Electronic Monitoring Audit Model Program
Reviewer Guidance Manual

Video Review Protocols for Multispecies Sector Trips
5/1/2022 to 4/30/2023

In Accordance with NOAA Fisheries:
Northeast Fisheries Science Center and
Greater Atlantic Regional Fisheries Office

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Introduction:

Electronic Monitoring (EM) refers to the use of technologies, such as video cameras, gear sensors, and reporting systems, to monitor fishing operations, effort, and/or catch. In 2010, NMFS implemented Amendment 16 to the groundfish FMP and established annual catch limits and accountability measures for the fishery. Amendment 16 also included a requirement for groundfish sectors to implement and fund an at-sea monitoring (ASM) program, and regulations allow sectors to use EM to satisfy their catch monitoring requirements. The Greater Atlantic Region is assisting with the development of two EM models in the Greater Atlantic Region: the Audit Model and the maximized retention model. This Guidance Document focuses on the Audit Model review requirements. The protocols and guidance provided in this manual are subject to change. NMFS will provide notice if/when new protocols are added or current protocols are amended.

The New England Fishery Management Council developed Amendment 23 to the groundfish FMP. Amendment 23 is intended to adjust the groundfish monitoring program to improve the reliability and accountability of catch reporting in the commercial groundfish fishery, and to ensure the monitoring program is providing accurate catch information.

The New England Fishery Management Council adopted Amendment 23 to the Northeast Multispecies Fishery Management Plan at its September 2020 meeting. The measures approved in the amendment include higher levels of monitoring (i.e., 100 percent, contingent on available funding) and approval of both the Audit Model and maximized retention model as optional tools to meet monitoring requirements. Amendment 23 will be submitted to NOAA Fisheries for review, and will not be an obstacle to proceeding with electronic monitoring in the Northeast groundfish fishery. Following final action, NMFS must determine that the action is consistent with all applicable law, as required by the Magnuson-Stevens Fishery Conservation and Management Act. The target date of implementation of approved monitoring measures is May 1, 2022.

The Audit Model EM program began in 2016 and includes vessels using a variety of gear types and from all sectors. Under the Audit Model EM program, participants must record the estimated weight and count of all discards on an eVTR and adhere to catch handling protocols at sea to ensure collection of discard data from the video footage. In particular, participants must hold all groundfish below the minimum fish size under a camera prior to discarding them to facilitate video review by a third-party EM service provider. NMFS audits a subset of trips taken by each participating vessel and compares the discard data submitted by the third-party EM service provider to the eVTR submitted by the vessel. The agency will apply the Delta Model to each EM trip's eVTR for catch accounting. The Delta Model makes minor adjustments to discards for eVTR over- or under-estimations made by the captain and is regularly updated for all trips within the fishing year. On audited trips, the EM data is compared to eVTR for accuracy and used to update the Delta Model . The goal of the Delta Model is to use eVTR self-reported discards estimates to improve catch accounting.

Operational EM programs have core standards that must be consistent among providers, and between providers and NMFS reviewers, including: reviewer training, data elements, species identification protocols, length measurement and weight estimation techniques, documenting events, documenting video quality, and reviewing procedures. Secondary reviews, when the

video is reviewed and annotated by NMFS staff, are conducted as a quality control of the service provider. Completed trip file records submitted by each reviewer are then compared. Based on criteria such as species counts, discard weights, image quality, system performance, and vessel performance suggestions are made to improve the data collection process and provide feedback to providers.

In order to provide data that can be meaningfully compared both among EM service providers and between NMFS and service providers, data must be collected using a standardized methodology. The purpose of this document is to provide guidance to video reviewers on items related to species identification, methods for obtaining lengths and weights, assigning an end disposition to the discards, and event documentation. This document also provides an overview of the general catch handling protocols for participating vessels and description of events. See page 3 for definitions of Vessel Monitoring Plans (VMP) and multispecies Annual Catch Entitlement (ACE).

This reviewer document is not vendor specific, it provides guidance that applies to the Audit Model Program. Essentially, the goal of this document is to provide EM reviewers working for NMFS as well as outside company's cohesive instructions on how to review an EM trip. The goal in establishing these guidelines is to both provide data sets that can be compared for research and as a means for evaluating the performance of EM review companies. This document should be actively referenced by new reviewers and veteran reviewers alike. Should discrepancies between review methods become apparent it is the responsibility of the reviewer to alert NMFS staff so that a preferred method for handling discrepancies can be determined and documented here.

Common Acronyms:

EM: Electronic Monitoring **eVTR**: Electronic Vessel Trip Report **ITIS**: Integrated Taxonomic Information System **JSON**: JavaScript Object Notation **VMP**: Vessel Monitoring Plan **VMAN:** VMP Management Application **NEFOP**: Northeast Fishery Observer Program **ASM**: At-Sea Monitor	**GARFO**: Greater Atlantic Regional Fisheries Office **NMFS**: National Marine Fisheries Service **NEFSC**: Northeast Fisheries Science Center **TDQ**: Training and Data Quality Branch **FMRD**: Fisheries Monitoring and Research Division **ACCSP**: Atlantic Coastal Cooperative Statistics Program **ACE**: Annual Catch Entitlement

Terminology Used in This Manual:

Reviewer: Any person trained and certified by NEFSC to view and analyze EM trips, hauls, or footage.

Trip: Defined as Port-to-Port deployments. The captain is required to submit an eVTR when the vessel returns to port for any reason (weather, mechanical failure, partial off-load, etc.). In the situation where a vessel returns to port, does not offload, and returns to sea to fish, the captain would be required to submit eVTRs for the two distinct fishing trips.

Haul: The deployment and subsequent retrieval of fishing gear.

Vessel Monitoring Plan: EM service providers are tasked with submitting VMP's uniquely designed for individual vessel's participating in an EM program in the Northeast Groundfish fishery. The VMP is an essential document that serves as an operations manual for a given vessel that the captain and crew must adhere to whenever they are assigned EM coverage. The VMP describes how fishing operations on the vessel will be conducted and how the EM system and associated equipment will be configured to successfully monitor fishing activity. The VMP contains detailed information pertaining to vessel layout, catch handling processes, vessel information and operations outline, EM equipment set-up, contact information, and EM system malfunction.

With guidance from federal agencies, the EM vendor will collaborate with individual vessel participants to ensure that the VMP is structured to minimize error and data loss. Prior to operating in the groundfish fishery with EM activated in lieu of an at-sea monitor, VMPs must go through an approval process by GARFO and NEFSC. VMP's may be revised based on suggestions from captains or recommendations from stakeholders.

Annual Catch Entitlement: ACE with respect to the NE multispecies fishery, means the share of the annual catch limit (ACL) for each NE multispecies stock that is allocated to an individual sector operator or state permit bank based upon the cumulative fishing history attached to each permit participating in that sector or held by state-operated permit bank in a given year. This share may be adjusted due to penalties for exceeding the sector's ACE for a particular stock in earlier years, or due to other violations of the Fishery Management Plan (FMP), including the yearly sector operations plan. When a sector's or state operated permit bank's share of a NE multispecies stock, as determined by the fishing histories of the vessels participating in that sector or permits held by the state-operated permit bank, is multiplied by the available catch, the result is the amount of ACE (live weight pounds) that can be harvested (landings and discards)

by participants in that sector or transferred by a state-operated permit bank during a particular permit year.

Catch: Any living or non-living items captured by gear, that is witnessed by vessel personnel, observed by a video analyst, or sea-sampler, regardless of whether it is brought on board.

Discard: Any catch item that has been in contact with the fishing gear and is disposed of or returned to the sea.

Impact to Review: Items that may impact the review include the inability to identify discards to species, collect length measurements, track fish, or collect haul level elements.

Reviewer IDs:

Reviewers will be given a NMFS observer program identification number. These reviewer IDs will be used to identify which reviewer performed the primary review.

Trip Level Elements:

A trip is defined as Port-to-Port deployments. The captain is required to submit an eVTR when the vessel returns to port for any reason (weather, mechanical failure, partial off-load, etc.). The vessel does not need to land in the primary port listed in the VMP in order for a trip to be considered complete. In the situation where a vessel returns to port, does not offload, and returns to sea to fish, the captain would be required to submit eVTRs for the two distinct fishing trips.


```
{
 "vessel_permit_number": 222222,
 "vessel_name": "Vessel B",
 "sail_datetime": "2020-16-02T16:24:45.000Z",
 "land_datetime": "2020-16-10T06:57:15.000Z",
 "evtr_num": 22222220062901,
 "all_effort_confirmed": "Y",
 "comments": "string"
}
```


Figure 1: Example of a trip object in JSON format.

Vessels are required to have a functional EM system for the duration of the trip. A functional EM system is defined as a system that continuously records activity on deck onto a hard drive or other suitable video storage device. The EM system consists of the control box, GPS, or other sensors, and the cameras. The captains are required to turn the EM system on before departing a dock or mooring, keep the system running for the entirety of the trip and wait to turn it off till after they land at a dock/mooring.

Catch accounting EM vessels will need to process all discards prior to ending a trip. A reviewer will enter a sail and land timestamp based on the video or other sensor data.

Sail Date: The reviewer will annotate a timestamp when they see the vessel leaving the dock with the intent of going fishing. This can be when the vessel either tosses the dock-lines or when you see them steam away from a mooring. If the vessel leaves a dock and lands at another dock without fishing, and departs again, the second departure time would be the sail date. If the reviewer cannot determine or track the departure location and the system is activated while underway, DO NOT annotate a SAIL_DATETIME. The EMS-SYSTEM NOT ACTIVATED AT DOCK event should be annotated when the video begins. This field should **only** be NULL **if** the EMS-SYSTEM NOT ACTIVATED AT DOCK is annotated.

Land Date: The reviewer will annotate a timestamp when they see the vessel land at a dock, regardless if the vessel is intending to offload catch. EM review should continue until all discards are measured and all catch is fully processed or when the vessel lands, whichever occurs last. If discards are collected during a haul but are not measured and the vessel lands and begins off-loading, the reviewer should continue watching the video to confirm all discards are processed. If video ends prior to being able to fully account for discards, DO NOT annotate a LAND_DATETIME. The EMS-SYSTEM OFF PRIOR TO LANDING event should be annotated when the video cuts out. This field should **only** be NULL **if** the EMS-SYSTEM OFF PRIOR TO LANDING is annotated.

All Effort Confirmed Y/N:

This trip level field is used to indicate if the EM system was functioning in a way that allowed the reviewer to confidently confirm all fishing effort (all hauls, gear types, and the offload/hold inspection) was reviewed. This field is looking for effort confirmation, *not* if catch can be tracked. Currently effort is verified via video and camera functionality. See below for examples of when this field would be marked Y or N.

Examples of when All Effort Confirmed= Y:

1. The EM system recorded full footage from dock to dock with no EM system issues (Video Gap, Camera Failure, System Failure).
2. Video gaps or a Camera Failure occurred on the trip but occurred either outside of fishing activity, or was brief enough so that fishing activity could still be reviewed confidently.
3. If footage begins when the vessel is still in the harbor or early in the steam, it can be confirmed that no fishing activity has been lost (i.e. land still in view).

Examples of when All Effort Confirmed= N:

1. If a prolonged video gap occurs during the trip, it cannot be verified that fishing activity did not occur during the gap.
2. If a video gap occurs and one or more haul elements cannot be recorded.
3. If a System Failure occurs during the trip.

Table 1: Trip Level fields

Name	Details/Instructions	Units/Format	Unknown Values
vessel_permit_number	federal permit number	6- digit code	Cannot be unknown
vessel_name	name of vessel	text	Cannot be unknown
sail_datetime	Date and time vessel departs the docks/trip starts	YYYY-MM-DD hh:mm:ss	Can be null if departure is unknown
land_datetime	Date and time vessel lands at to dock/trip ends	YYYY-MM-DD hh:mm:ss	Can be null if landing is unknown
eVTR_num	trip report number, report filed by captain, used as trip identifier	14-digit code	Cannot be unknown
all_effort_confirmed	Could all fishing activity be verified in review	Y/N	cannot be unknown
comments	any trip comments, general trip summary	text	can be left blank

General Gear Categories:

There are currently four gear categories operating in the multispecies EM program. Each trip will have a primary gear used and possibly secondary gear used. EM gear codes will align with codes established by the Atlantic Coastal Cooperative Statistics Program. The ACCSP is the data warehouse for the Atlantic states and works to standardize data sets among federal and state fishery programs. Gear category definitions and ACCSP codes can be found in Table 2.

Some vessels use multiple gear categories on the same trip. The most common multi-gear scenario is a combination of a handline/auto-jig and either gillnet or longline gear. A common scenario we observe is that vessels may test the waters with the handline before setting out the gillnet or longline gear.

If a gear not found in Table 2 is used, there is no requirement to document the haul activity or discards. The reviewer is still required to watch the video to confirm the system is functioning properly. The only events required would be EMS events like video or sensor gaps and camera or system failures.

If a gear found in Table 2 is observed in video, the reviewer will document the fishing effort and associated catch consistent with normal video annotation described in this manual. **The target species does not need to be groundfish in order to collect fishing effort or catch information.** If groundfish catch is observed, the captain is required to process those discards accordingly. If the reviewer sees a gear type from Table 2 being used but it is not approved in the vessel's VMP, the reviewer should *still* annotate that gear's haul elements accordingly and annotate any discards seen, and inform their program manager. For example, if a gillnet vessel drops a handline and that gear is not listed on their VMP, the handline haul should still be annotated and discards marked. However, if a vessel hauls lobster traps, that gear and/or associated groundfish catch does not need to be marked as a haul since it is not listed in Table 2. See Appendix's A and B for gear and vessel diagrams.

Table 2: Gear Category definitions and ACCSP Codes - Groundfish

Gear Type	Definition	ACCSP Category	ACCSP GEARCATCD
Otter Trawl, Bottom	A funnel shaped net that is towed along the ocean bottom, behind one boat. Large doors deployed to aid in keeping the net on the bottom	Trawls	091
Gillnet	One net or a series of nets tied together between a weighted leadline and floatline creating a vertical barrier of netting in the water column.	Gill Nets	200
Longline	Fishing gear that is or is designed to be set horizontally, either anchored, floating, or attached to a vessel, and that consists of a main or ground line with three or more gangions and hooks.	Long Lines	400

Handline/ AutoJig	Handlines and jigs are generally configured with a weight, leader, and at least one hook attached to a line. These gears may use baited hooks or fish-shaped lures made of plastic or metal with a barb at the end, which vary according to target species.	Hand Lines	700

Haul Definitions by Gear Category:

Currently vessels participating in an EM program fish with a variety of gears. Depending on the gear being used by fishermen on a trip that is selected for review, there are slightly different definitions of what is considered a 'haul' for EM data collection. The haul definitions used by EM will mimic the ASM program's gear specific definitions.


```
{
    "haul_id": 1,
    "gear_category": "091",
    "start_haul_datetime":
"2019-08-02T16:24:45.000Z",
    "start_haul_lat": 42.123456,
    "start_haul_lon": -67.123456,
    "end_haul_datetime":
"2019-08-02T16:24:45.000Z",
    "end_haul_lat": 42.123456,
    "end_haul_lon": -67.123456,
    "reviewer_id": "X99",
    "delayed_catch_process": "Y",
    "observed": "Y",
    "comments": "string"
  }
```


Figure 2: Example of a haul object in JSON format

Below is how to document the different haul time elements for each gear. A date, timestamp, and GPS coordinates should be created for each of the given elements within the haul based on the gear type. The reviewer should do his/her best in determining when each element occurs.

There may be instances where a haul element or series of elements cannot be annotated. Reasons may include missing video or the imagery is too corrupt to verify activity during that period of time. If one or more haul elements cannot be collected, for whatever reason, leave it blank or null and add a comment to the haul stating what occurred and why. DO NOT create a false annotation just to have a date/time entered.

While hauling gear or immediately proceeding a haul there is generally a period of catch processing. It is important to also review the catch processing period because the vessel may decide to discard fish originally marked as kept. For trawl vessels, this period occurs after haul back, when the net has been pulled from the water and the catch is dumped on deck. For gillnet/longline and handline/jig vessels, the catch processing can occur during gear retrieval but will likely continue after the haul has ended and the entire string is onboard. At this time fish are typically being gutted and stowed and discarding can occur as the quality of the fish is examined. No annotations are required indicating when processing has ended, but it is expected the reviewer watches all catch processing for possible discarding events.

Bottom Trawl:

HAUL BEGIN: First component of net deployed, i.e. net hits the water.

HAUL END: Hauling equipment put into gear with the intention of hauling back.

- Note: If the hauling equipment (i.e. winches) are not in view, the reviewer will use the wire from the winches to the trawl doors as the indicator of Haul End. When using the wire, look for rope or colored markings, as those will be most visible when the wire is in motion. Captains typically put depth markings on the wire that are visible on video. If the wire is not visible, the reviewer can mark the Haul End as when the trawl doors are fully up alongside the vessel.
- If the trawl net is deployed but not fished (i.e. doors not set out, net partially on reel, codend cleated to the side of the vessel), this is *NOT* a haul. The captain is cleaning the net with no intention to deploy it fully. No annotations are required for this type of event.

Gillnet or Longline:

HAUL BEGIN: Hauling equipment put into gear or retrieval of gear commences.

HAUL END: When the last piece of the surface system (highflyer or buoy) is brought on board.

- Note: If the highflyer/buoy is left in the water floating beside the vessel, the haul will end when the line is cleated. The vessel will likely set the same gear immediately and therefore not bring the gear completely onboard.
- Note: If the highflyer goes out of view and you do not see it come onboard, the haul will end when the last piece of rope comes over the hauler.
- If a gillnet string or a longline's mainline is broken/severed at any point and the vessel immediately retrieves the other end of the string and continues the haul, this would be considered one (1) haul. The second half of the string will only have one surface system (highflyer/buoy) and is a good indicator of a broken string. If another string is hauled in between the broken string, a new haul is created and the broken string would be counted as two (2) hauls.

Handline or Auto-Jig:

HAUL BEGIN: Do not record haul begin information for handline gears.

HAUL END: When all rods are stowed and fishing has ceased. Vessel has started to steam home and the deck is being cleaned.

- During the haul, the vessel can pick up gear and steam around in search of fish. All jigging activity should be accounted for as one (1) haul.
- If the captain hauls another gear type, the jig haul would end and a new haul would begin with that new gear. A new haul is *NOT* created if gear is being set (i.e. longline or gillnet) and the jig(s) is still on deck with the intent of continuing being fished. If another rod/reel/jig is added to the current set being fished, this DOES NOT constitute another haul, but a continuation of the current haul.

Haul Level Elements:

Observed Y/N:

Definition: Were all discard events in the haul viewable such that they could be adequately annotated by a video reviewer. "Adequately annotated," is defined as identification to the lowest taxonomic level possible and appropriate weight estimation (length measurement, tally, subsampling, visual estimate). If video cuts out, is missing, or obstructed and the catch cannot be tracked confidently to determine end disposition, then that haul would be unobserved.

Purpose: Indicates all discards were accounted for on the haul.

A haul is OBSERVED=Y when the reviewer can adequately annotate discards within that haul. A haul is OBSERVED=N when discards cannot be accounted for or tracked. Issues that may lead to discards not being trackable include, but are not limited to, video gaps, camera or system failure, bulk discarding, slipped or tripped bag, and system image impairment issues. The appropriate EM, Fishing Operations, or Crew Specific event should be created. This indicates the reason(s) the haul was unobserved and corrections can be made and feedback provided to the vessel. For the types of events, see the Documenting Event Standards section.

The reviewer will review and annotate all video, hauls, and discards regardless of whether the haul will be OBS Y or N. The ability to track discards may be impacted but the video should still be reviewed. The reviewer should do his/her best at documenting discards when issues arise (improper catch handling, system image impairment issues, etc.).

Delayed Catch Processing Y/N:

Vessels may elect to process their groundfish discards immediately as each animal is encountered; or process discards at the end of the haul after sorting is completed; or process discards together after several hauls. This last example is referred to as Delayed Catch Processing (DCP). Vessels are required to process discards upon changing statistical area, gear, or mesh within the trip, and prior to landing at a dock with the purpose of off-loading. A reviewer is still required to annotate each haul accordingly, if discard processing occurs or not.

If multiple hauls occur with no catch processing performed after each haul the reviewer will annotate all discards on the haul where they are processed. For example, if discards from haul's 1, 2, and 3 are kept and then processed at the end of haul 3, all the discards will be assigned to haul 3, DCP=Y for hauls 1 and 2 and DCP=N for haul 3. Reviewers will check DCP = Y for each haul when discards are not processed, irregardless if otherwise initiated by the captain (holds up a card with haul number) or kept separated. If discards are processed or none are seen being collected or stowed, the reviewer will check DCP=N for that haul.

DCP instructions will be included in VMPs for vessels that are electing to utilize this operational plan. If DCP is applied during a haul, the reviewer must confirm that groundfish discards were stored at the designated area on deck and retained within camera view.

Vessels may use a combination of DCP and non-DCP sampling on hauls within a trip. If the vessel is seen not retaining discards within a designated area or are stored out of view or the vessel is not retaining all groundfish discards throughout hauls documented as DCP, the reviewer should annotate a CSE-IMPROPER DCP event.

The processing of discards refers to the placing of fish on the measuring board appropriately as described in their VMP. Fish may still be discarded during the haul (Fish NK, drop-offs, etc.). Annotations of these discards do not impact the Y or N of this field.

This field will be used to indicate which haul discards were caught and if they were processed on that haul. When discards are post-processed by the Center for quota management, they will be parsed out to each haul where DCP=Y is annotated, similar to the cumulative sum estimation method at-sea observers use. A haul with DCP=N, will signify that discards were processed or that no discards were seen for that particular haul.

Table 3: Haul Level Fields:

Name	**Details/Instructions**	**Units/Format**	**Unknown Values**
haul_num	Ordinal number of the haul within the trip	integer	Cannot be null
gear_category	ACCSP gear category	3-digit code	Cannot be null, if unknown use ’000’
start_haul_datetime	collected by review platform when haul start is annotated	YYYY-MM-DD HH:MM:SS in ISO8601 format	Can be NULL if not observed by reviewer or necessary for gear type
start_haul_lat	collected by review platform when haul start is annotated	latitude in decimal places, can be positive, negative, or 0	cannot be blank (but can = 0)
start_haul_lon	collected by review platform when haul start is annotated	longitude in decimal places, can be positive, negative or 0	cannot be blank (but can = 0)
end_haul_datetime	collected by review platform when haul end is annotated	YYYY-MM-DD HH:MM:SS in ISO8601 format	Can be NULL if not observed by reviewer
end_haul_lat	collected by review platform when haul end is annotated	latitude in decimal places, can be positive, negative, or 0	cannot be blank (but can = 0)
end_haul_lon	collected by review platform when haul end is annotated	longitude in decimal places, can be positive, negative or 0	cannot be blank (but can = 0)
reviewer_id	Official Observer ID assigned by NEFSC to the reviewer.	3 character string (letter, number, number)	Required when start_haul or end_haul are not null
delayed_catch_process	Did delayed catch processing occur	Array (Y/N)	Cannot be blank
observed	Was the haul fully observed	Array (Y/N)	Cannot be blank

	by the reviewer (Y/N)		
comments	Notes on a haul such as anything unusual that occurred, etc.	text	Can be blank

Catch Handling Protocols:

Fish caught in the Multispecies Groundfish fishery can fall into three categories: allocated species, regulated species and species that do not have sector allocations and are non-groundfish. See Table 4 for a list of the groundfish species and which categories these species belong to. The EM program will focus on the groundfish species listed. Reviewers should have access to the current VMP while reviewing trips and large deviations from the approved catch handling behavior should be noted in the review data.

As specified in the VMP, vessels participating in the catch accounting EM program will have a designated area for processing and measuring allocated groundfish species discards and non-allocated groundfish species on deck (See Appendix B for vessel reference). Vessel participants are allowed to land one (1) Atlantic Halibut per trip. Any upgrading (discarding a smaller, previously caught Halibut in favor of a larger one caught on a subsequent haul) will be clearly visible to the reviewer and occur within camera view. A catch entry of the discarded Halibut should be made at the time of discarding with a comment stating 'UPGRADED'. If the haul of when the fish was caught is known, include it in the comments as well. Catch handling procedures will be documented in the VMP of each vessel and will vary slightly depending on the gear used by the vessel, the catch composition and the processing workflow (e.g., if the vessel has a conveyor).


```
"discard_events":
  [{"haul_id": 1,
    "species_common_itis": "COD, ATLANTIC",
    "species_code_itis": 164712,
    "weight": 1.5,
    "catch_weight_uom": "LB",
    "length": null,
    "catch_length_uom": "CM",
    "count": 1,
    "weight_determined_by": "VISUAL",
    "discard_datetime": "2019-08-02T16:24:45.000Z",
    "discard_lat": 42.123456,
    "discard_lon": -67.123456,
    "disposition": "031",
    "grade_code": "01",
    "reviewer_id": "X99",
    "comments": "string"}]
```


Figure 3: Example of discard annotations in JSON format.

Animals that are placed with kept catch or taken out of camera view for extended periods of time during hauling, sorting, or measuring phases of fishing effort should be considered as retained catch.

Fishermen are instructed to place individual catch items along the measuring strip and smooth out the fish if it is curled or aligned with the grid if off center. Once the fish is placed accurately the fisherman will momentarily ensure an unobstructed view of the fish by removing his or her

hands from the vicinity of the catch item and measuring strip. The reviewer should use his/her best judgment if a length can be obtained or not when a fish is not perfectly placed on the strip or hands are partially on the fish. Finding the exact frame where a fish is unobstructed may require rewinding or forwarding the video. If a length cannot be obtained an entry should be made with LENGTH = NULL, ESTMETHCD=VISUAL and enter in the visually estimated weight.

Species Identification Standards:

While sorting catch on a catch estimation trip, any of the 13 federally regulated groundfish species that the captain does not intend to land for market must be retained on board for catch accounting and length measurement processing before returning discards to the water. Vessels are allowed to discard non-regulated catch without passing them across the measuring strip, however all discarding must occur at designated control points as illustrated in the vessel's VMP.

The reviewer should make every effort to identify a catch item to species level (Table 4).

When an identification cannot be identified to a species found in Table 4 , the reviewer will make an annotation of FISH, NK, ESTMETHCD= UNKNOWN. Examples of a FISH, NK include groundfish that cannot be identified to the species (right eye flounder or a gadid discarded), fish that could be a target species (i.e. a flounder of similar size to an ACE species but not a large animal) or fish that cannot be identified at all (i.e. a blur being tossed over, water drop over fish). Entries of identifiable non-groundfish (i.e. skates, dogfish, monkfish, crabs) should NOT be included as a FISH NK catch entry. Entries of FISH NK should be limited to any unidentifiable fish discards.

The reviewer should be able to eliminate and exclude species based on what is visible. The reviewer should take the time to make sure the fish cannot be identified and that any non-groundfish species have been ruled out.

There are a handful of hake species encountered by fishermen participating in the Multispecies Groundfish Fishery. Many of these hakes are difficult to distinguish morphologically in person and from video footage. Because White Hake is a regulated groundfish species that are difficult to differentiate from other filamented hake (red, spotted, southern hakes), clearly documenting all of the individuals from these hake species is important for generating accurate estimates of the catch of White Hake. During the haul, the reviewer should tally ALL filamented hake (i.e. white, red, and spotted hakes), regardless if a reviewer can identify the individual to species using additional morphological characters (e.g., dashed lateral line of the spotted hake is visible). At the end of the haul, one (1) annotation of HAKE, RED/WHITE/SPOTD/SOUTHERN MIX will be made with the UNIT_COUNT filled out with the total number of filament hake species for the haul, this entry does not include hake that are measured. Individuals that can be positively identified as Silver Hake or Offshore Hake should NOT be included as part of this tally because they are non-groundfish species (i.e., species that can be discarded without catch entries). See the tally count subsampling section below for more details.

The only time White Hake should be noted is when they are discarded as 031 - POOR QUALITY. In these cases individuals are typically larger and easy to identify as White Hake, but are often damaged. An entry will be made for White Hake, with a visual estimated weight and categorized as 031 - POOR QUALITY. See the Documentation of Fish Disposition section for more details.

In addition to correctly identifying the species, a video analyst should be able to exclude similar species. A quick reference guide to species characteristics for regulated groundfish can be found in Appendix C.

Species Verification Program:

Accurate species identification, including proper documentation of groundfish, is essential for evaluating catch data. In Fishing Year 2022, species verification of EM reviewers will be evaluated by FMRD using a quarterly quiz. Reviewers will be required to take and pass quizzes at the beginning of each quarter via the internet or meet additional criteria outlined below in order to participate in EM video review. Quizzes will include images of all 13 federally managed groundfish species (Table 4) and also include some other similar non-groundfish species. EM reviewers will be required to identify species and in some cases list characteristics necessary to properly identify the species in the image. These assessments are used to verify that EM reviewers can consistently identify groundfish species according to the protocols used in the EM review program and to correctly discriminate groundfish from other commonly encountered non-groundfish species. EM reviewers must pass achieve a minimum passing score of approximately 85%, determined by the formula: (number of questions * 0.85) rounded down to the nearest whole number. Quiz results are made available to EM reviewers and EM provider staff via the FMO Portal.

Table 4: Federally managed groundfish species of the northeast multispecies complex.

Groundfish Species of the Northeast		
Common name	*'Allocated'*	*'Regulated'*
Atlantic cod	Yes	Yes
Haddock	Yes	Yes
Pollock	Yes	Yes
White hake	Yes	Yes
Atlantic halibut†	Yes	Yes
Winter flounder	Yes	Yes
American plaice flounder	Yes	Yes
Yellowtail flounder	Yes	Yes
Redfish	Yes	Yes
Witch Flounder	Yes	Yes
Ocean pout*	No	Yes
Windowpane flounder*	No	Yes
Atlantic wolffish*	No	Yes

* Regulations prohibit retention, † Regulations allow the retention of a single individual, upgrading possible

Protocols for Obtaining Lengths:

To turn image data into weight estimates fishermen place specimens on measuring boards (to produce lateral images of each fish directly on the board). Measuring boards are installed on deck and the view from at least one camera is focused on this 'measuring station'. Estimates of a catch item's length should be recorded in whole centimeters, with reviewers rounding to the nearest whole centimeter (i.e., round down when the estimate is less than 0.5 centimeters and up when the estimate is equal to or greater than 0.5 centimeters). Measuring standards follow current observer program's measuring protocols.

Reviewers will estimate a length in whole centimeters for *each* regulated groundfish species that is processed on the measuring strip and discarded on an EM multi-species trip. If a regulated groundfish species is placed on the measuring strip, but is seen being retained, no entry is required. In cases where the reviewer is uncertain if an individual fish is kept or discarded, the reviewer will make an annotation to species with the DISPOSITION= 900 UNKNOWN KEPT OR DISCARDED. Atlantic wolffish are exempted from length measurements and can be discarded without being placed on the strip. Make an annotation of WOLFFISH, ATLANTIC, LENGTH = NULL, DISPOSITION=099, ESTMETHCD=VISUAL and enter in the visual weight. A length measurement can be collected for Atlantic wolffish that are placed on the measuring board.

Generally, species length estimates represent a total length, however, for species with forked caudal tails, a fork length estimate should be recorded instead. Appropriate length estimates for each regulated species are illustrated in Table 3. The parameters used in length to weight conversion for each species can be found in Wigley et. al (2003). Some species exhibit seasonal variation in the parameters that best describe this length to weight relationship (related to spawning and other seasonal changes in body condition), and for these species subtly different parameters should be applied depending on the season they are caught. While annotating catch data, reviewers should inspect each animal to ensure that it is whole and intact. **Lengths should not be collected from groundfish that are missing body parts, reveal signs of significant predation, gear damage, or decomposition or any fish assigned a grade code other than 01-ROUND.**

Grade Code and Description:

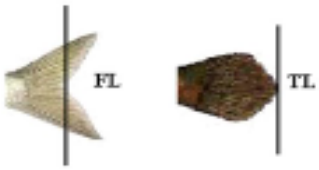
Catch annotations will be given a grade code or market category that describes what the weight represents that is similar to the ASM/NEFOP programs. This is to ensure the appropriate weight conversion is applied and the correct weight is provided to end users and the processed condition of the fish. This flag will be annotated for each catch item. The GRADE_CODE for EM will consist of three codes/descriptions. Fish that are intact or not altered will have a GRADE_CODE=01 (ROUND). Fish that are altered (i.e. gutted, headed, tailed, winged) will have the GRADE_CODE= 23 (GUTTED, HEAD ON, TAIL ON). White Hake can have two market codes associated with the weight. White Hake can also have the GRADE_CODE =24 (GUTTED, HEADS OFF, TAIL ON, BELLY FLAPS ATTACHED). ROUND fish will have a length measurement, any flounder species, or fish that are deemed 031-POOR QUALITY. Catch entries with an ESTMETHCD=VISUAL may have either three codes applied, depending on species. Any visual weight should represent what is seen by the reviewer and not what it would be whole. If an altered fish is seen being discarded, the appropriate market code should be applied. Common signs a fish has been processed is if it comes from the kept catch pile, you see

them process it and then discard it, the fish is missing its head (White Hake are processed in a manor where their heads are removed but the filaments are still visible), or a clean slit along the belly is seen on the fish.

Table 5: Length types for groundfish species

SPECIES	LENGTH TYPE	SPECIES	LENGTH TYPE
COD, ATLANTIC	*FL*	*HADDOCK*	*FL*
FLOUNDER, AM. PLAICE	TL	HAKE, WHITE	TL
FLOUNDER, WINDOWPANE	TL	HALIBUT, ATLANTIC	TL
FLOUNDER, WINTER	TL	OCEAN POUT	TL
FLOUNDER, WITCH	TL	*POLLOCK*	*FL*
FLOUNDER, YELLOWTAIL	TL	*REDFISH, ACADIAN*	*FL*
WOLFFISH, ATLANTIC *	TL		

FL= FORK LENGTH; TL= TOTAL LENGTH * Atl. Wolffish *doesn't* require a length



If a measurement cannot be obtained for a catch item, the reviewer will include a comment that describes the reason. These data are only useful if the text used by reviewers is consistent. Below are common examples that result in degrees of difficulty for measuring a fish. If multiple issues exist please separate them with commas:

- Not placed on measuring strip/grid
- Missing frame
- Poor image quality
- Fish extending out of camera view
- Crew interference
- Inanimate object obstructing view
- Catch item curled
- Damaged or poor quality

Determining Species Weights and Sub-sampling Methods:

Discarded species weights will be determined either by length-weight conversion (LENGTH), visual estimates (VISUAL), or a tally count sub-sampling (TALLY).

If a vessel is seen using another estimation method besides what is described in this document, a note should be made.

Length:

Fish will be placed on the designated measuring strip and have a length measurement collected by the reviewer. The weight will be generated by the agency after the review is submitted.

Visual Estimate:

Fish that are not placed on the measuring strip and any damaged fish will get a visually estimated weight. The weight recorded should represent what is seen, not what the fish would be whole or intact. If fish are not placed properly on the measuring strip, but an estimated length can be seen, use that estimated length to inform the visual estimate. If the UNIT_COUNT field >1 the reviewer should extrapolate the weight out to the total number of fish in the discard entry (ex: if the visual estimate for 4 fish is 0.4 lbs each, enter a weight of 1.6 lbs (0.4*4=1.6)).

Tally:

When there is an overabundance of a regulated groundfish species that will not be kept from a given haul, the captain can elect to use one of the sub-sampling methods outlined below Reviewers need to understand these protocols so they can interpret what captains are doing and tailor their data to match the captain's preferred methods. Reviewers should follow the captain's lead and estimate lengths following the protocol selected by the captain. Each gear type is unique and there are gear specific sub-sampling methods (See pages 19-20).

A reviewer should not assume sub-sampling will occur based on what has previously occurred on the vessel. If there is an initial review and a flag can be added to the hauls that indicate sub-sampling will occur, the primary reviewer can mark fish discarded outside the measuring period as ESTMETHCD=TALLY. Fish discarded down the conveyor or fish that are unhooked at the rail can be marked this way. If an initial review is not completed, fish discarded outside the measuring period should be marked as ESTMETHCD=VISUAL and a visual weight entered.

ESTMETHCD=TALLY should be applied only when 20 or more length measurements are obtained per species per processing unit (i.e. haul, DCP unit, sub-trip). Regardless of the cause, such as glare or camera blocking for example, if there are less than 20 length measurements collected by the reviewer, the portion of lengths that could not be determined from the sub-sample will be added to the tallied fish and the reviewer will submit a visual estimate for the combined total. However, if 20 or more lengths are obtained and the captain continues measuring and lengths could not be determined, that portion should be added to the total tally count for the sub-sampled species with an ESTMETHCD=TALLY.

Example 1: The captain measures and lengths are obtained from 26 fish and then 78 fish are passed under the camera to be tallied. The tallied fish should be entered as UNIT_COUNT=78, ESTMETHCD=TALLY, wt left null. The total estimated weight will be calculated from the average individual weight of the 26 fish lengths multiplied by the total count of 104 fish.

Example 2: The captain measures 20 fish and lengths are obtained from 18 fish because the reviewer could not confirm the length of **2** fish. After processing lengths, the captain passes **57** fish under the camera to be tallied. The total tally count should be entered as UNIT_COUNT=**59**, ESTMETHCD=VISUAL. The reviewer devises a visual estimate of 0.4 lbs per fish (59*0.4 lbs = 23.6 lbs) and enters a total weight of 24 lbs. The reviewer will use the appropriate event descriptor for the 2 fish that were measured but a length was undetermined.

If the reviewer feels not all individuals can be seen or made visible to the camera (ex: not moving skates or other fish around on conveyor), a Crew Event- Improper Catch Handling should be logged at the end of the haul along with a catch entry. If there is NO attempt to retain any individuals of the sub-sampled species for measurement a Crew Specific Event- Improper Catch Handling should be created.

Below are the gear-specific and species-specific sub-sampling protocols:

Trawl and Gillnet:

The captain/crew will collect all of the individuals of the species to be sub-sampled and keep them in camera view. From that species, the captain will randomly select at least 20 individuals and place these individuals on the measuring board following the standard measurement protocol. The remaining individuals will be passed under the camera at the measuring station in a manner that allows the reviewer to obtain an accurate count. At the end of the tally period, a catch entry should be made with the UNIT_COUNT filled out with the number tallied and ESTMETHCD=TALLY.

Longline:

During the haul, the captain/crew are allowed to ‘ping-off’ or unhook the species to be sub-sampled at the rail (sub-sampled fish are not retained and processed as required onboard gillnet and trawl vessels). The captain is choosing not to bring these fish onboard and they should NOT be considered as Not Brought On Board and therefore included in the catch records. Fish the captain attempts to gaff are not part of the sub-sample and should have an individual catch entry with a visually estimated weight. Fish that fall from the hook and there is no attempt to retrieve or the captain did not unhook the fish, these do not require catch entries. During the haul the captain will randomly select at least 20 individuals and place these individuals on the measuring board following the standard measurement protocol. Sub-sampled groundfish that are unhooked at the rail can be entered as a single catch entry at the end of the haul with the quantity discarded, LENGTH = null, DISPOSITION = 099 - DISCARDED, OTHER, and ESTMETHCD=VISUAL or TALLY.

In addition, if the reviewer is not able to obtain a length for 20 individuals of the sub-sampled species placed on the measuring board, the portion of the sub-sampled individuals without lengths will be recorded as ESTMETHCD=VISUAL.

Hake:

During the haul, the captain/crew will randomly collect 20 individuals from the combined southern/spotted/red/white hake species group (filament hakes) and retain them for measurement. The reviewer will create a catch entry and record the lengths under the species code of HAKE, RED/WHITE/SPOTD/SOUTHERN MIX. The captain and crew are allowed to discard dorsal-filamented hake as long as all hake can be seen by the camera(s). The reviewer will collect a count of all dorsal-filament hake discarded (not including silver or offshore hake) and will create one catch entry of HAKE, RED/WHITE/SPOTD/SOUTHERN MIX with the UNIT_COUNT filled out with the numbered tallied and ESTMETHCD=TALLY or VISUAL.

Protocol for Grouping Discards into a Single Catch Entry:

Typically, reviewers will annotate discards as individual catch entries to account for the exact time the animal was identified and discarded during fishing operations. In addition to sub-sampling, there are five circumstances when a reviewer can group multiple discards of one species classification into a single catch entry (UNIT_COUNT >1). The following scenarios are common examples of when a reviewer will quantify multiple discards as a single species catch entry:

1. Any time a container of fish is discarded in one action, a single catch entry that represents identified species will be submitted with a total count entered in the UNIT_COUNT field. Discarded catch dumped from the container that cannot be classified to a regulated species will be counted and recorded as FISH, NK. Groundfish species that are identified should have a total count and a visually estimated weight assigned to each species catch entry.

2. UNKNOWN KEPT OR DISCARDED: Fish that land on deck or fall off sorting tables/conveyors and are not recovered or picked up by crew cannot be confidently tracked. If multiples of the same species are observed landing on deck and cannot be tracked a reviewer can assign disposition code 900 to catch entries with a quantity > 1.

3. During confirmed sub-sampling on longline trips, the species selected for sub-sampling that are discarded outside the measuring period (i.e. unhooked at the rail) can be entered as a single catch entry at the end of the haul.

4. Hake that are discarded without measuring during catch sorting (i.e. discarded down the conveyor or tossed out of the checker-pen) can be entered as a single catch entry. There may be CSE- Improper Catch Handling applied if VMP protocols are not followed (ex: if <20 hake are discarded on a haul, if no attempt to retain and measure hake is made on a haul, or if >20 hake are discarded but <20 were measured).

Documentation of Fish Disposition:

This section gives guidance on how to assign a catch item a specific disposition or fate. These fish disposition codes mimic what NEFOP observers use to describe why fish are discarded. The disposition code will be entered in for each catch item under the DISPOSITION field of the EM Detail. A unique disposition code must be applied to each catch entry. The reviewer should make his/her best judgment as to which disposition code is best suited for the situation. The reviewer should never assume the disposition of a fish. For example, if a large groundfish is placed on the strip it should not automatically be coded as damaged or a LUMF. Check for signs of damage or indications by the captain that the fish is of less quality. The disposition codes can be found in Table 6.

Table 6: List of Fish Disposition Codes and Description

Code	Description
031	POOR QUALITY, REASON NOT SPECIFIED
099	DISCARDED, OTHER
900	UNKNOWN KEPT OR DISCARDED

Fish sometimes come aboard in less than preferred market conditions or have been damaged in some way (predation, sand flea, gear, etc.). This categorization includes any legal sized groundfish that the vessel owner/captain elects not to retain because of poor quality as a result of damage (i.e. LUMF) *and* any damaged sub-legal fish. These 'poor quality' fish should be processed by captains in the same manner as regulated groundfish that cannot be kept due to size restrictions. If a poor quality catch item is identified, a visual weight will be obtained by the reviewer. The visually estimated weight should be representative of what the reviewer sees of the fish, not what the fish would weigh if it were whole. The DISPOSITION will be recorded as 031- POOR QUALITY for that catch entry. No length measurements should be recorded for any poor quality or damaged fish. Furthermore, damaged sub-legal groundfish should be separated from a tally count sub-sample; a visual estimate will always be assigned to poor quality groundfish regardless of size.

Any catch item that does not show visible damage and is not kept by the vessel and is discarded will have a DISPOSITION recorded as 099- DISCARDED, OTHER. A length, a visual weight or tally count should be applied to the catch item. This disposition code will be the most commonly used code.

For catch items that the reviewer cannot determine the end status (kept or discarded) the DISPOSITION should be recorded as 900- UNKNOWN KEPT OR DISCARDED. Examples of this would be, but not limited to, fish that are left on deck and not physically discarded by the crew and not deemed as kept; fish seen on deck and then washed out of camera view; fish physically taken out of camera view and never seen by the reviewer being kept or discarded. A piece count and visual weight should be applied to the catch item(s). Identification to the lowest taxonomic classification is also required. If a catch item comes back into view and is observed

discarded (discarded by crew, washes out of scupper, etc) the disposition will be updated to 099-DISCARDED, OTHER.

A common observation of EM reviewers are fish that interact with the gear but do not land on the deck of a vessel or are not handled by the captain/crew. These fish do not require a discard annotation. These fish are considered Not Brought On Board and are not included in catch accounting. Not Brought Onboard is defined as any fish that is entangled or caught in the gear with the intent of being landed or retained, but does not come in contact with the vessel and is assumed to be unaccounted for by the captain and therefore not included in the eVTR (i.e., drop offs). Additionally, if fish from a prior trip are seen falling from the net during the set of the first haul no annotations are required.

Fish that are momentarily handled at the rail and are dropped or escape/slip from hand; fish that make contact with the deck and are then washed overboard or out a scupper; fish that are unhooked at the rail by the captain; or fish that the captain attempts to gaff should be documented as catch items with a DISPOSITION = 099- DISCARDED, OTHER applied. These fish have been seen by the captain and therefore be included in the eVTR. Depending on the situation, a Crew Event for Improper Catch Handling may be needed. See Event Documentation section for CSE_ICH examples.

Table 7: Discard Level Fields:

Name	**Details/Instructions**	**Units/Format**	**Unknown Values**
haul_num	sequential by order hauled	integer	can be null for discards that occur outside the haul
species_code_itis	either collected by reviewer or transcribed by software when submitted	6-digit code	cannot be unknown, all discards receive an ITIS code
weight	The weight of the discard	integer	Can be null, Cannot be 0, Can be < 1
catch_weight_uom	The unit associated with the entry	text (LB)	Always LB
length	The length measurement of a fish placed on the provider's measuring strip	integer	Cannot be null or 0
catch_length_uom	The unit associated with the entry	text (**cm**, in, etc.)	Always CM
count	1 is most common but there	≥1	cannot be

	are instances >1 discard per entry is observed		unknown or 0
weight_determined_by	The estimation method used by the reviewer to obtain weight	text	Cannot be blank
grade_code	ACCSP grade code indicating whether the weight represents round or dressed.	text	Cannot be unknown
discard_datetime	collected by review platform when annotation is created	YYYY-MM-DD HH:MM:SS in ISO8601 format	cannot be unknown
discard_lat	collected by review platform when annotation is created	latitude in decimal places, can be positive, negative, or 0	cannot be blank (but can = 0)
discard_long	collected by review platform when annotation is created	longitude in decimal places, can be positive, negative or 0	cannot be blank (but can = 0)
disposition	what was the fate of the discard (ex: not brought on board, damaged, etc.)	3-digit code	Cannot be null, if unknown use code ‘900’
reviewer_id	observer/reviewer ID collected by review platform when annotation is created	3 character string (letter, number, number)	cannot be blank
comments	notes on a discard such as ID characteristics, reason for Fish NK, etc.	text	Can be null, requires comments if Fish NK

Event Documentation Standards:

Occasionally, certain events will diminish the ability to obtain information and decrease the value of collected data. There are specific event types that respond to haul level observations and other events that apply to trip level concerns. Currently, there are three event types that require documentation. An event can either be a point or duration. A point event is annotated at the "first sight" of the event. A duration event begins at the "first sight" of the event and ends once the event has been resolved or when the haul has ended, depending on event type. Overlap may occur for certain duration events that are documented at the haul level. Location information (collected in the timestamp) and detailed comments will be included with the event entry.


```
"other_events": {
    "event_category": "FISHING OPERATIONS",
    "event_code": "BAG",
    "event_duration": "PT0D4H10M20S",
    "haul_id": 1,
    "event_datetime": "2019-08-02T16:24:45.000Z",
    "event_lat": 42.123456,
    "event_lon": -67.123456,
    "reviewer_id": "X99",
    "comments": "string"
  }
```


Figure 4: Example of an Event annotation in JSON format.

- Fishing Operations (Table 9)
- Crew Specific (Table 10)
- EM System Specific (Table 11)

Events are processed to document a variety of specific issues or concerns and will be used to further determine if data quality was jeopardized within a haul or at any time of the trip. It is important to distinguish event types and provide notation because events can assist in rapidly responding to system malfunctions or improve catch handling techniques. See Tables 5-7 for examples of specific event types. The frequency and duration of the stated examples can disrupt workflow and in extreme cases render haul or trip level data unusable.

Table 8: Event Level Fields:

Name	Details/Instructions	Units/Format	Unknown Values
event_code	event code will be translated from review platform (ex: gear conflict = GEARCON)	text code	cannot be unknown
event_duration	how long an event spanned, difference between event start and end times	string (PT0D4H10M20S) in ISO8601	can be blank, documented as PT0S for point events
haul_num	sequential haul number	number	only filled out if event occurs during a haul; can be null
event_datetime	either timestamp of point event, or start of duration event	YYYY:MM:DD HH:MM:SS in ISO8601	cannot be blank

event_lat	either latitude of point event, or start of duration event	latitude in decimal places, can be positive, negative, or 0	cannot be blank (but can = 0)
event_lon	either longitude of point event, or start of duration event	longitude in decimal places, can be positive, negative or 0	cannot be blank (but can = 0)
reviewer_id	observer/reviewer ID collected by review platform when an event is created	3 character string (letter, number, number)	cannot be blank
comments	summary or details of the event, cameras impacted, etc.	text	cannot be blank, all events require comments

Fishing Operations Events:

Fishing Operations events are related to the operations on a fishing vessel. These are outside of the crew's control and have the potential to increase review time and make discards hard to track. FOE's can be related to slipped or tripped bags of catch, damage to the system by the gear or waves, poor lighting or sun glare, and other weather related issues. Reviewers will annotate FOE's as either a point or duration based on the descriptor and provide as much information as the reviewing software allows.

Table 9: Fishing Operations Event Descriptors

SLIPPED OR TRIPPED BAG	WEATHER INDUCED POOR VISIBILITY
POOR LIGHTING OR SUN GLARE	OPERATIONS INDUCED CAMERA DAMAGE
OTHER OPERATIONS ISSUES	

Slipped or Tripped Bag: In the trawl fishery, sometimes the contents of a tow are released in the water or the catch is not fully brought onboard. A tripped bag indicates that the captain/crew made an intentional effort to release catch from the codend by either cutting through a large section of meshes, by setting the net out again to release the contents after surveying the composition of the bag on deck or by forcing the codend open off the stern or sides of the vessel to avoid a high amount of bycatch. A tripped bag can result from heightened safety concerns, mechanical issues, or because the catch is not the intended target species. Slipped catch (or bag) is the unintentional loss of catch. In both cases, the volume or amount of catch that is lost cannot be quantified and/or occur out of camera view. This is a duration event. Comments should include any observations regarding potential causes, such as sustained gear damage, mechanical

failure, or potential safety hazards and the species composition of released catch that was not brought on deck and handled by the crew. Since a full account of the catch cannot be made (i.e. discards cannot be tracked confidently), the haul will be marked OBSERVED=N and no catch entries need to be made for fish seen in the water or falling from the gear during the event. If discards are seen outside of this event, they should be annotated appropriately.

Weather Induced Poor Visibility: During fishing operations, reviewers will note when environmental conditions such as fog, high winds, or precipitation reduce image quality and impact video review at the haul level. Items that may impact the review are the inability to identify discards to species or collect haul level elements. Typically, more than one camera is impacted. This event does not include when the lens or dome cover is foggy or hazy due to damage. Video review that is impacted by a damaged camera or dome cover would fall under EMS-System Image Impairment. If the weather resolves during the trip and the cameras still have water on them (i.e. not cleaned after weather passed), a Crew Specific Event- Cameras Not Maintained should be annotated.

Poor Lighting or Sun Glare: During fishing activity (i.e. hauling, sorting, processing, or measuring catch) if sun glare or the deck lighting impacts the review, the reviewer will annotate this event. This event should be made when any lighting or shadows cause issues, including on the measuring strip. This is a point event made at the first sight of the glare or lighting issue. The reviewer does not need to create multiple point events within a haul if the glare impacts data collection multiple times within a haul. Detailed comments should include how often the lighting/glare was an issue and what cameras were impacted. This event may lead to a haul being reported as OBSERVED=N if discards cannot be adequately tracked due to the lighting, glare, or shadow issues.

> **Glare:** Reviewers will document glare whenever video of fishing operations is impeded by the presence of sharp-bright deck light or sun glare. This should be included when the primary camera(s) used by the reviewer are affected by glare or if glare directly impacts species identification or catch handling.
>
> > Note: In the trawl fishery the primary camera changes throughout the haul. Examples include, but are not limited to: if glare is impacting the view of the net reels or stern during haulback and fish cannot be tracked; during catch sorting when discards cannot be tracked or identified.
>
> **Poor Lighting:** Reviewers will document poor light conditions whenever video of fishing operations is affected by shadows or otherwise a lack of light that produces darker images of activity or fish.

Operations Induced Camera Damage: If a camera is damaged or destroyed as a result of fishing operations (ex: trawl doors, gear, booms, severe weather, etc. damaged a camera) this event should be annotated. This should be a duration event starting at the time in which the camera is damaged and extending to the end of the trip or when the issue is resolved. *The event will be all encompassing for the affected camera (ex: if video gaps are occurring as a result of camera damage, an EME-Video Gaps does not need to be annotated). If EM system issues occur on other cameras in the system following the camera damage, the appropriate EMS event should be annotated.* This may lead to one or more hauls being marked as OBSERVED = N if overlapping views are not sufficient to capture activity and/or track fish. Additionally, if the camera damage results in the inability to confirm fishing effort or hauls the

ALL_EFFORT_CONFIRMED should be NO. This event does not include instances where a camera appears out of focus due to pitting or scratches on the lens, that would be an EME-System Image Impairment event. This also does not include instances of camera/system tampering.

Other Operation Issues: This descriptor is designated for operational events that do not align with event descriptions listed in the Fishing Operations Event category. Events that are inputted as 'Other' can be either a duration or point event. A reviewer should document any unusual event that disrupts operations and/or impacts review. Detailed comments should be provided to help explain the situation.

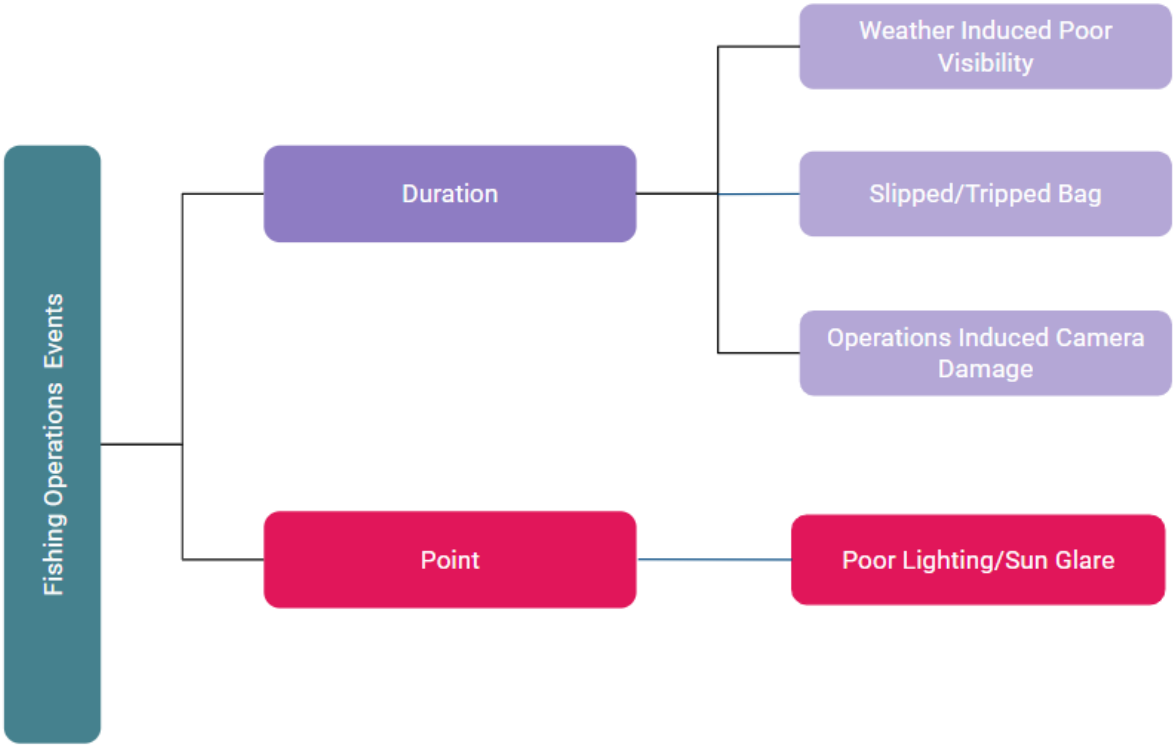


Figure 5: Chart depicting point vs. duration Fishing Operations Events

Crew Specific Events:

In order to have a functional EM program captains must follow their VMP. This includes being vigilant in keeping camera covers clean and clear of fish slime, water droplets, and/or encrusted salt spray and following the catch handling protocols. They are required to keep objects from obstructing camera views and must refrain from catch handling practices that disrupt the video analyst's ability to accurately collect data. Ensuring that these entries are made is critical as timely feedback is the only way to communicate to the captain's effectively (before a series of trips are recorded with undesirable conditions). Crew Events can be reported as either a duration event or as a singular-point event.

Table 10: Crew Specific Event Descriptors

CAMERA SYSTEM NOT MAINTAINED	BULK DISCARDING	IMPROPER CATCH HANDLING
IMPROPER DELAYED CATCH PROCESSING		OTHER CREW ISSUES

Camera System Not Maintained: Cameras must be monitored by vessel personnel throughout a trip. If any camera has water spots, fish slime, or anything on the lens and the reviewer's ability to ID discards to species, collect lengths, or track activity on deck is directly impacted, an entry should be made. This is a duration event documented at the haul level when review is first impacted by the appearance of the liquid or debris on the dome cover and continues until the affected camera view is no longer being used or is cleaned during the haul or there is no longer catch processing occurring on deck. This event may lead to a haul being reported as OBSERVED=N if discards cannot be adequately tracked due to water spots, slime, debris, etc.

> Note: If camera(s) are impacted by weather, a CSE-CAMERA SYSTEM NOT MAINTAINED is not necessary. The FOE-WEATHER INDUCED POOR VISIBILITY should be annotated instead.

Improper Catch Handling: Catch items (allocated and non-allocated species) that are not handled properly or any catch processing that is out of the purview of the vessel's VMP should be documented. This applies to any fish not properly handled, regardless of species classification (i.e. FISH NK entry made because cannot ID fish due to handling should also have an event made). These events can be annotated as either a point or duration, depending on the frequency. If Improper Catch Handling is documented 5 or fewer times during a haul the reviewer will use point events. If it occurs more than 5 times the reviewer will begin a duration event until either the issue is resolved, the haul ends, or all discards are processed. *In the instance when a duration event is annotated the prior point events do not need to be deleted.* Each instance of ICH does not need 5 points and then a duration annotated. Each instance of ICH is documented up to 5 and then a duration is created. If the vessel makes an attempt to properly place the fish on the strip (i.e. lays it flat multiple times, pulls hands away but fish curls up), no event is needed. The vessel is making a good faith effort but the fish is alive and hard to lay flat. Fish that are curved due to stiffness or rigor and are not straightened, an event should be created. The weight of the catch entry should be a visual estimate or via a sub-sample.

Examples of when to apply a CSE - Improper Catch Handling

1. If catch handling protocols are not followed when an observer is on board. Captain supposed to hand observer the laminated Information Sheet located on the vessel.
2. Discarding poor quality or damaged fish without proper placement on measuring strip
3. Allocated or regulated fish discarded down the conveyor without measuring, or picked out of checker-pen
4. Fish that are assigned as Fish NK because they are discarded either out of camera view or not at a designated control point described in their VMP
5. If a length *cannot* be collected or identification *cannot* be made due to part of the fish (nose and/or tail) being blocked by any part of the body or an object.
6. The measuring strip is taken out of camera view during the measuring period
7. Fish not placed straight or flat on the strip due to stiffness or rigor.
8. If no attempt to retain a species for measurement is made (i.e. all are discarded during sorting), regardless of quantity.
9. If less than 20 fish of a species are measured and a tally by the vessel is performed
10. If the first 5 flounders of each species do not have both the blind and eyed sides presented to the camera.

Examples of when NOT to apply a CSE - Improper Catch Handling

1. For longline vessels when poor quality fish are unhooked.
2. For longline vessels during sub-sampling when intact fish are unhooked.
3. Crew attempts to lay the fish flat and removes hands, but the tail keeps curling or the fish keeps moving and no length is obtained.
4. Fish that are classified as Not Brought On Board
5. Fish the captain attempts to gaff but are not retained.
6. Fish placed on the measuring strip that an identification *and* length are collected on the measuring strip, but a hand remains on the fish.

Bulk Discarding: Refers to any action where a container (tote, basket, etc.) of fish is dumped overboard or when catch that is piled or layered on deck is swept or shoveled overboard during video review and the contents cannot be confirmed as a groundfish or non-groundfish species. The distinction between a pile and single layer should be made. Fish discarded in containers or in piles cannot be observed, counted, or properly accounted for. Fish discarded in a single layer that can be tracked and accurately counted, would not constitute an event.This is a duration event that should span the entire time discarding is occurring. Detailed comments within the event should fully describe the situation. Since a full account of the catch cannot be made (i.e. discards cannot be tracked confidently), the haul will be marked OBSERVED=N and no catch entries need to be made for fish seen discarded during this event. If discards are seen outside of this event, they should be annotated appropriately. Other events may impact a reviewer's ability to verify piles of catch resulting in a Bulk Discarding event. It is important to include all events so the entire picture can be captured. Examples of event descriptors that could prompt Bulk Discarding include Cameras Not Maintained, Camera Blocking, Glare, Weather, etc.

Examples of Bulk Discarding:

1. Contents of the codend are dumped in a pile on deck then swept overboard by gear or crew and the contents cannot be identified or verified as only non-groundfish.
2. Contents within a checker-pen that has been moved to one corner or remains scattered in small piles on deck are then shoveled overboard and the contents cannot be identified or verified as exclusively non-groundfish.
3. Tote/container of unknown fish is dumped over.

Examples of NOT Bulk Discarding:

1. Throughout the haul, verified non-groundfish are pushed to a corner or side of a checkerpen by a crewmember and then discarded in one action.
2. Fish discarded in a single layer that can be tracked and counted.
3. A mound or pile of catch that is separated into a single layer before discarding.
4. Tote/container of confirmed non-groundfish is discarded.
5. Tote/container of confirmed guts and no whole fish is discarded.

Improper Delayed Catch Processing: This point event should be annotated when a reviewer sees a vessel not properly carrying out the Delayed Catch Processing protocols listed in their VMP. This includes instances when a vessel has enacted DCP but they are not retaining all groundfish discards throughout hauls documented as DCP and when the vessel is not retaining discards within the designated area/or discards are stored out of camera view during DCP period.

Other Crew Issues: This descriptor should only be used if the event does not fit one of the above scenarios. Detailed comments should be provided to help explain the situation. This event can be either point or duration, the determination is to be made by the reviewer.

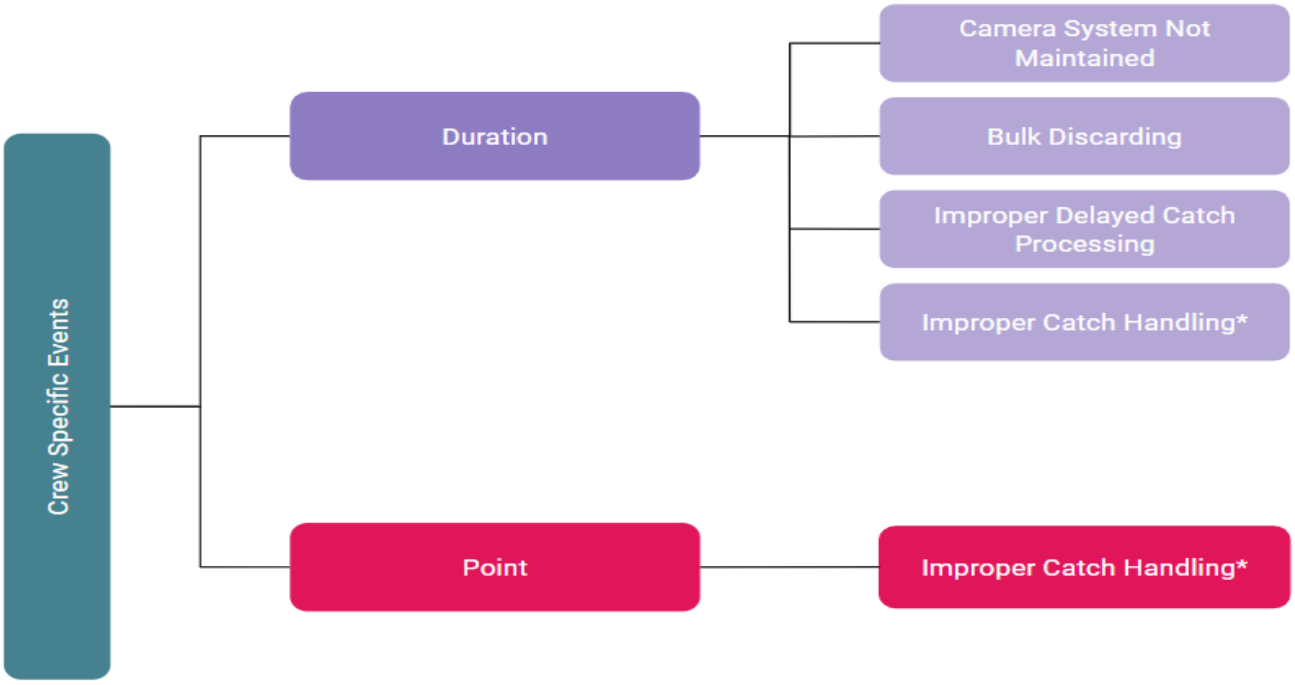


Figure 6: Chart depicting point vs. duration Crew Specific Events
* Improper Catch Handling can be a point or duration depending on frequency

EM System Specific Events:

EM System Specific events reflect failures in the EM camera system and can result in loss of video and data. These events can be documented at any point in a trip, regardless of fishing activity or potential impacts to review. EM System Events include when there are video or sensor gaps, camera(s) or system failure, when the EM system is not activated prior to departure or if it is shut off prior to landing, out of sync cameras. The event is created at the first sight of an issue, with the appropriate descriptor attached and ends when the event concludes or is resolved. Include any comments that may help to explain the situation.

Table 11: EM Specific Event Descriptors

SENSOR GAPS	VIDEO GAPS	CAMERA FAILURE
SYSTEM FAILURE	CAMERAS OUT OF SYNC	CAMERAS OUT OF POSITION
SYSTEM NOT ACTIVATED AT DOCK	SYSTEM TURNED OFF PRIOR TO LANDING	SYSTEM IMAGE IMPAIRMENT
OTHER SYSTEM ISSUES		

Sensor Gaps: If at any point during a trip, the GPS or other sensors are not functioning according to the specifications in the VMP, an event should be created. The reviewer should know how often the system pings or collects GPS (i.e. once every *x* seconds) and what it looks like in the software to know when a gap occurs. The event should encompass the entire time the sensors are not functioning. Comments should be made describing what type of sensor is not working and the impact to the review, if any. The ALL_EFFORT_CONFIRMED field should be marked as Y, as effort is confirmed via video.

Video Gaps: If any video is missing at any point in a trip, regardless of duration or number of cameras affected, an event entry should be made. The event should encompass the entire time the video is out or missing. Comments should be made describing any impact to the review. Hauls that could not be successfully observed should be recorded as OBSERVED = N. If a large or prolonged video gap occurs, do not assume all hauls were seen (see guidance below). **Video Gaps refer to when the video goes out or cameras freeze BUT comes back on or resumes playing at some point in the trip. If video remains out, document it as a Camera Failure.** Additionally the ALL_EFFORT_CONFIRMED field should be marked as N.

> **Guidance for Prolonged System Issues:**
>
> In the event that there is a camera outage (i.e. video gap or camera failure) and one or more hauls cannot be adequately reviewed or identified, reviewers shall follow the protocols:
>
> If there is an EM camera malfunction and video of either a haul element(s) and/or catch processing cannot be viewed, the reviewer **should not** assume how many hauls occurred during the malfunction. Reviewers should continue haul documentation with the next sequential haul number. For example, if footage goes out during H9 sorting for 6 hours, the next haul that should be documented by the reviewer will be H10, regardless if other hauls occurred. This may result in one or both of the start and end haul times to be NULL for the impacted hauls. If video resumes, and catch sorting for the next sequential haul has not started (i.e. trawl gear is deployed/in the water when footage resumes) the haul can be marked OBS = Y. However, if there is **any** footage of catch processing missing for the haul where the malfunction began, ended, or both, the haul(s) shall be marked OBS = N.
>
> > Examples of when a haul would be OBS = N include: if footage is missing during fixed gear hauls and catch processing is ongoing, or for mobile gear if footage ends or resumes while the crew is sorting, processing, or gutting catch, the net has been emptied into a checkerpen and catch is on deck, or during the measuring period. Any discards that are documented following the gap shall be attributed to the next sequential haul. In addition, reviewers shall enter the appropriate EM event (i.e. Video Gap, Camera Failure, etc.) and include detailed comments on what occurred.

Camera Failure: If video from one (1), multiple, or all cameras stop recording and no image is seen and persists for the duration of the trip an entry will be made. This event signifies that the camera was lost for the duration of the trip. This is a duration event and will be documented when the camera(s) first fails through the end of the trip. The comments should include which

camera(s) failed and what was seen when the cameras went out. If the reviewer could not successfully observe the haul, the haul will be recorded as OBSERVED = N. Additionally the ALL_EFFORT_CONFIRMED field should be marked as N.

System Failure: If at any point during a trip, the complete EM system (all cameras and all sensors) fails and stops operating, an event should be annotated. This is a point event made when the system fails. Detailed comments should include what was occurring when the system failed and any impacts to the data. If this occurs during fishing activity, the haul should be marked OBS=N. Additionally the ALL_EFFORT_CONFIRMED field should be marked as N. If the System Failure occurs after fishing activity has been completed but before the vessel lands at the dock, the reviewer should annotate a SYSTEM OFF PRIOR event as well.

Cameras Out of Sync: If at any point during a trip the cameras are no longer in sync with each other, an event should be created. Cameras are out of sync when images are more than 5 seconds apart. This is a duration event and should encompass the whole time the cameras are not synced to each other.

Cameras Out of Position: If at any point during the trip, one or more cameras are knocked out of position (i.e. view is not identical to VMP or the reviewer observes the camera being hit and knocked out of place), an event should be created. This is a duration event and should encompass the whole time the cameras are not positioned correctly. The event may span several hauls if no corrective action is taken. If vessel personnel or an outside technician corrects the camera position the event would end. Detailed comments on which cameras were affected should be added to the event entry.

> Note: Cameras mounted on booms must be positioned correctly once the vessel arrives on the fishing grounds.

System Not Activated at Dock: The EM system is required to be operational for the duration of the trip (departure from dock to landing at a dock). If the video for a trip starts while the vessel is already underway an event entry should be made when the system begins recording video. Event comments will include what the reviewer sees when the video began and if any fishing activity occurred. This is a single point event and should be made when the video is first seen. If all fishing activity could not be confirmed, the ALL_EFFORT_CONFIRMED field should be marked as N (i.e. if video begins with active hauling). If the vessel is just leaving the harbor or no gear has been deployed, the ALL_EFFORT_CONFIMRED=Y.

System Turned Off Prior to Landing: The EM system is required to be operational for the duration of the trip (departure from dock to landing at a dock). If the system is turned off prior to landing, an event entry should be made. This is a single point event and should be made when the video cuts out. If unprocessed kept catch from multiple hauls is present on deck or if catch processing is still occurring when the system is turned off multiple hauls could potentially be recorded as OBSERVED = N. Reviewers comments should include the approximate location of the vessel and if there was unsorted catch or crew present on deck at the time of the cameras being lost and generally what was taking place when the system was turned off. If all fishing activity could not be confirmed, the ALL_EFFORT_CONFIRMED field should be marked as N. For example if video begins with active hauling, the ALL_EFFORT_CONFIMRED=N. If the vessel is just leaving the harbor or no gear has been deployed, the

ALL_EFFORT_CONFIMRED=Y.

System Image Impairment: This refers to when the image has any issues that are caused by the EM system. This includes out of focus images/cameras, melting/running images, pixelated images, or any decrease in image quality. Damaged dome covers also fall under this event. See below for details on what impairs an image (Out of Focus, Melting/Running, Pixelization). This event should be annotated regardless of impact to review or data collection.

Out of Focus: Camera views or viewer screens should provide clear and unblemished images. Reviewers will assess camera views at the haul level and views that are blurry due to being out of focus and do not meet the manufacturer's quality standards must be documented, regardless of impact. Causes can include lens damage such as pitting or scratches, condensation in the lens or dome, as well as a general loss of clarity.

Example of Out of Focus

1. If after examining the VMP still images the camera does not match the supplied view and it is not due to water, salt, or slime.

Not an example of Out of Focus

1. If a camera is not maintained and water spots, dried salt spray, or fish slime are observed on the camera(s). This would result in a CSE - Camera System not Maintained

Pixelization: The reviewer will document video that has lost clarity as a result of pixelated images, defined as: The appearance of individual pixels and/or pixel blocks causing the individual pixels making up the image to become more prominent, thus causing a grainy appearance in the image.

Melting/Running: When the image colors blend and run together. The image appears to be melting down the screen.

Other System Issues: This descriptor should only be used if the event does not fit one of the above scenarios. Detailed comments should be provided to help explain the situation. This event can be either point or duration, the determination is to be made by the reviewer.

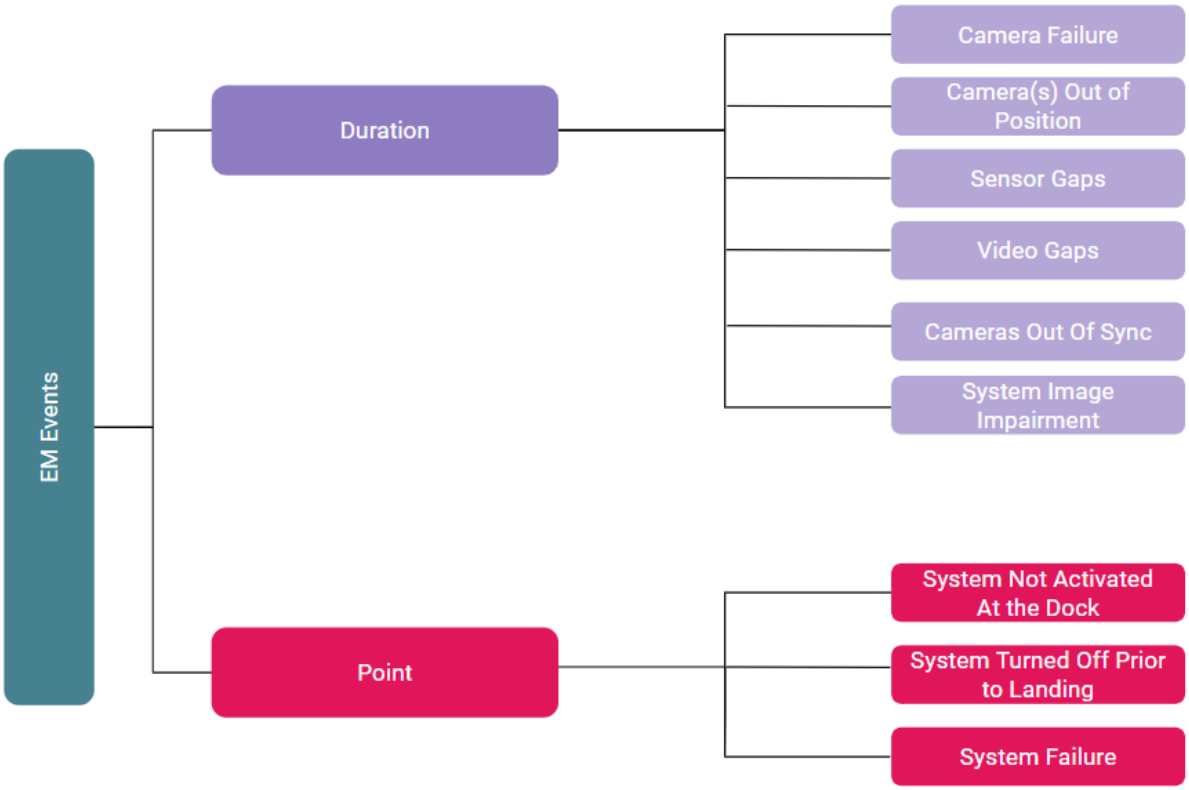


Figure 7: Chart depicting point vs. duration EM Specific Events

Submitting Reviews without Data:

In some instances where an EM trip review is not possible, such as EM system failure or loss of a video data for an entire trip, the API will accept an abbreviated JSON submission that marks the trip as submitted.

In addition to the elements vessel_permit_number and evtr_num, the following elements are required: all_effort_confirmed (must be "N"), and comments (an explanation for the abbreviated review must be noted). Please note the reviewer_id or name of the individual submitting the JSON.

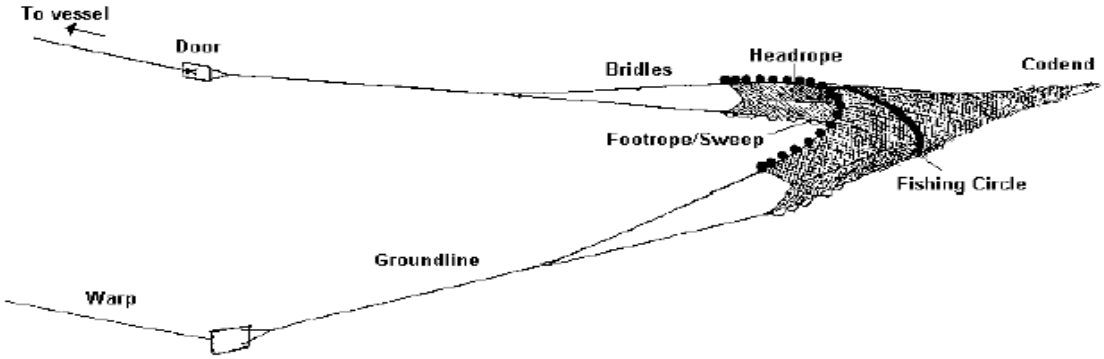

```
{
 "vessel_permit_number": 222222,
 "vessel_name": "Vessel B",
 "evtr_num": 22222220062901,
 "all_effort_confirmed": "N",
 "comments": "No video on HDD; pre-trip check completed, HDD appears to not have been seated properly to record; tech visit scheduled; submitted by X99."
}
```


Figure 8: Example of a trip with no data in EM JSON format

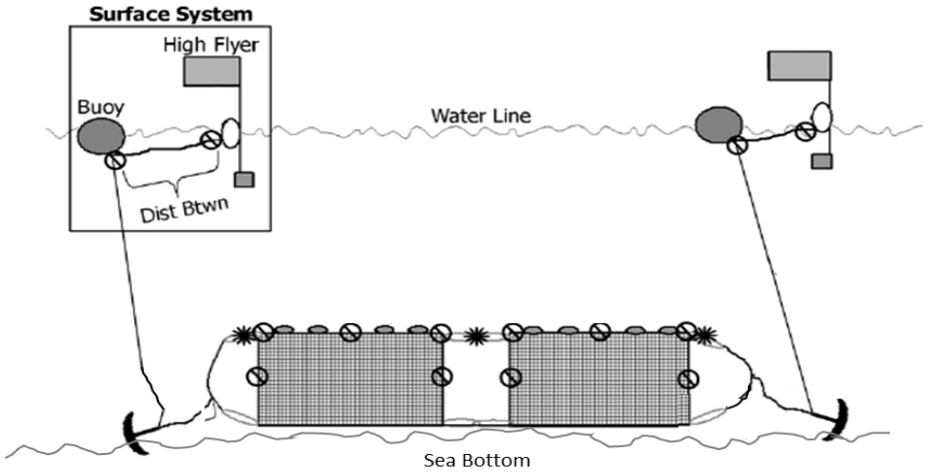
If there was a system malfunction an Issue should be entered in VMAN. If there was no HDD received for the trip an Incident Report should be filed.

Appendix A: General Gear Category Diagrams

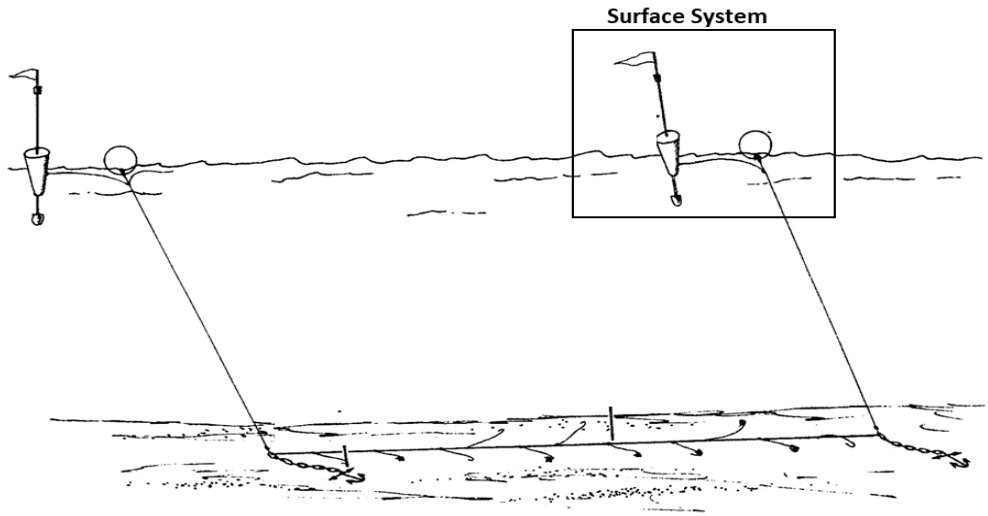
Bottom Trawl:



Gillnet:

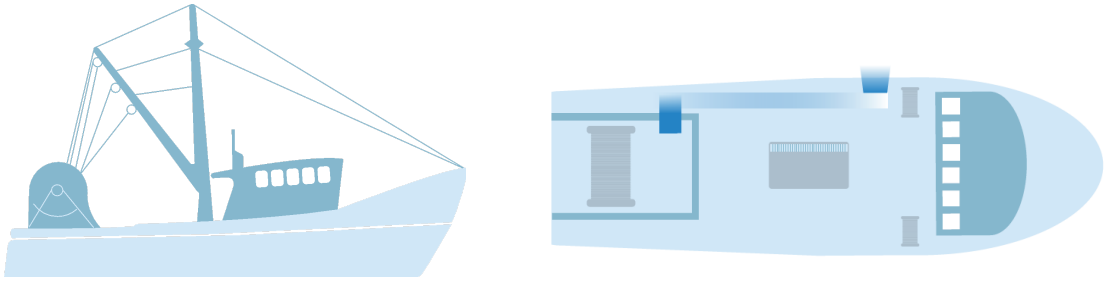


Longline:

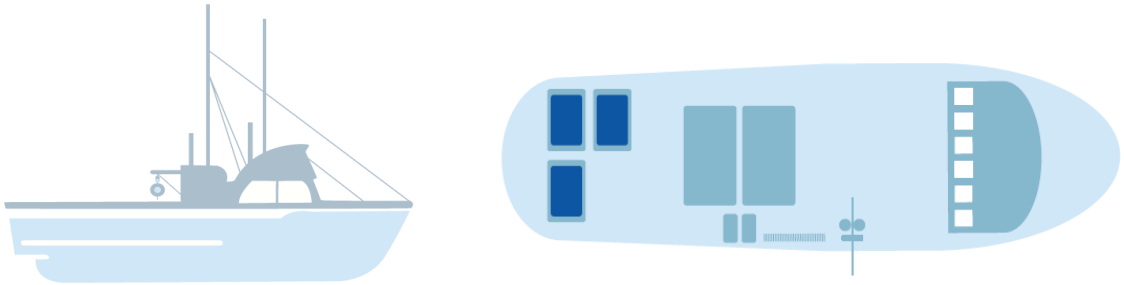


Appendix B: Generic schematics of vessel layout

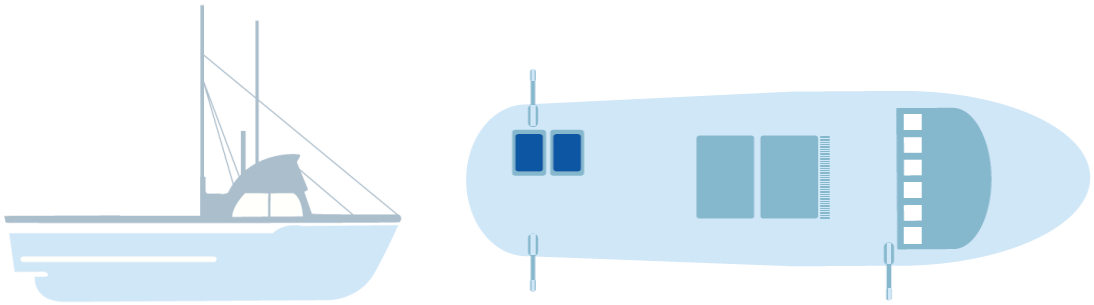
Trawl



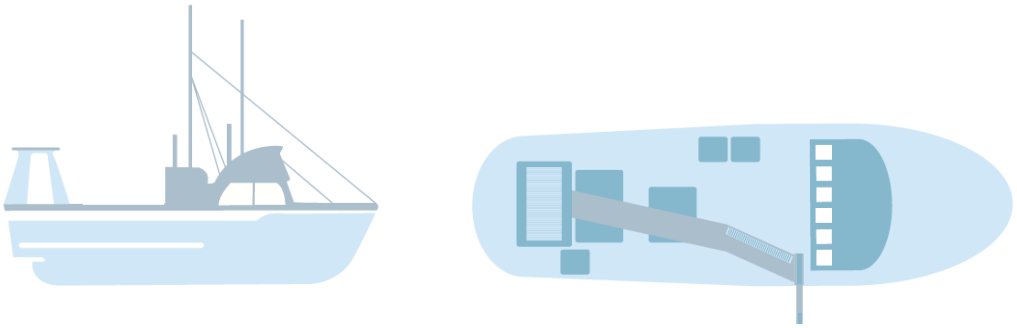
Longline



Handline/Jig



Gillnet



Appendix C: Primary Species Characteristics

Atlantic cod

- Speckled greenish-brown or reddish coloration
- Three dorsal fins
- White lateral line
- Prominent chin barbel

Pollock

- Solid blue gray dorsal color that fades to white along ventral surface
- White lateral line
- Three dorsal fins

Haddock

- Black lateral line
- Dusky black patch located above and behind pectoral fin
- Three dorsal fins

White hake

- Body rounded in front of vent
- Second dorsal and anal fin extend to tail stock
- Pelvic and dorsal fin rays present
- Pelvic fin rays do not reach vent

Acadian Redfish

- Body flame red
- Stout spines
- Bass or perch-like appearance

Windowpane flounder

- Left eyed
- Black and white spots on dorsal, anal, and caudal fins
- Ventral view body appears translucent
- Round overall body shape with pointed snout

American plaice flounder

- Right eyed, with large mouth
- Plain coloration
- Narrow caudal peduncle
- Rounded tail

Witch flounder

- Right eyed
- Upper side brown color often with black hue and dark margins along anal and dorsal fins
- Dark/black tipped pectoral fins
- Thin bodied

Winter flounder

- Thick bodied with light ventral side
- Small mouth
- Convex tail, thick caudal peduncle
- Right eyed

Yellowtail flounder

- Yellow mottled coloration on dorsal surface
- Protruding, upturned snout (dorsal side)
- Small mouth
- Convex tail

Atlantic halibut

- Right eyed
- Diamond shaped body
- Concave tail
- Underside white

Ocean pout

- Long slender body
- Broad, heavy head and large fleshy lips
- Long dorsal fin
- Rounded pectoral fin

Atlantic wolffish

- Bluish, gray color with broad dark bars covering length of body
- Large head with blunt snout
- Long dorsal and anal fins
- White underside

The following section illustrates identification characteristics of non-regulated finfish that are common bycatch in the Northeast groundfish fishery and also hold market value. Occasionally, a captain or crew member will present and process these fish on the measuring board. The species listed below are to assist reviewers in identifying non-groundfish..

Fourspot flounder

- Left eye
- Four distinct ocelli present on dorsal surface
- Large mouth
- Ventral view appears translucent

Red hake

- Dorsal surface brownish to bronze
- Pelvic and dorsal fin rays present
- Body rounded in front of vent
- Pelvic fin rays do reach or slightly pass vent

Silver/Offshore hake

- Lower jaw projects beyond upper
- Wide mouth (sharp teeth may be visible)
- Dark gray dorsal surface but most of the body is silver in color

Summer flounder

- Left eye
- Many ocelli present on dorsal surface
- Large mouth
- Robust tail

Appendix D: Minimum Sizes for Commercial Groundfish Species

Groundfish Minimum Fish Sizes

Species	Size (cm)
Witch flounder	33 (13 in)
Yellowtail flounder	30.5 (12 in)
American plaice flounder	30.5 (12 in)
Winter flounder	30.5 (12 in)
Redfish	17.8 (7 in)
Haddock	40.6 (16 in)
Pollock	48.3 (19 in)
Atlantic cod	48.3 (19 in)
Atlantic halibut	104 (41 in)
White hake	No minimum size

Appendix E: Electronic Monitoring EM Detail JSON Technical Requirements

Description:	**Trip review object**	
vessel_permit_number*	integer; The fishing vessel permit number.	
	example: 222222	
vessel_name*	string; The name of the fishing vessel	
sail_datetime*	string; Date the trip left the dock in ISO1806 standard datetime format	
	example: 2019-05-31	
land_datetime*	string; Date trip returned to dock in ISO1806 standard datetime format	
	example: 2020-06-01	
evtr_num*	integer; Electronic Vessel Trip Report serial number (formerly trip_id)	
	example: 12345619010102	
all_effort_confrimed*	string; Was the total fishing effort for the trip captured and confirmed, Y/N	
	Array [Y, N]	
comments	string; Notes pertaining to this trip or EM review.	
hauls	**description:**	**Haul object for each haul of this trip**
	haul_id*	integer; Ordinal number of the haul within the trip.
		minimum: 1
		example: 1
	start_haul_datetime	string($date-time); In ISO1806 standard datetime format
		example: 2019-08-02T16:24:45.000Z
	start_haul_lat	number($double); Latitude in decimal degrees
		minimum: 0
		example: 42.123456
	start_haul_lon	number($double); Longitude in decimal degrees
		maximum: 0
		example: -67.123456

	end_haul_datetime	string($date-time); in ISO1806 standard datetime format
		example: 2019-08-02T16:24:45.000Z
	end_haul_lat	number($double); Latitude in decimal degrees
		minimum: 0
		example: 42.123456
	end_haul_lon	number($double); Longitude in decimal degrees
		maximum: 0
		example: -67.123456
	observed*	string; Was the haul fully observed?
		Array [Y, N]
	delayed_catch_ processing *	string; Was catch processing delayed on this haul?
		Array [Y, N]
	reviewer_id*	string; Official Observer ID assigned by NEFSC to the reviewer.
		example: X99
	gear_category*	string; See Reference Table 1
	haul_id*	integer; Indicates the haul from which this discard resulted, if known.
	species_code_itis*	integer; See Reference Table 2
		example: 164712
	weight	number; Weight of the discard.
		example: 1.5
	catch_weight_uom	string; Unit of measure used when estimating the weight of the discard.
	length	integer; Length of discard.
		example: 12
	catch_length_uom*	string; Unit of Measure used to measure discard.
	count	integer; Number of discards this record represents.
	weight_determined_ by*	string; How was weight of discard estimated? See Reference Table 3

		example: LENGTH
	discard_datetime*	string($date-time); The date and time the discard occurred in ISO1806 standard format.
		example: 2019-08-02T16:24:45.000Z
	discard_lat*	number($double); Latitude in decimal degrees
		minimum: 0
		example: 42.123456
	discard_lon*	number($double); Longitude in decimal degrees
		maximum: 0
		example: -67.123456
	disposition*	string; See Reference Table 4.
	grade_code*	string: ACCSP grade code indicating whether the weight represents round or dressed. See Reference Table 6
		example: 01
	reviewer_id*	string; Official Observer ID assigned by NEFSC to the reviewer.
		example: X99
	comments	string; Notes that are specific to understanding this discard record.
	event_code*	string; See Reference Table 5.
	haul_id	integer; The haul within this event occurred, if known.
	event_datetime*	string($date-time); Timestamp in ISO1806 standard format.
		example: 2019-08-02T16:24:45.000Z
	event_lat*	number($double); Latitude in decimal degrees
		minimum: 0
		example: 42.123456
	event_lon*	number($double); Longitude in decimal degrees
		maximum: 0
		example: -67.123456
	reviewer_id*	string; Official Observer ID assigned by NEFSC to the reviewer.
		example: X99

	comments*	string; Notes that are specific to understanding this event.

Reference Table 1 – Gear Types - Groundfish

ACCSP_ GEARCATCD	ACCSP_CATEGORY_NAME	ACCSP_ TYPECD	ACCSP_TYPE_NAME
000	NOT CODED	000	NOT CODED
091	OTTER TRAWLS, BOTTOM	004	TRAWLS
200	GILL NETS	006	GILL NETS
400	LONG LINES	008	LONG LINES
700	HAND LINES	013	HAND LINES

Reference Table 2: Species List - Groundfish

COMMON_NAME	SCIENTIFIC_NAME	SPECIES_ITIS
COD, ATLANTIC	GADUS MORHUA	164712
FLOUNDER, WINTER	PLEURONECTES AMERICANUS	172905
FLOUNDER, WITCH	GLYPTOCEPHALUS CYNOGLOSSUS	172873
FLOUNDER, YELLOWTAIL	PLEURONECTES FERRUGINEUS	172909
FLOUNDER, AMERICAN PLAICE	HIPPOGLOSSOIDES PLATESSOIDES	172877
FLOUNDER, WINDOWPANE	SCOPHTALMUS AQUOSUS	172746
HADDOCK	MELANOGRAMMUS AEGLEFINUS	164744
HAKE, WHITE	UROPHYCIS TENUIS	164732
HAKE, RED/WHITE/ SPOT/SOUTHERN MIX [1]	UROPHYCIS SP	164729
ATLANTIC HALIBUT	HIPPOGLOSSUS HIPPOGLOSSUS	172933
REDFISH, ACADIAN	SEBASTES FASCIATUS	166774

OCEAN POUT	MACROZOARCES AMERICANUS	630979
POLLOCK	POLLACHIUS VIRENS	164727
WOLFFISH, ATLANTIC	ANARHICHAS LUPUS	171341
FISH, NK	OSTEICHTHYES	914179

[1] HAKE, RED/WHITE/SPOT/SOUTHERN MIX: the reviewer should aggregate all unidentifiable hake (i.e., red, white, and spotted) discards and report them under “HAKE, RED/WHITE/SPOT/SOUTHERN MIX”.

Reference Table 3 – Discarded Fish Weight Determined By

Code	**Weight Determined By**
15	LENGTH
06	VISUALLY ESTIMATED
11	ACTUAL, ELECTRONIC SCALE
05	TALLY
03	BASKET/TOTE COUNT
00	UNKNOWN

Reference Table 4 – Fish Disposition Codes and Descriptors

Code	Description
031	POOR QUALITY, REASON NOT SPECIFIED
099	DISCARDED, OTHER
052	INCIDENTAL TAKE
900	UNKNOWN KEPT OR DISCARDED

Reference Table 5: Event Categories, Descriptions and Codes

EVENT_CAT	EVENT_DESC	EVENTCD
CREW	CAMERA SYSTEM NOT MAINTAINED	CAMMAINT
CREW	BULK DISCARDING	BULKDISC
CREW	OTHER	OCI
CREW	IMPROPER CATCH HANDLING	ICH
CREW	IMPROPER DELAYED CATCH PROCESSING	IDCP
EM SPECIFIC	SYSTEM FAILURE	SYSTEM
EM SPECIFIC	CAMERA FAILURE	CAMFAIL
EM SPECIFIC	SENSORS GAPS	SENSGAP
EM SPECIFIC	VIDEO GAPS	VIDGAP
EM SPECIFIC	OTHER	OSI
EM SPECIFIC	CAMERAS OUT OF SYNC	COS
EM SPECIFIC	SYSTEM NOT ACTIVATED AT DOCK	NAATDOCK
EM SPECIFIC	SYSTEM TURNED OFF PRIOR TO LANDING	SYSOFFPRIOR
EM SPECIFIC	CAMERAS OUT OF POSITION	CAMKNOCK
EM SPECIFIC	SYSTEM IMAGE IMPAIRMENT	IMGIMPAIR
FISHING OPERATIONS	OTHER OPERATIONS ISSUES	OOI
FISHING	SLIPPED OR TRIPPED BAG	BAG

OPERATIONS		
FISHING OPERATIONS	WEATHER INDUCED POOR VISIBILITY	WEATHER
FISHING OPERATIONS	POOR LIGHTING OR SUN GLARE	LIGHTORGLARE
FISHING OPERATIONS	OPERATIONS INDUCED CAMERA DAMAGE	CAMDAMAGE

Reference Table 6: Market Codes and Grade Descriptions

CODE	DESCRIPTION
00	UNKNOWN
01	ROUND
23	GUTTED, HEAD ON, TAIL ON
24	GUTTED, HEADS OFF, TAIL ON, BELLY FLAPS ATTACHED

References:

Wigley, S.E., McBride, H.M. and McHugh, N.J., 2003. Length-weight relationships for 74 fish species collected during NEFSC research vessel bottom trawl surveys, 1992-99.

Version History:

Release Date	Description of Edits	V.
3/23/2022	FY22 DATA SPECTS	1