fish Pots / Traps

In Chapter 6, “Fixed Gear Sampling on Small Boats”, pots are referred to as traps, as that is the common terminology used by fishers.

Traps used on smaller vessels are typically lightweight rectangular traps (See Figure 6-4), although other configurations may also be encountered. Small trap vessels typically fish for live fish markets. Common nearshore target species are California sheephead, cabezon, greenling, rockfish, and California scorpionfish. Some small vessels also use traps to target sablefish in deeper waters.



Figure 6-4: Sheephead Trap

Gear Type 15 - Troll Gear

Trolling involves towing multiple fishing lines behind a vessel while it is under way (See Figure 6-5). Lines are attached to a pair of **outriggers** that are lowered to approximately 45-degree angles from the boat when fishing.

Outrigger - A stabilizing frame extending laterally beyond the main structure of the vessel.

Gurdies- powered spools or reels

Fishing lines are set and retrieved using **gurdies** mounted on the vessel in sets of two, three or four. Each gurdy spool, usually powered by hydraulics, contains and works one line.

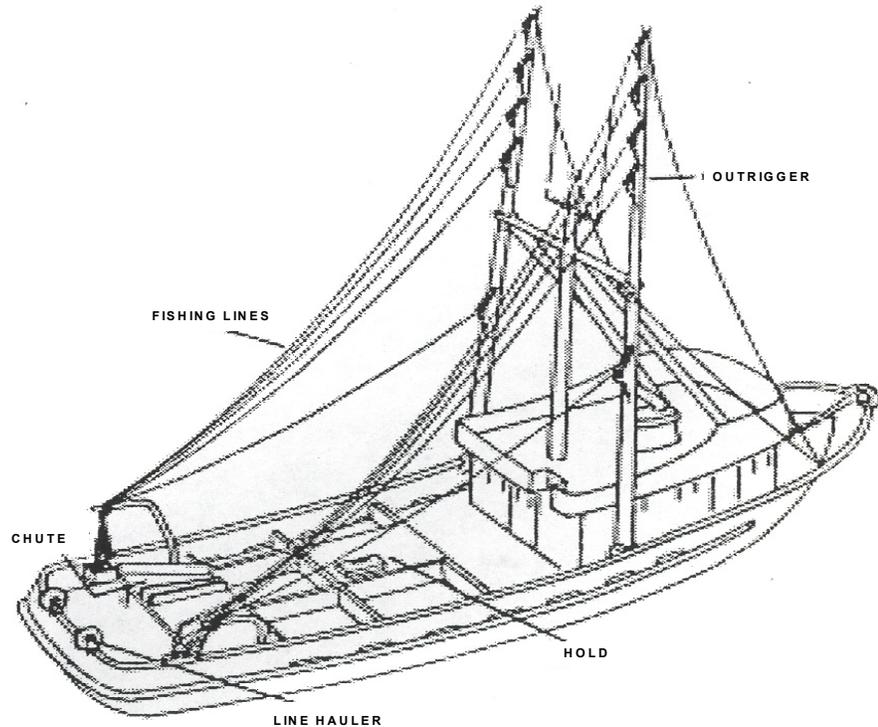


Figure 6-5: Troll Gear (with outriggers in non-fishing position)

Groundfish Troll Fishery

Groundfish are targeted with other troll gear configurations. The lines are typically weighted with some sort of lead weight or bar and fished at or near the sea floor. Groundfish gear may resemble that of an albacore troller, but may also consist simply of weighted rod-and-reel lines with hooks being dragged along the bottom of the ocean. Multiple jigs or baited hooks may be attached to the troll line by leaders or gangions. A variety of fishing lures, such as hoochies and

scampies, are also commonly used. To target rockfish congregating at different depths and around rock pinnacles, some troll gear configurations utilize floats to keep the hooks suspended in the water column. By adjusting the floats, weights, length of main line and location of gangions, the hooks can be set up to fish at a range of depths within the desired band (See Figure 6-6).

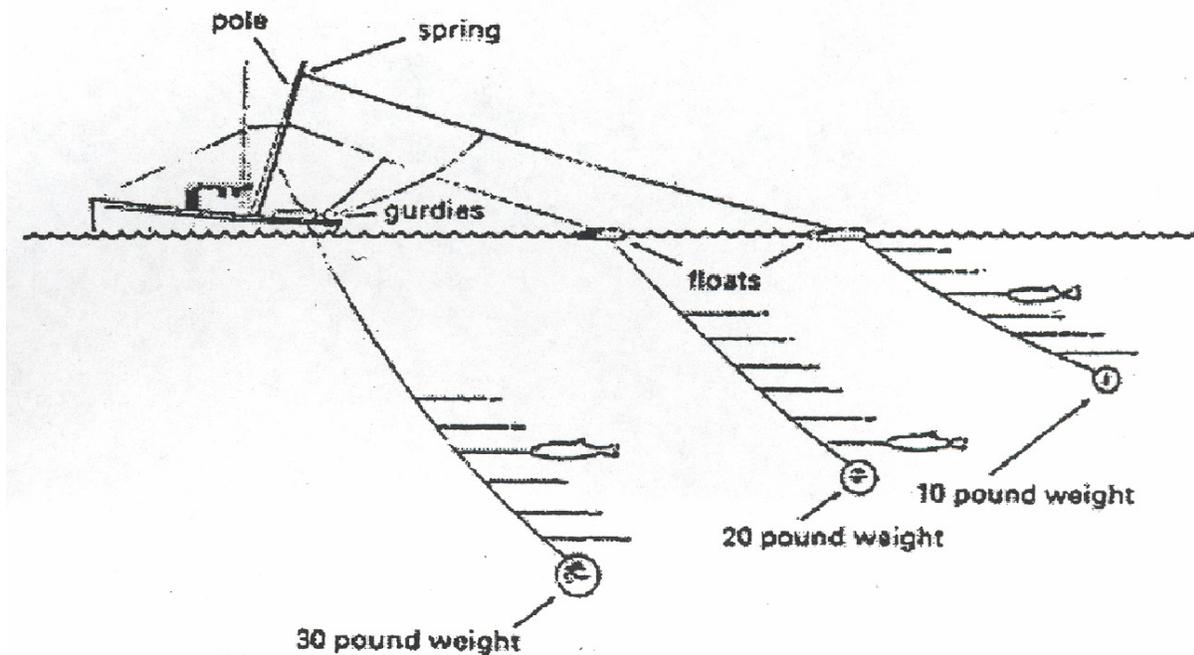


Figure 6-6: Groundfish Troll Gear

One type of groundfish troll gear is sometimes called ‘dingle bar’ gear because there is a distinct ‘ding’ transmitted up the steel trolling wire any time the bar touches bottom. The gear is designed to be fished three to six feet above rocky bottom and the iron bar is allowed to touch the bottom only occasionally to adjust for varying depths. Jigs are hung from multiple gangions attached to each line. The jigs have fishing lures, and are sometimes tipped with bait. This gear is very selective and is primarily used to target lingcod or Pacific halibut.

Gear Type 19 - Longline Gear (fixed hooks)

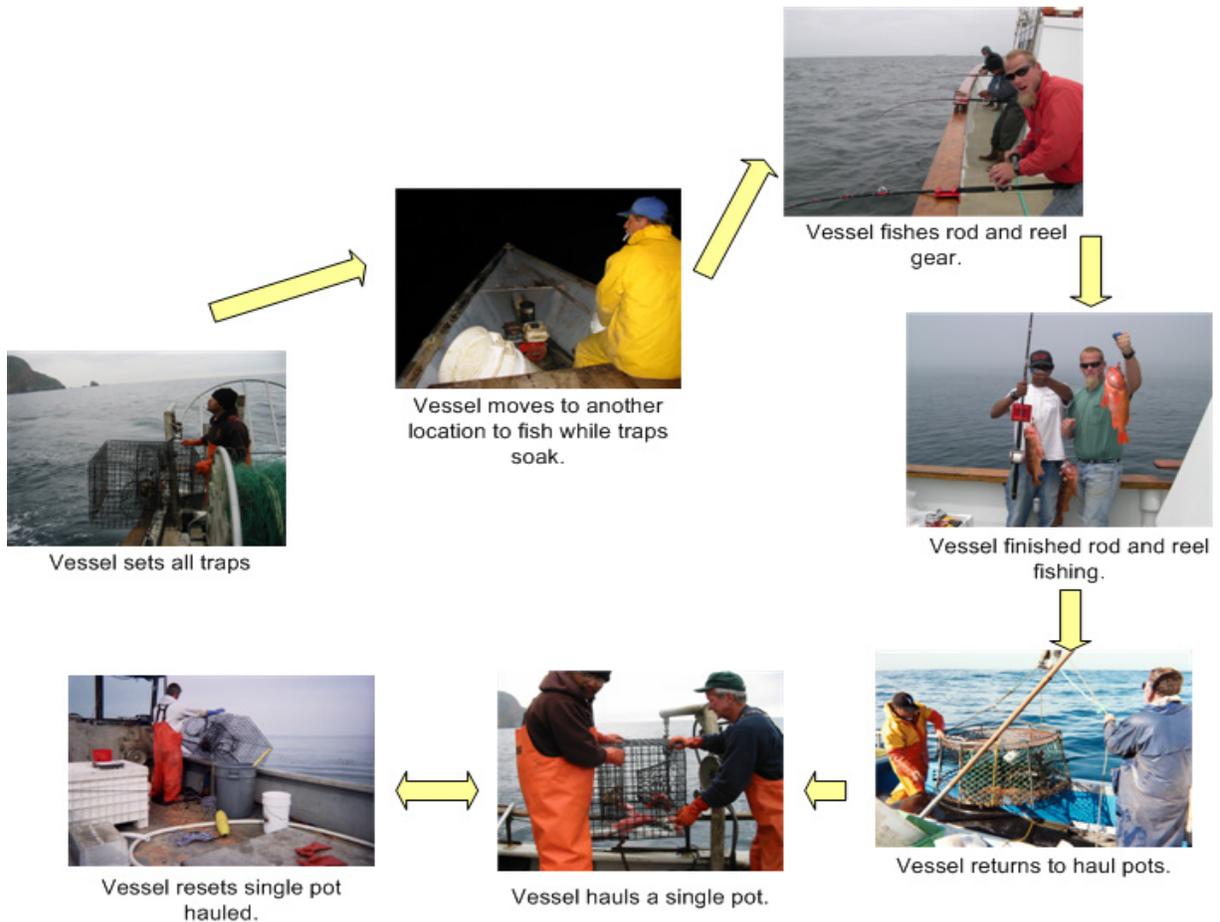
See Chapter 5, "Fixed Gear Sampling."

Gear Type 20 - Longline Gear (snap-on hooks)

See Chapter 5, "Fixed Gear Sampling."

III. Small Fixed Gear Vessels

Operations on Small Fixed Gear Vessels

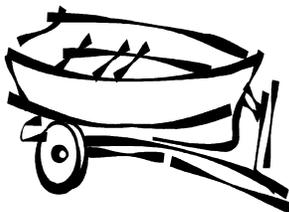


Safety on Small Boats

Observers should be aware of unique safety issues that arise on small vessels. Small vessels are often not required to carry the same amount and types of safety gear as larger vessels, especially when they are only operating within 3 miles of shore. These vessels also run a higher risk of capsizing. When moving about on the vessel, take note of how much your movement causes the vessel to rock back and forth. On very small vessels, sudden movement could cause you or someone else to fall overboard. Carefully stow your EPIRB and immersion suit, and wear a Personal Flotation Device (PFD) at all times. Observers who work on a lot of small boats can request to be issued a Personal Locator Beacon (PLB). It can be carried on a person or attached to a PFD.

These vessels generally fish under good weather conditions, but conditions can change quickly. There is often little or no shelter on small boats, so if the wind or waves pick up, you can get soaked quickly. Do not neglect to bring along raingear and wear clothing that is easily layered. It is also good to bring drinking water, sunscreen and a hat to protect from sunburn and dehydration. Remember, you may have no shelter from the weather or sun all day.

Gear for Small Boats



Carefully consider what gear to bring when observing on vessels with extremely limited space. Many small vessels only make one-day trips. It isn't necessary to bring much personal gear on board, but remember to be prepared for changing weather conditions.

Working on small vessels requires a good working relationship with the fisher. Ask for their help in determining where to be while under way (not fishing) and a sampling location that will minimize interference with fishing operations.

On most small boats, there is very little room to work, and it will not be possible to bring a platform scale and baskets. Observers commonly find that they can pack all of the sampling gear they will need into a 5-gallon bucket or a single observer basket. The goal is take up as little space as possible without compromising your ability to collect the required data. The following is a list of sampling gear needed on small vessels:

- 6-pound and 25-pound hanging scales.
- Lightweight bucket with holes drilled in the bottom.



Tip* If an appropriate bucket is not included in the sampling gear that is issued, contact PSMFC or acquire one at a local hardware store. Small plastic paint buckets work well.

- Portable GPS unit.
- Length Frequency strip.
- Clipboard, deck forms, and other items normally used to collect and record data.

Although vessels are normally expected to provide food for observers, fishermen who day trip are less likely to provide food and drink. Discuss this before the trip or plan to bring enough drinks and snacks to get through the day.



IV. Data Collection on Small Fixed Gear Boats

The fisheries that small fixed gear vessels participate in include:

- Non-Sablefish Endorsed (limited entry)*
- OR Nearshore (open access)
- OR Rockfish (open access)
- CA Nearshore (open access)
- WC Open Access Fixed Gear (open access)

*The non-sablefish endorsed feet commonly use conventional longline gear or strings of pots to fish.

The data flow on small fixed gear vessels is generally the same as for large fixed gear vessels. (See Chapter 5, “Fixed Gear Sampling”.) The primary differences are due to the following factors:

- Defining a set and recording location information is less straightforward on small boats.
- Determining the amount of gear in a set is often complicated by repeated sets and retrievals of small units of gear.

The data flow for sampling small fixed gear vessels is:

1. Defining a Set.
2. Documenting Fishing Effort Information.
3. Determining Amount of Gear in a Set.
4. Tally Sampling.
5. Recording Catch, Species Composition, Fishing Effort Information.

Defining a Set

A grouping of gear can be considered one set if the following are the same:

1. Date
2. Gear Type
3. Geographic Area
4. Depth
5. Species Assemblages

Unlike vessels using traditional longline and pot gear with two end buoys, defining a set on vessels that use other types of fixed gear can be somewhat complicated. Small pieces of gear with individual buoys are often set haphazardly in a general area or fishing spot. The gear is frequently set and retrieved over and over again, with individual pieces of gear soaking for as little as 5 minutes between retrievals. If each retrieval was considered a set, one day of fishing could have over fifty sets, with each set only having one or two fish caught. Obviously, this would create an unreasonable quantity of paperwork for the amount of data collected.

Therefore, individual pieces of gear can be grouped to form a single set using a standard set of criteria. When it is not possible to easily define a set as the retrieval of a distinguishable string of gear, any grouping of gear that meets all of the following criteria can be considered one set:

1. **Date** - Data collected on the same day can be considered for grouping into a set. If the vessel is fishing for multiple days, data from each day should be grouped separately.
2. **Gear Type** - Data collected from the same gear type can be considered for grouping into a set. **If more than one gear type is being used, data must be recorded separately for each gear type.**
3. **Geographical Area** - Data that is collected in the same general area can be considered for grouping into a set. An area may be defined by a physical feature, such as a cove or reef or it may simply be defined by distance. There is not an assigned distance used to determine if data should be recorded separately or together. Dividing data into separate hauls based on geographical area is up to the discretion of the observer. If unsure how to record the data, discuss the situation with a Debriefing or Lead observer.
4. **Depth** - Data that is collected in the same depth range can be considered for grouping into a set. Like geographic area, there is not an assigned depth change that requires data being recorded in separate sets. However, if the species composition or fish size changes noticeably, the depth has changed enough for the data to be grouped separately.
5. **Species** - Data that is collected that has the same target species or species assemblage can be considered for grouping into a set. Any noticeable change in species composition requires the data to be grouped separately.

The following 3 criteria are often closely related and should be considered together when deciding if data can be grouped:

- Geographical area
- Depth
- Species



Documenting Fishing Effort Information

Fixed gear vessels are not required to keep vessel logbooks. There are two options for getting fishing effort information which consists of haul location, depth and time information:

- Skipper's Personal Logbook - Most small boats do not keep records of fishing locations and depths.
- Observer collects information.

Recording Locations

If the vessel does not keep a logbook, there are two sources for location information:

1. Vessel Equipment - Many vessels have Loran or GPS devices, but be wary of using location information from electronic devices on small boats as they are sometimes inaccurate.
2. Handheld GPS - You may be issued a handheld GPS unit for noting haul locations. These devices have handy features that allow you to save positions as way points that you can reference later. Write down the positions or way points on the back of your Fixed Gear Catch Form at the same time that time and depths are noted.

Recording Depth

To determine fishing depths either:

1 fathom = 6 feet

1. Use the vessel's depth finder (preferred).



Tip* Check to see if the depth is displayed in feet or fathoms. If the vessel is fishing in a nearshore fishery, the depth will mostly likely be displayed in feet.

OR

2. Use locations and chart - If the vessel does not have a depth finder, use position information (lat/longs) and charts to estimate fishing depths.



Tip* Record the depth range, the shallowest depth to the deepest depth.

Recording Time

If the vessel does not have a logbook observers can record the times from their watch or the vessel's clock. There are times when gear is set on the previous trip. Observers can ask the captain for the set times or ask the observer from the previous trip for this information.

At minimum, for each set record:

- Location, depth and time of first gear to be deployed.
- Location, depth and time of final gear retrieval.



Tip* If you don't write it down as it is happening, you will not have critical information needed to complete your data forms.

Additional Fishing Effort Information

Write down additional locations, times, and depths as the vessel moves around throughout the day, being sure to note starting and end positions if there are multiple hauls.

Marking multiple way points in a handheld GPS is a convenient way to look at where the vessel moved throughout the day, and may help determine if data should be divided into separate hauls.

Observers must document at least two positions (start and end) if there was only one haul in a day. Additional location, time, and depth information can be taken any time during the day but information that is evenly spread out (every hour) is the most representative of vessel activity. The observer should attempt to document positions that mark the boundaries of the general fishing area rather than multiple positions in nearly the same spot. If the vessel doesn't move around very much, fewer positions need be recorded.



Tip* The additional information must be recorded on the Trip Form – Haul Locations and entered into the database. See the Trip Form – Haul Locations instructions and Stick Gear example at the end of the chapter, page 65.



Determining Amount of Gear in a Set

Once you have defined the set, the number of hooks or traps in the set must be determined. To determine the amount of gear in a set on small fixed gear vessels, determine the:

1. Number of hooks or traps per gear segment.
2. Number of **gear segments** in a set.

Gear Segment – A single tub, pole, cable, or other unit of gear.



Tip* On small boats, it is usually possible to sample 100% of the gear. Therefore, the total number of hooks or traps will be equal to the number of hooks or traps sampled, unless gear has been lost.

Determining the Number of Hooks per Gear Segment

Two approaches can be used to determine the number of hooks per gear segment:

- Average number of hooks per gear segment.
- Actual number of hooks per gear segment.

Average number of hooks per gear segment:

Vessels generally have a consistent number of hooks per gear segment. Hook counts should be done at least once per trip. Always document in the Observer Logbook when average hook counts were done and why that time was chosen. To determine average number of hooks:

- Count the number of hooks in each gear segment. If it is not possible to count all of the gear, a minimum of **1/5** of the gear should be counted and an explanation of the circumstances that made it impossible to count all of the gear should be documented in the Observer Logbook.
- Sum the hook counts for all gear segments counted and divide by the number of gear segments counted to determine the average number of hooks per gear segment.



$$\text{Average \# Hooks per Gear Segment} = \frac{\sum \text{Hooks Counted}}{\# \text{ of Gear Segments Counted}}$$



$$\text{Total Hooks} = (\text{Total Gear Segments}) \times (\text{Average Hooks per Gear Segment})$$

Actual Numbers of Hooks per Gear Segment

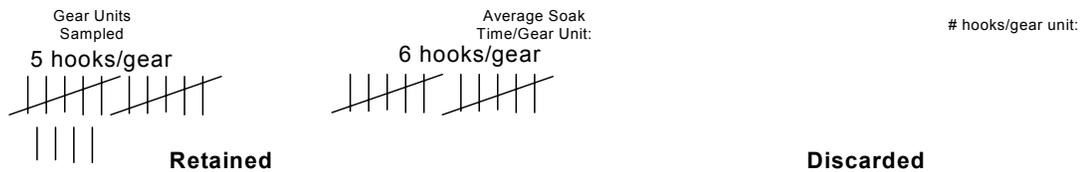
If sets are composed of gear segments with varying numbers of hooks, it may be possible to keep track of the

actual number of hooks retrieved rather than using average counts. To use actual counts:

Actual numbers of hooks per gear segment are often collected for stick, rod-and-reel, and similar gear types.

- Create columns on your raw data sheet with each possible hook count (per gear segment, see example below).
- Each time gear is retrieved, put a tally mark in the column with the correct number of hooks that are present.
- When the set is complete, count the total number of hooks retrieved by multiplying each tally by the corresponding number of hooks and sum the results.

Official Total Catch Calculations



Counting hooks on rod-and-reel vessels

When multiple lines are fished simultaneously, it may not be possible to keep track of each retrieval while also collecting species composition data.

In these situations, the number of hooks may be determined by using a random temporal sampling strategy:

1. Determine an appropriate length of time for the hook count sampling periods.
2. Randomly select time units when gear retrievals will be counted.
3. Count the number of gear retrievals that occur during the selected sample periods.
4. Multiply the number of gear retrievals by the average or actual numbers of hooks per gear segment (as described

above) to determine the total number of hooks retrieved during the randomly selected time period.

5. Determine the total amount of time that fishing occurred for the set.
6. Extrapolate the number of hooks retrieved during the random sample periods to the total fishing time to estimate the total number of hooks in the set.

Temporal Subsample - Total Hook Count Calculation:



$$\text{Total Hooks} = \frac{(\text{Total \# Hooks in Sample}) \times (\text{Total Time (min) of Set})}{\text{Minutes Elapsed During Hook Count Sample Periods}}$$

Number of gear segments in a set

Determining the number of gear segments in a set depends upon how a vessel is fishing. Many small vessels set and haul the same gear segments multiple times in the same set. When this fishing pattern is observed, gear should be counted each time it is set and retrieved. The number of gear segments is the total number set rather than simply the total amount of gear being used to fish.

Example: If a segment of gear is set and retrieved 5 times in the same set, that piece of gear is counted 5 times rather than once when determining the total amount of gear in the set.

Multiple Retrievals in a Set

There are two options for counting the number of gear segments in a set when a vessel hauls and sets the same gear segments multiple times:

1. Count each gear segment retrieved, accounting for gear that is lost (not retrieved).

2. Count each time a gear segment is set.



Tip* To keep track of the total amount of gear in the set, tally the number of sets or retrievals on the back of the Fixed Gear Catch Form with the raw data.

Single Retrieval per Set

Some vessels will set the gear one time for a defined set. If the gear is set and retrieved only one time in a set, the options for counting gear segments are similar to options used on traditional longline and pot vessels:

1. Count hooks/traps while they are being baited.
2. Count hooks/traps while the gear is stored on the vessel.
3. Count hooks/traps during gear deployment (the setting of gear).
4. Count hooks/traps while gear is being retrieved. This can be extremely difficult on hook and line vessels, especially when you need to sample for species composition at the same time. Also, counting hooks in the evening, morning, and night can be difficult due to available light.

Unlike on larger, traditional longline and pot vessels discussed in Chapter 5, “Fixed Gear Sampling”, counting hooks or traps during the retrieval of an unsampled set is not typically an option on small vessels because the observer will generally sample all hauls. (See Chapter 5, “Fixed Gear Sampling” for more information on determining the amount of gear in a set on longline vessels.)

V. Sampling Small Fixed Gear Vessels

Tally Periods

Tally sampling on fixed gear vessels is conducted as the gear is being retrieved. When tallying on a line vessel, the observer counts every individual that comes up on the line, including drop-offs. When tallying on a pot vessel, the observer counts all individuals in a pot.

Small Fixed Gear vessels generally haul very little gear per day and catch less than 1000 lbs of fish per day. For that reason, **hauls are 100% tally sampled.**

NOTE: If you are on a vessel that must be subsampled, see Chapter 5, “Fixed Gear Sampling”.

General Instructions for Tally Sampling

1. Determine the amount of gear to tally sample.
 - In general, sets on small boat fixed gear are 100% tally sampled.
2. Collect the equipment needed to tally sample:
 - A clipboard, one to six hand counters, and the Fixed Gear Catch Form are needed to tally sample (See Figure 6-7). *The tally sample raw data is documented on the back of the Fixed Gear Catch Form.* The next section will discuss how to document tally samples.
3. Find a location on deck to tally sample.
 - Most likely, only a small location will be available for a tally/sample station on small fixed gear vessels. A tally/sample station should be very near to where the fish comes aboard. From the tally station, observers must be able to clearly identify fish as they come aboard and identify drop-offs and individuals preyed upon. Organize the gear in your tally/sample station by placing the observer

scale (if deck space allows), handscales, and length frequency/tape measurer close at hand.



Tip* These vessels always attempt to get discard over quickly. Be sure all the gear is organized in such a way that the fish can be quickly weighed, lengthed, and returned to the sea.

4. Count each species that comes up on the line or in the pot by disposition (retained versus discarded). For species in large quantities, use the hand counters. For other species, make hash marks next to their common name.
 - **Species similar in appearance** - Some species, such as Shortraker and Rougheye rockfish, are similar in appearance and cannot be distinguished unless they are in hand. For these species, tally as a mixed group such as Rougheye/Shortraker or Shortspine/Longspine.

Species that are known to be retained by the vessel will have some fish that are discarded. Tally sample these separately in the raw data:
Drop-off - Fish that fall off the line as they leave the water line. These individuals do not make it aboard the vessel.
Predation - Fish that have been damaged by whales, sand fleas, hagfish, lingcod or other animals.
Smalls - Fish that are considered by the vessel to be too small and not profitable to keep.

Tips for Documenting Tally Samples

- The back of the Fixed Gear Catch Form is divided into two sections, **Retained** and **Discarded**. Write down species names that are likely to be caught down the middle of the form..



Tip* See examples of how to prepare your forms for tally sampling- See “Example of raw data sheet.” on page 25..

- **Drop-offs and Predation of retained species-** While tally sampling, some fish that *would have been retained* drops off the line or is preyed upon and discarded. These discarded fish, which would have been retained, should be documented in the raw data as such. Be prepared by creating an area on the deck form to document all drop-offs and

individuals preyed upon for the retained target species.

- **Small individuals of retained species** - While tally sampling, some fish that *would have been retained* are considered too small by the vessel to keep and are discarded. These discarded fish, which would have been retained, should be documented in the raw data as such. Create a space on the back of the Fixed Gear Catch Form to document “smalls” of the retained target species.
- **Pacific halibut** - Generally, Pacific halibut are not caught on small boat fixed gear vessels, at least not in any quantity. Therefore, it is not necessary to designate an area on the form for PHLB.
- **Gear Units** - Since the vessel will most likely be pulling multiple units of gear during the set, be prepared to document the gear units as they are brought aboard on your form.

Official Total Catch Calculations		
Gear Units Sampled 5 hooks/gear	Average Soak Time/Gear Unit: 6 hooks/gear	# hooks/gear unit:
Retained		Discarded
<u>Black RF</u>		<u>Black RF DO</u> <u>Predation</u>
		<u>Small Black RF</u> <u>Blue RF</u>
<u>Lingcod</u>		

Figure 6-7: Example of raw data sheet.

Collecting Weights

During each set/haul, the observer is responsible for counting each individual that is on the line or in the pot (i.e., tally sampling) and collecting weights for each fish species. There are 5 methods for determining weights on fixed gear vessels. They are listed below in order of preference:

Extrapolation of fish weight- To determine the total weight of a species when less than 100% are weighed during a set. The average weight per fish is determined and this value is then multiplied by the total number of fish in the tally sample.

1. Extrapolated or actual weights from individuals in same set. **Extrapolated** weights are used if only a subsample of the total fish caught are weighted.
2. **Actual weights from individuals outside the set.** If an actual weight of a species was not collected during a set, then an actual weight from similar set (called a “like” set) can be used in the extrapolation calculation.
3. Visually estimated weight.
4. PHLB Length/Weight Conversion (only for Pacific Halibut)
5. Fish ticket weights (Retained species only)



Tip* Weight estimates for drop-offs and fish affected by predation are based on the average weight for retained individuals of the same species.

Extrapolated or actual weights from individuals in same set

Since 100% of hooks/pots are tallied, individuals for average weights will be collected while tally sampling.



Tip* Collect, at minimum, 15 individuals from non-target species for average weight calculations. Count and weigh at least 30 individuals from target species.



Tip* Fish carcasses or skeletons should not be weighed. These fish are tallied as fish discarded due to predation. Use the average weight derived for the species from whole specimens.

Extrapolated Weight from “Like” Sets

There may be one or more species for which it was impossible to collect individuals to use for average weights. This usually happens if only a few individuals of a given species that are caught. If this occurs, use average weights of the same species from a similar set when available.

Visual Estimates of Large Organisms

On many small boats, there isn't space for a platform scale and the observer will only be able to weigh organisms up to 25 lbs on hanging scales. When an organism is too large to weigh, a visual estimate is made. Large organisms commonly encountered on small boats include sharks and skates.

For example: Large skates will usually break the gangions when they leave the water. This means the observer will not be able to get a weight for large skates and using an average weight from smaller skates would be biased. Therefore, taking a visual estimate of the weight is the best option.

Visual Estimates for Retained Species

If possible, observers should actually weigh retained species or obtain a subsample of retained individuals to determine average weights. However, on some vessels, it may not be possible to weigh retained fish. Because fishers participating in the live fish market are extremely concerned about the condition of their fish, they may not allow the observer to handle live retained catch. Also, physical constraints aboard the vessel may make it impossible to obtain a random sample of unsorted retained catch.

If it is not possible to collect and weigh a sample of retained fish for average weights, visual estimates can be obtained by one of the following methods (in order of preference):

- Record visual estimate of every retained individual as it comes aboard and sum estimates by species.
- For more abundant species, use a systematic sampling strategy (described above) to visually estimate the weight of every *n*th fish. Determine the average of these visual estimates and multiply by the total number tallied.
- When a retained species is consistent in size, apply a visually estimated average weight to the total tally. With this method, rather than visually estimating the weight of individual fish, the tally is multiplied by an "overall" average weight estimate for that species.

Note: When visual estimates are used for retained species, the same average weights must be applied to fish of the same species that are discarded due to drop-off or predation. These are also recorded as visual estimates.



Fish Ticket Weights (Retained Fish Only)

If it is not possible to collect and weigh a sample of retained fish for average weights and visual estimates were not made, delivery weights (fish tickets) can be used to calculate the average weights of retained species. Because fishers participating in the live fish market are extremely concerned about the condition of their fish, collecting samples of retained individuals may not be possible. Visual estimates of fish are preferred over fish ticket weights. When using delivery weights:

1. **Tally ALL retained individuals by species by haul.**
2. Observe the weighing of the fish by species upon landing, if possible. If not, ask the skipper for a copy or look at the weights on the fish ticket.

3. Calculate average weight of species by:



$$\text{Average Species Wt} = \frac{\text{Landing Weight of Species (lbs)}}{\text{\# of Individuals of Species Caught During ENTIRE Trip}}$$

4. For each haul, calculate the weight of retained species.



$$\text{Species Wt by Haul} = (\text{Average Species Wt}) \times (\text{\# of Individuals Caught in Haul})$$

Pacific Halibut

Pacific halibut are not commonly encountered on most small fixed gear vessels. For specific instructions regarding Pacific halibut, see Chapter 5, “Fixed Gear Sampling”.

Random Sampling for Collecting Average Weights

The preferred method for collecting individuals for average weight determinations on small fixed gear vessels is to use a systematic sampling frame with a random start, and to collect individuals throughout the entire set.

Individuals may be collected systematically by one of the following methods:

- Systematically select individuals throughout entire set.
- Weigh all individuals from the systematically selected gear units throughout set.

Systematically Sampling Individuals Through Entire Set

1. Estimate the total number of individuals that will be caught on the set. Ask the skipper if unsure.
 - **Example:** 100 kelp greenling
2. Determine the number of individuals that will be collected.

- **Example:** 20
3. Determine the sampling frequency (n) by dividing the estimated number that will be caught by the number of fish that will be collected.
 - **Example:** 100 (estimated #)/ 20 (# wanted) = 5 (n). The sampling frequency is every 5th fish.
 4. Randomly select the start point between 1 and n using the random number table or watch.
 - **Example:** Use random number table to select a number between 1 and 5 (n). 2 is randomly selected.
 5. Collect and weigh randomly selected start fish and every nth fish throughout the set.
 - **Example:** Collect the 2nd, 7th ($2 + 5(n)$), 12, 17.....97th.

Systematic Sampling of Gear Segments Throughout Entire Set

This method works well when a species is caught consistently through the entire set and when the gear can be divided into sampling units, such as sticks, traps, or strings of traps.

1. Define the population.
 - **Example:** An estimated 300 cabezon will be caught in a set of traps
2. Sampling frame by gear.
 - **Example:** A string of trap gear.
3. Determine the sample unit. Sample unit = individual traps (collect all cabezon in each selected trap), total number of traps or sample units.
 - **Example:** Sample units are 150 traps in a string of gear.
4. Number all units
 - **Example:** 1 - 150 traps.

5. Determine how many Sampling Units are in the sample.
 - **Example:** Assume 300 cabezon are caught in 150 traps, and assume there will be 2 CBZN per trap and a total of 30 CBZN are needed for average weights. (total traps to sample = 30 average weight CBZN / 2 CBZN per trap, ANSWER = 15 traps) 15 traps or sample units to get desired number of fish for average weights. So, 15 pots (sample units) will need to be sampled.
6. Divide total traps or units by the number of Sampling Units desired in sample = n.
 - **Example:** $n=150 \text{ units} / 15 \text{ Sampling units} = 10$, so n is every 10th pot.
7. Randomly select a random number between 1 and n using the random number table or watch.
 - **Example:** Use random number table to select a number between 1 and 10 (n). 9 is randomly selected.
8. Collect and weigh the fish in the randomly selected gear segment and every nth gear segment throughout the set.
 - **Example:** Collect fish from the 9th, 19th ($9 + 10(n)$), 29th

VI. Documenting Tally Samples

The tally sample is normally documented on the back of the Fixed Gear Catch Form, along with the weights of individuals of each species weighed. Once sampling for the haul is complete, the Catch Form and Species Composition Forms can be completed.

Catch Categories on Fixed Gear Vessels

As a review, there are two rules that apply to catch categories:

- Retained and discarded individuals are always in separate catch categories.
- Individuals are grouped in the same catch category when they are sampled together. All individuals in the grouping must have the same weight method, hook counts and sample method.

Grouping, Assigning Weight Methods, and Naming Catch Categories on Fixed Gear Vessels

On fixed gear vessels, the method used to obtain the weight of the species (actual weight/extrapolation, visual, fish ticket, etc.) determines how it's grouped into catch categories and the weight method that should be documented.

- All species whose weight was determined by an actual or extrapolated weight from the same set or from “like” sets, should be grouped in the same catch category by disposition (retained and discarded). On the Fixed Gear Catch Form, these catch categories will have **Weight Method 13 - Tally Sample**.
 - As these catch categories will have a species composition sample, the name of the catch category is irrelevant. ZMIS is most commonly used.
- Species whose weight was determined by a visual estimate should be placed in their own catch categories. On the Fixed Gear Catch Form, these catch categories will have **Weight Method 14 - Visual Experience**.
 - As these catch categories will *not* have a species composition sample, the most descriptive catch category code possible should be used. To determine catch category code, in order of preference, use:
 - Species specific code (i.e. ARRA, Aurora rockfish)

- Species grouping code (i.e. NSLP, North Slope Rockfish)
 - FISH - single fish species that is discarded.
 - INVT - invertebrate discard.
 - MBOT - miscellaneous bottom items, including rocks, mud, logs, bones, garbage, etc.
 - ZMIS - mixed catch which can include fish species, invertebrates, and bottom items (like rocks, logs, etc.).
- Pacific halibut whose weight is determined using the length-to-weight table should be placed in it's own catch category, by disposition. The catch category weight method on the Fixed Gear Catch Form will be **WM-9 P. Halibut Length/Weight Conversion**. Weight Method 9 - P. Halibut Length/Weight Conversion will be used when lengths are visually estimated OR actually lengthed and the weights are derived from Appendix Pacific Halibut Length/Weight Table.
 - As these catch categories will *not* have a species composition sample, the most descriptive catch category code, **PHLB**, should be used.
 - The visually estimated lengths will be documented on the Length Frequency form using sample method 10 -P. Halibut visual length estimate. The actual lengths taken will be documented on the Biospecimen form.
 - All retained species whose weight was determined by fish ticket weights should be grouped in the same catch category. On the Fixed Gear Catch Form, these catch categories will have **Weight Method 13 - Tally Sample**.
 - As these catch categories will have a species composition sample, the name of the catch category is irrelevant. ZMIS is most commonly used.

Based upon these rules, complete the Fixed Gear Catch Form, as much as possible.



Tip* The “Sample Weight” field should not be filled in for catch categories with weight method “13- Tally Sample” until after the Species Composition Form is completed.

Fixed Gear Catch Form Instructions

The Fixed Gear Catch Form (See Figure 6-8) is used to document sample weight and other catch information. A Catch Form should be completed for all hauls.



Tip* The “weight” column is filled out differently on the Fixed Gear Catch Form than on the Trawl/Prawn Catch Form. For Fixed Gear, the weights recorded are sample weights; for Trawl/Prawn, the weights represent total weight estimates for the catch category.

- **Haul Number** – Record the number of the haul.
- **Date** – Record the date as MM/DD/YY.
- **Trip Number** – This number is automatically generated by the database. Complete this field once the trip has been started in the database.



Tip* Some observers find it easier to start a trip prior to leaving port. Doing this allows the observer to fill in the Trip Number while at-sea rather than when the observer returns to port.

- **USCG #**– Record the USCG vessel number posted on the exterior of the vessel or request this six or seven digit number from the vessel skipper or a coordinator. **If the vessel does not have a USCG number, leave field blank.**

- **Page _ of _** – Number forms sequentially with in a haul.
- **Catch #** - Number the catch categories consecutively, starting from 1 for each haul. The numbers on the paper Catch Form must match the numbers assigned by the database when data is entered.
- **R or D** – Record whether the catch category is **R** – Retained or **D** – Discarded.
- **Catch Category** – Record, in capital letters, the catch category sampled in the 3 or 4-letter PacFin code. For a list of PacFin catch category codes, see Appendix Catch Categories List and Target Strategies.
- **Sample Weight** – Record the weight of the tally sample for the catch category in pounds.



Tip* The “Sample Weight” field should not be filled in for catch categories with weight method 13 until after the Species Composition Form is completed. At this stage, only complete the “Sample Weight” column for catch categories with weight methods 9 or 14.



Tip* If there is a species composition sample for the catch category, the Sample Weight should be the same as the Keypunch Weight on the Species Composition Form!! (If not, there is a problem.)

- **Numbers of Fish** – The total number of fish in the catch category **MUST** be documented if weight method 14 – Visual Experience or 9 – P. Halibut Length/Weight conversion. Do not record the number of fish for weight method 13 – Tally Sample.
- **Hooks/Pots Sampled** – Record the number of hooks or pots that were tally sampled.

- **Weight Method** – Document the weight method used to estimate the catch category.
 - 6 - Other
 - 9 – P. Halibut Length/Weight Conversion
 - 13 – Tally sample
 - 14 – Visual Experience

- **Catch Purity** – If catch category was *sampled* for species composition, record **M** - Mixed if more than one species was within sample. Record **P** - Pure if there was only one species in species composition sample.

If the catch category was *not sampled*, record as **P** – Pure if the catch category is composed of 95% or greater a single species or as **M** – Mixed if the catch category is composed of less than 95% a single species.



- **Discard Reason** – Record the skipper/crew's discard reason for discarded catch categories
 - 11 - Incidental/Accidental
 - 12 - Drop-off
 - 13 - Market
 - 14 - Other
 - 15 - Predation
 - 16 - Regulation
 - 17 - Safety
 - 18 - Market (Dockside only)



Tip* Look only at the primary reason for discard. For instance, if the vessel is not retaining Spiny Dogfish and one drops-off, do not record the reason for discard as drop-off. Even if it had made it on the vessel, the fish would not have been retained. This also applies to fish preyed upon that drop-off. If a fish that would have been retained drops off because it's been preyed upon, the reason for discard should be predation (even if the fish made it aboard it would not have been retained due to predation).

- **Average Time on Deck** - This column should not be collected or used in 2010.(Present on form v. 6)
- **Comments** – Document anything important about each catch category. **Species names should be recorded here if catch category is not accompanied by a species composition sample and catch category name does not indicate species.**
- **Keypunch Checks** – These are required fields for **Sample Weight, #'s of Fish, and #'s of Hooks/Pots Sampled** columns. Sum up the entries in each column and place the total in the corresponding keypunch box at the bottom of the form.

VII. Completing the Species Composition Form



In order to complete the Species Composition Form (See Figure 6-9), the total weight of each species in the tally sample needs to be determined. Average weight calculation will need to be done for species whose weight was determined by:

1. A random subsample of all individuals caught were weighed (all individuals of species not weighed).
2. Fish ticket weights use for retained species AND trip had more than one haul.

Average Weight Calculations

For species that all the individuals in the tally sample were not weighed, an average weight calculation is used to calculate the sample weight of the species. To determine sample weight:

1. Weigh and count randomly selected individuals by species.
2. Divide the weight of individuals weighed by the number of individuals weighed and then multiply by the total number of individuals of that species in tally sample.



$$\text{Total Sample Wt} = \frac{\text{Wt of Subsample} \times \text{Total \# in Tally Sample}}{\text{\# in subsample}}$$

Using Delivery Weights for Average Weights of Talled Individuals

If it is not possible to collect and weigh a sample of retained fish for average weights and visual estimates were not made, delivery weights (fish tickets) can be used to calculate the average weights of retained species.

1. Observe the weighing of the fish by species upon landing, if possible. If not, ask the skipper for a copy or look at the weights on the fish ticket.



Tip* Visual Estimates of species are preferred over fish ticket weights. Use fish ticket weights if you were not able to get visual, actual or average weights.

1. Calculate average weight of species by:



$$\text{Average Species Wt} = \frac{\text{Landing Weight of Species (lbs)}}{\text{\# of Individuals of Species Caught During ENTIRE Trip}}$$

2. For each haul, calculate the weight of retained species.



$$\text{Species Wt By Haul} = (\text{Average Species Wt}) \times (\text{\# of Individuals Caught in Set})$$

Sample Methods on Fixed Gear Vessels

There are three sample methods that describe species composition sampling on fixed gear vessels. **Remember, only catch categories with weight method 13 - Tally sample will have species composition samples.**

Sample Method 4 – Fixed Gear Sample

Used for species whose weight is determined by:

1. Extrapolated or actual weight from individuals in the same set.



Tip* It is not necessary to place those species whose weight is extrapolated in a different catch category than species those that each individual was weighed. They should ALWAYS be in the same catch category.

2. Extrapolated weight from individuals in a “like” set.



Tip* If an average weight from like “set(s)” is used, be sure to document in raw data the haul number(s) that were used.

Sample Method 5 - Fixed Gear Fish Ticket Verified

Used for species whose weight is determined by using the fish ticket (landing receipt) weight AND when the observer has “verified” that the weight on the fish ticket represents the number of individuals per species in the retained tally sample. **For a fish ticket weight to be considered verified, the observer must observe the landing and be 100% confident that all fish in their tally sample are weighed at the landing.**



Tip* Visual Estimates of species are preferred over fish ticket weights. Use fish ticket weights if you were not able to get visual, actual, or average weights.

Sample Method 6 - Fixed Gear Fish Ticket Unverified

Used for species whose weight is determined by using the fish ticket (landing receipt) weight AND when the observer was not able to see the landing or is not confident all individuals in the tally sample were included in the fish ticket weight.

Release Methods (Nearshore Fisheries Only)

Fishers in the nearshore fisheries may use special techniques to increase the probability of survival of discarded rockfish species. Document, on a species level, the most common method used to release rockfish species. Leave blank if unsure and for all non-rockfish species.

Note: Document the “normal” release method of the vessel. If method being used by observer is different than the vessel’s normal release method, be sure to document what the vessel normally does without observer presence!

Thrown directly over (TO) - Rockfish species is generally thrown directly back to sea, without venting or other release method.

Mostly Vented (MV) - Rockfish species is normally vented by the crew prior to release back to sea.

Mostly Released at depth by cage (DC) - Rockfish species is placed in a cage and released at depth.

Mostly Released at depth by weighted line (DW) - Rockfish species is placed on a weighted line and released at depth.

Mostly Released at depth by other method (DO) - Rockfish species is released at depth by a different method. Describe method in observer logbook.

Other Method of Release (OM) - Rockfish species is carefully released using a different method. Describe method in observer logbook.

Not Collected (NC) - Rockfish release method was not collected.

Species Composition Form Instructions

Species composition information is recorded on the Species Composition Form (See Figure 6-9).

- **Haul Number** – Record the number of the haul that the sample came from.
- **Date** – Record the date as MM/DD/YY.

- **Trip Number** – This number is automatically generated by the database. Complete this field once the trip has been started in the database.



Tip* Some observers find it easier to start a trip prior to leaving port. Doing this allows the observer to fill in the Trip Number while at-sea rather than when the observer returns to port.

- **USCG #** – Record the USCG vessel number posted on the exterior of the vessel or request this six or seven digit number from the vessel skipper or a coordinator. **If the vessel does not have a USCG number, leave field blank.**
- **Page _ of _** – Number forms sequentially with in a haul.
- **Trawl Biosampling List** - Do not complete on fixed gear vessels.
- **Catch #** - Record the number that corresponds to the catch category on the Catch Form.



- **Catch Category** – Record, in capital letters, the catch category in the 3 or 4-letter PacFin code. For a list of PacFin catch category codes, see Appendix Catch Categories List and Target Strategies.
- **Sample Method** – Record the method used to sample the catch category.
 - 4 – Fixed Gear
 - 5 - Fixed Gear Fish Ticket Verified
 - 6 - Fixed Gear Fish Ticket Unverified
- **KP Weight and KP Number** – Sum up the total weight of all species in the catch category sample and place the total weight in the Keypunch (KP) Weight box. Sum up the total number of all individuals in the catch category

sample and place the total number in the Keypunch (KP) Number box.



Tip* Check to be sure the KP Weight on the Species Composition Form is the same as the Catch Category Sample Weight on the Catch Form!! (If not, there is a problem).

- **Species** – Record the common name of the species in the sample. This column must be filled in with the species name. Do not simply enter the species code! The common name listed on the paperwork must match the common name used in the database. See Appendix for Species Codes.
- **Species Code** – Record the species code number of the corresponding species. This can be done prior to entering data and not on deck. See the Appendix for All Species Codes.
- **Sample Weight** – Record the total weight of the species in the sample (**can be extrapolated**).
- **Fish Number** – Record the number of fish of each species in the sample (**can NOT be extrapolated**).

- **Reason for Discard** – Record the skipper’s/crew’s reason for discard for each discarded species.
 - 11 - Incidental/Accidental
 - 12 - Drop-off
 - 13 - Market
 - 14 - Other
 - 15 - Predation
 - 16 - Regulation
 - 17 - Safety
 - 18 - Market (Dockside only)



Tip* Look only at the primary reason for discard. For instance, if the vessel is not retaining Spiny Dogfish and one drops-off, do not record the reason for discard as drop-off. Even if it had made it on the vessel, the fish would not have been retained. This also applies to fish preyed upon that also drop-off. If a fish that would have been retained drops off because it’s been preyed upon, the reason for discard should be predation (even if the fish made it aboard it would not have been retained due to predation).

- **Release Method** - Document the two letter code that corresponds the release method used for **rockfish** species in the nearshore fishery.
 - TO** - Thrown directly over
 - MV** - Mostly Vented
 - DC** - Mostly Released at depth by cage
 - DW** - Mostly Released at depth by weighted line
 - DO** - Mostly Released at depth by other method
 - OM** - Other Method of Release
 - NC** - Not Collected
- **Basket Weights and #** – Use this column on deck to document numbers and weights. These columns are not commonly used for fixed gear data. Tally sample raw data is usually recorded on the back of the Catch Form.

Once the Species Composition Form is completed, fill in the “Sample Weight” column on the Fixed Gear Catch Form with the “Keypunch Weight” for those catch categories with weight method 13.

VIII. Determining OTC on Fixed Gear Vessels

The following weight methods are to be used to calculate OTC on fixed gear vessels.

Weight Method 6 – Other

There are two situations where weight method 6 - Other is used on fixed gear vessels:

- Hauls not sampled - sum of like sets used for OTC
- Hauls where the number of hooks/pots sampled by catch category is different. For example: The observer samples the first half of a set and a marine mammal is caught in the second half of the set.

Weight Method 8 – Extrapolation

This method is used when less than 100% of the gear is tally sampled.



$$\text{OTC} = \frac{(\sum \text{All Catch Category Wt on Catch Form}) \times (\text{Total \# Hooks in Set})}{\text{\# of Hooks Sampled}}$$

Note: When GEAR IS LOST, Weight Method 8 - Extrapolation must be used to calculate OTC in order to account for the unsampled (lost) gear. An extrapolation for lost gear is made when a gear segment, such as a stick or trap is lost, but NOT when individual hooks break off.

Weight Method 11 – Retained + Discarded

This method is used when 100% of the gear is tally sampled.



$$\text{OTC} = \sum \text{All Catch Categories on Catch Form}$$

IX. Recording Fishing Effort Information

Fishing effort information must be recorded for every set a vessel makes while the observer is on board. The fishing effort information is recorded on the Trip Form, which is separated into two sections (See Figure 6-12 and (See Figure 6-14).

Seabird Avoidance Gear

Seabird avoidance gear - only record the gear if its actually being used and not just because the vessel always sets at night.

Vessels that fish with hook and line gear often have seabirds following the vessel, attacking hooks as they are set. In order to prevent bait from being stolen and birds from dying, some vessels use a seabird avoidance device while setting their gear.

WCGOP seabird avoidance gear codes are:

- 0 - No
- 2 - Streamer Line(s)
- 3 - Buoy Line
- 4 - Weights
- 5 - Night Setting (Exclusively)
- 6 - Other (Describe in haul comments)

Common types of seabird avoidance gear include:

2-Streamer/Tory Lines (Single and Paired)

Streamer/tory lines consist of a length of line, streamers (smaller pieces of line) attached along a portion of the length, and one or more floats at the terminal end. Paired

streamer lines consist of two streamer lines, one deployed on each side of the main groundline.

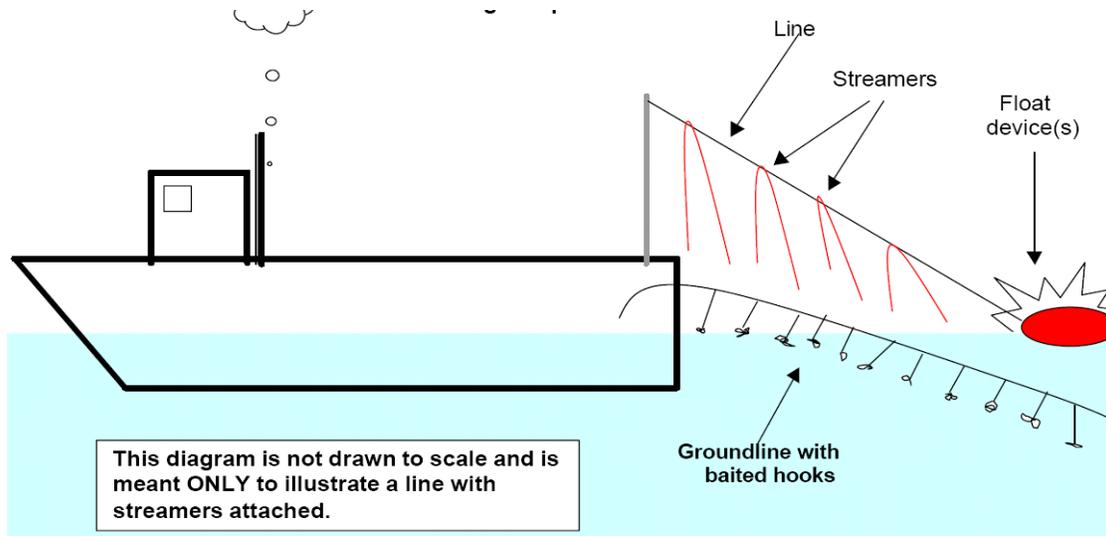


Figure 6-10: Streamer Line Diagram

3 - Buoy Bag Line

A buoy bag line consists of a length of line (no streamers attached) and one or more float devices at the terminal end.

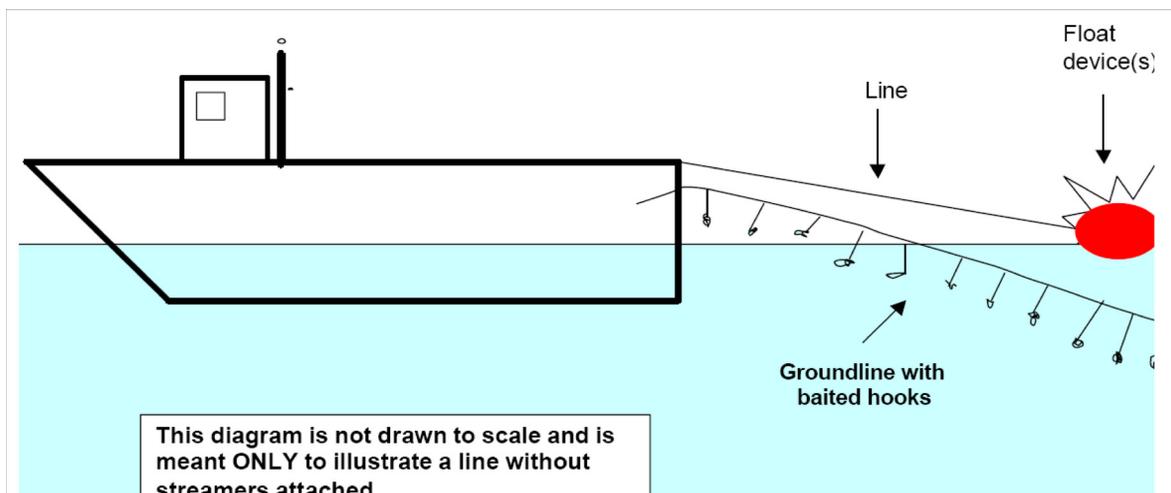


Figure 6-11: Buoy Line Diagram

4 - Weights

Crew adds extra weights to the groundline for the purpose of sinking gear more quickly.

5 - Night Setting (Exclusively)

The vessel sets at night to avoid seabird bycatch.

6 - Other

Vessel uses a different method to avoid/reduce seabird bycatch. Describe method used in observer logbook and in haul comments.

EFP -Permits that allow fishing activities that would otherwise be prohibited. The permits are usually written by the states and must pass a vote by the PFMC.

Trip Form Instructions

A Trip Form must be completed for all observed trips. (See Figure 6-12)

- **Fishery Type** (along top right-hand border)– Circle the fishery type the vessel participated in (**LE** = Limited Entry, **OA** = Open Access, or **EFP** = Exempted/Experimental Fishing Permit).
- **Page #** – All Trip Forms are numbered together by trip.
- **Trip Number** – This number is automatically generated by the database. Complete this field once the trip has been started in the database.



Tip* Some observers find it easier to start a trip prior to leaving port. Doing this allows the observer to fill in the Trip Number while at-sea rather than when the observer returns to port.

- **USCG #** – Record the USCG vessel number posted on the exterior of the vessel or request this six or seven digit number from the vessel skipper or a coordinator. **If the vessel does not have a USCG number, leave field**

Question: What's a trip?

Answer: A trip is a fishing activity that typically results in the completion of a fish ticket (landing receipt). The exception is when the vessel fished but did not retain any species.

blank and fill in the State Registration Number field.

- **State Registration Number** – Use this field **only** if the vessel does not have a USCG number. The state registration number will begin with a **CF** in California, **OR** in Oregon, and **WN** in Washington.
- **Observer Name** – Record your first and last name.
- **Year** - Record the year as 20YY.
- **Vessel Name** – Record the full name of the vessel.
- **Partial Trips** – Check the box if the trip included more days than were observed. (Fish ticket includes unobserved catch.)



Tip* Partial trips usually occur when a vessel fishes multiple day trips in a row.

- **Total # of Fishing Days (Known)** – Document the total number of days the vessel fished before landing and document it in the database and trip form in the trip notes. **This field is only completed when the trip is a partial trip.**



Tip* Do not guess or make an assumption to complete this field. If you do not know how many days the trip lasted, leave column blank.



- **Fishery** - Record the name of the fishery the vessel was selected for:
 - Limited Entry Zero Tier
 - CA Nearshore
 - OR Blue/Black Rockfish Nearshore
 - OR Blue/Black Rockfish
 - WC Open Access Fixed Gear

- **Vessel Logbook Name** - Record the name of the logbook the vessel is using to record fishing effort information. The following logbooks can be used:

Fishery	Vessel Logbook Name
Limited Entry Zero Tier	No logbook required, however, if vessel is recording information in a logbook, document the logbook's name. If logbook name is not available in the database, contact the Database Manager.
CA Nearshore	No logbook required, however, if vessel is recording information in a logbook, document the logbook's name. If logbook name is not available in the database, contact the Database Manager.
OR Black/Blue Rockfish and OR Black/Blue Rockfish Nearshore	OR Nearshore
WC OA Fixed Gear	OR Fixed Gear (Oregon vessels only) California and Washington do not require logbooks. However, if vessel is recording information in a logbook, document the logbook's name. If logbook name is not available in the database, contact the Database Manager.

- **Permit/License #** – Document the permit/license number being used. All fixed gear fisheries, with the exception of WC Open Access Fixed Gear, must have a permit/license number documented. Limited Entry Sablefish vessels can have up to three permits stacked. All permit numbers associated with the vessel must be documented. Ask the skipper of the vessel for the permit numbers being fished or contact coordinator.
- **Vessel Logbook Page Number** - The Vessel Logbook number is the page number(s) where the skipper is recording the trip information. Do not record the number of the entire Logbook!
- **Observer Logbook #** - Record the number on the front page of the Observer Logbook used to document information about the trip.

Question: Why do observers record logbook page numbers?

Answer: The fishing locations of vessels carrying observers are compared to the fishing locations of vessels not carrying observers to ensure vessel activity has not changed with observers on board.

- **Skipper's Name** – Record the first and last name of the skipper.
- **# of Crew (including captain)** – Document the number of crew, including the captain, on the vessel.
- **Departure Date/Time** – Document the date and time the vessel left port.
- **Departure Port** – Document the port the vessel departs from.
- **Landing Date/Time** – Document the date and time the vessel returns to port.
- **Landing Port** – Document the port to which the vessel returns.
- **Fish Ticket Number** – Obtain the numbers of all landing receipts (fish tickets) from the vessel skipper, the port biologist, or the state liaison. **This is a required field for all fisheries and trips!**
 - CA fish tickets begin with a letter followed by six digits.
 - OR fish tickets are seven digits.
 - WA fish tickets begin with a letter followed by six digits.
- **WOC** - The state agency code will be **C** - for California deliveries, **O** – for Oregon deliveries, or **W** – for Washington deliveries.
- **Date** – Document the date in MM/DD/YY of fish ticket issuance.

Question: Why are observers required to record Fish Ticket Numbers?

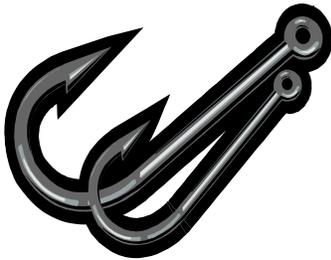
Answer: When observer data is analyzed, the total landed weight from the Fish Ticket is used to estimate the amount of discard by species per landed weight of target(s).

Haul Information

- **Haul/Set Number** – Number hauls consecutively, starting with 1 for each trip.



Tip* Hauls must be numbered in the order retrieved!! If hauls are numbered in the order they were set, all Catch, Species Composition, and Trip Information will need to be renumbered at debriefing.



- **Observer Total Catch Estimate (OTC)** – Record the total catch estimate to two decimal places. Observer Total Catch estimate is recorded in pounds.
- **Weight Method** – Enter the number that represents the weight method used to obtain the observer total catch estimate. The weight methods that may be used for fixed gear OTC's are:
 - 6 - Other
 - 8 - Extrapolation
 - 11 - Retained + Discarded
- **Total Hooks/Pots** – Record the total number of hooks or pots in the set. This number should include lost gear.
- **Gear Performance** – Record one of the following codes to document gear performance:
 - 1 - No problem
 - 2 - Pot was in the haul
 - 3 - Net hung up
 - 4 - Net ripped
 - 5 - Trawl net or codend lost, pot(s) lost, other gear lost
 - 7 – Other problem – Document other gear related problem in the comments section
- **Seabird Avoidance Gear (Gear types 7, 9, 19, & 20 only)**- Document the number that describes that type of

Total Hooks/Pots

Always record the number of pots /hooks set, not retrieved in this column. If gear is lost, use gear performance code 5 and document how much gear is lost in the comments section.

seabird avoidance gear used or document “No” if not used.

- 0 - No (not used)
- 2 - Streamer Line(s)
- 3 - Buoy Line
- 4 - Weights
- 5 - Night Setting (Exclusively)
- 6 - Other (Describe in haul comments)

- **Avg. Soak Time** - If set was NOT defined by buoy to buoy and gear type is NOT pole, circle the average range of soak time of a single unit of gear. (Gear types 7 and 9 always; Gear types 10, 19 and 20 sometimes).

- < 1 minute
- 1 to 5 minutes
- 5 to 15 minutes
- 15 to 30 minutes
- 30 to 45 minutes
- 45 to 60 minutes
- 1 to 2 hours
- 2 to 6 hours
- 6 to 12 hours
- 12 to 24 hours
- 24 to 36 hours
- 36+ hours

- **Comments** – Document any information that is important about the haul. This could include gear performance issues or weather or sampling issues.
- **OTC Keypunch Check** – Sum the OTC’s for an entire trip and record total weight of trip in the OTC keypunch check box. (If more than one Trip Form is used, sum total catch estimates of ALL hauls to obtain keypunch check.)
- **Total Hooks/Pots Keypunch Check** – Sum all of the hooks/pots counts for an entire trip and record total hooks/pots count of trip in this column. (If there are

multiple Trip Forms, add total hooks/pots counts of ALL hauls to obtain keypunch check.)

Trip Form - Haul Locations

(See Figure 6-14)



Tip* Observers are often required to record haul location information on their own.

- **Trip Notes** – Document any information pertinent to understanding the trip.
- **Haul/Set Number** – Number hauls consecutively, starting with 1 for each trip in the order they were retrieved.
- **Start and End Date** – Document the date the haul was set and the date the haul was retrieved as MM/DD.
- **Start and End Time** – Document the Pacific Standard Time (PST) when the first hooks were put into the water for the start time. **Document the time when the last hook is brought on board during retrieval for the end time.**



Tip* When additional positions and depths are recorded, they are noted in the lines below the start and end times for the corresponding haul. The times entered in the additional lines should fall between the start and end times, which are entered in the first two rows for the haul (See “Stick Gear Example” on page 65.)

Loran: If the vessel is using Loran C and the degrees of latitude and longitude cannot be obtained while at sea, document the Loran coordinates so that you can convert the positions to degrees after the trip. See the Appendix for Loran Information and how to convert Loran C coordinates to latitude and longitude positions.

- **Start and End Latitude** – Document the latitude (in degrees, minutes, 1/100th of a minute) that the haul was set and retrieved.



Tip* When an observer boards a vessel that has a GPS, check to be sure the it's recording in degrees, minutes, 1/100th of a minute. If it's not, ask the captain to change the view to 1/100th of a minute instead of seconds. (See Figure 6-13)

- **Start and End Longitude** – Document the longitude (in degrees, minutes, 1/100th of a minute) that the haul was set and retrieved.



Figure 6-13: GPS Showing Latitude and Longitude

Fathoms: 1 Fathom = 6 Feet

- **Depth** – Document the fishing depth in **fathoms**.
- **Gear Type** – Enter a code for the gear type based on the configuration of the gear, and how it is being fished. (Example: If the vessel is using a fishing pole while under way (trolling), the gear type would be recorded as 15 - All Troll Gear.)
 - 7 - Vertical Hook and Line
 - 8 - Pole
 - 9 - Other Hook and Line Gear

- 10 - Fish Pot
- 15 - All Troll Gear
- 16 - All Other Miscellaneous Gear
- 19 - Longline (Fixed hooks)
- 20 - Longline (Snap-on hooks)

****If the fishing vessel is not using one of the above gear types, this is most likely the wrong section of the manual.**

- **Target Strategy** - Enter the vessel's target strategy. Refer to Appendix Catch Categories List and Target Strategies.

TRIP FORM - HAUL LOCATIONS

Haul/ Set #		Date		Time	Latitude		Longitude		Depth of Catch (fathoms)	Gear Type	Target Strategy
		Month	Day		Degrees	Minutes	Degrees	Minutes			
	Start										
	End										
	Start										
	End										
	Start										
	End										
	Start										
	End										
	Start										
	End										
	Start										
	End										
	Start										
	End										
	Start										
	End										
	Start										
	End										
	Start										
	End										
	Start										
	End										

Trip Notes:

Figure 6-14: Trip Form – Hauls Location

X. Trip Discard

Dead Fish in a Live Fish Market

When vessel operators are selling to live fish markets, they generally do not want to land dead fish. Quotas for nearshore fisheries are relatively small, sometimes as low as 100 pounds for a 2-month period for a particular species. Dead fish have a small fraction of the value of live fish, and in some cases, buyers of live fish will not buy dead fish at all. When fish die in the live tank some vessel operators will keep them for personal use, while others may discard them before making a delivery. Fish retained for personal use may or may not be recorded on the fish ticket. If dead fish are brought in to port, they should be recorded in observer data as retained catch. If fish are discarded prior to the end of the trip, they should be recorded as discarded catch. **Use Reason for Discard 18 - Market (Dockside only) for fish discarded as discussed above.**

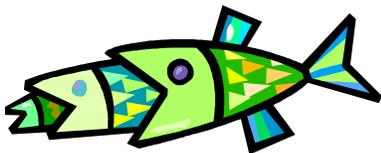
Discard That Cannot Be Attributed to a Specific Haul

If there were multiple hauls in a fishing trip and discard occurs at the end of the trip, it is unlikely that the observer will be able to attribute the discard to a specific haul. In instances where the discarded species was only caught in one particular haul, the discard can be applied to that haul. Otherwise, discard that cannot be attributed to a specific haul is recorded on the Trip Discard Form.

Trip Discard Form Instructions

The Trip Discard Form is not entered into the database system. Document the information from the Trip Discard Form (See Figure 6-15) in the Trip Notes on the Trip Page in the database.

- **Trip Number** - Record the trip number generated by the database system.
- **USCG #-** Record the USCG vessel number (if they have one.) If the vessel does not have a USCG number, leave entry field blank.
- **Date** - Document the month (MM) and day (DD) that the trip discard took place.
- **Time** - Document the time, in PST military time, that the trip discard took place.
- **Species** - Document the common name of the species that was discarded.
- **Weight** - Document the weight, in pounds, of species discarded.
- **# Of Fish** - Document the number of fish discarded (if known.).
- **Weight Method** - Document the weight method used to estimate the species weight.
 - 1-Actual Weight
 - 6-Other
 - 7-Vessel Estimate
 - 8-Extrapolation
 - 9-Pacific Halibut L/W
 - 14 - Visual Experience
- **Discard Reason** - Record the skipper/crew's reason for discard for each species.
 - 11 - Incidental/Accidental
 - 12 - Drop-off
 - 13 - Market
 - 14 - Other
 - 15 - Predation
 - 16 - Regulation
 - 17 - Safety
 - 18 - Market (Dockside only)

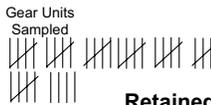


XI. Examples

Stick Gear Example

In these examples, be aware that the biological sampling duties that observer's are responsible for on every haul are not addressed. Biological sampling is described in detail in Chapter 7, "Biological Sampling" and Chapter 8, "Protected Resources"

Haul/Set #	Date	Time	Latitude		Longitude		Depth (fm)	Gear Type	
			Degrees	Minutes	Degrees	Minutes			
1	Start	7/4	0935	36	14.467	125	44.114	10	9
	End		1030	36	14.467	125	44.114	10	9
	Start		1130	36	14.467	125	44.114	10	9
	End		1250	36	14.467	125	44.114	10	9

Gear Units Sampled:  Average Soak Time/Gear Unit: 30 minutes # hooks/gear unit: 3
 10 sticks pulled multiple times

Retained	Tally Sample	Discarded
5.0 lbs, 2.5 lbs, 2.5 lbs, 3.0 lbs, 3.5 lbs, 2.75 lbs, 2.75 lbs, 2.0 lbs	Cabezon	1.75 lbs, 2.0 lbs, 4.0 lbs, 1.25 lbs
1.75 lbs, 1.0 lbs	Kelp Greenling	
1.25 lbs	Black and Yellow RF	.75 lbs, .75 lbs (regs) (vented)
3.0 lbs, 3.25 lbs, 2.25 lbs, 2.25 lbs, 3.75 lbs, 1.89 lbs	Grass RF	1.0 lbs, 2.6 lbs (regs)(vented)
1.0 lbs	Kelp RF	
	Swell Shark	4.5 lbs
	Blue RF	2.7 lbs, .89 lbs, 2.0 lbs, 3.3 lbs (market)
	Lingcod	12.0 lbs, 9.0 lbs (regs)
	Gopher	.50 lbs, 2.1 lbs (regs) (vented)
	Sunstar	1.0 lbs, .5 lbs, .5 lbs

Total Hooks in Set = 39 sticks X $\frac{3 \text{ hooks}}{\text{stick}}$ = 117 hooks

OTC = Retained + Discarded = 45.39 lbs + 57.59 lbs = 102.98 lbs

CHAPTER 6
Fixed Gear Sampling on Small Boats

TRIP FORM - HAUL LOCATIONS

Trip Notes:

Haul/ Set #		Date		Time	Latitude		Longitude		Depth of Catch (fathoms)	Gear Type	Target Strategy
		Month	Day		Degrees	Minutes	Degrees	Minutes			
1	Start	07	04	0935	36	14 47	125	44 11	10	9	CBZN
	End	07	04	1250	36	14 49		44 14	10		
↓	Start	07	04	1030	36	14 45	↓	44 12	12	9	CBZN
	End	07	04	1130	36	14 46		44 13	11		
	Start										
	End										
	Start										
	End										
	Start										
	End										
	Start										
	End										
	Start										
	End										
	Start										
	End										
	Start										
	End										
	Start										
	End										

OAR Control No. 0946-0593 expires 9/30/2012

CHAPTER 6
Fixed Gear Sampling on Small Boats

Haul #

SPECIES COMPOSITION FORM

Trawl Biosampling List
 1 2 3

Page 2 of 2

Date

Trip Number

USCG #

CATCH #	Catch Category	Sample Method	KP Weight	Species	Species Code	Sample Weight	Fish #	Discard Reason	Release method	Basket Weight	#	Basket Weight	#						
			KP Number																
1	ZMIS	4	45.39	Cabezon	689	24.0	8												
			18																
														Kelp Greenling	392	2.75	2		
														Black n Yellow	355	1.25	1		
														Grass RF	365	16.39	6		
	Kelp RF	369	1.0	1															
2	ZMIS	4	57.59	Cabezon	689	9.0	4	16											
			25																
														Black n Yellow	355	6.0	7	16	MV
														Grass RF	365	3.6	2	16	MV
														Swell Shark	587	4.5	1	13	
														Blue RF	316	8.89	4	13	MV
														Lingcod	603	21.0	2	16	
	Gopher RF	364	2.6	2	16	MV													
	Seastar	20	2.0	3	13														

Trawl Sample Methods : 1-Whole haul species 2-Single basket 3-Multiple basket Fixed Gear Sample Methods: 4-FG Sample 5-FG(Verified Fish Ticket) 6-FG(Unverified Fish Ticket)
 Reasons for Discard: 11-Incidental/Accidental 12-Drop-off 13-Market 14-Other 15-Predation 16-Regulation 17- Safety 18 - Market (Dockside only)
 Release Methods (Nearshore Fisheries Only): TO-Tossed over MV-Mostly Vented DC-Mostly released at depth by cage DW-Mostly released at depth weighted line DO-Mostly released at depth other method
 OM-Other release method used

Rod and Reel Example

Haul/Set #	Date	Time	Latitude		Longitude		Depth (fm)	Gear Type
			Degrees	Minutes	Degrees	Minutes		
1	Start	0730	38	21.59	120	16.478	8	
	End	1030	38	21.79	120	16.482	8	
	Start							
	End							

Gear Units Sampled



Average Soak Time/Gear Unit:

hooks/gear unit: 6

Retained

Tally Sample

Discarded



Black and Yellow RF

2 @ 1.5lbs	1 @ .75lbs
1 @ .75lbs	2 @ 1.75 lbs
1 @ .75lbs	1 @ .75 lbs (regs)
1 @ .75lbs	1 @ .75 lbs (vented)



Vermillion RF



Gopher RF



Lingcod

Cabazon

1 @ 2.75 lbs	1 @ 2.25 lbs
1 @ 3.75 lb	1 @ 2.25 lbs
1 @ 3.50 lbs	1 @ 4.50 lbs (regs)
1 @ 2.00 lbs	2 @ 6.50 lbs
1 @ 4.00 lbs	1 @ 7.00 lbs

Kelp Greenling

2 @ 1.75 lbs	
1 @ 1.25 lbs	
1 @ 1.00 lbs	
1 @ 1.50 lbs	(regs)
1 @ 1.00 lbs	

Total Hooks in Set = 59 rods X 6 hooks = 354 hooks
stick

OTC = Retained + Discarded = 40.23 lbs + 52.75 lbs = 92.98 lbs

CHAPTER 6
Fixed Gear Sampling on Small Boats

Haul #

FIXED GEAR CATCH FORM*

Page 1 of 2

Date Trip Number USCG #

Catch #	R or D	Catch Category	Sample Weight	#s of Fish Req. for wt. methods 6, 14, 9	# Hooks/Pots sampled by catch category	Weight Method	Catch Purity	Discard Reason	Comments
1	R	ZMIS	40.23		354	13	M		
2	D	ZMIS	52.75		↓	13	M		
Keypunch Checks			92.98		708				

*Gear Types 7, 8, 9, 10, 15, 16, 19, 20 Fixed Gear Catch Form v. 7 January 2010
 OMB Control No. 0648-0593 expires 9-30-2012

CHAPTER 6
Fixed Gear Sampling on Small Boats

Haul #

SPECIES COMPOSITION FORM

Trawl Biosampling List
1 2 3

Page ____ of ____

Date

Trip Number

USCG #

Catch #	Catch Category	Sample Method	KP Weight		Species	Species Code	Sample Weight	Fish #	Discard Reason	Release method	Basket Weight	#	Basket Weight	#					
				KP Number															
1	ZMIS	5	40.23	21	Black n Yellow RF	355	11.05	12											
					Vermillion RF										331	5.8	2		
					Gopher RF										364	2.38	3		
					Lingcod										603	21.0	4		
2	ZMIS	4	52.75	27	Cabazon	689	7.75	10	16										
					Black n Yellow RF										355	38.5	11	16	MV
					Kelp Greenling										392	6.5	6	16	

Trawl Sample Methods: 1-Whole haul species 2-Single basket 3-Multiple basket Fixed Gear Sample Methods: 4-FG Sample 5-FG(Verified Fish Ticket) 6-FG(Unverified Fish Ticket) Species Composition Form v.10 Jan 2010
Reasons for Discard: 11-Incidental/Accidental 12-Drop-off 13-Market 14-Other 15-Predation 16-Regulation 17- Safety 18 - Market (Dockside only)
Release Methods for RF (Nearshore Fisheries Only): TO-Tossed over MV-Mostly Vented DC-Mostly released at depth by cage DW-Mostly released at depth other method OM-Other release method used
OMB Control No. 0648-0593 expires 9-30-2012

CHAPTER 6
Fixed Gear Sampling on Small Boats

Species Composition Measurements and Calculations

Species	Measurements, Formulas, and Calculations
ZMIS 1	<p style="text-align: center;">Average Weights for Retained from Fish Ticket Weights</p> <p style="text-align: center;">Fish Ticket Weights(verified) Black N Yellow: 35 lbs (Total of 38 fish caught on trip) Vermillion: 14.5 lbs (Total of 5 fish caught on trip) Gopher: 27 lbs (Total of 34 fish caught on trip) Lingcod: 21 lbs (Total of 4 fish caught on trip)</p>
	<p style="text-align: center;">Black N Yellow Ave Wts</p> <p style="text-align: center;">$\frac{35 \text{ lbs}}{38 \text{ fish}} = .921052631 \text{ lbs/fish}$</p> <p style="text-align: center;">BNY wt = 13 fish X .921052631 lbs/fish = 11.05263157 lbs BNY 12 @ 11.05</p>
	<p style="text-align: center;">Vermillion Ave Wts</p> <p style="text-align: center;">$\frac{14.5 \text{ lbs}}{5 \text{ fish}} = 2.90 \text{ lbs/fish}$</p> <p style="text-align: center;">VERM wt = 2 fish X 2.90 lbs/fish = 5.8 lbs Verm 2 @ 5.8</p>
	<p style="text-align: center;">Gopher Ave Wts</p> <p style="text-align: center;">$\frac{27 \text{ lbs}}{34 \text{ fish}} = .794117647 \text{ lbs/fish}$</p> <p style="text-align: center;">GOPH wt = 3 fish X .794117647 lbs/fish = 2.382352941 lbs GOPH 3 @ 2.38</p>

Longline Example

Haul/Set #		Date	Time	Latitude		Longitude		Depth (fm)	Gear Type
				Degrees	Minutes	Degrees	Minutes		
1	Start	11/17	1030	32	51.03	117	25.18	300	19
	End	11/20	1150	32	50.31	117	25.09	295	19
	Start								
	End								

Gear Units Sampled:  Average Soak Time/Gear Unit: _____ # hooks/gear unit: 750 hooks/tub

Retained

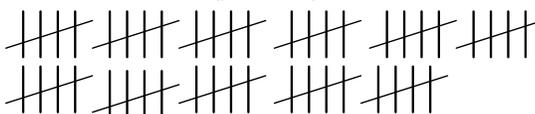
Tally Sample

Discarded

SSPN Visual average wt = 1.25 lbs

81 fish

SSPN (predated)



SABL Visual estimate

3.5 lbs

Octopus

1.1 lbs

Longnose Skate

3.5 lbs 1.0 lbs

4.0 lbs 5.0 lbs

8.0 lbs 6.0 lbs



LSPN Visual average wt = 0.6 lbs



LSPN (predated)



Brown Cat Shark

1.25 lbs 1.25 lbs

1.25 lbs 1.50 lbs

1.0 lbs



BLGL Actual weight

2.5 lbs

Sea Stars

0.2 lbs

0.2 lbs

Blue Shark

3.5 lbs

4.0 lbs

Black Hagfish

0.3 lbs

CHAPTER 6
Fixed Gear Sampling on Small Boats

Species Composition Measurements and Calculations

Species	Measurements, Formulas, and Calculations
ZMIS 7	<p>Longnose skate $3.5 + 4.0 + 5.0 + 8.0 + 6.0 + 1.0 = 6 @ 27.5$ Longnose skate: $\frac{27.5 \text{ lbs}}{6 \text{ fish}} \times 19 \text{ fish} = 87.08 \text{ lbs}$</p> <p>Brown Cat Shark $1.25 + 1.25 + 1.0 + 1.25 + 1.5 = 5 @ 6.25$ Brown cat shark: $\frac{6.25 \text{ lbs}}{5 \text{ fish}} \times 10 \text{ fish} = 12.5 \text{ lbs}$</p>
SSPN 1	Vis aver wt = 1.25 lbs SSPN 1 = $\frac{1.25 \text{ lbs}}{\text{fish}} \times 81 \text{ fish} = 101.25 \text{ lbs}$
LSPN 3	Vis aver wt = 0.6 lbs LSPN 3 = $\frac{0.6 \text{ lbs}}{\text{fish}} \times 6 \text{ fish} = 3.6 \text{ lbs}$
SSPN 5	Vis aver wt = 1.25 lbs SSPN 5 = $\frac{1.25 \text{ lbs}}{\text{fish}} \times 55 \text{ fish} = 68.75 \text{ lbs}$
LSPN 6	Vis aver wt = 0.6 lbs LSPN 6 = $\frac{0.6 \text{ lbs}}{\text{fish}} \times 3 \text{ fish} = 1.8 \text{ lbs}$