

Groundfish Electronic Monitoring Program Manual

PRELIMINARY DRAFT

*[This is an early draft of the EM Program Manual in this Report for review by the Council and its Advisory Bodies. This draft focuses on providing those elements in their entirety in this early draft, specifically the protocol for the service providers' review of EM data. Other sections of the manual are incomplete because they are dependent on databases that have yet to **[be]** built. However, these aspects of the manual are not expected to affect fishermen's ability to project their future costs under the EM program. NMFS will be working with providers over the next year **[clarify timeline]** to complete these sections of the manual, based on agreed upon formats for databases and reports. NMFS has provided notes in italics throughout the document to indicate what sections are incomplete and what kind of additional information can be expected.]*

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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. Beginning in 2021, 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

Figure 1 shows an overview of the roles and responsibilities of the different parties and the data flow that we envision will be used under the EM program beginning in 2021. The decision points related to each step are further discussed in the remainder of this report. In refining the roles and responsibilities in this scheme, we endeavored to minimize complexity, redundancies, and costs. The steps are as follows:

1. Before a trip, the vessel operator makes a trip declaration **[clarify exemptions and frequency of declaration by fishery – separate these two declaration requirements]** to the Office of Law Enforcement (OLE) and the West Coast Groundfish Observer Program (WCGOP). WCGOP opens an EM trip in the database, which would be shared with the appropriate EM service provider.
2. Following the trip, the vessel operator submits the logbook **[Throughout manual clarify use of the word logbook – trawl logbook vs. discard logbook]** to WCGOP and the hard drive to their contracted EM service provider.
3. WCGOP would enter the logbook data into the database. The logbook data would then be available for upload into the vessel account system for initial debits of discards. Some elements of the logbook data would be made available to the EM providers to use in the video review (e.g. codend capacity), but the majority of the logbook data would be withheld until after the video review to ensure that the review is done blind.
4. WCGOP would apply the random selection protocol to the logbook data to determine which hauls or other portion of the EM data needs to be reviewed and reported by the

provider, and provides that information to the vessel's EM service provider through the database.

5. When the EM service provider receives the hard drive ~ 10 days after the trip, the provider would review the selected hauls and submit the summary report to WCGOP through the database. *[Note: The timing of this report needs to be determined. What would be a reasonable timeframe for a provider to complete initial review after receiving a hard drive?]* **[Need more detail about deadlines for submission of hard drives by fishery in order to answer the question of a "reasonable timeframe for a provider to complete initial review".]**
6. The database would automatically apply the business rules to compare the logbook and EM data for the selected hauls and output a result for the provider. The output would include the logbook data for the reviewed hauls for the provider to use in QA/QC of the result and providing feedback to the vessel operator. The output would also identify whether the remainder of the trip needs to be reviewed and submitted per the sampling protocol.
7. If the logbook passes the initial comparison, the logbook data would stand as the discard source used to debit the vessel account. If the logbook does not pass, the provider would then review the remaining hauls and submit the updated data to WCGOP through the database, and the EM data would be used to debit the vessel account.
8. Following the review, the provider would also submit a drive report (see Appendix A for current drive report template) through the drive report database. The provider would also need to provide feedback to the vessel operator, including catch handling, duties of care for the EM system, etc., and provide copies of all of these reports to NMFS. *[Note: The format and timing of these feedback reports needs to be determined. Currently, PSMFC sends an email with the drive report attached to the vessel operator, and copies the vessel operator, vessel owner, OLE, and NMFS. Is this still an acceptable method for all parties? An alternative may be to use the drive report database, where the drive reports can be made available to vessel operators and owners.]*
9. Providers will also be required to notify NMFS of any EM system malfunctions or other requests for technical assistance. *[Note: The format and timing of these reports needs to be determined. They currently take the form of an email to NMFS and PSMFC].*
10. For the NMFS audit, WCGOP will direct the provider to submit raw EM data and other records from some trips according to the NMFS audit procedures. *[Note: The format of this transmission needs to be determined.]*



Figure 1. EM Program Roles and Responsibilities Align steps noted above with figure

1.1.1 Vessel owners and operators

§660.604 Vessel and first receiver responsibilities.

[Additional background information to be included.]

1.1.2 EM Service Providers overall comment to reduce redundancy between all documents (i.e., guidelines and manual or to only have one doc with requirements – be sure language is consistent between docs.

An EM Service Provider is any person, including their employees or agents, that is granted a permit by NMFS to provide EM services for vessels as required under §660.603 and §660.604. Prior to becoming a service provider in the West Coast Groundfish Electronic Monitoring Program, an applicant must submit a complete application package to NMFS. If approved, NMFS will issue the provider an EM provider permit and endorsement.

Per regulations an EM service provider must:

- (1) Operate under a NMFS-accepted EM Service Plan (*see* § 660.603(b)(3)(vii)).
- (2) Provide and manage EM systems, field services, and technical assistance as required under § 660.603(k);
- (3) Provide technical and litigation information to NMFS or its agent (*see* § 660.603(1)).

- (4) Provide technical support to contracted fishing vessels 24-hours per day, seven days per week, and year-round as provided under § 660.603(k)(4);
- (5) Provide EM data processing, reporting, and record retention services to contracted vessels using EM (*see* § 660.603(m)).
- (6) Comply with data integrity and security requirements, including requirements pertaining to hard drives and data files containing EM data, (*see* § 660.603(n)).

To be an EM service provider, a person must obtain an EM service provider permit and endorsement by submitting 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 (*insert link*).

The EM Program Guidelines (*insert link*) provide best practices and flexible frameworks for creating vessel monitoring plans which explain the EM hardware and catch handling components. 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.

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.

[Additional background information to be included]

1.1.3 Permits and Monitoring

[Additional background information to be included]

1.1.4 WCGOP

[Additional background information to be included]

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.

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) Ensure that the EM system is set up, wires run, system powered, and tested with the vessel in operation;
- (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. **[Ensure that reg text is bolded and consistent between docs]**

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. **[Ensure that reg text is bolded and consistent between docs]**

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. **[Ensure that reg text is bolded and consistent between docs]** *[The format and timing of these reports must be developed through additional conversations with interested EM service providers.]*

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 format of these reports must be developed through additional conversations with EM service providers. NMFS will also provide additional information on what actions constitute and how to identify harassment.]

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. WCGOP uses the logbook to identify the number of hauls on a trip, and randomly select which hauls to request the provider review based on a gear and sector-specific sampling rate below.
 - a. The sampling unit would be hauls on an individual trip, with a minimum of 1 haul per trip being reviewed.
 - i. Shorebased whiting – 100% of hauls
 - ii. Non-whiting midwater trawl – [100% of hauls for maximized retention, 25% for optimized retention]
 - iii. Bottom trawl - 25% of hauls
 - iv. Fixed gear - 25% of hauls
 - v. MS/CV - 100% of hauls
 - b. If multiple gear types used on the trip, the highest sampling rate used [Mixed gear trips (e.g., Non-whiting MDTW max retention with BTW would need 100% review – this is excessive)].
 - c. If the selected haul has lost gear, a different haul would be selected for review.
 - d. Providers would not be expected to review steam time. NMFS will review all steam time [clarify steam time is returning from the grounds or between hauls] for trips selected for the provider audit.
2. The provider conducts the primary video review, which includes: [consider adding an option for provider to review steam time and the storage costs for that vs. NMFS doing it]
 - a. Review of all raw sensor and image data to determine completeness. [Make edits regarding sensor data to be consistent with previous edits in guidelines]
 - b. Review of sensor data to annotate start and end times and locations, and identify the total number of hauls and the hauls to be reviewed.
 - c. Review of selected hauls and development of EM summary report and drive report.
3. Provider submits initial EM summary report and drive report to NMFS. EM data is compared to logbook data based on the following business rules.
 - a. The provider submits the haul-level data, and 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 the trip is returned for review of the remaining hauls.
 - 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.
 1. Another option – If the logbook estimate is a lot higher than the EM estimate, the vessel owner may prefer 100% review and use

the EM data instead. Rather than triggering 100% review, allow the vessel owner to opt for 100% review.

- iv. Certain incidents can trigger automatic 100% review:
 1. Data gap in the imagery data that could affect data collection (e.g., more than short power interruption) on any haul.
 2. Prohibited discard.
 - v. A vessel owner may opt for 100% review at any time.
4. The provider receives the results of the initial comparison and the corresponding haul-level logbook data. The provider provides a feedback report to the vessel operator and owner based on the results of the initial audit. If the trip passed the audit, no further video review is required.
 5. If the trip failed one or more tests in the audit, the provider reviews the remaining hauls from the trip and resubmits the EM summary report for comparison to the remaining hauls in the logbook based on the same business rules outlined above.
 - a. Another option – The EM data could replace the logbook data in the vessel account after 100% review, rather than running the trip through the business rules again at the trip level.
 6. Halibut viability – 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/audit for hauls with halibut discards.
 - c. Option C – Vessel-specific EM DMR based on previous observer and/or EM viabilities.

e.d. Option D – Use vessel specific DMR using average weight/length/time on deck developed by EM Provider for reviewed hauls and apply to all unviewed hauls with halibut on trip.

[Suggest clarifying that vessel owner/skipper may choose their option via the VMP]

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).

[Species ID guides and other training materials are in development and will be provided with a final version of this manual]

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 **[Make language consistent with edits in Guideline regarding tracking hard drives]**. 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.

Once a hard drive (or other acceptable data transmission) is received by the EM service provider, the original data files must be stored, unmodified, following the retention requirements of not less than three years after the date of landing of a trip. Any annotation or further processing of the data must be done on a copy.

2.3.4.1 Initial Review: Interval Annotation

[This section describes procedures for video analysis used by PSMFC. They are preliminary and have not been reviewed and are subject to change.]

In order to ensure that trip and haul information was accurately reported in the logbook and for NMFS to establish a correct sampling frame (i.e. number of hauls in the logbook matches number of hauls in the EM data), the service provider will first review and submit interval annotation data to NMFS. If the data is complete and matches the logbook for number of trips and number of hauls within each trip, then the service provider will be able to proceed with review at the prescribed sampling rate. If there is a mismatch or unacceptable time gaps, then 100% review may be required.

Interval Annotations:

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

All trips from a drive will be reviewed 100% for completeness, with the interval annotations completed by the service provider. Even if you are not reviewing a given trip at 100%, it is important to identify each trip and set/haul within a trip to ensure an accurate sampling frame. Use video and sensor data to identify trips and fishing events. Each trip will be given a unit Trip ID number.

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.)

2.3.4.2 Review for Discards and Catch Handling: Point Annotations *[Define Interval and Point annotation]*

[This section describes procedures for video analysis used by PSMFC. They are preliminary and have not been reviewed and are subject to change.]

After reporting the interval annotations to NMFS, they will be compared to the logbook data and checked for accuracy.

For hauls selected for review (or all hauls): After NMFS receives the interval annotation data, the service provider will be given the selected hauls to sample based on the random sampling frame, and will create point annotations. **Point annotations** will capture discard events and include weight, species identification, and discard type, and be used to create summary discard data.

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.

1) Non-Halibut 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).

a. **Retained:**

- i. Annotate retained counts for **the 2 priority rockfish species (Cowcod and Yelloweye Rockfish).**
- ii. Annotate any retained protected species with Piece Counts: sea birds, turtles, marine mammals, green sturgeon, and Dungeness crab (if able).

b. Discarded IFQ:

- 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 the **Fate** of catch

Options for fate:

1. **Unintentional** [use a different term rather than unintentional here and elsewhere] **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. Do not include weight, as it is not representative of the live fish.
5. **Retained:** Catch kept after being sorted, and any fish onboard after all sorting¹ is complete.
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.

[Note: Pacific halibut-specific discard annotation is under development]

Whiting

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 Haul** begins for both shoreside and mothership when the doors return to the vessel at the haul annotation end.
 - a. Video haul ends for shoreside when all of the catch has been removed from the net and stowed in the fish holds, and the hatches are closed. In the case that the hold is full, the video haul will end when the catch has been brought onboard completely and the crew has finished sorting everything (they may cover the catch with a net).
 - b. Video haul ends for mothership when the codend is released and no longer in view.

CATCH:

All shoreside and MSCV whiting EFP 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.

[Note: method for supplying the service provider with codend capacities given on the logbook is under development.]

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. To calculate a weight per strap value divide the codend capacity by the total number of straps on the net.
- b. Discard Types:
 - i. **Selective Discards:** 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.
 1. Enter the **Species** of discard to the lowest identifiable taxonomic level
 2. Record a **Weight** estimate in pounds
 3. Record a **Piece Count** if possible
 - ii. **Non-Selective Discards:** Discards that have not been deliberately sorted from the rest of the catch. These can be assumed to have the same species composition as the total catch
 1. Record an **Estimated Weight**
 2. Record the **Fate**

- a. **Discarded – General:** Catch has been shoveled off deck, deliberately discarded from codend, catch cinched-out of a mothership net, or any other situation where mixed catch was intentionally discarded.
- b. **Discarded – Unintentional:** Catch has bled out of bag or net had a blow-out panel, or any other situation where mixed catch was unavoidably discarded.

[Note: fate categories are under review. The following draft categories are provided here as reference only and may not reflect PSMFC current protocol for annotating discard events.]

iii. Situational Categories:

a. **Discard – General:**

i. Catch is on deck:

- 1. Visually estimate how many round baskets the fish would fill.
- 2. One round basket filled with hake weighs approximately 80lbs.
- 3. Multiply the estimated number of baskets by 80 to get an estimated weight of discard.
- 4. Example: Pile of fish looks like it might fill 7 round baskets. $7 * 80 =$ **560 lbs** of non-selective discard

ii. Catch spilled while zippering the codend for mothership transfer:

- 1. 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
- 2. Multiply the number of straps by the number of pounds per strap for that codend
- 3. Example: Fish spilled filled 3 straps prior to cinching.
 - a. $3 \text{ straps} * 3,500 \text{ lbs/strap} =$ **10,500 lbs** of non-selective discard

iii. Discarded straps of catch:

- 1. Do not count straps that are immediately released as retained
 - a. This catch may be brought near or on the stern of the vessel during hauling
- 2. Only annotate the weight for this catch once as a **Non-Selective Discard**
- 3. 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

b. **Discard – Unintentional:**

i. Net bleeds/Blowout Panel – Catch in the water with net reference:

- 1. 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.
- 2. After the bleed, estimate catch following the above steps.
- 3. Record the difference between the estimated weight of fish before and after the bleed
- 4. Example:
 - a. Before bleed: $19 \text{ straps} * 100\% \text{ full} * 3000 \text{ lbs/strap} = 57,000\text{lbs}$
 - b. After bleed: $17 \text{ straps} * 75\% \text{ full} * 3000 \text{ lbs/strap} = 38,250 \text{ lbs}$

- c. **Discarded amount:** 57,000 lbs – 38,250 lbs = **18,750 lbs** of non-selective discard
- ii. Net Bleeds/Blowout Panel – Catch in the water with no net reference:
 - 1. This is a very subjective estimate
 - 2. Estimate the number of round baskets the fish on the surface would fill.
 - 3. Multiply total number of baskets by 80 lbs/basket
- iii. Entire net spill:
 - 1. Assume the codend is slightly overfull causing the codend failure
 - 2. If this trip contained full or overflowing hauls prior to this haul, use the two most recent full or overflowing hauls.
 - a. 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
 - b. Calculated the average of those two haul values
 - c. Record the average total catch value as a non-selective discard for this haul
 - 3. If this trip did not contain full or overflowing hauls
 - a. Take the known codend capacity of the vessel and add 10%
 - b. 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) Non-Halibut Catch:

a. Retained:

- i. Only **priority the following two** fish species need to be annotated as “**Retained**” with **Piece Counts** for all individuals: **Cowcod rockfish and Yelloweye rockfish**. If for some reason a count is unable to be obtained (e.g. twenty thousand cowcod are caught), a weight should be determined instead.
- ii. Annotate any retained protected species with Piece Counts: sea birds, turtles, marine mammals, green sturgeon, and Dungeness crab (If able).

b. Annotate all **Discarded IFQ** fish species

- i. Enter the **Species** to the lowest identifiable taxonomic level
- ii. Record a round **Weight** estimate in pounds
- iii. Record **Length** of discarded species if held up to a measuring board
 1. Only record length if fish is whole
 2. Record total length
- iv. Record the **Fate** of catch
Options for Fate:

Note: fate categories are under review.

1. **Unintentional Discard:** Catch that was not deliberately removed from the gear by crew, but fell out/off of the fishing gear before entering the vessel.
2. **Unknown:** Catch taken out of view of the camera or unsorted catch on deck when camera fails.
3. **Discarded – General:** Catch released.
4. **Discarded – Damaged:** Catch with scavenger predation or general damage, deeming catch unmarketable, which is released. Count required for IFQ species.
5. **Retained:** Catch kept after being sorted¹, and any fish onboard after all sorting¹ is complete.

¹Sorting is the process in which the catcher actively decides which catch is kept or released.

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 may not

show up on a fish ticket with retained catch. Fish with this fate are treated as discards in the database.

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

1. **Round Basket** [Volume= 0.0422 m³] (100% Full):
 - a. Flatfish: 80 lbs.
 - b. Roundfish: 80 lbs.
 - c. Rockfish: 60 lbs.
2. **Tote** [Volume= 0.079 m³] (100% Full):
 - a. Flatfish: 150 lbs.
 - b. Roundfish: 150 lbs.
 - c. Rockfish: 120 lbs.
3. **Observer Basket** [Volume= 0.04 m³] (100% Full):
 - a. Flatfish: 76 lbs.
 - b. Roundfish: 76 lbs.
 - c. Rockfish: 60 lbs.
4. **20 Gal Containers** [Volume= 0.07571 m³] (100% Full):
 - a. Roundfish: 144 lbs.
 - b. Rockfish: 115 lbs.
5. **32 Gal Containers** [Volume= 0.1211 m³] (100% Full):
 - a. Roundfish: 203 lbs.

2.3.5 Providing Summary Data

[The format and transmission of summary data will depend on conversations with interested service providers to determine the appropriate format. NMFS will work with interested service providers over the next year to determine these details and develop the databases.]

2.3.6 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, including reviewing at 100 percent following escalation from a lower review rate.

[The format and mode of transmission of these reports will need to be determined through discussion with interested service providers. NMFS has been developing a database that would allow video reviewers to login, enter, and submit a drive report using an online user interface, and then for NMFS to process the reports and share them with individual vessel owners on the back end.]

If NMFS determines that the report requires clarification or edits, we will send the report back to the service provider before it is finalized.

2.3.7 Data Storage and Access

EM raw data, reports, and other records must be stored for 3 years **[note that this may need to be updated in the future]** from the date of landing for a trip.

[New rulemaking may revise the regulations to align with the draft national policy once it is completed. Under this model, EM data for a fishing year (calendar year) will be stored for 12 months after IFQ data is finalized. NMFS will publish a public notice informing the data finalization date for each year, typically occurring in March/April of the next 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 where NMFS and authorized officers can access and 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.

Must not release a vessel's EM data and other records specified in this section (including documents containing such data and observations or summaries thereof) except to NMFS and authorized officers as provided in section § 660.603(m)(6), or as authorized by the owner or operator of the vessel **[note that this may need to be changed in the regs]**.

2.3.8 Providing Data for NMFS Audit

[This section describes the draft protocol for NMFS audit of EM service providers' video review. They are preliminary and have not been reviewed and are subject to change.]

Draft WCGOP Audit Protocol **[consider adding steam time review protocols]**

1. WCGOP would randomly select trips that have already been reviewed by the service provider to audit.
 - a. WCGOP would target audit of 10% of trips by each vessel, with more trips reviewed as needed.
 - b. WCGOP would front-load the audit at the beginning of the program, reviewing the first 3 trips from each vessel. The frequency of audit would then decrease to simply monitor quality.
 - c. WCGOP would also review **[up to]** the first 3 trips from any new vessel to establish initial data quality.
 - d. Trips that carried a WCGOP observer may be exempt from the WCGOP audit. The observer data could instead be used to QA/QC the EM estimates.
2. WCGOP's EM estimates and the provider's EM estimates would be compared based on the following business rules.
 - a. If the provider's EM estimates are within 10% (or 2lb for amounts <10lb) of the WCGOP EM estimates, no additional action is needed.
 - b. If the provider's EM estimates are more than 10% greater or lower than the WCGOP EM estimates, then:
 - i. The WCGOP estimate will replace the provider's estimate in the logbook audit. This may necessitate changes to the vessel owner's vessel account.
 - ii. WCGOP will refer the issue to the provider for action, such as QA/QC of additional trips, follow-up with the video reviewer, or additional training.
 - iii. Repeated data quality errors may affect a provider's eligibility for an EM provider permit.

Appendix A. Drive Report Template

Incident Type	Vessel Type	Incident	Low Priority	High Priority
Functionality Issues	All vessels	Function test was not completed		Before departing port
		Vessel did not stop fishing when a Critical malfunction occurred (Note: they are allowed to complete the tow if gear is already deployed)		Any instance
Data Quality Issues	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
Reporting Issues	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
Other Fishing Regulations	All vessels	Gear deployed or retrieved in a closed area		Any instance
Catch-related Issues	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)		

Table 1. Business Rules for Non-whiting IFQ Trips

Species/Group	Rule
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.
Canary rockfish, and yelloweye rockfish,	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

*Although canary rockfish and petrale sole have been declared rebuilt, they are being managed under rebuilding plans in the current specifications cycle through 2016.

Table 2. Business Rules for Pacific Whiting IFQ Trips

Species/Group	Rule
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.