Maximized Retention Electronic Monitoring Program Reviewer Guidance Manual

Video Review Protocols for Multispecies Sector Trips
5/1/2023 to 4/30/2024

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

Table of Contents:

List of Tables:

List of Figures: Page Number

List of Appendices Page Number

Introduction to the Maximized Retention Program

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 Maximized Retention Model review requirements.

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 EM programs as optional tools to meet monitoring requirements. 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 date of AM23 implementation was January 9, 2023. Sectors can elect to use an approved EM program as their monitoring tool.

The Maximized Retention and Electronic Monitoring (MREM) program was first approved under an exempted fishing permit (EFP) in 2018 to evaluate the ability of EM paired with a human dockside monitoring (DSM) component to verify full retention of allocated groundfish. Under this model EM is used as a compliance and verification tool and biological data is collected at the dealer by the DSM. Reviewers are responsible for annotating: haul begin/end time elements, non-discard events, and recording non-compliant ACE discarding if observed.

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, documenting events, documenting video quality, and reviewing procedures. All primary reviewed EM trips are subject to editing by the agency. This is a quality control of the reviewer and service provider. Feedback is given to the reviewer and provider on reviewer protocol adherence and overall performance.

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, when and how to annotate discards, 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 common terminology and definitions found in this manual.

This reviewer document is not vendor specific, it provides guidance that applies to the Maximized Retention Model Program. 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.

Definitions

Common Acronyms

ASM: At-Sea Monitor	**VMAN:** VMP Management Application
DSM: Dockside Monitor	**GARFO**: Greater Atlantic Regional Fisheries Office
EFP: Exempted Fishing Permit	**NMFS**: National Marine Fisheries Service
EM: Electronic Monitoring	**NEFSC**: Northeast Fisheries Science Center
eVTR: Electronic Vessel Trip Report	**TDQ**: Training and Data Quality Branch
ITIS: Integrated Taxonomic Information System	**NEFOP**: Northeast Fishery Observer Program
JSON: JavaScript Object Notation	**FMRD**: Fisheries Monitoring and Research Division
VMP: Vessel Monitoring Plan	**ACE**: Annual Catch Entitlement
FOE: Fishing Operations Event	**EME**: Electronic Monitoring Event
CSE: Crew Specific Event	**DCP**: Delayed Catch Processing

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.

Fixed Gear: Gears that are set to soak in a particular area, typically unattached from the vessel, and retrieved after a period of time that can range from less than an hour to more than a week.

Mobile Gear: Gears that are deployed from the vessel(s) and pulled through the water, before being retrieved and the contents emptied.

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 when sailing on a declared groundfish trip. 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 participating in an operational EM program, 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.

Catch: Any living or non-living items captured by gear, which is witnessed by vessel personnel or 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 review include the inability to identify discards to species, track fish, or collect haul level elements.

Electronic Monitoring Annotation

Reviewer IDs:

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

Trip Begin and End Definitions:

A trip is defined as a Port-to-Port deployment. The captain is required to submit an eVTR when the vessel returns to port for any reason (weather, mechanical failure, 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 eVTR's for two distinct fishing trips.


```
{
  "vessel_permit_number": 222222,
  "vessel_name": "Vessel B",
  "sail_datetime":"2020-06-29T16:24:45.000Z",
  "land_datetime": "2020-06-31T06:57:15.000Z",
  "evtr_num": "22222220062901",
  "all_effort_confirmed": "Y",
  "comments": "string",
}
```


Figure 1: Example of trip object in EM JSON

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. 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 power it off until after the offload and hold inspection is completed by the DSM.

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 pushes away from the dock or when you see them steam away from a mooring.

If the reviewer cannot determine or track the departure location and/or the system is activated while underway, DO NOT annotate a SAIL_DATETIME. The EME-SYSTEM NOT ACTIVATED AT DOCK event should be annotated when the video begins. The SAIL_DATETIME field should **only** be NULL **if** the EME-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. The video should continue until the offload is complete and the hold is inspected.

If the reviewer cannot verify the vessel landed at a dock, DO NOT annotate a LAND_DATETIME. If a video gap occurs and there is no footage of the vessel landing, but following the gap there is footage of the vessel offloading and the hold inspection, an EME-Video Gaps event should be annotated and the LAND_DATETIME would be NULL.

If there is no video of the landing, offload and hold inspection, annotate an EME-SYSTEM FAILURE. If

there is no video of the offload and/or hold inspection the reviewer will submit an Incident Report through the Fishery Monitoring Portal. There are times when NMFS will give a waiver to DSM coverage. In these cases, there will be no DSM present or hold inspection to be seen on video. FMRD will contact the provider of any MREM trip given a DSM waiver. If a DSM waiver is given, **do not** annotate the EME-SYSTEM FAILURE event. Please add a note to the trip comments stating a 'DSM Waiver given by NMFS'.

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, all gear types) 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, and 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).
4. If footage ends prior to the vessel landing, it can be confirmed that all effort has concluded (i.e. land is in view, near harbor, etc.)

Examples of when All Effort Observed = 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 and footage of potential fishing activity is lost.

Table 1: Trip Identifier Annotations

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

Gear Categories and Codes:

There are currently four gear categories operating in the multispecies EM programs. 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 (ACCSP). 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 commonly observed scenario is vessels testing the waters with the handline before setting out gillnet or longline gear.

If a gear not found in Table 2 is used, there is no requirement to document the haul activity or any discarding. The reviewer is still required to watch the video to confirm the system is functioning properly. Electronic Monitoring Events (EME) such as video or sensor gaps and camera or system failures, still should be annotated if present.

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 it 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. 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 Type definitions and ACCSP Codes

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	Long section of line that is spooled on a reel. Generally will have a weight attached to a swivel towards the end of the line, with a shorter piece of line attached to a hook or a jig. The hook may be baited or fish shaped lures may be used.	Hand Lines	700

Haul Definitions by Gear Type:

Below is how to document haul time elements for gear types observed on EM vessels. A date, timestamp, and GPS coordinates should be created for each of the given elements within the haul. The reviewer should do their best in determining when each element occurs. The haul definitions used by EM will mimic the At-Sea Monitor program's gear specific definitions.

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.


```
{
  "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": "N",
  "observed": "Y",
  "comments": "string"
}
```


Figure 2: Example of haul object in EM JSON

Bottom Otter Trawl:

HAUL BEGIN: First component of net deployed, i.e. net hits the water with the intent to fish.

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. Please provide comments if another haul end determination is used for the timestamp.
- 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 would *NOT* count as a haul. No annotations are required for this type of event.
- Note: Boats may adjust the wire during a haul. This could be due to the vessel making a turn or avoiding something on the ocean bottom. These instances would not be annotated as a Haul End timestamp since the intent is not to haul back the gear to end fishing.

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 off. 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.

Table 3: Elements of Haul Entries in the EM JSON Submission

Name	Details/Instructions	Units/Format	Unknown Values
haul_id	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 (always N for MREM)
observed	Was the haul fully observed by the reviewer (Y/N)	Array (Y/N)	Cannot be blank
comments	Notes on a haul such as anything unusual that occurred, etc.	text	Can be blank

Haul Level Elements:

Haul 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. 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, released 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.

If catch from multiple hauls is on deck (i.e. deckloading occurs) and an event such as a Video Gap, System Failure, Bulk Discarding, etc. results in the inability to track catch, all hauls with catch on deck should be marked as OBSERVED=N. For example if catch from H2, H3, and H4 are all on deck and there is a 2 hour video gap, those 3 hauls would be OBSERVED=N.

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 their 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). MREM vessels retain the groundfish that would otherwise be discarded, thus this field does not apply in the program.

This haul field will always be DELAYED_CATCH_PROCESSING=N

Catch Sorting and Processing:

While hauling gear or immediately preceding 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. On fixed gear vessels this period often occurs while gear is being hauled and for some time immediately following. During 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.

Species Identification Standards:

During review of an EM trip, species identification will be required for any discard of an allocated groundfish species (Table 4). The ID characteristics used by the reviewer should be reflective of what is observed in the footage (see Appendix C for a list of common ID characteristics by species used for EM review). Annotating discards at the species level is preferred, but may not always be possible due to instances such as diminished image quality, failing to discard at control points, or camera blocking.

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

When an identification cannot be determined the reviewer will make an annotation of FISH NK. Examples of a FISH NK include groundfish that cannot be identified to the species, 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, etc.) should NOT be included in any 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 dorsally-filament 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. Under Amendment 23 only White Hake is required to be retained and processed on shore by a DSM. All whole hake that are discarded will have a catch annotation using the HAKE, RED/WHITE/SPOTTED/SOUTHERN MIX species code. There are no Incident Reporting requirements for mixed hake discards since species identification cannot be consistently determined using EM footage. 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).

If a large hake that has been cleaned or processed (i.e. headed and gutted) or is of poor quality and is seen being discarded, a HAKE, WHITE species code annotation should be made. These individuals are typically larger and easy to identify as White Hake. White Hake, when processed, has the heads removed, the only groundfish processed in such a manor. The filaments are still visible. Any identified White Hake discards will be reported as an Incident Report through the Fishery Monitoring Portal since it is a regulated groundfish.

There are multiple red-colored scorpionfish species encountered by fishermen participating in the Multispecies Groundfish Fishery. Many of these red-colored fish have similar colorations and morphological characteristics that make ID via video footage impossible. Because Acadian Redfish is a regulated groundfish species that are difficult to differentiate from other red-colored scorpionfish (Blackbelly Rosefish and other scorpionfishes such as Longspine, Highfin and Spinycheek), clearly documenting all of the individuals from these red-colored fish species is important for generating

accurate estimates of the catch of Acadian Redfish. All red-colored fish that are discarded will have a catch annotation using the SCORPIONFISH, NK species code. There are no Incident Reporting requirements for Scorpionfish, NK discards since species identification cannot be consistently determined using EM footage.

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. 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 and 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 Fishery Monitoring Portal.

Catch Handling Protocols:

Fish caught in the Multispecies Groundfish fishery can fall into three categories: regulated groundfish species, allocated groundfish species, and species that do not have sector allocations and are non-groundfish. Depending on the designation of these species, captains will be responsible for handling individuals in different ways. See Table 4 for a list of groundfish species and which categories these species belong to.

Groundfish vessels participating in the MREM program will be retaining/landing all allocated groundfish, regardless of size. Non-allocated groundfish (Atlantic Wolffish, Atlantic Halibut, Ocean Pout, and Windowpane Flounder) will be discarded at designated discard control point(s) outlined in the vessel's VMP. Non-allocated groundfish are not accounted for during MREM trip reviews, and thus do not require an annotation when discarded. 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 cutting machine, conveyor, etc.). 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.

Animals that are placed with kept catch and taken out of camera view for extended periods of time during hauling, or sorting phases of fishing effort should be considered as retained catch, please see the Documentation of Fish Disposition section for more details.

If an allocated groundfish is discarded at the hands of or as result of the crew, a catch entry shall be made. Any allocated groundfish seen being discarded also requires an Incident Report be submitted

through the Fishery Monitoring Portal. No entries are required for the non-allocated and non-groundfish species. The vessel is allowed to discard these species, as long as it is in camera view at one of the discard control points. See Table 4 for a list of the groundfish species.

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

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

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

Creating a Discard Entry:

Since EM review is used as a compliance tool in the MREM program, the discard annotations are not as robust and typically occur less frequently to those in other EM programs. Length and weight data are not collected via EM review. Since no length or weight data is collected, the grade code in catch data will always be entered as GRADE_CODE = 01 (ROUND) and the ESTIMATION_METHOD = UNKNOWN for all species. Only a UNIT_COUNT is required. Subsampling will not occur on MREM trips and should not be documented during review. There may be instances in which a high volume of discards are observed including: higher than usual Fish NK entries due to image quality issues or improper handling, vessels who are new to the program or have added a new crewmember and are yet to master MREM handling.

Discarded Groundfish That Do Not Require Annotation:

There are several categories of allocated discarded groundfish that do not require a discard annotation. For mobile gear this includes fish that are seen escaping from the net during haulback, fall from the net and overboard while moving nets to checkerpens, wash overboard during haulback, fall from the net while setting gear, or wash overboard immediately after haulback. For fixed gears examples include fish that break-free at the water line, fish that fall from the hauler, fish that fall from a hook, and 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. Allocated groundfish that are handled by the crew and discarded will require a catch entry. Examples include when a crewmember tosses, kicks, sweeps, hoses, or shovels allocated groundfish or unidentifiable fish overboard. See the Documentation of Fish Disposition section for full details on annotation requirements.

Protocols for Discards Observed During Offloads:

Reviewers are required to review the entire offload to verify a hold inspection is completed by the DSM and to ensure no egregious discard events occur during the offloading process. During this time it is possible that small amounts of otherwise landed groundfish are seen being discarded with ice or seen falling from baskets during the transfer of catch from the vessel to the processing facility. These discards are considered part of normal operations and are inadvertent. For that reason these discards do not require an annotation or an event.

In the instance egregious discarding is seen at the dock, the reviewer should annotate a CSE-Bulk Discarding event at the first sight of the discarding. The reviewer should include comments in the event entry describing the species contents if identifiable as best they can. Offloads typically occur by the species which can be used to aid in fish identification (groundfish vs non-groundfish). The CSE-Bulk Discarding event will not have a haul number attributed to it (entered as NULL or 0) since the event occurs outside of a haul. All hauls prior to the CSE-Bulk Discarding event must be marked as OBSERVED = N. If Bulk Discarding is seen occurring during an offload, *all* hauls on the trip must be changed to OBSERVED =N.

Examples of more egregious discarding that would require event documentation include, but are not limited to, the intentional dumping of totes of groundfish over the rails once at the dock or shoveling groundfish over rails or out of scuppers.

Protocols and Recommendations for Vessels with Cutting Machines:

Commonly high volume vessels targeting gadids will utilize a fish cutting machine to increase efficiency during the processing of kept catch. It is important that reviewers examine the vessel's VMP prior to review to determine if a cutting machine is present and where it is located on deck. Occasionally, fish may fall, get thrown from, or wash under the cutting machine if a mechanical error occurs. This may result in the fish sloshing around on deck and washing out of a scupper. The crew are required to retain these fish, however, discards may occur. In the case these discards are observed, the reviewer shall create a catch entry. If multiple fish are observed washing out of the scupper at the same time a grouped entry can be annotated at the species level. There may be instances in which it is difficult to determine the end disposition of these fish, in that case the reviewer shall create a discard annotation with the DISPOSITION = 900 (UNKNOWN KEPT OR DISCARDED). There may also be a CSE-Improper Catch Handling annotation affiliated with these discards if scuppers are not kept clear of debris or pooled water; please reference the Improper Catch Handling event definition for additional details. Keep in mind that not all catch processing may occur in the view of the cutting machine. Make sure all catch processing is reviewed and any discards annotated.

Protocols for High Volumes of Discards on MREM Trips:

Under MREM protocols all length and weight data is collected at the dock by the DSM. MREM reviewers will rarely encounter high volumes of discards, and it is uncommon that these will be intentionally discarded. However in cases in which this is observed the reviewer should annotate the appropriate catch entry or event(s). Examples of when a high volume of discards or catch entries would be annotated includes: higher than usual FISH NK annotations due to dirty or out of focus cameras, or vessels who have recently joined the MREM program or added a new crewmember who are yet to master MREM handling.

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. There are three 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, and a count can be determined, 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. Note: if the contents cannot be identified **and** quantified, a reviewer should annotate a CSE- Bulk Discarding.

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 UNIT_COUNT > 1.

3. If >1 groundfish of the same species is discarded at the same time (i.e. washed overboard, discarded over the conveyor, etc.) reviewers can create a discard annotation with the count seen discarded.

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 at sea human 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 their best judgment as to which disposition code is best suited for the situation. These codes can be found in Table 5.

Table 5: List of Fish Disposition Codes and Description

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


```
"discard_events": [ {
    "haul_id": 1,
    "species_common_itis": "COD, ATLANTIC",
    "species_code_itis": 164712,
    "weight": null,
    "catch_weight_uom": "LB",
    "length": null,
    "catch_length_uom": "CM",
    "count": 1,
    "weight_determined_by": "UNKNOWN",
    "discard_datetime": "2019-08-02T16:24:45.000Z",
    "discard_lat": 42.123456,
    "discard_lon": -67.123456,
    "disposition": "099",
    "grade_code": "01"
    "reviewer_id": "X99",
    "comments": "tossed over rail"
  } ],
```


Figure 3: Example of discard annotations in the JSON

In the MREM program, any catch item that does not show visible damage and is actively discarded by crew, or makes contact with the deck and is discarded will have a disposition of 099- DISCARDED, OTHER. This will be the most commonly used disposition code when reviewing.

Sometimes fish come aboard in less than preferred market conditions or have been damaged in some way (predation, sand flea, gear, etc.). As per program requirements and vessel's VMP, all 9 species of allocated groundfish must be retained, regardless of size and condition. This categorization includes any poor quality legal sized groundfish as a result of damage (i.e. LUMF) *and* any damaged sub-legal fish. If for some reason a poor quality catch item is discarded, the reviewer shall make an entry with the disposition recorded as 031- POOR QUALITY for that catch entry. This can be a FISH NK entry if an ID cannot be made.

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).

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.

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 should be applied to the catch item(s). If a catch item comes back into view and is observed being discarded (discarded by crew, washes out of scupper, etc) the disposition will be updated to 099- DISCARDED, OTHER. Fish with this disposition code will not require an Incident Report since the end fate of the fish cannot be verified.

For catch items that the reviewer can confirm as being discarded (i.e. seen going over and into the water) but cannot determine the condition (i.e. whole vs damaged), the DISPOSITION should be recorded as 000-DISCARDED, UNKNOWN REASON. There may be events also noted if this code is used. A piece count should be applied to the catch item(s). For example, if the cameras covering a discard control point are too dirty that condition cannot be determined, but if the fish is seen going over in another view, that fish would get the (000) code.

Table 6: Elements of Catch Entries in the EM JSON Submission

Name	**Details/Instructions**	**Units/Format**	**Unknown Values**
haul_id	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	No weights collected in MREM program	integer	NULL in MREM program
catch_weight_uom	No weights collected in MREM program	text (LB)	NULL in MREM program
length	No lengths collected in MREM program	integer	NULL in MREM program
catch_length_uom	No lengths collected in MREM program	text (**cm**, in, etc.)	NULL in MREM program
count	1 is most common but there are instances >1 discard per entry is observed	≥1	cannot be unknown
weight_determined_by	No weights collected in MREM program	text	UNKNOWN in MREM program
grade_code	Market codes do not apply to MREM	text	01 in MREM program
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 an individual event 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. For duration events that do not require documentation to be confined to between the beginning of a haul and end of processing and impact multiple hauls the reviewer should record the haul number as the first haul the event occurs on. Comments should include details on any other hauls that were impacted. For example if an EME-Video Gaps event is annotated during Haul 5 sorting, but Haul 6 is set during the gap, the reviewer would enter 5 as the haul_id and comment that haul 6 was deployed. Overlap may occur for certain duration events that are documented at the haul level. Location information (collected in the timestamp) will be included with the event entry. All events will require comments describing the impact an event had on the trip or review.


```
"other_events": [   {
    "event_category": "FISHING OPERATIONS",
    "event_code": "BAG",
    "event_duration": "PT4H10M20S",
    "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 Event Documentation in the EM JSON file.

- Fishing Operations Specific (Table 8)
- Crew Specific (Table 9)
- EM System Specific (Table 10)

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 8-10 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 7: Elements of “Other Events” in the EM JSON Submission

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 (PT4H10M20S) in ISO8601	can be blank documented or PT0S for point events
haul_id	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 released 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 all FOE's as a duration based on the descriptor and provide as much information as the reviewing software allows.

Table 8: Fishing Operations Event Descriptors

RELEASED BAG	WEATHER	OTHER OPERATIONS ISSUES
POOR LIGHTING/SUN GLARE	OPERATIONS INDUCED CAMERA DAMAGE	

Released Bag: In the trawl fishery, sometimes the contents of a tow are released in the water or the catch is not released on deck or sorted. This can be intentional or unintentional. During these types of events, it is hard to quantify the catch that is released. This event is to document any discarding of unsorted catch not brought on board or released on deck. Some things to look for on video are, but not limited to, a rushing to the stern/net reel, or catch seen in the water as net is brought up, or the crew cut the net and let catch escape, or the net is not dumped but let back out in the water to be cleared. This is a duration event. Comments should include all 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 the volume or amount of catch that is lost cannot be quantified and/or occur out of camera view, 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.

Examples of Released Bag events:

1. If catch is seen spilling into the water during haulback or while bringing the net on board.
2. If the captain or crew are observed cutting net meshes while preparing to bring the net on board and catch is observed spilling from the net.
3. If after bringing the net on board the net is either cut or the codend is opened and catch is released overboard

.

Examples of when **not** to apply a Released Bag event:

1. If the net comes up with visible damage, but no catch is lost.
2. Hauls where there is very little or no catch landed, but the codend is closed when the net is brought on board.
3. Contents of the net are shaken down and a pile of fish can be seen inside the codend and then the codend is then released into the water without the catch being processed or dumped on deck. This would be noted as a Crew Specific Event- Bulk Discarding.

Weather:

During fishing operations, reviewers will note when environmental conditions such as rough seas, fog, high winds, or precipitation impact review at the haul level. Scenarios where a video review may be impacted include: the inability to track fish, identify discards to species, collect lengths or visually estimate weights, or collect haul level elements. Examples of when to document this event when on deck operations are impacted include: when rough seas result in lost catch, difficulty tracking catch, or impact the vessels ability to haul or retrieve gear. If the volume of catch lost due to weather cannot be determined, no annotation is required and the haul will be marked as OBSERVED = N. In the instance weather is impacting the cameras, more than one is usually affected. 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 EME-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. This event has the potential to make a haul OBSERVED=N, depending on the scenario.

Poor Lighting/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 duration event every time the review is impacted. It starts at the first sign of glare or poor light and ends when the glare or poor lighting is resolved or the haul ends, whichever occurs last. Detailed comments should include what is impacted by the glare or low-light 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. This can include instances where the cameras go into night mode, or low-light mode (image recording in grayscale or in black and white) while catch is on deck being processed and/or sorted. Reviewers should refer to the VMP for additional information on when/if the system may record in greyscale.

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 event does not need to be annotated). If EM system issues occur on other cameras in the system following the camera damage, the appropriate EME event should be annotated.* This may lead to one

or more hauls being marked as OBS = N if overlapping views are not sufficient to capture activity and/or track fish. Additionally, if this event leads to the inability to confirm effort (i.e. a critical camera is damaged and haul cannot be determined, or the event triggers a prolonged video gap or camera failure) the ALL_EFFORT_CONFIRMED would = N. This event does not include instances where a camera appears out of focus due to pitting or scratches on the lens, which would be an EME-System Image Impairment event. This also does not include instances of camera/system tampering. If system tampering is observed during review, an Incident Report must be submitted to the Fishery Monitoring Portal.

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. An example of an FOE - Other event is the net snagging on a scupper door when releasing catch on deck, subsequently opening the door and discarding catch (099). When annotating this event, also mark the haul as unobserved, create an *estimated* FISH, NK count entry with a description of catch composition, and create a *precise* count entry for any identifiable and easily countable groundfish discards (e.g. individual Cod, Haddock, etc), if applicable. Another example is when a vessel lands and only offloads lobster (i.e. no groundfish offloaded and no DSM seen).

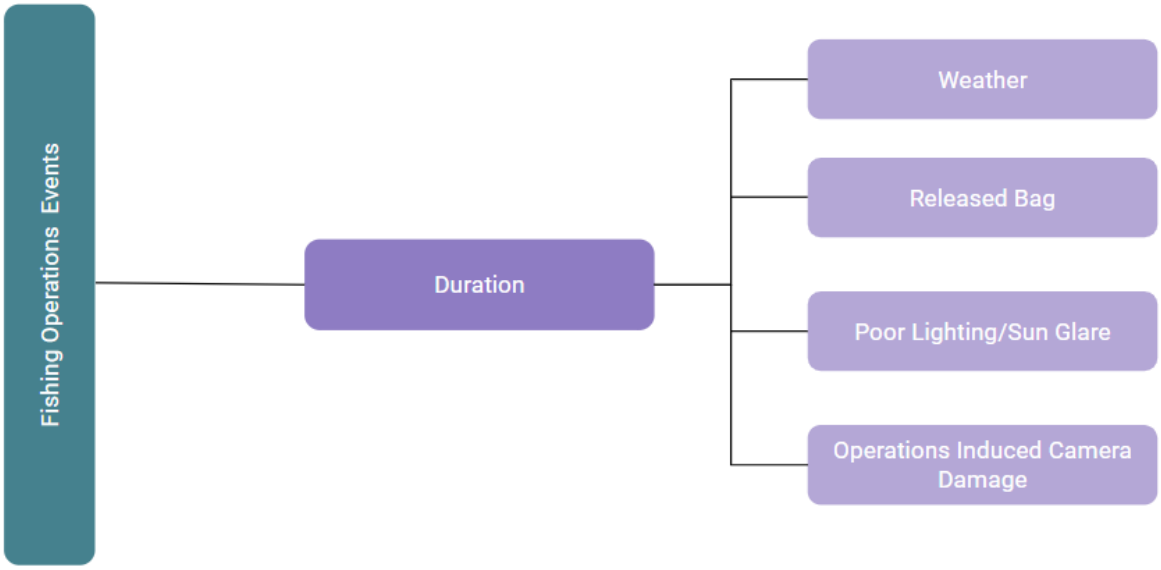


Figure 5: Chart depicting point vs. duration Fishing Operations Events

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 9: Crew Specific Event Descriptors

CAMERA SYSTEM NOT MAINTAINED	IMPROPER CATCH HANDLING
BULK DISCARDING	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 or track activity on deck is directly impacted, an entry should be made. This is a duration event entry 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, is cleaned during the haul, or there is no longer processing occurring on deck. This event may lead to a haul being reported as OBS=N if discards cannot be adequately tracked due to water spots, slime, debris, etc. If a haul is marked as unobserved due to footage being unwatchable after annotating this event, an Incident Report should also be submitted to the Fishery Monitoring Portal.

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

Improper Catch Handling: This event is used to document general improper catch handling or when the vessel is not adhering to the VMP. This **DOES NOT** apply when allocated or unallocated groundfish are seen being discarded. This event is not specific to the vessel's crew and applies if a human observer does not follow catch handling requirements as well (ex: discarding at non-control points). Examples of when to apply an ICH event in MREM include, but are not limited to, discarding at a non-discard-control point, not properly stowing the catch so that it can be sampled by the DSM, and letting catch wash out scuppers at a high rate or not keeping scuppers clear of debris such as totes, baskets, piles of non-groundfish catch, or pooled water. If a reviewer sees no attempt to retain fish left on deck for reasons unrelated to gear damage, weather, safety, etc., this event should be annotated. **This event is annotated as a point at every occurrence.**

> Examples of when to apply a CSE - Improper Catch Handling
>
> 1. Fish that are discarded either out of camera view or not at a designated control point described in their VMP
> 2. Fish NK that cannot be identified due to catch handling (i.e. the inability to identify **is not** due to weather, cameras not maintained, a camera out of position, glare, etc.)

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

1. Allocated groundfish that are handled and discarded. The catch entry implies improper catch handing. An Incident Report is required when any allocated groundfish are discarded.
2. Fish that do not require a discard annotation (see pg. 14).

Bulk Discarding: Any discarding action where an accurate count of fish cannot be obtained. This includes when 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. The contents cannot be confirmed as groundfish or non-groundfish. 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, Glare, Weather, etc.

If a bulk discarding event is observed during an offload, the reviewer shall annotate the event with the haul number entered as 0 or NULL. Any hauls prior to the CSE-Bulk Discarding event must be marked as OBS = N, so if Bulk Discarding is seen occurring during an offload, all hauls on the trip must be changed to OBS =N.

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 of the net are shaken down and a pile of fish can be seen inside the codend and then the codend is then released into the water without the catch being processed or dumped on deck.
3. 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.
4. Tote/container of unknown fish is dumped over.

Examples that are 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.
6. Tote/container of identified groundfish is discarded and both ID's and counts can be made. This would warrant an incident report at the trip level.

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.

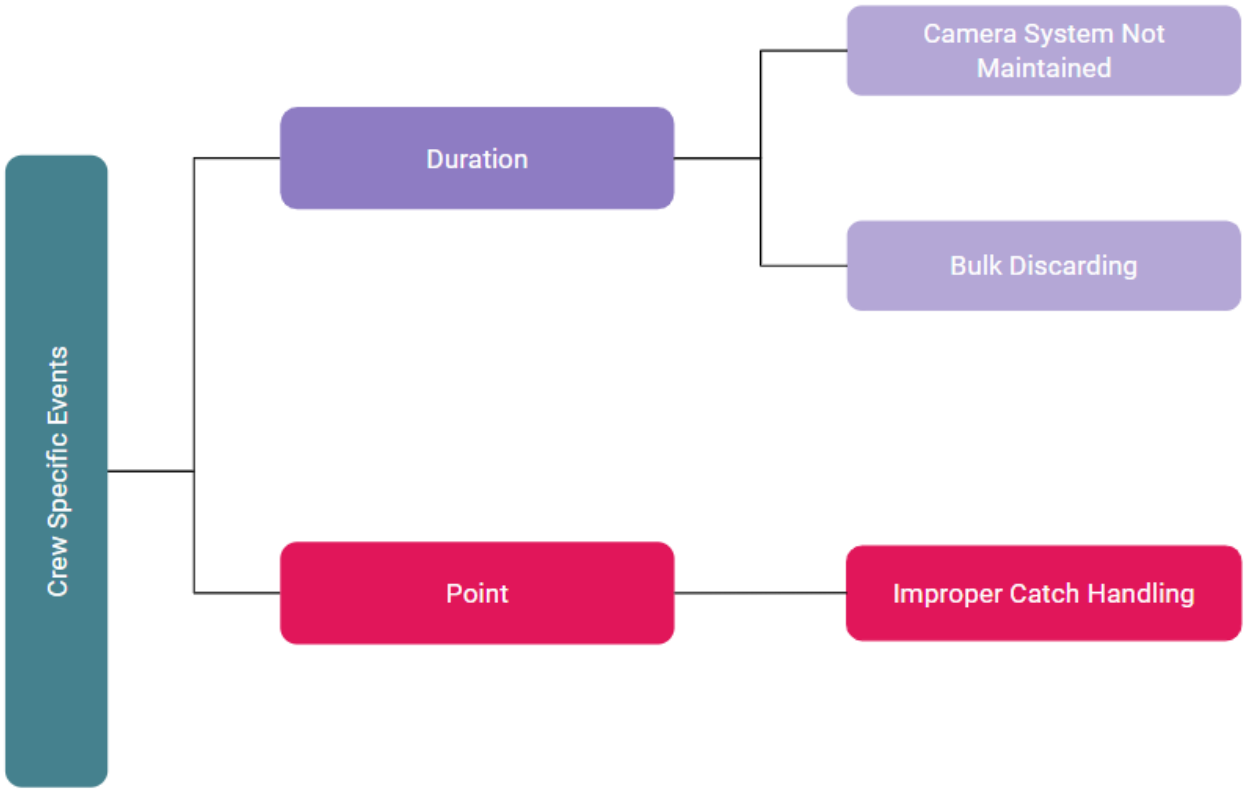


Figure 6: Chart depicting point vs. duration Crew Specific Events

EM Events:

EM 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 Events include when there are video or sensor gaps, camera(s) or system failure, out of sync cameras, or when the EM system is not activated prior to departure. EM events can be reported as either a duration event or a singular point event. Include any comments that may help to explain the situation. EM Events may impact the ALL_EFFORT_CONFIRMED and OBSERVED fields. For guidance on those trip and haul elements, please refer to the definition and examples on page 6 or individual event definitions below.

Table 10: 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 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 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 on how to document prolonged video gaps below. Video Gaps refer to when the video goes out or cameras freeze BUT then comes back or resumes playing on at some point in the trip. If video remains out, document it as a Camera Failure.

> **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 outlined in this section.
>
> 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. If the cameras come back on and video resumes, document the event as a Video Gap. This event signifies that the camera was lost for the duration of the trip. This is a point event and will be documented when the camera(s) first fails. If all cameras **and** the GPS/sensors stop working and remain out for the rest of a trip, reviewers should document a System Failure event. 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.

System Failure: If the EM system (all cameras and all sensors) fails and stops operating and does not resume, an event should be annotated. This event should be made anytime the system fails, regardless of when that occurs within the trip and what is happening on deck. This includes, but is not limited to, instances when the system fails mid-trip, when the system fails at the dock or prior to landing. 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. Any haul impacted by failure should be marked as OBSERVED=N. If a System Failure is annotated prior to the end of a trip and the offload is not able to be seen, data loss has occurred and an Incident Report must be submitted through the Fishery Monitoring Portal.

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 and catch items are harder to track. 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 observed 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, the entire trip, or multiple trips 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 through the end of the trip, offload, and hold inspection by a DSM). 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. If this event is annotated and data loss is observed due to the event (i.e. the cameras turned on and the first footage is of the vessel in the middle of fishing effort), an Incident Report should also be submitted to the Fishery Monitoring Portal. 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.

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, and Recording at a Lower Frame Rate). 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 still images from the VMP, 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.

Recording at a Lower Frame Rate: This occurs when the image appears to be choppy or fragmented, but time is elapsing as normal. This can happen due to low light conditions or camera programming or an unknown reason. Reviewers should reference the frame rate(s) listed in the VMP to help determine when this is occurring.

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.

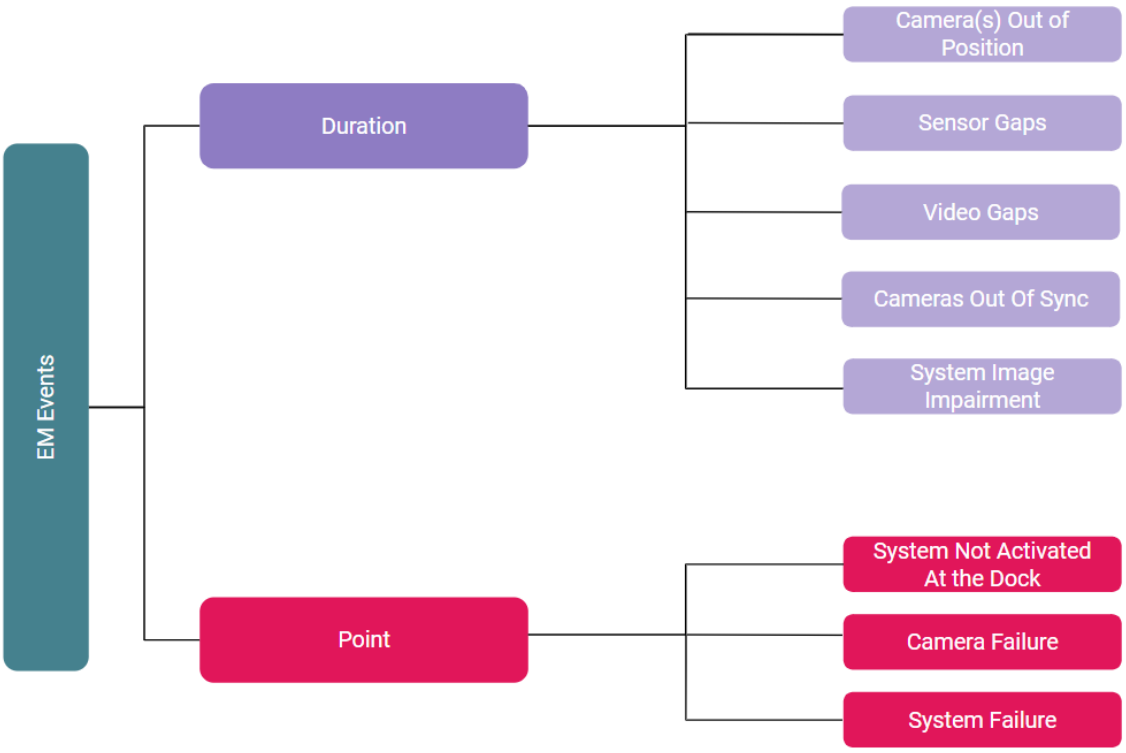


Figure 7: Chart depicting point vs. duration EM Specific Events

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 (application programming interface) 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.

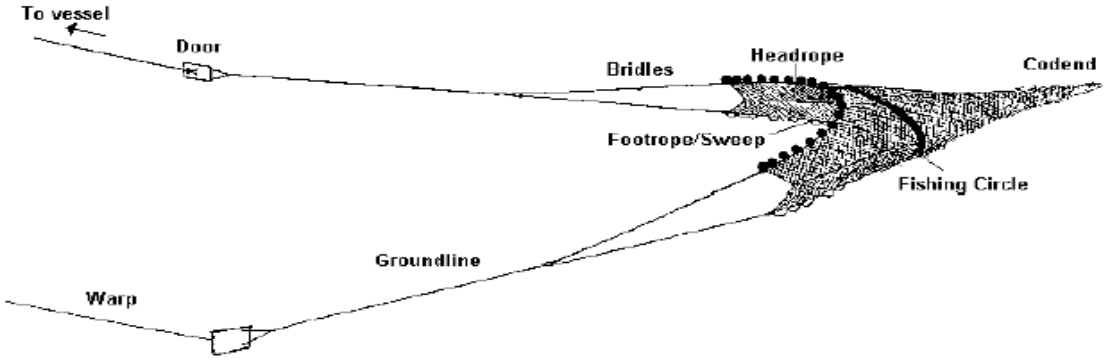

```
{
  "vessel_permit_number": 222222,
  "vessel_name": "Vessel B",
  "evtr_num": 22222220062901,
  "all_effort_confirmed": "N",
  "comments": "No video on HDD; pre-trip check completed, HDD appears to not have been seated properly to record; tech visit scheduled. Submitted by X99"
}
```


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

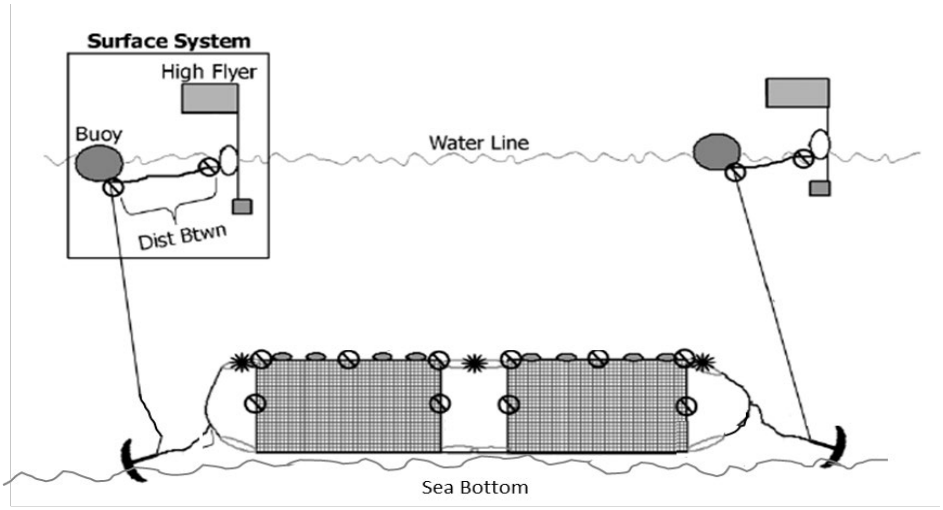
If there was a system malfunction an Issue should be entered in VMAN. If there was no hard drive data received for the trip an Incident Report should be filed.

Appendix A: General Gear Category Diagrams

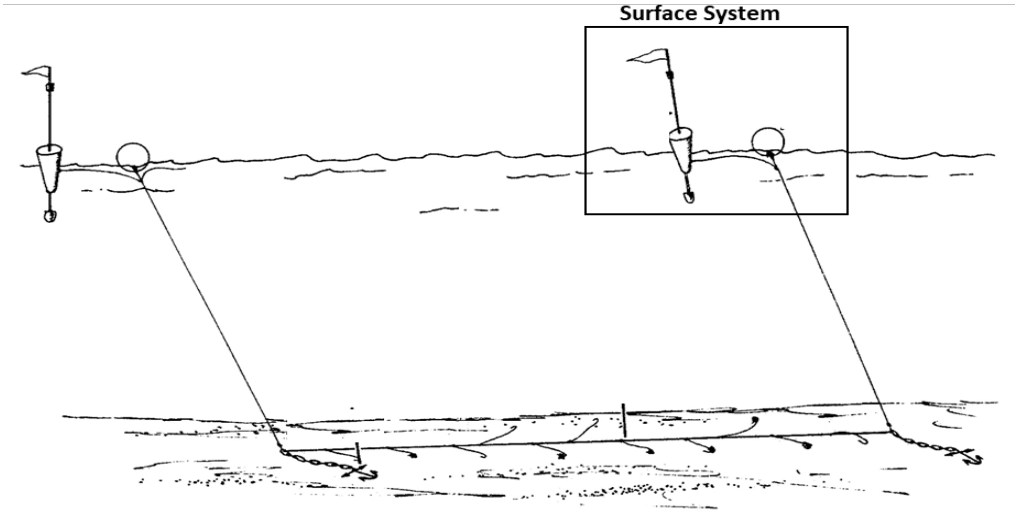
Bottom Trawl:



Gillnet:

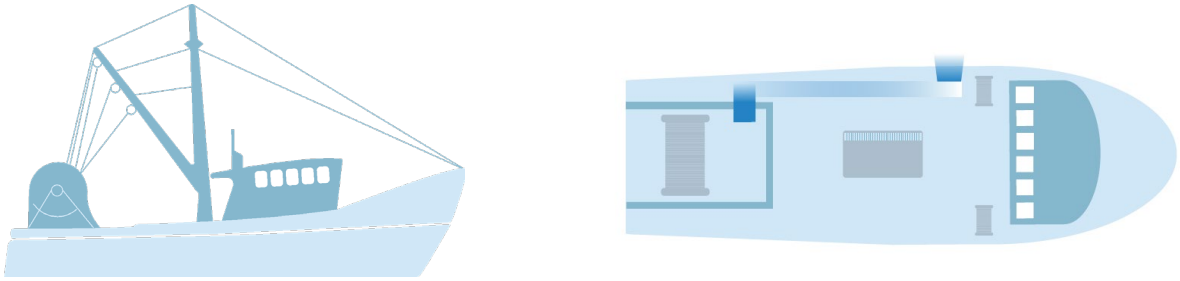


Longline:

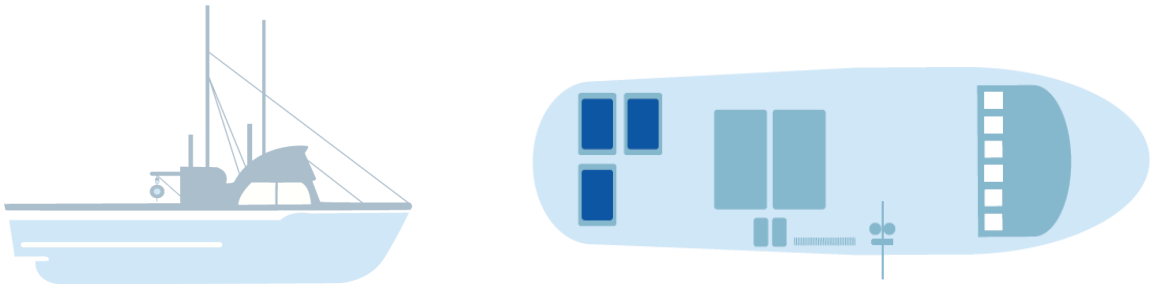


Appendix B: General Schematics of Vessel Layout

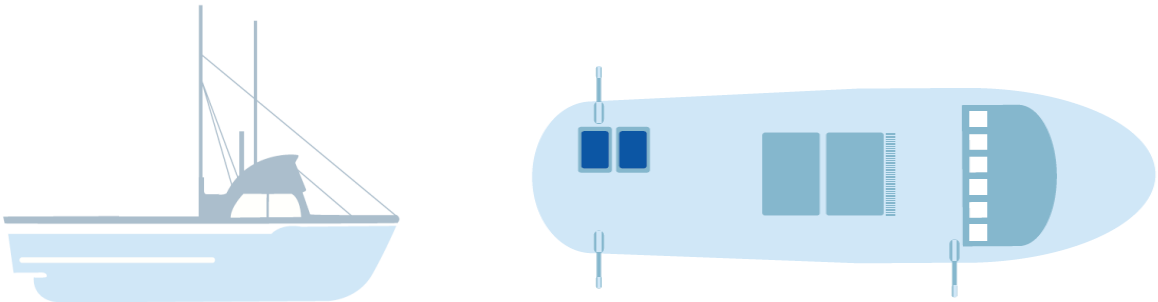
Trawl:



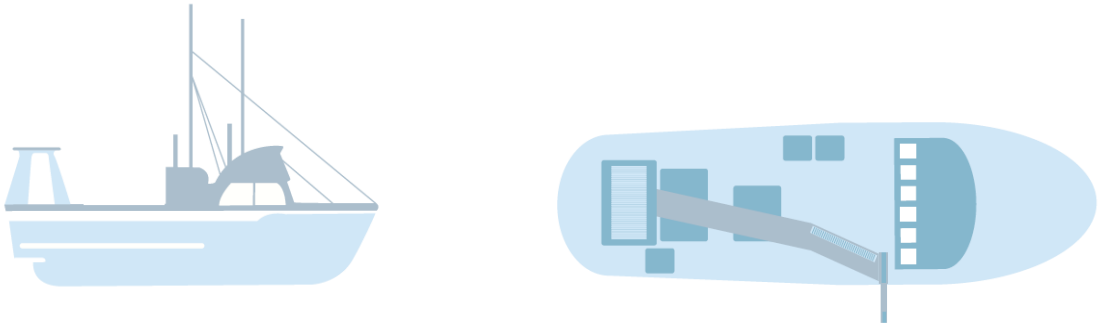
Longline:



Handline/Jig:



Gillnet:



Appendix C: Primary Species Characteristics for EM review

Atlantic Cod

- White lateral line, lateral line curves distinctly downward under second dorsal fin
- Greenish-brown to reddish color overall with darker rust colored spotting, color fades to white below
- Three dorsal fins, two anal fins
- Posterior margin of tail straight or with slight fork
- Subterminal mouth
- Long, distinct white chin barbel

Pollock

- White lateral line that is uniformly strait along sides
- Solid blue gray dorsal color fades to white below
- Three dorsal fins, two anal fins
- Deeply forked tail
- Terminal mouth
- No obvious chin barbel

Haddock

- Black lateral line
- Three dorsal fins, 2 anal fins
- First dorsal fin tall and sail like
- Dusky black patch located above and behind pectoral fin
- Slightly forked tail
- Subterminal mouth
- Small chin barbel

White Hake

- When processed, fish will be headed and gutted with filaments likely visible
- When damaged, pelvic and dorsal fin rays present and likely visible
- Second dorsal and anal fin extend to caudal peduncle
- Body rounded in mid-section
- Milky/off-white coloration
- Dorsal and pelvic fin filament(s) present

Hake Mix (Red, White, Spotted, Southern) Group

- Second dorsal and anal fins long and extend to caudal peduncle
- Body rounded in mid-section
- Body coloration ranges from brownish bronze or coppery brown to silvery gray, overall color lightening ventrally
- Pelvic filament(s) present

Scorpionfish, NK Group (Acadian Redfish, Blackbelly Rosefish, etc)

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

Windowpane Flounder

- Left eyed flounder with large mouth
- Thin bodied, underside of body appears translucent
- Black and white spots on dorsal side, anal, and caudal fins
- Round overall shape with pointed snout.

American Plaice Flounder

- Right eyed flounder with large mouth
- Dorsal side brown to tan in color with light ventral side
- Narrow caudal peduncle
- Tail rounded or with slight point at middle

Witch Flounder

- Right eyed flounder with small mouth
- Dorsal side brown color often with black hue
- Ventral side gray with blackish or brown hue
- Dorsal anal and caudal fins usually with black at outer margins
- Pectoral fin on upper side dark at outer edge black tipped
- Thin bodied; tail rounded or with slight point at middle
- Narrow caudal peduncle

Winter Flounder

- Right eyed flounder with small mouth
- Dorsal side brown to tan or gray in color, may be darker spotting overall
- White ventral side (but may have light yellow at base of dorsal, anal and caudal fins)
- Thick bodied with wide and thick caudal peduncle and tail
- Tail Rounded

Yellowtail Flounder

- Right eyed flounder with small mouth
- Dorsal surface brown to tan overall (rust/orange/yellow mottling or spots may be visible)
- Ventral side light but often with yellow at base of dorsal and anal fins and over tail
- Protruding, upturned snout (dorsal side) with distinct indent just above eye
- Rounded tail with thin caudal peduncle

Atlantic Halibut

- Right eyed with large mouth
- Thick, diamond shaped body
- Concave tail (not flat edged or rounded)
- Ventral side cream colored to white

Ocean Pout

- Long, slender body
- Overall color muddy yellow to reddish brown (bars may be visible)
- Broad, heavy head and large, fleshy lips (except small specimens, e.g., < 30 cm)
- Rounded pectoral fin

Atlantic Wolffish

- Bluish, gray color with broad dark bars along length of body, lighter ventrally
- Large head with blunt snout, large conical teeth
- Long dorsal and anal fins extending almost to tail
- Large, rounded pectoral fin
- Tail small and rounded

The following section illustrates identification characteristics of non-regulated finfish that are common bycatch in the Northeast groundfish fishery and also hold market value. These species do not require annotations but are included to assist in ruling out when vs. when not to annotate.

Fourspot Flounder

- Left eyed
- Large mouth
- Body shape slender, not spade shaped like Windowpane Flounder
- Tail relatively thin, convex shape with small point, not as a robust as Summer Flounder
- Overall brown to tan on top (some white spots or mottling may be present), ventral side white and may appear party translucent
- Usually 4 prominent ocelli on upper side, 2 ocelli at mid body and 2 at base of tail

Silver/Offshore Hake

- Dorsal surface dark gray, overall silver in color, lighter below
- Pelvic fin and first dorsal fin without filaments
- Overall round, cigar-like body shape (streamlined)
- Large terminal mouth (teeth may be visible)
- 2 dorsal fins with second dorsal fin long

Summer Flounder

- Left eyed flounder with widely spaced eyes (gap between eyes greater than eye diameter)
- Color sandy to dark brown in color often with many ocelli) usually visible on dorsal surface
- Thick body
- Large mouth with small, sharp teeth
- Tail convex

Wrymouth

- Brown coloration with dark spotting on body and into dorsal fin
- Gaping upturned mouth
- Small eyes on top of head
- Continuous dorsal, anal, and caudal fin
- Rounded tail

Cusk

- Frog-like shaped head (dorso-ventrally compressed)
- 1 dorsal fin with partially joined caudal and anal fin
- Long chin barbell
- Fins edged in white with dark sub-marginal bands
- May have yellow band marks alongside body

Fourbeard Rockling

- Long slender body
- 2 dorsal fins; 1st modified into a dark filament
- 4 barbells around mouth
- Pelvic fins with rays
- Prominent black marking on tail (ink dip)

Appendix D: 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_confirmed*	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]
		string; Was catch processing delayed?

	delayed_catch_ process*	*Array [Y, N]*
	reviewer_id*	String; Official Observer ID assigned by NEFSC to the reviewer
		Example: X99
	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($double); Longitude in decimal degrees
		maximum: 0
		example: -67.123456
	disposition*	string; See Reference Table 4.
	grade_code*	string: ACCSP grade code indicating whether the weight represents round or dressed.
		example: 01
	reviewer_id*	string; Official Observer ID assigned by NEFSC to the reviewer.
		example: X99
	comments	string; Notes that are specific to understanding this discard record.
	event_category*	string
		Array [FISHING OPERATIONS, CREW, EM SPECIFIC]
	event_code*	string; See Reference Table 5.
	haul_id	integer; The haul within this event occurred, if known.
	event_datetime*	string($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
HALIBUT, ATLANTIC	HIPPOGLOSSUS HIPPOGLOSSUS	172933
OCEAN POUT	MACROZOARCES AMERICANUS	630979
POLLOCK	POLLACHIUS VIRENS	164727
SCORPIONFISH, NK	SCORPAENIDAE	166704
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
900	UNKNOWN KEPT OR DISCARDED
000	DISCARDED, UNKNOWN REASON

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 CREW ISSUES	OCI
CREW	IMPROPER CATCH HANDLING	ICH
EM SPECIFIC	SYSTEM FAILURE	SYSTEM
EM SPECIFIC	CAMERA FAILURE	CAMFAIL
EM SPECIFIC	SENSORS GAPS	SENSGAP
EM SPECIFIC	VIDEO GAPS	VIDGAP
EM SPECIFIC	OTHER SYSTEM ISSUES	OSI
EM SPECIFIC	CAMERAS OUT OF SYNC	COS
EM SPECIFIC	SYSTEM NOT ACTIVATED AT DOCK	NAATDOCK
EM SPECIFIC	CAMERAS OUT OF POSITION	CAMKNOCK
EM SPECIFIC	SYSTEM IMAGE IMPAIRMENT	IMGIMPAIR
FISHING OPERATIONS	OTHER OPERATIONS ISSUES	OOI
FISHING OPERATIONS	RELEASED BAG	BAG
FISHING OPERATIONS	WEATHER	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

Version History:

Release Date	Description of Edits	V.
5/15/23	FY23 Data Specifications	1