

## Groundfish Electronic Monitoring Program Manual

DRAFT (July 21, 2020)

*This draft manual incorporates feedback from the November 2019 Pacific Fishery Management Council meeting, including comments submitted by the Groundfish Electronic Monitoring Policy Advisory Committee (GEMPAC). Additionally, proposed changes presented by NMFS to the Council in [April 2020](#), [June 2020](#), and other proposed changes identified by NMFS through ongoing collaboration with Electronic Monitoring Service Providers, and through database construction, have also been included in this draft. Changes that conflict with current regulation are dependent on proposed regulatory changes and are considered preliminary.*

*Key updates to this version include:*

- *Deadlines for EM summary, feedback, technical assistance, and other reporting requirements based on Council recommendations from the June 2020 meeting*
- *Discard logbook processing role filled by the EM service providers and not NMFS staff based on Council recommendation from the June 2020 meeting*
- *Trips as the sampling unit, not hauls, so that entire trips are reviewed and not a portion of hauls in a trip selected for review where the review rate is <100%.*
- *Additional information regarding submitting EM data to NMFS*

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## 1. Background

In 2011, NOAA Fisheries implemented a catch share program for the West Coast Groundfish Trawl Fishery. The Pacific Coast Groundfish Fishery's Trawl Catch Share Program (Trawl Rationalization Program), consists of an Individual Fishing Quota (IFQ) Program for the shorebased trawl fleet and cooperative programs for the at-sea mothership and catcher/processor trawl fleets.

The catch share program divides the amount of catch allocated to the trawl fishery into shares controlled by individual fishermen or groups of fishermen (cooperatives). Under this program, fishermen have more flexibility for harvesting their catch than under the previous management structure.

100-percent at-sea monitoring of all fishing trips is a requirement of the Trawl Rationalization Program. Human observers were originally the only approved method to satisfy the at-sea monitoring requirement. Under a regulatory program, electronic monitoring (EM) may be used as an alternative to meet this requirement. This manual contains the detailed requirements and standards that EM providers will use for processing and reporting EM data to NMFS in the EM Program.

### 1.1 EM Program Overview

The roles and responsibilities of the different parties and the data flow under a proposed regulatory EM program are briefly described in this section, from a trip start to data submission. In the continuing effort to minimize redundancy and costs to industry and NMFS, the overview shows key changes from previous draft versions of the program manual. The steps are as follows:

1. Before a trip, the **vessel operator** of an EM-authorized vessel makes the proper declarations to the Office of Law Enforcement (OLE) and, the West Coast Groundfish Observer Program (WCGOP). The vessel captain or WCGOP staff opens an EM trip in the database, which would be shared with the vessel's EM service provider.
2. Following the trip, the vessel operator submits copies of their discard and retained logbooks to their certified **EM service provider**. The vessel operator also submits the hard drive/EM data to the EM service provider.
3. The EM service provider data enters the logbook data and submits it to NMFS **within 48 hours (two business days) from receipt of the discard logbook from the vessel**. NMFS uses the logbook data to debit at-sea discards.
4. The service provider will also store EM data, conduct review of EM data, and provide summary data to NMFS. The service provider is expected to submit EM summary data to NMFS no later than **fifteen business days (approximately three weeks)** from the date of hard drive receipt.
5. Complete trips are reviewed. In fisheries where the review rate is not 100%, specific trips will be randomly selected. All hauls in a selected trip will be reviewed. NMFS will

notify the EM service provider which trips are selected for review based on the trip declaration made to WCGOP.

6. If the logbook passes the initial comparison, the logbook data will stand as the discard source used to debit the vessel account. If the logbook does not pass, the EM data will be used to debit the vessel account.
7. Following the review, the provider would also submit a feedback report (“drive report”), which captures feedback on the review for the vessel owner, operator, and NMFS. Drive reports should also be submitted within **fifteen business days** from the date of hard drive receipt.
8. Providers will also be required to notify NMFS of EM system malfunctions or other requests for technical assistance. Summaries of these notifications, including issue resolution, will be included in the feedback reports.
9. For the NMFS debriefing, WCGOP will direct the provider to submit raw EM data and annotation records, according to the NMFS debriefing procedures. WCGOP may conduct a review of the data for a completed trip, to ensure data quality and provide feedback to the service provider through debriefing reports.

#### 1.1.1 Vessel owners and operators

As an EM Service provider, you are partnering with vessel owners and operators participating in the shorebased trawl IFQ and/or catcher vessels in the whiting mothership cooperative to provide EM equipment, maintenance, and data services. Vessel owners and operators have the responsibility of applying for and maintaining a vessel EM Authorization (<https://www.fisheries.noaa.gov/west-coast/commercial-fishing/west-coast-fishing-permits>) in order to qualify for participation in the EM program. Owners and operators will contact you for technical support, and will submit to you their vessel’s EM data (hard drives and discard logbooks).

Service providers will work with vessel owners and operators to fill out the EM System Certification form (<https://www.fisheries.noaa.gov/west-coast/commercial-fishing/west-coast-fishing-permits>) during EM system installation, and help to construct the vessel monitoring plan for NMFS approval. If a vessel does not follow the requirements laid out in their VMP, then the EM service provider must inform the vessel and NMFS of the issue so that the issue can be resolved in a timely manner.

#### 1.1.2 EM Service Providers

To be an EM service provider, you will first submit an application to the NMFS West Coast Region Fisheries Permit Office. More information about the application process, including

forms and templates for the **EM Service Plan**, can be found online at:

<https://www.fisheries.noaa.gov/west-coast/commercial-fishing/west-coast-fishing-permits>

The EM Program Guidelines provide best practices and flexible frameworks for creating an EM Service Plan and vessel monitoring plans, which together explain the complete EM services for vessel and provider. There are gear-specific catch handling and sorting requirements which must be followed across vessels, and EM service providers must be able to review and report EM summary data for IFQ discards to NMFS using standardized methods contained in this manual.

### 1.1.3 Permits and Monitoring Branch

Staff in the Permits and Monitoring Branch of the West Coast Region's Sustainable Fisheries Division will process your service provider application, manage permits associated with the EM program, and work with service providers and the vessel to address concerns from feedback.

Permits and monitoring staff will be responsible for:

- Processing EM service provider permit applications and issuing service provider permits
- Processing vessel EM authorization applications and issuing EM authorizations
- Reviewing EM system certification forms
- Providing assistance in the creation of vessel monitoring plans, and approving final plans
- Reviewing service provider feedback and technical reports
- Provide the initial point of contact for reports of potential harassment, conflicts of interest, or system tampering (see section 2.2)

The Permits and Monitoring Branch manages permits for the limited entry and trawl catch share programs for the groundfish fishery. This branch also processes service provider applications for other monitoring programs, such as observer and catch monitoring.

### 1.1.4 WCGOP

The [West Coast Groundfish Observer Program](#) (WCGOP) is responsible for ensuring that EM service providers follow the species identification and discard estimation protocols for the video review. NMFS will perform a secondary review of a portion of the trips reviewed by an EM service provider.

**WCGOP will be responsible for:**

- Identify trips that are selected for the initial review to the provider.
- QA/QC of the data summary.
- Reporting discard data for catch accounting purposes.

- Secondary review and debriefing of the EM provider.
- Storing video and annotated data from the debriefing process.
- Data analysis and reporting as needed.

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## 2. EM Service Provider Responsibilities

### 2.1 Field and Technical Support

Employees of an approved EM service provider will provide field and technical support services. This includes managing EM systems, installation, maintenance and technical support, according to the NMFS-accepted EM service plan. (regulatory text in **bold**).

At the time of installation, the EM service provider must:

- (i) Install an EM system that meets the performance standards under § 660.604(j);**
- (ii);**
- (iii) Brief the vessel operator on system operation, maintenance, and procedures to follow for technical support or field service;**
- (iv) Provide necessary information for the vessel operator to complete the VMP, such as images and diagrams of camera views and vessel layout, specific information about system settings, and designated discard control points; and,**
- (v) Complete an EM System Certification Form for the vessel owner.**

**The EM service provider must communicate with vessel operators and NMFS to coordinate service needs, resolve specific program issues, and provide feedback on program operations.**

**The EM service provider must provide maintenance and support services, including maintaining an EM equipment inventory, such that all deployed EM systems perform according to the performance standards at § 660.604(j) and that field service events are scheduled and carried out with minimal delays or disruptions to fishing activities.**

**The EM service provider must provide technical assistance to vessels, upon request, in EM system operation, the diagnosis of the cause of malfunctions, and assistance in resolving any malfunctions. Technical support must be available 24-hours per day, seven days per week, and year-round.**

**The EM service provider must submit to NMFS reports of requests for technical assistance from vessels, including when the call or visit was made, the nature of the issue, and how it was resolved.**

### 2.2 Technical Assistance and Litigation Information

As a requirement of its permit, the EM service provider must provide the following to NMFS or authorized officers, upon request:

- (1) Assistance in EM system operation, diagnosing and resolving technical issues, and recovering corrupted or lost data.**

- (2) Responses to inquiries related to data summaries, analyses, reports, and operational issues with vessel representatives.**
- (3) Technical and expert information, if the EM system/data are being admitted as evidence in a court of law. All technical aspects of a NMFS-approved EM system may be analyzed in court for, inter alia, testing procedures, error rates, peer review, technical processes and general industry acceptance. To substantiate the EM system data and address issues raised in litigation, an EM service provider must provide information, including but not limited to:
  - (i) If the technologies have previously been subject to such scrutiny in a court of law, a brief summary of the litigation and any court findings on the reliability of the technology.****
- (4) All software necessary for accessing, viewing, and interpreting the data generated by the EM system, including maintenance releases to correct errors in the software or enhance the functionality of the software.**
- (5) Notification to NMFS of any change of management or contact information or a change to insurance coverage.**
- (6) A copy of any contract between the service provider and entities requiring EM services.**
- (7) Proof of sufficient insurance.**
- (8) Copies of any information developed and used by the EM service provider and distributed to vessels, including, but not limited to, informational pamphlets, payment notifications, and description of EM service provider duties; and,**
- (9) EM data and associated meta data, and other records specified in the regulations.**

The EM service provider must also notify NMFS within 24 hours after the EM service provider becomes aware of the following:

- (i) Any information, allegations, or reports regarding possible harassment of EM provider staff;**
- (ii) Any information, allegations, or reports regarding possible EM system tampering;**
- (iii) Any information, allegations, or reports regarding any action prohibited under §§ 660.12(f) or 660.602(a)(13); or,**
- (iv) Any information, allegations or reports regarding EM service provider staff conflicts of interest.**

The EM service provider will directly contact the EM Program Coordinator to notify NMFS of the above information, allegations, or reports.

### 2.3 Data Services

The EM service provider must process vessels' EM data according to a prescribed sampling scheme, as specified by NMFS, and determine an estimate of discards for each trip using standardized estimation methods. This section describes the EM service provider's responsibilities in processing, reporting, and storing vessels' EM data, and the standard sampling and estimation methods that must be used.



### 2.3.1 Overview of the Logbook Audit Model

1. The EM Service Provider will report the vessel's logbook data to WCGOP, which will then be used as the initial discard debit to that vessel's account.
2. Upon receipt of the hard drive, the EM Service Provider will then confirm trip level EM data matches the logbook, and work with the vessel operator to resolve discrepancies.
3. Based on the below sampling frames, WCGOP will notify the provider of the randomly selected trips to sample for the newly submitted trips.
  - a. The sampling unit would be at the trip level, and all hauls for a selected trip would be reviewed.<sup>1</sup>
    - i. Shorebased whiting – 100% of trips
    - ii. MS/CV - 100% of trips
    - iii. Non-whiting midwater trawl – [100% of trips for maximized retention, 25% for optimized retention]
    - iv. Bottom trawl - 25% of trips
    - v. Fixed gear - 25% of trips
  - b. If multiple gear types are used on the trip, then the highest sampling rate is used.
  - c. Steam time (vessel movement between hauls and from the fishing grounds) may be reviewed, for certain fisheries and vessel types. Whether or not providers or NMFS conducts this review is still pending.
4. The provider conducts the **primary video review** for trips selected for review, which includes:
  - a. Review of all raw sensor (as applicable) and image data to determine completeness.
  - b. Review of sensor data to annotate haul start and end times and locations, and to identify the total number of hauls in a trip.
  - c. Annotate discard events (described in Section 2.3.4)
5. Provider submits an **EM summary report** to NMFS. The EM data is compared to logbook data based on the following business rules.
  - a. The sum total of the hauls reviewed for each species is compared between the logbook and EM data.
    - i. If the logbook estimate is within 10% of the EM estimate (or 2lb for amounts <10lb) for all species, then the logbook estimate is used to debit the vessel account and no additional video would be reviewed.
    - ii. If the logbook estimate is more than 10% less than the EM estimate for any species, then additional trips may be reviewed.
    - iii. If the logbook estimate is more than 10% more than the EM estimate, then the logbook estimate is used to debit the vessel account and no additional review is needed.
    - iv. Certain incidents may trigger automatic 100% review:
      1. Data gaps that could affect data collection (e.g., more than short power interruption) which are identified on any trip

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<sup>1</sup> Review rates are still being discussed and may change.

2. Prohibited discard events captured on a reviewed trip may trigger 100% review on future trips
  - v. A vessel owner may opt for 100% review at any time.
6. Once the service provider completes and submits the summary data then the service provider will submit feedback to the vessel owner, operator, and to NMFS using a web application (see Appendix A for drive report fields)

### 2.3.2 Data Processing Staff

**The EM service provider must ensure that its data processing staff are fully trained in:**

- (i) Use of data processing software;**
- (ii) Species identification;**
- (iii) Fate determination and metadata reporting requirements;**
- (iv) Data processing procedures;**
- (v) Data tracking; and,**
- (vi) Reporting and data upload procedures.**

Requirements for each of the above components are explained in the following sections.

### 2.3.3 Species Identification

EM data reviewers working for a service provider must be trained for accurate species identification and be knowledgeable of fishing operations for the west coast groundfish fishery. As an EM service provider, you will describe how you train your staff and their qualifications for employment as video reviewers in the EM Service Plan (EMSP). For additional information regarding species ID<sup>2</sup> and west coast observer training materials, please refer to the WCGOP page:

<https://www.nwfsc.noaa.gov/research/divisions/fram/observation/index.cfm>

### 2.3.4 Data Tracking and Processing

A provider will describe procedures for tracking hard drives and/or data files throughout their use cycle in their EMSP. At any given point, the service provider should be able to report where a given hard drive is located, for example, by assigning it a unique ID and documenting its deployment, transit, receipt, data wiping, and redeployment.

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<sup>2</sup> The Observer Program species ID guide is not currently published online, but is available as a supplemental document upon request

Once a hard drive (or other acceptable data transmission) is received by the EM service provider, the original data files must be stored following the retention requirements (see section 2.3.7). Any annotation or further processing of the data must not alter the original files.

### *Interval Annotation*

Interval annotations mark the start and end points of a fishing event in the service provider's EM review software. Trips, hauls, and haul processing events may have interval annotations which flag the start/end points of those events in the data timeline.

Interval Annotations:

- Trip: mark all trip start and end points
- Haul/set: mark all haul start and end points

All trips from a drive should be reviewed for completeness, to identify potential data gaps, but only trips selected for review require interval annotations.

Time Gaps: Are reported along with the interval annotations. At this level, data gaps would include gaps which affected your ability to create the interval annotations. Gaps may be attributed to delayed system start, power loss, hard drive swap, or failure of one or more EM cameras. Additionally, for shoreside trips you must verify that the EM system recorded until the start of the offload. (If there are multiple offload points for a single trip, recording must continue until the final offload begins.)

### *Review for Discards and Catch Handling: Point Annotations*

**Point annotations** will capture individual discard events and include weight, species identification, and discard type. Creating point annotations allow the service provider and NMFS to pinpoint discard events in the EM data and confirm the characteristics of that event. The point annotations will be used in creating the summary report (See section 2.3.5 on data fields).

### *Fixed Gear*

Defining a set of conventional longline or pot gear is straightforward. A set begins at a buoy and ends at a buoy. The set includes all of the hooks or pots in between the two buoys. Generally, conventional longline sets have thousands of hooks and span two or more miles. Pot sets range from 10 to 50 pots per string. All hooks or pots set together in a string, even those lost prior to retrieval, are considered a set and included.

Fixed gear vessels will have all discarded IFQ fish and retained priority species annotated.

Discarded invertebrates and non-IFQ fish will not be annotated, with exceptions listed below.

Annotate all discarded protected species with counts (sea birds, turtles, marine mammals, and green sturgeon [with the exception of Dungeness crab]). Annotate all **retained** protected species with counts (sea birds, turtles, marine mammals, dungeness crab (WA and OR), and green sturgeon).

a. **Retained:**

- i. Annotate retained counts for priority rockfish species.
- ii. Annotate any retained protected species with Piece Counts: sea birds, turtles, marine mammals, green sturgeon, and Dungeness crab.
- iii. Record **disposition**
  1. **Retained**
  2. Discard

b. **Discarded IFQ/IBQ:**

- i. Record the **Species** to the lowest identifiable taxonomic level
- ii. Record a round **Weight** estimate in pounds
- iii. Record a piece **Count** estimate, if able.
- iv. Record **Length** of discarded species if held up to a measuring board
  1. Only record length if head and tail are still attached to each other
  2. Record total length
- v. Record **disposition**
  1. Retained
  2. **Discard**
- vi. Record the **reason for discard** code  
Avoid making assumptions about the discard reason. If discard reason is unknown use Other/Unknown  
Options for reason for discard:
  1. Unintentional Discard: Catch that was not deliberately removed from the gear by crew, but fell out/off of the fishing gear.
  2. Unknown: Catch taken out of view of the camera or unsorted catch on deck when camera fails.
  3. Discarded – General: Catch released. No damage apparent that would deem catch unmarketable, no state of decomposition apparent.
  4. Discarded – Damaged: Catch with scavenger predation or general damage, deeming catch unmarketable, which is released. Count required for IFQ species AND for decomposed fish that are indistinguishable from IFQ.
  6. Throwback: Catch previously identified as retained and has now been discarded or utilized on-board.
  7. Utilized On-board: Catch is consumed/intended to be consumed by crew, or used as/intended to be used as bait. It might be filleted onboard. This catch will not show up on a fish ticket with retained catch. Fish with this fate are treated as discards in the database.

## Whiting

### HAUL:

- 1) **Haul** begins when the doors go into the water and ends when the doors return to the vessel. A haul will appear in the sensor data as a drop in speed, with an increase in either hydraulic pressure or drum rotation or both.
  - a. If the vessel is making a turn the doors may come back up for the turn and then go back down to resume fishing. Do not end the current haul. Record the two or more segments as a single haul.
  - b. If at the end of a haul the vessel does not empty the codend and instead resets the net along with the contents of the codend for a second haul, annotate two separate hauls with comments.
  - c. If you suspect that an annotated haul may not match up with logbook records (as can happen with water hauls and other unusual hauling activity), leave a comment at the haul level.
- 2) **Video Hauls** encompass the sorting, processing and stowing of catch.
  - a. Video Haul begins when the doors return to the vessel at the haul annotation end.
  - b. Video Haul ends when all of the catch has been sorted and stowed in the fish holds, and the hatches are closed.
    - i. If the catch handling of the haul is incomplete before the next haul is brought onboard, end the video haul when the new net is dumped. Start the next video haul at that time.
      1. Create annotations for the catch, specific to each haul within the associated video haul

### CATCH:

All shoreside and MSCV whiting vessels will have all fish that are discarded/utilized on-board annotated.

Annotate all discarded protected species with counts (sea birds, turtles, marine mammals, and green sturgeon [with the exception of Dungeness crab]). Annotate all retained protected species with counts (sea birds, turtles, marine mammals, *Dungeness crab (WA and OR)* and green sturgeon).

- 1) Each vessel has its own codend(s) with a specific design, total capacity, number of straps, and number of pounds that can fill each strap. This capacity may be used to estimate discards. Codend capacities are available in discard logbook data submitted to the EM service provider by the vessel operator. These capacities should be made available to the reviewer in a way that ensures blind review, so that other fields of the discard logbook are not made available to the reviewer.
- 2) **Discards:**
  - a. Record ALL discard events

- i. If fish thought to be discards are shoveled into an empty codend and then placed into the water, these will be included with the next haul. Do not record any retained or discard weight for these fish for the current haul, but comment on the situation.
  - ii. If fixed gear pots are included in the whiting catch and the contents are discarded, annotate as selective discards. The fish included in the pot should be identified down to species level if possible, and a visual estimation of the weight recorded in the annotation. Include a comment in the video haul annotation with the number of pots.
  - iii. It may be necessary to calculate large volume discards by using the estimated capacity of the codend. To calculate a weight per strap value divide the codend capacity by the total number of straps on the net.
- b. Annotating discards:
- i. IFQ and non-IFQ fish (less than 6 ft) discards that have been deliberately separated from the rest of the catch, whether it is sorted to species or not.
  - ii. Record the **reason for discard** code  
 Avoid making assumptions about the discard reason. If discard reason is unknown use Other/Unknown  
Options for reason for discard:
    1. Unintentional Discard: Catch that was not deliberately removed from the gear by crew, but fell out/off of the fishing gear.
    2. Unknown: Catch taken out of view of the camera or unsorted catch on deck when camera fails.
    3. Discarded – General: Catch released. No damage apparent that would deem catch unmarketable, no state of decomposition apparent.
    4. Discarded – Damaged: Catch with scavenger predation or general damage, deeming catch unmarketable, which is released. Count required for IFQ species AND for decomposed fish that are indistinguishable from IFQ.
    6. Throwback: Catch previously identified as retained and has now been discarded or utilized on-board.
    7. Utilized On-board: Catch is consumed/intended to be consumed by crew, or used as/intended to be used as bait. It might be filleted onboard. This catch will not show up on a fish ticket with retained catch. Fish with this fate are treated as discards in the database.
  - iii. Discards that have not been deliberately sorted from the rest of the catch (mixed catch). These discard events may have the same species composition as the total catch. Catch may have been shoveled off deck, deliberately discarded from codend, catch cinched-out of a mothership net. Catch may have bled out of the net or released through a net blow-out panel.
    1. Record unsorted/unidentified
    2. Record an **Estimated Weight**
    3. Record the **reason for discard**
  - iv. Examples of situational discard estimates for Pacific whiting
    - a. Catch is on deck:
      - i. Visually estimate how many round baskets the fish would fill.
      - ii. One round basket filled with hake weighs approximately 80lbs.

- iii. Multiply the estimated number of baskets by 80 to get an estimated weight of discard.
- iv. Example: Pile of fish looks like it might fill 7 round baskets.  $7 * 80 = 560$  **lbs** of non-selective discard
- b. Catch spilled while zippering the codend for mothership transfer:
  - i. Based on how far back the bag is cinched, estimate how many straps the fish that are not included in the cinched codend would fill
  - ii. Multiply the number of straps by the number of pounds per strap for that codend
    - 1. Example: Fish spilled filled 3 straps prior to cinching.
      - a.  $3 \text{ straps} * 3,500 \text{ lbs/strap} = 10,500 \text{ lbs}$  of non-selective discard
- c. Discarded straps of catch:
  - i. Do not count straps that are immediately released as “retained”
    - 1. This catch may be brought near or on the stern of the vessel during hauling
  - ii. Use codend capacity/strap weights to determine how many straps are being discarded at each percentage (or estimate a weight if this strategy does not fit the situation) and determine the Discarded weight
- d. Net bleeds/Blowout Panel – Catch in the water with net reference:
  - i. Make an estimate of fish in the net prior to the bleed based on number of full straps, how full the straps are and how many pounds per strap that codend would represent.
  - ii. After the bleed, estimate catch following the above steps.
  - iii. Record the difference between the estimated weight of fish before and after the bleed
  - iv. Example:
    - 1. Before bleed:  $19 \text{ straps} * 100\% \text{ full} * 3000 \text{ lbs/strap} = 57,000\text{lbs}$
    - 2. After bleed:  $17 \text{ straps} * 75\% \text{ full} * 3000 \text{ lbs/strap} = 38,250 \text{ lbs}$
    - 3. **Discarded amount:**  $57,000 \text{ lbs} - 38,250 \text{ lbs} = 18,750 \text{ lbs}$  of non-selective discard
- e. Net Bleeds/Blowout Panel – Catch in the water with no net reference:
  - i.
  - ii. Estimate the number of round baskets the fish on the surface would fill.
  - iii. Multiply total number of baskets by 80 lbs/basket
- f. Entire net spill:
  - i. Assume the codend is slightly overfilled causing the codend failure
  - ii. If this trip contained full or overflowing hauls prior to this haul, use the two most recent full or overflowing hauls.
    - 1. Take the total retained catch + the total non-selective discarded catch for each of the two hauls to obtain the total catch of each haul
    - 2. Calculate the average of those two haul values
    - 3. Record the average total catch value as a non-selective discard for this haul
  - iii. If this trip did not contain full or overflowing hauls
    - 1. Take the known codend capacity of the vessel and add 10%

2. Example: Vessel has a codend capacity of 160K lbs, codend is spilled as it is pulled up to the vessel, record the discard as 176K lbs.

## Bottom Trawl

### HAUL AND VIDEO HAUL:

- 1) **Haul** begins when the doors go into the water and ends when the doors return to the vessel. A haul will appear in the sensor data as a drop in speed, with an increase in either hydraulic pressure or drum rotation or both.
  - a. If the vessel is making a turn the doors may come back up for the turn and then go back down to resume fishing. Do not end the current haul. Record the two or more segments as a single haul.
  - b. If at the end of a haul the vessel does not empty the codend and instead resets the net along with the contents of the codend for a second haul, annotate two separate hauls with comments.
  - c. If you suspect that an annotated haul may not match up with logbook records (as can happen with water hauls and other unusual hauling activity), leave a comment at the haul level.
- 2) **Video Hauls** encompass the sorting, processing and stowing of catch.
  - a. Video Haul begins when the doors return to the vessel at the haul annotation end.
  - b. Video Haul ends when all of the catch has been sorted and stowed in the fish holds, and the hatches are closed.
    - i. If the catch handling of the haul is incomplete before the next haul is brought onboard, end the video haul when the new net is dumped. Start the next video haul at that time.
      1. Create annotations for the catch, specific to each haul within the associated video haul

### CATCH:

Annotate all discarded protected species with counts (sea birds, turtles, marine mammals, and green sturgeon [with the exception of Dungeness crab]). Annotate all **retained** protected species with counts (sea birds, turtles, marine mammals, dungeness crab (WA and OR), and green sturgeon).

- 3) Retained:
  - a. Only priority fish species need to be annotated as “**Retained**” with **Piece Counts** for all individuals. If for some reason a count is unable to be obtained (e.g. twenty thousand cowcod are caught), a total weight should be determined instead.
  - b. Annotate any retained protected species with Piece Counts: sea birds, turtles, marine mammals, green sturgeon, and Dungeness crab (If able).
  - c. Record **disposition**
    - i. Retained
    - ii. Discard
- 4) Annotate all **Discarded IFQ** fish species



- a. Enter the **Species** to the lowest identifiable taxonomic level
- b. Record a round **Weight** estimate in pounds
- c. Record **Length** of discarded species if held up to a measuring board
  - i. Only record length if fish is whole
  - ii. Record total length
- d. Record **disposition**
  - i. Retained
  - ii. Discard
- e. Record the **reason for discard** code  
 Avoid making assumptions about the discard reason. If discard reason is unknown use Other/Unknown

Options for reason for discard:

1. Unintentional Discard: Catch that was not deliberately removed from the gear by crew, but fell out/off of the fishing gear.
2. Unknown: Catch taken out of view of the camera or unsorted catch on deck when camera fails.
3. Discarded – General: Catch released. No damage apparent that would deem catch unmarketable, no state of decomposition apparent.
4. Discarded – Damaged: Catch with scavenger predation or general damage, deeming catch unmarketable, which is released. Count required for IFQ species AND for decomposed fish that are indistinguishable from IFQ.
6. Thrownback: Catch previously identified as retained and has now been discarded or utilized on-board.
7. Utilized On-board: Catch is consumed/intended to be consumed by crew, or used as/intended to be used as bait. It might be filleted onboard. This catch will not show up on a fish ticket with retained catch. Fish with this fate are treated as discards in the database.

5) Halibut discards - viability

Pacific halibut discards use a default 90% mortality rate on board bottom trawl vessels. A time on deck model has been approved for use, where correct handling procedures and the amount of time individual fish are on deck are used to determine specific mortality for trips selected for EM review. For trips not selected for EM review, there are four options currently under consideration:

1. Options from [November 2017 Supplemental GMT Report 2](#):
  - a. Option A – Use the 90% EM DMR associated with dead viability for all halibut.
  - b. Option B – Mandatory review for hauls with halibut discards and use time-on-deck formula.
  - c. Option C – Vessel-specific EM DMR based on previous observer and/or EM viabilities.
2. Option D (Alternative presented at the November 2019 GEMPAC meeting)– Use vessel specific DMR using average weight/length/time on deck developed by EM Provider for reviewed trips and apply to all unviewed trips.

## 6) Volumetric references

The following container weights can be used for the respective species groups:

1. **Round Basket** [Volume= 0.0422 m<sup>3</sup>] (100% Full):
  - a. Flatfish: 80 lbs.
  - b. Roundfish: 80 lbs.
  - c. Rockfish: 60 lbs.
2. **Tote** [Volume= 0.079 m<sup>3</sup>] (100% Full):
  - a. Flatfish: 150 lbs.
  - b. Roundfish: 150 lbs.
  - c. Rockfish: 120 lbs.
3. **Observer Basket** [Volume= 0.04 m<sup>3</sup>] (100% Full):
  - a. Flatfish: 76 lbs.
  - b. Roundfish: 76 lbs.
  - c. Rockfish: 60 lbs.
4. **20 Gal Containers** [Volume= 0.07571 m<sup>3</sup>] (100% Full):
  - a. Roundfish: 144 lbs.
  - b. Rockfish: 115 lbs.
5. **32 Gal Containers** [Volume= 0.1211 m<sup>3</sup>] (100% Full):
  - a. Roundfish: 203 lbs.

### 2.3.5 Discard Logbook Data

Vessel captains are responsible for documenting EM trips and discards in their logbook. The type of discard logbook depends on the fishery and gear type used. Bottom trawl, fixed gear, and midwater trawl vessels each have different logbook reporting requirements. All are required to report IFQ or unsorted discards with estimated weight and reason. EM vessels will initiate a trip in the Observer Trip Selection (OTS) app. Within 24 hours of the vessel's landing, the captain must submit all pages from the logbook for that trip. Under proposed changes to the EM Program, the vessel operator will submit logbook data directly to their EM service provider upon trip completion. The provider is required to transcribe and submit the logbook transcription details to NMFS via the TripsAPI/CatchAPI. Additional details on the API are available in section 2.3.6 *Providing Summary Data*. Once additional documentation for the API is complete, it will be made available.

Contact WCGOP for additional details about the required fields and API access.

### 2.3.6 Providing Summary Data

The EM Service Provider will submit summary data to the EM database. The summary data should contain trip and catch data aggregated for each individual haul. Detailed point annotation data is not required. All Logbook, Trip and Catch summary data will be submitted via an OpenAPI using a JSON format. Providers will be able to submit requests via the API and retrieve basic trip information necessary for submitting data such as the TripID. The TripID is critical to linking Logbook, Trip and Catch summary data with the WCGOP database.

TripsAPI/CatchAPI overview:

- Username and Password are required to access the EM TripsAPI/CatchAPI.
- User sends a request with username and password. API responds with a valid JSON Web Token (JWT).

TripsAPI:

- User sends request containing basic trip info (Vessel Name, Vessel ID, Fishery, Start/End dates + Ports, etc). API responds with a unique 6 digit TripNum/TripID.
- User sends request containing TripNum. API responds with trip details associated with that trip.
- User sends request containing one or more search criteria, such as Vessel ID. API responds with all trips that match the search criteria.

CatchAPI:

- User sends request containing Logbook data or EM Review summary data (Must also contain a TripNum/TripID from Trips API). API stores data and confirms success.
- User sends request containing updated Logbook data or updated EM Review summary data. API updates stored data and confirms success.

Contact WCGOP for additional details about the required fields and API access. Once additional documentation for the API is complete, it will be made available.

### 2.3.7 Drive Reports and Feedback Loop

The EM Service Provider must communicate with vessel operators and NMFS to coordinate data service needs, resolve specific program issues, and provide feedback on program operations. The EM service provider must provide feedback to vessel representatives, field services staff, and NMFS regarding:

- (i) Adjustments to system settings;
- (ii) Changes to camera positions;
- (iii) Advice to vessel personnel on duty of care responsibilities;
- (iv) Advice to vessel personnel on catch handling practices; and,
- (v) Any other information that would improve the quality and effectiveness of data collection on the vessel.

Summary reports for each drive will be created by the service provider and submitted to NMFS and the vessel owner (see Appendix A). These reports capture potential compliance issues, malfunctions, and repairs or other corrective action taken.

An initial drive report must be submitted to NMFS after completing final review of the data. NMFS will provide an online user interface for service providers to enter and submit reports. Once final, the report will be made available to the vessel owner and/or other authorized representative.

#### 2.3.8 Data Storage and Access

Current regulations require EM raw data, reports, and other records must be stored for 3 years from the date of landing for a trip. At the Pacific Council's recommendation, NMFS is undertaking a rulemaking that considers revising this requirement to be 12 months from when data is finalized for a given fishing year.

EM data may be stored locally on hard drives, local servers, or using cloud storage services.

NMFS expects most requests for access or submission of EM data and other records associated with a specific EM trip will be made during the year in which that trip was taken (January 1 – December 31) and until data is finalized for that year (on or about March 1 of the following year). EM data files may be transmitted to NMFS via a secure website from which NMFS and authorized officers can download the data files, or by mailing a hard drive, CD, or other medium containing the data files. The provider may wish to take this information into account when planning for and comparing the costs and accessibility of different storage options.

#### 2.3.9 Providing Data for NMFS Debriefing

The West Coast Groundfish Observer Program (WCGOP) is responsible for completing the QA/QC of the EM summary data, which will include secondary review of the video data from some trips. The WCGOP will calculate an independent catch estimate to compare against the providers estimates. Upon request the EM provider will provide all video, sensor, and annotated data files for review.

The NMFS debriefing protocol will generally follow the same review procedures as conducted by the service provider described above. The detailed process for selecting debriefing data, data QA/QC, and feedback will be provided at a later date.

## Appendix A. Drive Report Template

<b>Incident Type</b>	<b>Vessel Type</b>	<b>Incident</b>	<b>Low Priority</b>	<b>High Priority</b>
<b>Functionality Issues</b>	All vessels	Function test was not completed		Before departing port
		Vessel did not stop fishing when a <b>Critical</b> malfunction occurred (Note: they are allowed to complete the tow if gear is already deployed)		Any instance
<b>Data Quality Issues</b>	All vessels	Catch handled outside of camera view or inconsistent with VMP, camera view obstructed, lighting inadequate, etc., resulting in an inability to identify the species of fish caught and/or discarded or the fate of the catch		Any instance
		Time gaps in sensor or video data		Any instance
		Any evidence of tampering or other damage or disruption to the EM system		Any instance
<b>Reporting Issues</b>	All vessels	Hard drive not submitted or submitted with incomplete data set		Any instance
		Logbook not submitted or submitted incomplete		Any instance
		Offload was delayed, but video was not turned on to record the time in port		Any instance
<b>Other Fishing Regulations</b>	All vessels	Gear deployed or retrieved in a closed area		Any instance
<b>Catch-related Issues</b>	All vessels	Discarded outside designated control point		Any instance
		Discarded for a mechanical or safety issue		Any instance
		Discarded salmon or undersize lingcod		Any instance
	Non-whiting vessels	Retained Pacific halibut, marine mammal, seabird, sea turtle, eulachon, Dungeness crab seaward of WA/OR, or green sturgeon		Any instance

	Whiting vessels	Discarded fish other than 1 tote/haul of operational discards, animals larger than 6-ft		Any instance
	Bottom trawl	Discarded IFQ species or non-IFQ species (other than 1 tote/haul of operational discards, animals larger than 6-ft, invertebrates)		Any instance
	Fixed gear vessels	Discard of IFQ species or non-IFQ species (other than animals larger than 6-ft, invertebrates, depredated fish)		

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Table 1. Business Rules for Non-whiting IFQ Trips

<b>Species/Group</b>	<b>Rule</b>
All IFQ species/groups	If a discard is reported on EM, but not in the LB, use the EM estimate. If a discard is reported in the LB, but not by EM, use the LB estimate.
<b>Yelloweye rockfish</b>	If the LB and EM estimate are not equal, use the larger of the two estimates.
All other IFQ species/groups	If the absolute difference between LB and EM is 10% or less of the EM estimate, use LB. If absolute difference is greater than 10%, use the larger of the two estimates.
All IFQ species/groups	If there is no EM estimate (e.g., due to EM system failure), use LB estimate.

LB = logbook, EM = electronic monitoring

Table 2. Business Rules for Pacific Whiting IFQ Trips

<b>Species/Group</b>	<b>Rule</b>
Total weight of discard	If a discard is reported on EM, but not in the LB, use the EM estimate. If a discard is reported in the LB, but not by EM, use the LB estimate.
Total weight of discard	If the absolute difference between LB and EM is 10% or less of the EM estimate, use LB. If absolute difference is greater than 10%, use the larger of the two estimates.
Total weight of discard	If there is no EM estimate (e.g., due to EM system failure), use LB estimate.