



New England Fishery Management Council

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MEMORANDUM

DATE: June 2, 2015
TO: Groundfish Committee
FROM: Groundfish Plan Development Team (PDT)
SUBJECT: Discussion of the At-Sea Monitoring Program for Groundfish Fishery Sectors

The Groundfish Plan Development Team (PDT) met on May 12, 2015, and May 28, 2015 to discuss the At-Sea Monitoring (ASM) program for Groundfish Fishery Sectors.

Attendance at 5/12/15 meeting:

Participating in the meeting were Dr. Jamie Cournane (PDT Chair), Ms. Rachel Feeney, Mr. Jonathon Peros (NEFMC), Ms. Sarah Heil, Ms. Aja Szumylo, Mr. William Whitmore, Mr. Daniel Caless, Ms. Danielle Palmer, Mr. Tim Cardiasmenos (GARFO), Mr. Paul Nitschke, Mr. Chad Demarest, Ms. Anna Henry, Mr. Greg Ardini (NEFSC). Mr. Steven Correia (MA DMF) participated remotely. Approximately 12 members of the public joined the meeting.

Attendance at 5/28/15 meeting:

Participating in the meeting were Dr. Jamie Cournane (PDT Chair), Ms. Rachel Feeney, Dr. Fiona Hogan, Mr. Jonathon Peros (NEFMC), Ms. Sarah Heil, Ms. Aja Szumylo, Mr. Mark Grant, Mr. Daniel Caless (GARFO), Mr. Paul Nitschke, Mr. Chad Demarest, Ms. Amy Martins, Ms. Anna Henry, Mr. Greg Ardini, Mr. Michael Palmer (NEFSC). Mr. Steve Correia (MA DMF) and Ms. Danielle Palmer participated remotely. Dr. J. Michael Lanning (GARFO) also joined the call. Members of the public in attendance included Ms. Maggie Raymond, Ms. Libby Etrie, Ms. Clare Fitzgerald, and Ms. Nicole Rossi.

Problem statement:

A monitoring program is an essential design element within a catch share system. Amendment 16 (A16) established industry-funded at-sea monitoring (ASM) requirements within the sector management system to facilitate accurate monitoring of multispecies catch, and to ensure that sector catch entitlements would not be exceeded. The amendment stated that the level of ASM coverage should be less than 100 percent of sector trips, but meet the coefficient of variation specified in the Standardized Bycatch Reporting Methodology (SBRM) and accurately monitor sector operations. While A16 established a performance standard for coverage levels, it did not provide guidance on what level the CV standard should be applied. Framework Adjustment 48

clarified that the CV standard was intended to apply to discard estimates at the overall stock level for all sectors combined.

Amendment 16 also did not lay out explicit goals for sector monitoring beyond accurate catch estimation, so the Council further articulated the goals and objectives of the sector monitoring program in Framework 48 in order to assist NMFS and the sectors in designing and evaluating proposals to satisfy monitoring requirements in sector operations plans (FW 48 goals outlined in Table 1).

For FY 2010 through 2014, NOAA Fisheries was able to fully fund the ASM program for sectors. In a letter dated February 24, 2015, NOAA Fisheries indicated that, due to funding changes required by the SBRM Amendment, the industry would be responsible for covering ASM costs before the end of calendar year 2015. A breakdown of industry and agency ASM cost responsibilities, as defined in the Industry-funded Monitoring Omnibus Amendment, is identified in Table 2.

From the February 2015 GARFO analyses conducted to determine ASM requirements for FY2015:

Total monitoring coverage of 24 percent would require 5,321 days of at sea monitoring coverage at an assumed seagoing cost of \$710 per sea day, with total cost of \$ 3.78 million. This cost estimate does not reflect other government costs incurred for both NEFOP and ASM Program observers, such as data processing, data auditing, administration, and the identification of trips required to carry monitors.¹

This cost estimate is likely an overestimate of sector ASM costs for FY 2015 for several reasons. Most importantly, this estimate includes the total monitoring coverage of 24 percent (NEFOP+ASM) for FY 2015. However, after accounting for the NEFOP target coverage level of 4%, the ASM target coverage level is 20%. Additionally, this cost estimate is for the entire fishing year, but NOAA Fisheries is funding the industry's costs for a portion of FY 2015. Sectors are not expected to be responsible for ASM cost until after August 2015. The GARFO estimate does not take into account the FY 2015 ACLs, and how reductions for some stocks may lead to reduced fishing effort and changes in fishing practices (e.g., 75% reduction in the GOM cod ACL from FY 2014 to FY 2015). The number of days of ASM coverage required (5,321 days) is based on the number of sea days used in FY 2013. NMFS and industry cost responsibilities for ASM has also been the subject of the Industry Funded Monitoring (IFM) Amendment (Table 2).

The cost of the ASM program is expected to be substantial. At the April 2015 Council meeting, the Council passed the following motion unanimously due to concerns regarding the economic feasibility of industry covering monitoring costs in FY2015 and beyond:

¹ Summary of Analyses Conducted to Determine At-Sea Monitoring Requirements for Multispecies Sectors FY2015 (document #7 in Committee packets). p.18. Available at: <http://www.greateratlantic.fisheries.noaa.gov/aps/monitoring/nemultispecies.html> and [on the Council website](#).

That the Council:

1. *Request that NMFS prepare an estimate of the cost/revenue ratio for the at sea sector monitoring based on the current approach (e.g., in terms of CVs and methodology) for fishing year 2015 (i.e., taking account of reduced ACLs for some species and likelihood a reduction in the number of trips);*
2. *Initiate a framework to address the perception (to be confirmed or rejected based on number 1) that the fishery will not be viable under the current approach for at sea monitoring.*

In order to directly address a new Council priority for 2015 (#2 above), the PDT refocused its work² to ASM for the May PDT meetings in order to provide information in time for consideration at the June Committee and Council meetings.

Summary of PDT ASM Discussion:

The primary purpose of the PDT meetings was to engage in a technical discussion of potential ideas for revisions to the ASM program and existing monitoring requirements for Groundfish Sectors. The PDT recognizes that changes to the monitoring system may come through a range of Council or agency actions. In reviewing the goals and objectives, the PDT noted that its initial discussions on the ASM program seemed to be in line with Goal 6 (perform a periodic review of the monitoring program for effectiveness), and that this would likely be the first step in the development of a monitoring framework action. Additionally, the PDT highlighted that some of the current goals could be mutually exclusive (e.g., if the level of monitoring needed is cost prohibitive).

The PDT is seeking further guidance on monitoring issues from the Committee (see below).

PDT Questions for the Committee:

1. In regard to Part 2 of the April Council motion:
 - a. What is considered ‘viable’? As ‘viable’ is a value-laden term, the PDT requests further guidance from the Committee on how to determine viability in the context of the groundfish fishery.

The PDT offers the following metrics as potential metrics and approaches to quantifying ‘viable’, recognizing that this list is not exhaustive.

- i. A fishery is viable when economic rents (e.g., having positive scarcity rents in the scallop fishery) or accounting profits are above zero. If accounting profits are positive, fishing effort continues. In the converse, if economic rents or accounting profits fall below zero, the fishery is no longer viable and people choose to stop fishing. FY 2012 and 2013 were not likely viable by this definition.

² Progress on certain 2015 Groundfish priorities is stalled. The PDT placed its work on recreational measures process improvement on hold and Council Staff ceased working on the windowpane flounder management measures white paper.

- ii. Inactive vessels increase within a sector (but difficult to know how many active are required to be viable – is it 3 or 30 or 300?)
 - b. Does the development of a monitoring framework action depend on whether or not the “perception” is confirmed or rejected?
2. What are the goals and objectives for this action?
- a. Does the Committee intend to evaluate, or make modifications to, the current monitoring goals for the FMP (see Table 1)?
 - b. Is the Committee interested in short-term ‘tuning’ of the existing system?
 - c. Does the Committee intend to review the existing coverage level standard?
 - d. How does electronic monitoring fit into this discussion?

Table 1. NE multispecies monitoring program goals and objectives.

Monitoring programs established for the NE multispecies are to be designed and evaluated consistent with the following goals and objectives:

- 1) Improve documentation of catch:
 - a) Determine total catch and effort, for each sector and common pool, of target or regulated species; and
 - b) Achieve coverage level sufficient to minimize effects of potential monitoring bias to the extent possible while maintaining as much flexibility as possible to enhance fleet viability.
- 2) Reduce the cost of monitoring:
 - a) Streamline data management and eliminate redundancy;
 - b) Explore options for cost-sharing and deferment of cost to industry; and
 - c) Recognize opportunity costs of insufficient monitoring.
- 3) Incentivize reducing discards:
 - a) Determine discard rate by smallest possible strata while maintaining cost-effectiveness; and
 - b) Collect information by gear type to accurately calculate discard rates.
- 4) Provide additional data streams for stock assessments:
 - a) Reduce management and/or biological uncertainty; and
 - b) Perform biological sampling if it may be used to enhance accuracy of mortality or recruitment calculations.
- 5) Enhance safety of monitoring program.
- 6) Perform periodic review of monitoring program for effectiveness.

[Title 50 Chapter VI §648.11](#)

Table 2. At-Sea Monitoring Cost Responsibilities³

NMFS Cost Responsibilities
NMFS would be responsible for funding the costs to set standards for, monitor performance of, and support administration of industry-funded monitoring programs. These program elements would include: <ul style="list-style-type: none"> • The labor and facilities costs associated training and debriefing of monitors • NMFS-issued gear (e.g., electronic reporting aids) • Certification of monitoring providers and individual monitors; performance monitoring to maintain certifications • Developing and executing vessel selection • Data processing • Costs associated with liaison activities between service providers, and NMFS, Coast Guard, Councils, sector managers and other partners
Industry Cost Responsibilities
The industry would be responsible for funding all other costs of the monitoring program (not covered by NMFS). These program elements and activities would include, but are not limited to: <ul style="list-style-type: none"> • Costs to the provider for deployments and sampling (e.g., travel and salary for observer deployments and debriefing) • Equipment, as specified by NMFS, to the extent not provided by NMFS • Costs to the provider for observer time and travel to a scheduled deployment that doesn't sail and was not canceled by the vessel prior to the sail time. • Provider overhead and project management costs (e.g., provider office space, administrative and management staff, recruitment costs, salary and per diem for trainees) • Other costs of the provider to meet performance standards laid out by a fishery management plan

Potential Overarching Approaches

The PDT brainstormed potential overarching approaches to address concerns about the ASM program and how this may relate to goals and objectives within the FMP. The PDT is providing these ideas for the purposes of discussion and does not expressly support or reject any of these ideas at present. The PDT noted that these approaches are likely to require different timelines, and that, if the Council initiates an ASM action, the feasibility of completing the action in time for May 1, 2016, may be difficult depending on the content.

- No change to goals and objectives or ASM program. As a result, industry may decide to reorganize based on more similar fishing practices. Aligning gear and fishing practices could reduce the ASM coverage and costs needed to achieve a CV target of 30%.
- No change to monitoring goals and objectives and ‘tune’ the ASM program – e.g., making sampling more efficient from a cost perspective and prioritizing the current monitoring goals to reflect this policy;

³ Cost responsibilities for NMFS and industry as defined in the draft Industry Funded Monitoring (IFM) Amendment. Information on the IFM amendment can be found at <http://www.mafmc.org/actions/observer-funding-omnibus>.

- Modify groundfish monitoring program including the goals and objectives – e.g., redesigning the monitoring program and directly link to the new goals and objectives.

Potential Ideas and Trade-offs:

The PDT discussed ideas around improving monitoring which could also potentially reduce the cost of monitoring. However, part of the cost of this potential monitoring improvement may result in losing the ability to use ASM data for stock assessments. Most of the data for the estimation of groundfish discards for assessments could be lost if non random sampling introduces a significant bias for the broader stratification used for the stock assessments. This may further degrade the linkage between stock assessments for quota estimation and the monitoring of the catch relative to the quotas.

There are other important tradeoffs to consider with changes in ASM coverage. The monitoring of catch on a sector, gear, and stock stratification requires high coverage rates to obtain the precision necessary to have confidence in the discard estimates for each stratum. There are relatively high CVs (>30%) estimates for important discards strata with the existing coverage rates in FY2013. Reductions in coverage rates would result in greater variability in monitoring discards at the present stratification. Random error alone could be significant factor for either overcharging or producing lower estimates of the discards for a particular sector gear combination relative to the true underline discards for that stratum. Collapsing the sector stratification to gear and stock will improve the precision of the estimates but this comes at the cost of fleet-wide discard estimates. The fleet-wide estimate should still be an appropriate reflection of the stock-wide discards but will likely no longer be a good reflection of the true discards for an individual specialized sector.

The PDT brainstormed potential ideas for revisions to the ASM program (below). The PDT is providing these ideas for the purposes of discussion and does not expressly support or reject any of these ideas at present. The costs and benefits of these ideas are not clear without further analysis, and the PDT noted that some of these approaches could be considered in combination. The implementation timeline for these ideas varies.

Potential ideas include:

- Removing the ASM requirement for sector trips targeting monkfish, skates, and dogfish (redefine a sector trip and/or create a fishery exemption area).
 - For example, FW48 created an exemption which allows for lower coverage rates for sector trips on a Monkfish DAS in the SNE Broad Stock Area using ELM gillnet gear. NMFS specifies a coverage rate for these trips on an annual basis.
 - This would reduce overall monitoring costs of sector trips which direct on non-groundfish species, and reduce the amount of data collected. Operationalizing this concept may reduce flexibility for vessels (ex: pre-sail declaration for targeting skates or dogfish, which follow GF DAS). If these non-groundfish trips can be identified in the data streams then further stratifying out the non-groundfish trips could lower the cost of ASM monitoring since less monitoring would be needed. However stratifying these trips out would move them to the other sub-component bin and result in an increase in the discard to kept rate for the remaining groundfish trips. The resulting discard estimate should not change greatly.
- Increasing the CV standard ($> CV30$)
 - Reductions in monitoring will result in increases in variability of the discard estimates for particular sector gear stock combinations. Uncertainty with the actual removals used in the stock assessment will also increase.
 - Monitoring of discards by the sector-gear-stock stratification level may no longer be supported by the lower coverage level.
 - Decreases in monitoring that result in an increase in the CVs could also increase the potential bias through observer effects.
- Establish sector specific coverage requirements
 - Coverage rate would be tied to sector composition (gear type) and fishing practices. This method may improve accuracy and/or reduce costs of the ASM program.
 - Coverage is driven by consistency of discard rates relative to the expected amount of discards, not by pounds of fish discarded. Sectors with high and consistent discards would need fewer trips observed to achieve a CV30 compared to a sector with low and inconsistent discards.⁴
- Prioritizing coverage of how the CV standard is applied based on stock status, or stock area fished, or proportion of discards.
 - This idea would require the development of performance criteria.
- Establishing sector specific management uncertainty buffers or discard rates.

⁴ Summary of Analyses Conducted to Determine At-Sea Monitoring Requirements for Multispecies Sectors FY2015 (document #7 in Committee packets). p.20. Available at:

<http://www.greateratlantic.fisheries.noaa.gov/aps/monitoring/nemultispecies.html> and [on the Council website](#).

- This approach would reduce/eliminate ASM costs for sectors, and allow for stability in planning fishing businesses operations. A fixed discard rate could greatly reduce a disincentive to discard. Time lags in setting and adjusting rates may lead to a disconnect between fishing behavior and discard rates (e.g., year 1 → year 3)
- Redesigning and re-stratifying the catch monitoring system to be proportional to landings and discards.
- Using a combination of monitoring tools (ASM, EM, DSM) to achieve monitoring goals, objectives, and requirements.

Table 3. Definition of terms

Terms	Discussion
Accounting profits	Accounting profit (i.e., bookkeeping profit) is total monetary revenue minus total costs.
Accuracy, bias, monitoring effects	Accuracy is a measure of how close the estimate or computed value is to the true value. In most cases where calibration is not available, the accuracy of an estimate is unknown. Systematic differences between the true value and estimate represent bias . Bias could result from poorly calibrated measuring devices or poor sampling design (non-random sampling). If there are monitoring effects – either due to non-random trip selection or changes in behavior when observers are on board – then the discard estimates may be biased.
Coefficient of Variation (CV)	<p>CV is normally defined as the standard deviation (SD) of an estimate divided by the mean of the estimate. In the SBRM framework, however, CV is defined as the standard error of the estimate divided by the estimate. CV is a dimension-less value. If the CV and point estimate of the discards are known, then the SE can be determined as:</p> $CV = SE \text{ of the estimate} / \text{estimate}$ $CV * \text{estimate} = SE$ <p>This relationship allows creation of a confidence interval around any discard estimate. The interval that is plus/minus $1.96 * SE$ of the estimate will cover 95 pct of the distribution. There is a 97.5 pct probability that the discard estimate will be equal to or less than the mean plus 1.96 times the SE. With discards at a given proportion of the catch, the SE can be used to determine the upper bound of the confidence interval.</p>
Economic Rent	Economic rent is net economic yield of total benefits minus total costs. In fisheries, the economic rent is the difference between the value of sustainable yield and the cost of catching the sustainable yield.
Precision	Precision is the measure of how close repeated measures are to each other. In general, the true value is unknown. Unless a bias exists, higher precision will lead to better accuracy.