Industry Funded Monitoring: EM Reviewer Manual for High Volume Herring Trips

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

TABLE OF CONTENTS:

List of Figures:

List of Tables:

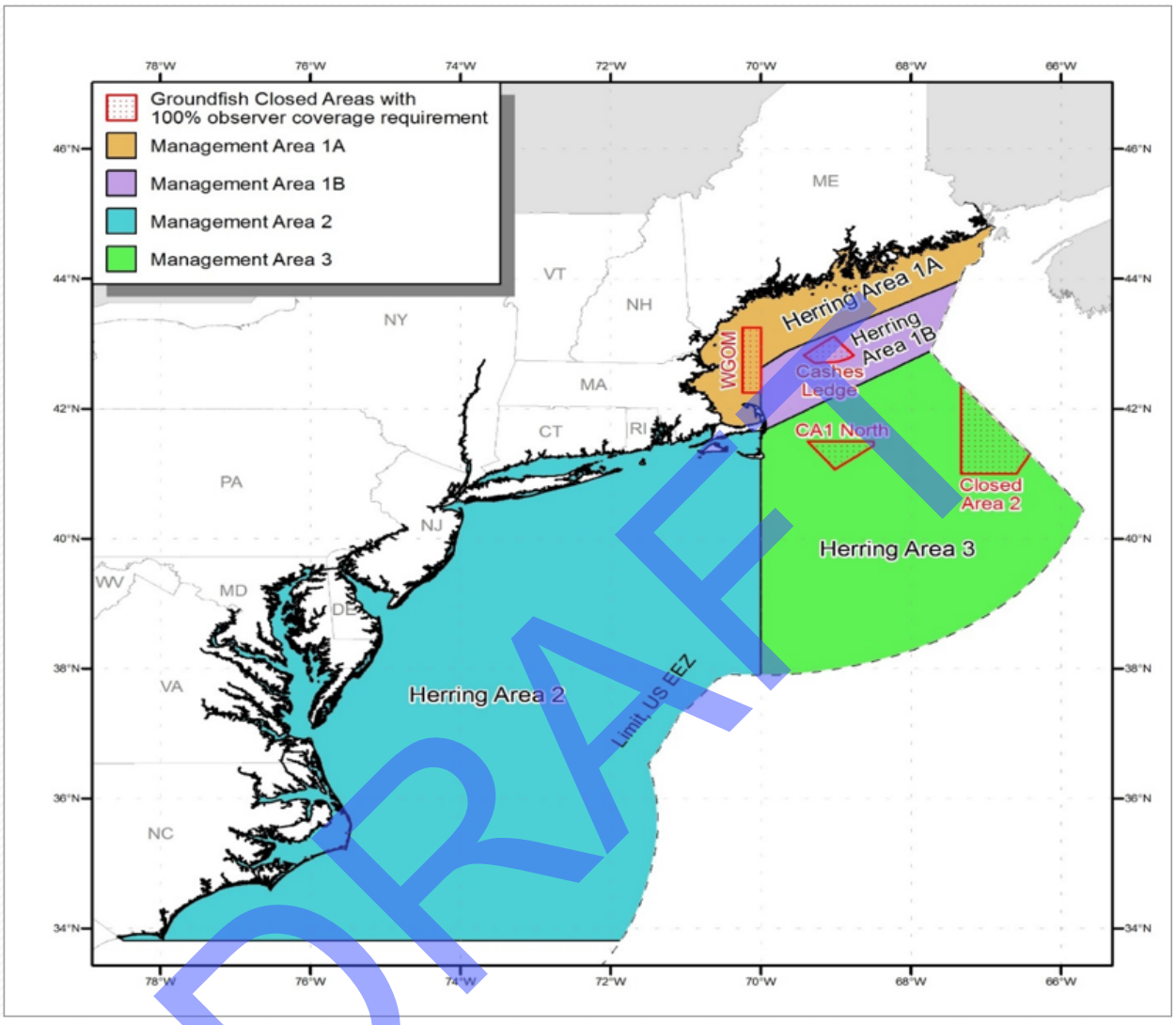

Figure 1. Atlantic herring Management Areas including Groundfish Closed Areas.

Introduction:

The Northeast Fishery Science Center contracted with Saltwater Inc. between 2016 and 2018 to conduct a preliminary study to determine if electronic monitoring (EM) was a suitable implementation to enhance monitoring and survey discarding events in the Atlantic herring and Atlantic mackerel midwater trawl fisheries[1]. Based upon the analysis and results of the project, the New England Fishery Management Council (NEFMC) approved the use of EM in conjunction with portside sampling coverage under the Industry-Funded Monitoring (IFM) Omnibus Amendment as a monitoring option for midwater trawl vessels declared into the Atlantic herring fishery.

During the 2021 fishing year (April 1, 2021-March 31, 2022), midwater trawl vessels with Category A or B herring permits are eligible to participate on an Exempted Fishery Permit (EFP) that exempts vessels from IFM at-sea coverage requirements. EFP participants will utilize a combination of portside sampling and EM when selected for IFM coverage to meet requirements. The EFP specifically exempts vessel participants from at-sea monitoring requirements, including slippage compliance measures, seasonal restrictions of groundfish closed areas, and operational discarding events when declared into a Northeast multispecies closed area. Vessel operators must ensure that their systems are operating on all herring trips if the vessel plans to pump catch onboard. Vessels are also subject to portside sampling and NEFOP SBRM coverage.

Purpose:

This manual is designed to provide general information and distinct data collection points for IFM Atlantic herring video reviewers. The scope of the data collection is aligned with the rules and requirements described in the EFP. Review protocol may be modified by Fisheries Monitoring Operations (FMO) staff during the year to further guide program development.

1

[1] http://s3.amazonaws.com/nefmc.org/4.Herring-and-Mackerel-Fishery-Electronic-Monitoring-Project_Final-Report.pdf

Keys to Review:

Vessels are participating in this program to further develop EM and portside sampling in the Atlantic herring fishery and to fulfill the requirements of the New England Industry Funded Monitoring Omnibus Amendment.

- EM herring data will be used to confirm catch retention as well as verify compliance with slippage restrictions.

- Reviewers will not confirm species identification or collect species counts for targeted catch or haddock discards that are not brought onboard.

- Primary and secondary reviewers will use the Fishing Operations descriptor: 'High Volume Discard' to document scenarios for targeted or haul-level catch that is not brought onboard the vessel.

- Primary and secondary reviewers will select 'Unknown' as the event description for all High Volume Discard events documented during video review.

- Fisheries Monitoring Operations staff will evaluate High Volume Discard events and make the final determination for each entry based on additional video review. The outcome of each event will be documented based on the high volume fishery definitions for: Operational Discards, Partial Release, and Full Release.

- Reviewers must create a discard entry for each Individual Animal observed and separate entries for each Protected Species interaction that may occur during a haul.

- Reviewers must document discarding of haddock that are brought onboard, however, a discard entry is not required for other groundfish species or non-target species identified by reviewers when discarded by the crew.

EM vessels participating in the EFP are permitted to discard non-regulated species that are removed from the dewatering box.

- If a reviewer has identified haddock being retained or discarded by the crew at a previous time during the trip and the reviewer cannot verify a discarded catch item then a discard entry is warranted for fish that can not be identified. Entries will be recorded as Fish, NK.

- Species identified as Fish, NK signals the presence of haddock observed during the trip. The reviewer will include the comment: "*Haddock previously identified by the reviewer on this trip*." for each Fish, NK discard entry.

- Portside data will be used to collect information about species composition of the catch including age and growth data collection.

- Trips selected for Standardized Bycatch Reporting Methodology (SBRM) coverage must operate EM in addition to carrying an observer when selected. IFM reviewers will consider an observer (or sea-sampler) as part of the crew in the event of non-compliance with VMP catch handling requirements.

The reviewer will evaluate all video, sensor, and/or imagery files from a trip and attempt to annotate hauls, pumping operations, and discard events regardless of whether the haul will be OBS Y or N. The ability to track fishing operations and on-deck activity may be impacted at times but all recorded video and sensor files should still be assessed to document activity that occurred during the trip. It is acceptable for reviewers to scan video at faster playback speeds while a vessel is transiting to/from the fishing grounds, or while patrolling for fish when no catch is present on deck. However, fishing activity or any segment of a trip when unprocessed catch is present should be reviewed at a slower speed to ensure accuracy with data collection and compliance monitoring.

Documentation for Northeast Electronic Monitoring Information System (NEMIS):

An in depth user instructions for NEMIS API can be found here:

https://apps-nefsc.fisheries.noaa.gov/NEMIS/index.php/docs/readme#dual

The guide offers a thorough overview of the API production points, submitting test trips, and troubleshooting trip submission errors for resubmission. EM trip reviews that are successfully submitted to the API will receive a unique report identifier once the JSON file has been uploaded. The following is an example of a successful submission:

{ "error': false,

"review_id" : "319",

"logged" : true }

Trip Review: Start and Stop:

There are no annotation requirements for reviewers to denote the start or stop of a trip. However, a reviewer will always verify the start and end of a trip was recorded on video.

Review Start: Verify that the vessel is at a dock or mooring prior to departing with the intent of beginning a fishing trip. If the reviewer cannot determine or track the departure location and the system is activated while underway, an EMS-SYSTEM NOT ACTIVATED AT DOCK event should be annotated. Camera systems must be activated by the captain prior to departure and a system check should be conducted to confirm the system and cameras are functioning properly.

Review Stop: Trip review should continue until the vessel has returned to port. If the video feed ends and the reviewer is not able to confirm that the vessel landed, an EMS-SYSTEM OFF PRIOR event should be annotated.

Trip Level Information:

A trip duration is defined as port-to-port and does not necessitate offloading catch at the end of the trip. A 100% trip review (port-to-port) is required for each EM trip selected by the agency regardless of a vessel's PTNS declaration.

Vessel and trip information will identify the vessel name, hull and permit numbers, timestamps for datetime sail and land, and an indicator for pair trawl submissions. Data elements such as the sail date, eVTR, and vessel permit must correspond with a trip record identified in the NOAA Fishery Monitoring Portal: (https://apps-nefsc.fisheries.noaa.gov/fmportal/).

Program Code: FMRD analysts will identify and code selected trips on the backend. The Program code *250 EM-Industry Funded Monitoring Herring Compliance* will be assigned to each trip that is submitted through the API by a video reviewer, unless otherwise directed.

- ❏ Reviewer Identification
- ❏ Vessel Permit Number
- ❏ Vessel Name
- ❏ Datetime Sail
- ❏ Datetime Landed
- ❏ eVTR
- ❏ Pair Trawl Trip: (*Yes* or *No*)
- ❏ Total Hauls
- ❏ Reviewed Hauls
- ❏ Comments

Note: If fields are auto-populated, please confirm accuracy prior to submitting a trip.
Reviewers will provide a trip level comment if the total number of hauls was estimated using sensor data. For example, if cameras are knocked out of view, damaged, or not operational for a period of time, GPS/vessel speed, and other sensor data can stand in to approximate a haul as long as these system components were functioning properly. In the event of missing sensor and video data occurring periodically during a trip review, the project manager should notify FMO and request the total number of hauls that were identified on the eVTR.

Trip Review API Submissions Without Data

EM trip reviews that do not have video will be submitted to the API by the reviewer. If an EM system failure occurs before a vessel has begun fishing or if video data for an entire trip is lost/corrupted, the reviewer will address trip level data fields and upload an abbreviated JSON submission that documents a trip as un-reviewable.

In addition to the elements: vessel_permit_number, date_sail, and evtr_num, the following attributes are required: observed (must be "N"), reviewed_hauls (must be 0), total_hauls (may be zero if the number is not known), and comments (an explanation for the abbreviated review must be noted). An example of a successful trip review submission missing data is provided in Figure 2.


```
"vessel_permit_number": 123456,
"vessel_name": "Fake Vesselname",
"evtr_num": 1234567,
"date_sail": "2020-01-13",
"observed": "N",
"total_hauls": 9,
"reviewed_hauls": 0,
"comments": "Video was corrupted or lost or some other explanation"
```


Figure 2. API validation test for a JSON file without EM data that is successfully loaded.

Haul Level Data Elements:

Definition of an observed haul for IFM EM video reviewers:

> An ***observed haul*** certifies that there was video and sensor data available to monitor fishing operations: collect haul elements; assess pumping operations; confirm and verify catch retention and compliance; and track gear transitions that occur in preparation for pumping out the contents of the net and the retrieval of the gear over the stern, concluding a haul.

There are 2 elements used to define the duration of midwater trawl haul: *Start Haul* and *End Haul*. The end haul element collected from single midwater trawlers differ from the actions that define the end haul element for pair midwater trawlers. A midwater trawl haul begins when the net (or codend) is lowered into the water for the purpose of setting out to target herring. The haul end time collected for single midwater trawl corresponds to the time when the winches are

engaged to retrieve the net after the gear was fully deployed, including the doors and/or anchor weights.

For paired vessels, the haul end time is recorded when the tow cables have been fully retrieved aboard both vessels. Vessels are parallel and are within close distance of each other. A reviewer will be able to verify the end haul from crew actions that involves detaching the cables from the blocks. Single and Pair Midwater Trawl share the same gear category code.

Note: Sensor data may be used to annotate set start and end haul point events.

Table 1. Gear Category Codes for Midwater Trawl and Purse Seine Video Review.

Code	Gear Category
092	Single Midwater Trawl
092	Pair Midwater Trawl
030	Purse Seine

Haul elements collected from Single Midwater Trawl:

- ❏ The **Start Haul** is entered when the codend is lowered into the water for the purpose of fully setting out the gear.
- ❏ **End Haul** marks the time winches are engaged and tow wire is brought back fully signifying the end of the tow

Table 2. Gear Category: (092) Single Midwater Trawl.

Single MWT Haul Element	**Fishing Event**
start_haul_datetime start_haul_lat start_haul_lon	Codend is lowered into the water surface
end_haul_datetime end_haul_lat end_haul_lon	Hauling equipment is engaged with intention to haul back and end the tow

Haul elements collected from Paired Midwater Trawl:

Vessel 1: Deploying Net

- ❏ The **Start Haul** is when the codend is lowered into the water for the purpose of fully setting out the gear.
- ❏ **End Haul:** Vessels have closed gap and are parallel, tow cables have been retrieved to signify the end of the haul.

Vessel 2: Wing Vessel

- ❏ The **Start Haul** when the warp has been passed over from the paired vessel that set gear; warp is retrieved by crew.
- ❏ **End Haul:** Tow cables have been fully retrieved to the blocks, vessels are parallel, crew begins detaching cable from the block signifying the end of the haul.

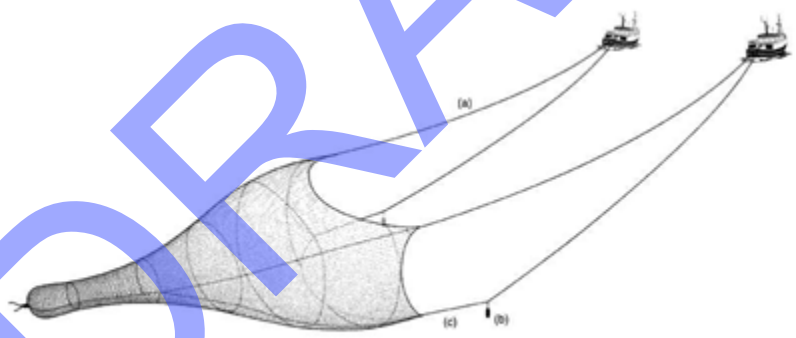

Figure 3. Pair Trawl example with gear deployed.

Table 3. Gear Category: (092) Pair Midwater Trawl

Pair Trawl Haul Element	Fishing Event (Vessel 1)	Wing Vessel Fishing Event (Vessel 2)
start_begin_datetime start_begin_lat start_begin_lon	Codend is lowered into the water surface	Warp has been passed over from vessel that set gear
end_haul_datetime end_haul_lat end_haul_lon	Tow cable has been retrieved, paired vessel is parallel, crew is preparing to haul back net	Tow cable has been retrieved, vessels are parallel, and crew begins detaching cable from the block

Haul elements collected from Purse Seine:

- ❏ The **Set Start** is entered when the skiff, highflier, or sea anchor hits the water with the intention to set the net.
- ❏ **Start Haul** and **End Haul** times and coordinators are not collected for purse seine hauls.

Table 4. Gear Category: (030) Purse Seine.

Purse Seine Haul Element	Fishing Event	Start_Haul* End_Haul*
set_start_datetime set_start_lat set_start_lon	Skiff, highflier, or sea anchor, hits the water with intention to set the net	[Does not Apply]

Other data elements and values collected for each haul include:

- ❏ Haul number
- ❏ Gear category
- ❏ Triplex Used: (Yes or No)
- ❏ Did the vessel pump catch? (Yes, No, Unknown)
- ❏ Haul Observed: (Yes or No)
- ❏ Comments

The triplex (or net winch) is a mechanical device that serves several purposes in a high volume fishery. Primarily, it is used to haul up a fishing net or seine and can be controlled at various speeds. A triplex can also be used to release fishing gear back into the water. In the Atlantic

herring fishery, the device can also be used to force the remaining contents of a net or purse seine toward the pump intake hose. The machine consists of 3 high-powered rollers and it is commonly located middeck on the gunwale.

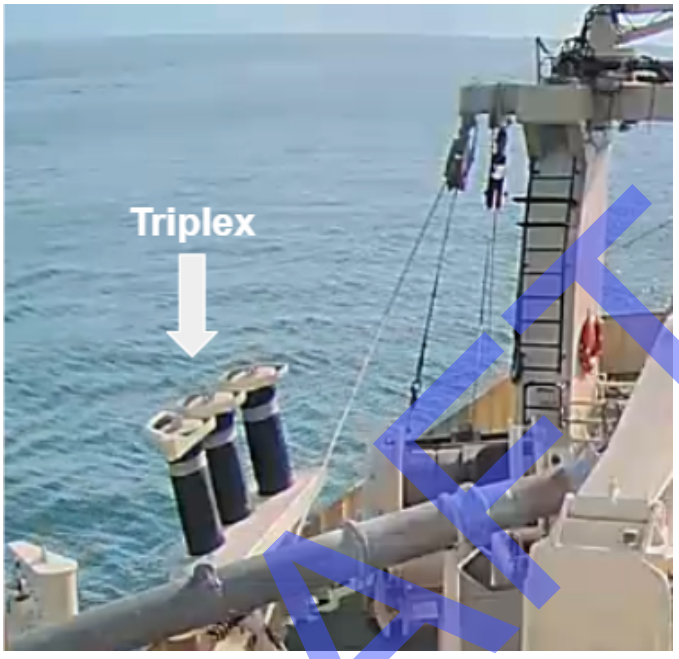

Figure 4. Example of a triplex.

Pump Operations:

There are 3 data elements related to uninterrupted catch pumping operations. Pump begin, pump end, and gear onboard, each element is a required field whenever a vessel uses their pump. Pump operation data elements will be entered as individual point events during review.

Pump Begin: Timestamp entry signifies when pump is activated and sea-water first enters the dewatering box.

Pump End: Timestamp entry signals the end of pumping operations; the pump has been turned-off and sea water is no longer entering chutes or dewatering box at full force. The crew will prepare to release the pump and will then proceed to reel the net back over the stern.

Gear Onboard: Timestamp entry indicates when the entire net has been brought back on deck.

Note: *If Haul Observed = 'Yes' then all 3 annotations for pump operations must contain a value .*

Figure 5. Overhead view of a dewatering box.

Pump Stop Events:

During review, if the pump is stopped during operations the reviewer will record a pump stop event for each occurrence throughout the duration of catch pumping. The reviewer will also select a reason that signals other actions taken by the crew.

> **Pump Stop**: An interval that documents when the pump is turned off in between pump begin and pump end segments. It is possible that a reviewer will encounter multiple pump stops during catch pumping activity. Each pump stop will be recorded as a ***point event***.

Reviewers will collect additional information related to each pump stop event. A pump stop reason will be assigned whenever pumping is halted before all catch has been pumped onboard. A reviewer will select one identifier for each pump stop event: *Unknown*, *Pump Detached*, *Pump not Detached, Other.*

Pump Stop Reason:

> ***Unknown*** **-** Select, if you cannot see the pump/net connection in the water because of video gaps, camera, or other system issues.

Pump Detached - Select, if the pump is detached from the net and then refitted to resume pumping operations.
Pump Not Detached - Select, if pumping operations are randomly halted and the pump fitting is not detached from the codend of the net. Pumping reconvenes at a later time, and the reason for stopping the pump was not clearly understood based on the actions that followed.

Pump Adjustment - Select, if pumping operations are halted and the pump is raised from the water, lowered deeper into the water, or repositioned in any way without removing the pump from the net fitting. Pumping resumes after the adjustment has been annotated.

Other - Select, if pumping stops and the crew engages in on-deck activity unrelated to the inspecting or repositioning the pump; pumping resumes at a later time.

High Volume Operations:

Reviewers should not make inferences and judgment calls when pumping operations are stopped due to perceivable safety or mechanical issues. Building evidence to support these conclusions require input from the vessel operator or engineer and cannot always be validated from video. Additionally, while a reviewer can make an assumption, for example, that dogfish are the reason for stopping the pump based on their abundance, making this determination requires direct communication with vessel personnel.

Occasionally, pumping operations are halted to attend to other concerns on deck. A few common examples are if a holding tank is near capacity, the engineer needs to gauge remaining volume, or if the holding tank has reached capacity, the engineer and crew will close off the holding tank and prepare to switch over to another tank. In order to complete a transition to a new tank pumping operations must be stopped.

Discard Event:

IFM reviewers must record discard events for haddock that are brought on board and discarded by crew or swept overboard through scuppers, or washed out of camera view by water. A discard event is not required for species identification and/or species counts for haddock or target level catch that are not brought on board the vessel. The crew is permitted to discard regulated groundfish species other than haddock and non-allocated species, i.e., dogfish and skates. Incidental takes and individual animals will be documented with discard event annotations and the reviewer must document both types of occurrences: animals brought on board and animals that are not brought on board the vessel.

While vessels may discard most finfish species, if a reviewer has identified haddock being retained or discarded by the crew at any previous time during the trip and the reviewer cannot verify a discarded catch item then a discard entry is warranted for fish that can not be identified. If there is discarding over prolonged intervals of time, each identifiable haddock can be tally-counted and grouped into a single discard event entry: (See page 14 for details on grouping discards). *If more than one individual animal or incidental take occurs on a haul, each animal must be recorded as a discrete discard event record.*

- Ensure the correct haul number and timestamp is assigned to the discard entry.

- Species disposition code *099-Discarded, Other* will be applied to discarding of haddock that are required to be kept and Fish, NK entries for catch that was pumped onboard.

- Disposition code *052-Incidental take* is designated for incidental takes. Comments for incidental takes will include:
    - if the animal was brought on deck
    - or if the animal fell out of gear
    - or was not brought on deck and observed in the water.

  Each incidental take animal will be annotated as a single entry. **Incidental Take** Species include: Bird, NK, Seal, NK, Dolphin, NK, Whale, NK, Turtle, NK.

- Individual Animals will be coded as either *099-Discarded*, *Other* or *043-Not Brought On Board, Fell Out/Off of Gear*. Each animal will be annotated as a single entry. **Individual Animals** include: Shark, NK, Sturgeon, NK, Swordfish, Tuna, NK, Ray, NK

- **Vertebrates, Unclassified** Will be selected as the species name for any animal that is larger than a target species or groundfish species and cannot be classified or identified because of physical condition or a reviewer's inability to clearly view the animal at the time of the interaction before it is discarded or falls from the gear into the water.

- Any portion of the catch (target species, non-regulated, or regulated) that is not brought on board the vessel is documented as a High Volume Discard. See page 19 for the High Volume Discard definition.

- Species identification and counts are not required for High Volume Discard Event annotations.

- A discard entry is not used for finfish if they fall from the net or pumping equipment, are observed floating in the water, or are otherwise not brought onboard.

- For a comprehensive species list, see page 21.

Table 5. Species Disposition Codes.

Code	Description	Identifying Species
043	NOT BROUGHT ON BOARD, FELL OUT/OFF OF GEAR	Individual Animals
099	DISCARDED, OTHER	Haddock, Fish, NK, Individual Animals
900	UNKNOWN KEPT OR DISCARDED	Haddock, Fish, NK
052	INCIDENTAL TAKE	Mammals, Sea Birds, Sea Turtles

The reviewer will assign values or descriptors to each of the 9 specific elements and ensure accuracy with each discard event.

1. Haul number
2. Discard Timestamp, Lat/Long
3. Species Common Name
4. Species Code
5. Species Disposition Code
6. Count (Total number of haddock or Fish, NK that were discarded)
7. ID characteristics, Comments
8. Reviewer ID
9. Camera View:
   Pump; Dewatering Box; Stern; Other

Grouping Haddock/Fish, NK Discards into a Single Discard Entry:

IFM video reviewers should group haddock that are brought onboard and discarded into a single discard entry when they are confident that all groundfish consolidated into the entry meet specific physical identification characteristics of haddock.

If haddock are being retained by the crew, or have been identified previously as discarded and a reviewer can not confidently identify a finfish being discarded then that discard will be identified as a Fish, NK. Fish, NK will be recorded as single discard entries unless a specific timestamp is associated with multiple Fish, NKs discards.

The following scenarios are common examples of when an IFM reviewer will quantify multiple discards (UNIT_COUNT >1) as a single species catch entry:

1. If haddock are being retained in containers by crew but are then 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 a container that cannot be identified as a non-restricted discard species will be counted and recorded as FISH, NK, if a higher classification cannot be made.

2. While the pump is on, if haddock are being tossed overboard after removal from chutes or the dewatering box, the reviewer can tally count haddock and group into a single discard entry once pumping has ended.

3. UNKNOWN KEPT OR DISCARDED: Fish, NK or haddock that land on deck or overflow from tanks or chutes and are not recovered or picked up by crew will be tally counted into distinct species groups and a reviewer will assign disposition code 900 to each discard entry with a estimated quantity > 1, if their fate cannot be determined.

4. If multiple haddock are washed overboard immediately following the end of the haul a single entry can be made. If multiple species (haddock and Fish, NK) are observed, a separate entry for each should be created with a tally count and estimated weight when applicable at the approximate end of the event.

Midwater Trawl Event Categories:

- EM Specific
- Fishing Operations
- Crew Specific

EM System Specific Events:

EM System Specific events reflect failures in the EM camera system and can result in loss of video and corresponding data. EM events will be documented at any point in a trip, regardless of fishing activity or potential impacts to review. 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; if video feeds become out of sync; if camera(s) are out of position; or if there are system impairment issues. An event is created at the first sight of the issue, with the appropriate descriptor marked and ends when the event concludes or is otherwise resolved. Reviewers will include comments that may help to explain the situation.

Table 6. EM Specific Event Descriptors.

Sensor Gaps	Cameras out of Sync	System Image Impairment
Video Gaps	Cameras out of Position	Nighttime System Image Impairment
Camera Failure	System not Activated at the Dock	Other System Issues
System Failure	System Turned Off Prior to Landing	

Sensor Gaps: If at any point during a trip, the GPS or other sensors are not functioning, an event should be created. The event should encompass the entire time the sensors are not functioning. Comments should be made describing what type of sensor was lost and the impact to the review, if any.

Video Gaps: If a video feed drops out or 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 there are gaps. Comments should be added to describe direct impacts to the review. Hauls that could not be successfully reviewed will be recorded as OBSERVED = N. Gaps refer to when the video goes out but then comes back on at some point in the trip. If video from a camera or multiple cameras drops out for the remainder of the trip, document as a Camera Failure.

Camera Failure: If video from one (1) or more camera(s) but not all cameras within the array 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. The comments will include the camera(s) that failed and what activity was taking place 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 at any point during a trip, the complete EM system (all cameras and all sensors) fail and cease to operate and log information, an event should be made with comments stating the situation. The event should encompass the entire time the system is not functioning. Detailed comments should be included in the event entry.

Cameras Out of Sync: If at any point during a trip video feeds 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. The event should encompass the whole time the camera imagery is not synced to other cameras.

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. The event 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 prior to beginning fishing operations.

System Not Activated at Dock: The EM system and all associated components must be operational for the duration of a trip (departure from dock until confirmed 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.

> The EM Provider must determine the reasons for delayed activation of the system. Comments related to the causes will be included with the event in addition to other reporting sources such as work logs or portal entries.

System Turned Off Prior to Landing: The EM system is required to be operational for the duration of the trip (departure from dock until confirmed landing at a dock). If the system is turned off prior to landing, an event entry should be made that includes comments on the approximate location of the vessel and on-deck activity; if there was catch or crew present on deck at the time of the cameras being lost. This is a single point event and should be made when the video cuts out. If the vessel is actively retrieving gear or pumping catch onboard when the system is turned off the trip could result in a failure. Multiple hauls could potentially be recorded as OBSERVED = N. Under these circumstances the provider must provide access to the video prior to submitting the trip. Reviewers must comment on what was taking place when the system was turned off.

System Image Impairment: Is the documentation of imagery that exhibits any issues caused by the EM system. This includes out of focus images, melting/running images, pixelated images, or a decrease in image quality due to poor lighting, not caused by nighttime activity. Damaged dome covers will also be identified in this descriptor. See below for details on what impairs an image:

> *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

Glare: Reviewers will document glare whenever video of fishing operations is impeded by the presence of sharp-bright 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 fisheries, 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.

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.

Night-Time System Image Impairment: This event is specific for night-time hours when fishing activity is occurring and the reviewer cannot adequately confirm a vessel is meeting compliance regulations. This includes all the examples listed above, but will also include instances in which deck lights are either nonexistent or insufficient for tracking fish.

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.

Crew Specific Events:

It is imperative that vessel operators and crew adhere to their VMP on an EM trip. A significant factor to a successful trip is ensuring that cameras are properly maintained and cleaned whenever necessary. Vessel personnel are required to maintain unobstructed camera views and they must refrain from catch handling practices that disrupt the video analyst's ability to accurately collect data. Ensuring that these event entries are made is critical as timely feedback is the only way to communicate to the vessel effectively. Crew events can be reported as either a duration event or as a singular-point event.

Table 7. Crew Specific Event Descriptors.

Camera(s) not Maintained	Camera Blocking	Other Crew Issues
Bulk Discarding	Improper Catch Handling	

Camera System Not Maintained: Cameras must be inspected by vessel personnel throughout a trip. If a camera has anything covering the lens cover, such as water spots or dried salt spray and the reviewer's ability to confirm identification of discarded species or track activity on deck is directly impacted, an entry should be made. This duration event entry is 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. This event may lead to a haul being reported as OBS=N if pumping operations or deck activity cannot be adequately tracked due to water spots, ice buildup, 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.

Camera Blocking: Once mobile gear is deployed cameras must be maintained and routinely checked to ensure views are clear and unobstructed for the remainder of the trip. Partial or complete obstruction of a camera view(s) will be documented as a duration event anytime a camera is blocked and fishing activity has begun. The end points of the event will signify the beginning: *when the view was initially blocked* and, conclusion: *when the camera view became fully unobstructed*. Camera views that are periodically blocked throughout fishing operations (when gear is in motion; while the vessel is pumping catch or preparing/concluding pumping operations; or when catch is present on deck) will be documented if the reviewer could not validate VMP catch handling requirements and compliance, or confirm the fate of catch items that were caught by the vessel.

Improper Catch Handling: This event descriptor will not be used during year 1 of the EFP.

Bulk Discarding: This event descriptor will not be used in year 1 of the EFP.

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.

Fishing Operations Events:

Fishing Operations event descriptors for high volume fisheries are essential annotations that will be audited for additional evaluation by FMRD staff. It is critical for these annotations to mark specific sequences for tracking purposes. Reviewers should communicate directly with FMO staff prior to submitting a trip if there is any uncertainty with documenting Fishing Operation events.

Table 8. Fishing Operations Event Descriptors.

High Volume Discard	Start Fish Pump to Other Vessel	Stop Fish Pumped from Other Vessel
Release of Unidentified Matter	Stop Fish Pumped to Other Vessel	Other Operation Issues
Weather Induced Poor Visibility	Start Fish Pumped from Other Vessel	

High Volume Discard: Catch that is not brought on board, that is observed falling, spilling out of the net or pump will be documented by a reviewer as a 'High Volume Discard'. A discard event entry detailing species and count is not required unless the reviewer confirms that an Incidental Take or Individual Animal was caught and released. A High Volume Discard Event annotation will include an option to identify the camera that was used: *Pump, Stern, Both Views.* This event category is exclusively used in high volume fisheries and should not be applied to groundfish data collection specifications during the 2021 fishing year.

The point event entry will coincide with the exact time discards were observed. This point event is used to document any amount of catch that is not brought on board whether the action is seen or if a reviewer is confirming the presence of fish floating in the water that cannot be traced to catch that was pumped onboard and then washed off deck through scuppers or over the stern. If multiple High Volume Discard events occur during the haul or pumping operations, each event will be recorded separately by the reviewer.

Enter the event at first sight of an occurrence and from the options menu select the camera view(s) used to verify the event. Each event record will include comments describing the observation.

- ❏ Include a High Volume Discard Event for any portion of catch that is not brought onboard the vessel, whenever catch is observed in the water, escaping from torn sections of the net, or seen falling from gear or equipment.

Confirm a camera view option was selected:
Camera View Options: *Pump, Stern, or Both*

Primary and Secondary reviewers will select *Unknown* as the Event Reason for all High Volume Discard events. These events will be further examined by Fisheries Monitoring Operations (FMO) and Data Quality Team (DQT) to determine if the reviewer annotation was an operational discard or slippage event.

Release of Unidentified Matter: If at anytime during pumping operations or gear maneuvering a large object is observed in the net or pump and cannot be positively identified, and the crew extracts or releases the object without bringing it on board the vessel, the reviewer will document a Release of Unidentified Matter event, if the reviewer could not distinguish general species characteristics and provide a discard event entry.

Weather Induced Poor Visibility: During fishing operations, reviewers will note when weather events related to fog, high winds, sun glare, or precipitation reduce image quality and impact video review at the haul level. Typically, more than one camera is impacted. If the weather resolves during the trip and the cameras still have water on them a Crew Specific Event-Cameras Not Maintained would be annotated. 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.

Start Fish Pump to Other Vessel: When catch is pumped from the vessel's gear to a pair or carrier vessel, the start and stop times must be recorded. If catch from the vessel selected for review is pumped out of the net to another vessel, add the point event when pumping begins.

Stop Fish Pump to Other Vessel: When catch is pumped from the vessel's gear onboard a pair or carrier vessel, the start and stop times must be recorded. At the conclusion of pumping, add a Stop Fish Pump to Other Vessel event to verify that pumping has ended.

Start Fish Pump from Other Vessel: When catch from a paired or alternate vessel is pumped onboard the vessel selected for review, add a Start Fish Pump from Other Vessel event when catch first enters the dewatering box.

Stop Fish Pump from Other Vessel: When catch from a paired or alternate vessel is pumped onboard the vessel selected for review, add a Stop Fish Pump from Other Vessel event when the pump is turned off and operations are deemed complete.

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.

Table 9. FY 2021 Industry Funded Monitoring EM Review Species List.

NESPP4	COMMON_NAME	SCIENTIFIC_NAME	SPECIES_ITIS
1477	HADDOCK	MELANOGRAMMUS AEGLEFINUS	164744
5260	FISH, NK	OSTEICHTHYES	161030
3591	SHARK, NK	SQUALIFORMES	159785
4212	STURGEON, NK	ACIPENSERIDAE	161064
4328	SWORDFISH	XIPHIAS GLADIUS	172482
4657	TUNA, NK	EUTHYNNUS THUNNUS SP	172418
6753	RAY, NK	RAJIFORMES	160806
6100	BIRD, NK	AVES	174371
6994	SEAL, NK	PHOCIDAE	180640
6997	DOLPHIN, NK (MAMMAL)	DELPHINIDAE	180415
6999	WHALE, NK	CETACEA, WHALE	180403
8160	TURTLE, NK	CHELONIOIDEA	173749
5270	VERTEBRATES, UNCLASSIFIED	VERTEBRATA	331030