Amendment 23 Review: Groundfish Sector Monitoring Program DRAFT Report Outline

Groundfish Plan Development Team

This is a working DRAFT of the Report – to be updated with additional analyses, descriptions, and conclusions.

June 12, 2026

New England Fishery Management Council

Intentionally Blank

1. Introduction

Overview

Amendment 23 to the Northeast Multispecies Fishery Management Plan[1] (Amendment 23) revised the Groundfish Sector Monitoring Program to improve documentation of catch and accuracy of collected catch data while maintaining the existing goals and objectives of the program. It was the Council's intent that the catch reporting requirements should be fair and equitable for all commercial groundfish fishermen, while maximizing the value of collected catch data, and minimizing costs for the fishing industry and the National Marine Fisheries Service (NMFS).

The Council's rationale in Amendment 23 for increasing the at-sea monitoring (ASM) coverage target to 100 percent was to establish a baseline of accurate and precise catch information for the fishery, while balancing concerns from the industry about the costs of higher monitoring coverage levels.

In Amendment 23, the Council stated that 100-percent monitoring:

- Increases the accuracy of catch estimates and reduces the potential for bias more than all the other options considered;
- Was the only option that completely removes bias in catch estimates; and
- Scored the highest in terms of compliance and enforceability of the monitoring program.

In addition, the Council discussed that:

- More data is needed to improve the overall science and provide more information to support better management;
- Combining 100-percent monitoring with EM and removing management uncertainty buffers would minimize increased costs to industry; and
- Higher coverage for a limited time could improve cost-effectiveness of the current and future monitoring system by providing a baseline of accurate and precise catch information.

Amendment 23 included a requirement for the Council to review the Groundfish Sector Monitoring Program to evaluate whether the monitoring program is meeting the goals once data from 2 complete fishing years are available (and periodically after the initial review).

This report documents the development of the review metrics, compiles PDT review analyses, and provides relevant background information.

Goal of the Review

The goal of the review is to evaluate whether the Groundfish Sector Monitoring Program, defined at 50 CFR 648.85(e)(1), is meeting the goal of improved accuracy of catch data, while maximizing value and minimizing costs of the program. The Council specified that the review

[1] See Amendment 23 webpage

should: use complete data from 2 fishing years (once the data are available) and periodically after the initial review, be flexible and general, and include establishing metrics and indicators of how well the monitoring program improved accuracy while maximizing value and minimizing costs.

In Amendment 23, the Council gave the following rationale for the Groundfish Sector Monitoring Program review:

Rationale: Periodic review of the monitoring coverage rates will allow for an evaluation of whether the monitoring program is meeting the goal of improved accuracy of catch data, while maximizing value and minimizing costs of the program through a future action. The Council identified this option as preferred to ensure the Council evaluates this program to be sure enhanced levels of monitoring data are working as intended and the increased costs to industry are providing expected benefits from improved accuracy and reduced potential for bias in catch data.

The Council discussed how the scope of the review would be different if 100-percent coverage levels were selected compared to lower coverage levels. The Council selected a coverage target of 100 percent in Amendment 23 and specified the review process would be more limited because there would be comprehensive monitoring. Amendment 23 noted that the review would likely include metrics such as discard estimate coefficients of variation (CV)[2] and a measure of how catch (discards and landings) changed following comprehensive monitoring.

However, the Council also selected a lower monitoring standard of 40-percent coverage in the event that federal funds are not available to reimburse industry costs for higher monitoring coverage, and Amendment 23 noted it would likely be necessary to include additional metrics in a review to ensure monitoring targets are being met and are effective. For example, the review process with lower monitoring standards would likely include analyses of whether: the program is operating in a way the Council intended, was catch accurately being measured, was there evidence of bias, were monitoring standards being met, etc. This review was expected to be completed by the Groundfish Plan Development Team (PDT) with substantial support by other relevant NMFS staff. Amendment 23 highlighted that the review process for monitoring coverage rates may result in an adjustment to the goals and objectives of the groundfish monitoring program.

Additionally, the Council established a review process for exclusions from the monitoring program to verify whether the intent of those exclusions (e.g., that the catch composition has little to no groundfish) is being met.

After receiving this report, should the Council determine that changes to the Groundfish Sector Monitoring Program are warranted, the Council could prioritize taking action to make those changes in a future year. Any action by the Council to change the program would include further analyses to inform the action.

[2] Discard estimate CVs were not selected as a metric for this review.

Goals and Objectives of the Groundfish Sector Monitoring Program

The primary goal of the Groundfish Sector Monitoring Program[3] is to verify area fished, as well as catch and discards by species and gear type, in the most cost-effective means practicable. The following goals and objectives of groundfish monitoring programs are equally-weighted secondary goals that sector monitoring programs are to be designed to be consistent with:

(i) Improve documentation of catch:
- (A) Determine total catch and effort, for each sector and common pool, of target or regulated species and ocean pout; 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.

(ii) 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.

(iii) 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.

(iv) 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.

(v) Enhance safety of monitoring program.

(vi) Perform periodic review of monitoring program for effectiveness.

Description of the Groundfish Sector Monitoring Program

A sector must develop and implement an ASM and/or EM program that may be approved by NMFS as both sufficient to monitor catch, discards, and use of sector annual catch entitlements (ACE); and as consistent with the sector monitoring program goals and objectives[4]. The details of any ASM or EM program must be specified in the sector's operations plan and must meet the operational standards. Maximized retention electronic monitoring (MREM)[5] and audit EM models were approved to be used in place of ASM. Other types of EM may be used in place of ASM if the technology is deemed sufficient by NMFS, but no additional EM programs have been approved as of 2026. The Regional Administrator approves or disapproves ASM/EM programs as part of a sector's operations plan.

[3] See 50 CFR 648.11(l)(1).
[4] See 50 CFR 648.11(l)(2).
[5] NMFS suspended the MREM program beginning May 1, 2024.

2. Methods and Data

Review Metrics

The PDT initially generated a list of possible metrics and indicators for the Amendment 23 review, with additional input from the Groundfish Advisory Panel (GAP), Groundfish Committee (Committee), Council, and Scientific and Statistical Committee (SSC). Members of the Groundfish PDT then met in February and March 2025 to discuss continued development of metrics and indicators for the review of Amendment 23. In addition to the updated list of metrics[6], the PDT also drafted a discussion document[7], which provided background on the Amendment 23 review, described the review objectives, and organized the metrics into review questions and themes. The PDT then presented that work to the GAP and Committee at a joint meeting on March 21, 2025. At their meeting on March 21, 2025, the GAP and Committee provided the following guidance to the PDT:

- *Pare down and prioritize the Amendment 23 review metrics list, focusing primarily on review themes 2 and 3[8], and focus on metrics that can be explicitly connected to A23*
- *Complete the Amendment 23 review by first half of 2026 to inform future funding decisions and management actions*

The Committee met again on June 10, 2025, and received a pared-down list of metrics from the PDT[9]. The Committee supported the PDT's recommendation for a pared-down list of metrics to evaluate Amendment 23 monitoring program effectiveness, focusing on metrics specific to program efficacy, data impacts, and fishery impacts. Further, the PDT proposed to focus on 20 metrics following the Committee's guidance to focus on metrics that could be explicitly linked to effects of the monitoring program and Amendment 23. The review metrics are organized into three themes.

[6] See March 14, 2025, list of possible metrics and indicators.
[7] See March 14, 2025, draft discussion document.
[8] Review theme 2 was *Do higher monitoring coverage rates improve accuracy and reduce bias of catch data?* And review them 3 was *What the impacts of monitoring costs to fishery performance?*
[9] See PDT memorandum dated June 4, 2025, and June 5, 2025, A23 Review Metrics List.

Table 1. Summary of metrics in the Amendment 23 monitoring program review, including a brief description and rationale. Grey-shaded cells indicate core metrics.

ID	Metric	Description	Rationale
Review Theme 1: Program Reach			
M19	Achieved coverage	Overall achieved coverage rates AND Achieved-to-Target ratio:	Mission critical
		• By coverage type	
		• By sector	
M20	ASM coverage targets	• What was the target each year?	Mission critical (related to M19)
		• Were targets constant throughout the year?	
		• If < 100%, what was the basis for setting the target?	
		• When was the target announced (e.g. the date)?	
M28	Waiver counts	By reason (grouped PTNS coverage outcome reason and standard categories)	May be directly attributed to A23
			Likely readily reported out
			Explanatory to M27
M29	Acceptance rates	Providers accepting selected trips for coverage	Explanatory to M27 (may be difficult to draw conclusions directly)
M31	Refusals		Likely readily reported out (FMO)
M32	Incidents	By broad category (i.e., safety, crew behavior, etc.)	
M33	PTNS notification compliance	Compare PTNS notification compliance over time compared notification compliance under the 100% coverage target – Has compliance increased?	
M34	PTNS cancellations		
M27	Coverage equitability	How is achieved coverage spread across the fleet?	Major Council concern
		• Between sectors	Similar / supplemental analytical lift to addressing M19
		• Within sector	

		• Potentially consider other factors (e.g., individual vessel, trip type [day vs multiday], gear type, vessel size class, etc.)	
M38	Distribution of vessels	• By program (ASM / audit model EM / MREM)	Explanatory to M27
		• How many / what types of vessels select into each program (by vessel size class, gear type, port, etc.)	Difficult to meaningfully track reasons for opting in/out, but consider involving sectors in the review process directly instead
		• How many / what types of vessels choose to leave each program?	
		• How many / what types of vessels participate in 7130 exclusion (vessel size type, gear type, port, etc.)	
M39	EM video review rates	• How is this operating under A23?	Likely readily available (low data lift)
Review Theme 2: Data Impacts			
M1	Observer bias	Compare monitored and un-monitored trips:	Mission critical
		• Trip duration	
		• Species and size composition of landed groundfish	Clarify: discard composition cannot be compared for unobserved trips (limited to comparing on observed trips pre- and post-A23)
		• Species composition of discarded groundfish	
		• Landed-to-discarded ratio by species	
M2	Biased vessels	Change in vessels with observer bias pre- / post-A23	Reframe: show A23 effects on biased vessels that *remain in the fleet post-A23,* rather than those that *left the fishery post-A23*
		• Did the vessels landscape change after implementing high coverage?	

		• Did vessels that showed observer bias remain in the fishery post-A23?	Vessels may have left the fishery for many reasons, which are difficult to track (see M38 rationale) and may not be related to A23
M3	Magnitude of observer bias	Determine magnitude of the bias	Mission critical
		• Explore suggestions offered for pursuing two PDT analyses:	
		1) Methods to predict groundfish catch in the presence of an observer	
		2) Methods to evaluate groundfish catch ratios A23 analysis	
		• Potential for simulation analysis using Quota Change Model	
M6	Discard estimates	By monitoring program (ASM, audit model EM, MREM/DSM, NEFOP)	Mission critical
		Compare:	
		• Same boat using two different monitoring tools	
M10	Exclusion-~~observed discard~~ catch estimates	• 7130 exclusion	Folded into this review
		• ELM exclusion	Explicitly prescribed in A23
		• Verify intent of exclusions (low groundfish catch)	
		• For 7130 exclusion examine discard estimates – are there changes post-A23 with new exclusion	
M11	Management uncertainty buffers	Evaluate assumption of 100% coverage target when removing management uncertainty buffers	Mission critical
<u>Review Theme 3: Fishery Impacts</u>			
M12	Total monitoring costs	Summarize overall reimbursed industry sampling costs and agency shoreside administrative costs – How much have things cost for industry and shoreside? How much has the agency spent? How much has the industry been reimbursed?	Mission critical
M13	Industry monitoring costs	Compare monitoring costs before and after A23:	Mission critical
		• Overall monitoring costs	Direct Council support

		• Where possible, by categories (e.g., sea day rate, travel costs, training costs, meal reimbursement, equipment, operations costs, etc.)	
		• Monitoring costs relative to operational costs	Explanatory to M2
M14	Cost efficiency	• Cost comparison between EM-monitored trips (audit model and MREM) and human-at-sea monitored trips	Mission critical
		• Update cost efficiency analysis and summarize agency costs relative to funding	

Sector Manager Feedback

As part of the development of review analyses, the PDT sought feedback from sector managers on preliminary analyses for select metrics. On May 11, 2026, the PDT sub-group presented preliminary analyses to sector managers covering the following review metrics:
trends in fleet participation, catch composition, and revenue information. The PDT sub-group asked managers for feedback to help with refining the analyses and informing presentation of analyses and results.

Data Impacts

- M1 Observer Bias
- M2 Biased Vessels
- M3 Magnitude of Observer Bias
- M11 Management Uncertainty Buffers

Fishery Impacts

- M13 Industry Monitoring Costs

Program Reach

- M28 Waiver Counts
- M29 Acceptance Rates
- M31 Refusals
- M32 Incidents
- M33 Pre-Trip Notification System (PTNS) Compliance
- M34 PTNS Cancellations

Sector managers highlighted that the outcomes and data included in this report are as important to inform industry as they are to management, and had suggestions for the analyses presented and the contents of this report:

- Sector managers asked several questions regarding the analyses under the Data Impacts

theme. In response, analysts fine-tuned how analyses looked at effects by gear type, and included a plain language explanation of the analyses, the results, and interpretation of the results.

- Sector managers asked many questions regarding the metrics under the Program Reach theme. A sector manager recommended that evaluation of coverage equitability should also consider seasonality of monitoring coverage. In response to the suggestions, this report contains additional context around safety waivers and the vessels of concern (VOC) list; provides information regarding rates of PTNS compliance looking across the fleet of individual vessels, rather than across sectors; provides counts of vessels in analyses when possible without violating confidentiality; and provides information in tables, as well as figures, when possible.
- Sector managers expressed interest in having additional information on the Fishery Impacts theme, particularly regarding actual reimbursed costs, non-seaday costs (e.g., meals, travel), and cost information broken out across different components of the fishery (e.g., gear, vessel size), much of which is presented in this report. In response to their questions and suggestions, this report includes a plain language explanation of the analyses, the results, and interpretation of the results.

Criteria for Analyses

General section on the data sources and how basic terms like ‘trip,’ ‘exclusion trip,’ ‘bias,’ and ‘equitability’ are defined when used in this report and its supporting analyses.

Discards

Discussion of what discards are and how they are analyzed in terms of bias. Key points will include the difference between legal discards of fish below the minimum size and illegal discards of fish that are required to be retained under the current regulations. Include points about legal-sized unmarketable fish (LUMF).

3. PDT Analyses and Results

The PDT has identified three review questions (and themes) that explore multiple aspects of the groundfish monitoring program and evaluate how successful it is in achieving its goals. Analyses of the 20 metrics, and their results, are grouped by these three themes. Data Impacts looks at catch, bias, the exclusion of some trips from the ASM requirement, and the removal of management uncertainty buffers (MUB). Fishery Impacts looks at the costs of the program – overall, for NMFS, and for the industry. It also looks at potential changes to where fishing occurs and which ports are used to evaluate potential spatial observer bias. Program Reach looks at vessel participation in monitoring programs, EM review rates, ASM Coverage targets, achieved coverage, and details of how coverage was assigned and distributed to look at coverage equitability.

Data Impacts

The Data Impacts theme looks at catch, bias, the exclusion of some trips from the ASM requirement, and the removal of management uncertainty buffers (MUB). These were the most complex analyses.

Relevant Metrics
M1 Observer Bias
M2 Biased Vessels
M3 Magnitude of Observer Bias
M6 Discard Estimates
M10 Exclusion Catch Estimates
M11 Management Uncertainty Buffers (MUB)
M9 Catch Allocation by Statistical Area/Broad Stock Area (BSA) Reporting

The following sections may be reorganized by analysis.

Observer Bias

Biased Vessels

Magnitude of Observer Bias

Discard Estimates

Groundfish Trip Definition

Trips are classified as commercial groundfish trips based on declarations, permit profiles, landing ratios, and gear deployment. The classification logic uses a hierarchical approach, running tests at the subtrip level before rolling classifications up to the entire trip.

Groundfish Trip Indicator

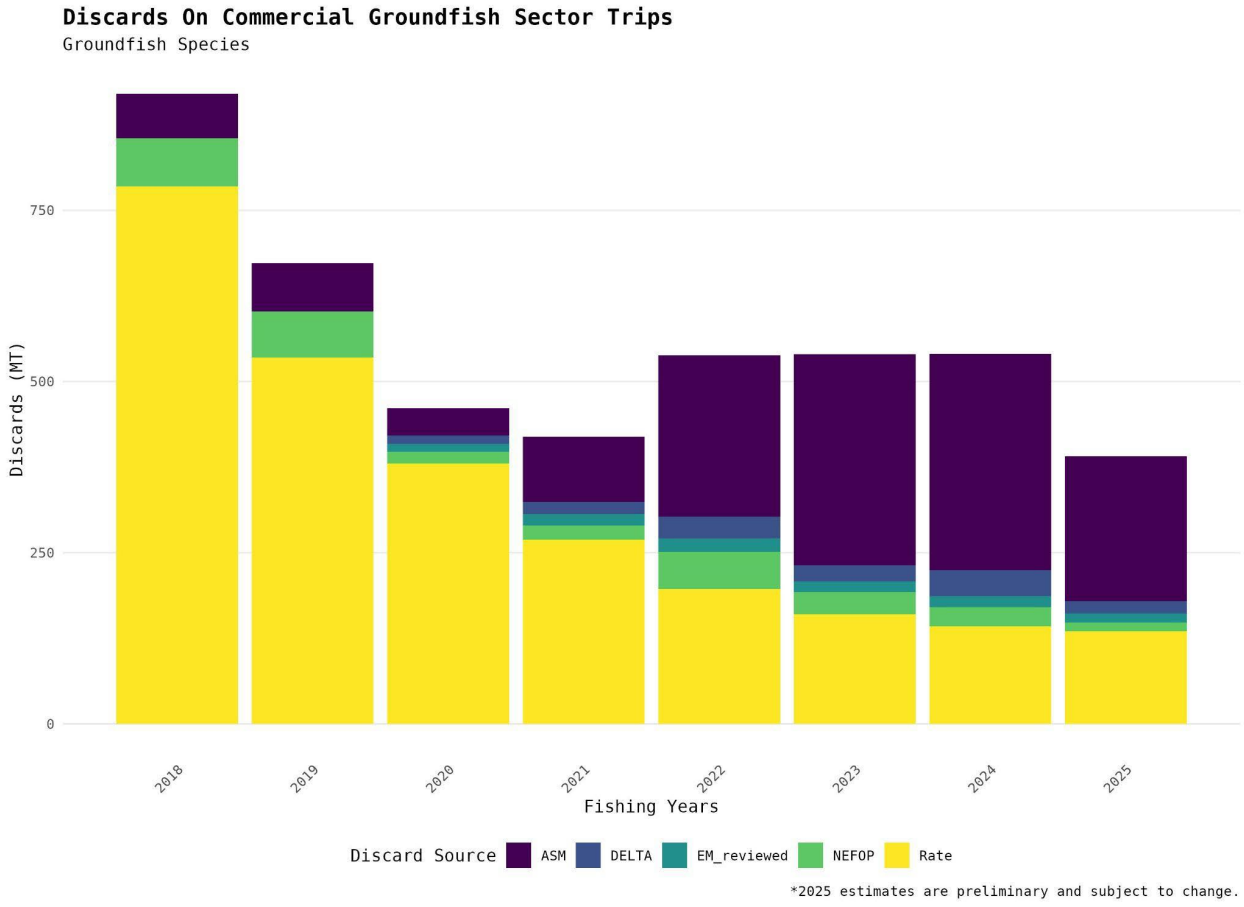
A trip is designated as a commercial groundfish trip if it represents an intended groundfish effort, an active multi-species permit/gear combination, or an unflagged trip where the groundfish landings exceed thresholds.

If any single subtrip meets the criteria, the entire trip and all of its associated subtrips are rolled up into the commercial groundfish category. A subtrip triggers this active flag through any of the following operational profiles:

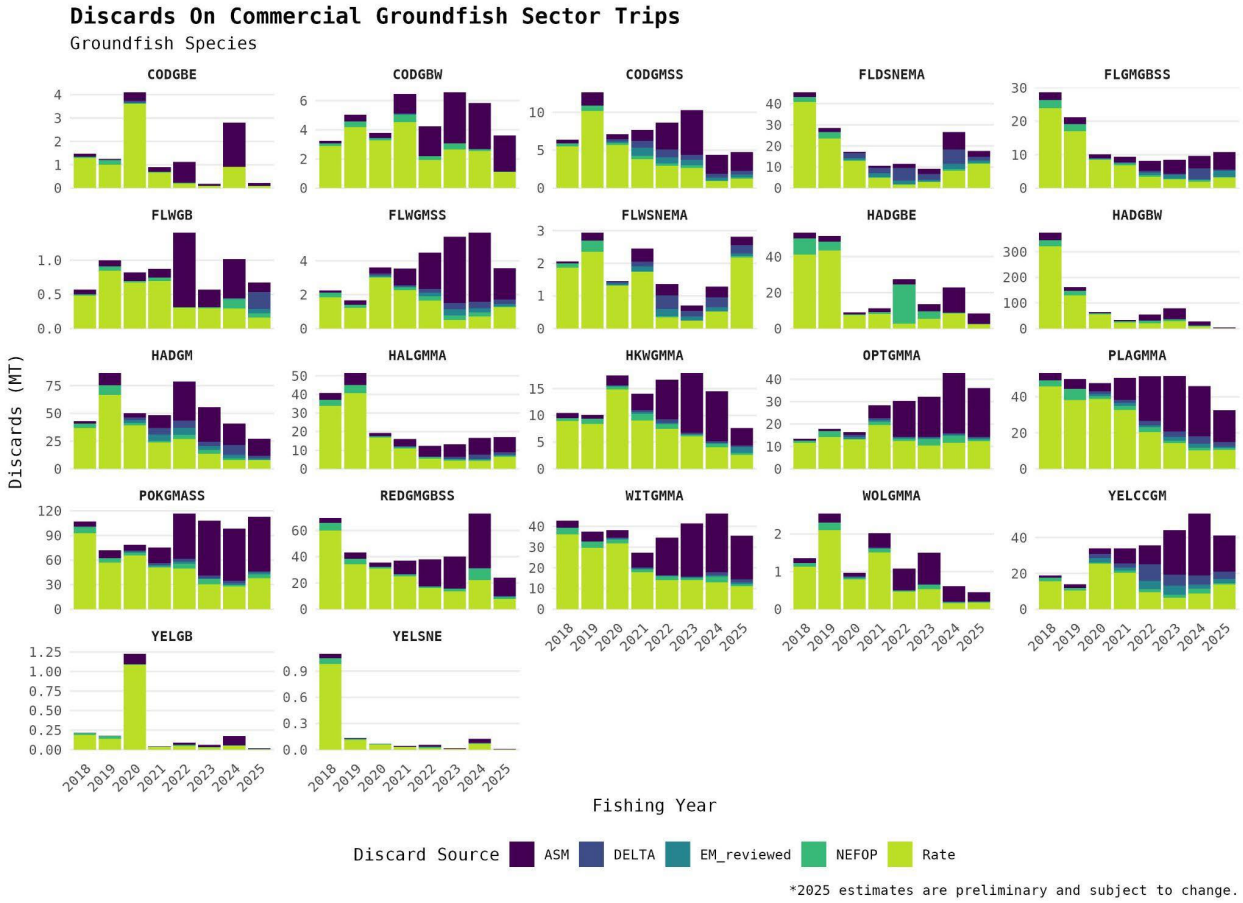
1. **Targeted Multispecies Activity**: The vessel explicitly declared a Northeast Multispecies (NMS) activity plan on its Vessel Monitoring System (VMS).
2. **Monkfish/Multispecies Effort**: The vessel declared a Monkfish (MNK) activity plan while holding valid Monkfish and Multispecies permits, utilized standard groundfish gear (trawls, gillnets, or bottom longlines), and incurred a positive Multispecies Days-at-Sea (Mult-DAS) charge.
3. **Undeclared/DOF Handgear**: The vessel did not declare and activity plan, or declared out of fishery (DOF) and trip was not a research trip, while holding a MUL-HB permit using gear in the handgear set, and groundfish landings exceed 5% of the total subtrip landings
4. **Uncharged Monkfish Catch**: The vessel declared a Monkfish (MNK) activity plan under and held appropriate permits, but incurred *zero* Days-at-Sea charges while landing groundfish pounds using standard groundfish gear.
5. **Misdeclared Groundfish**: Vessel declared out of fishery and trip was not a research trip, while holding MUL-A and groundfish landings exceeds 5% of total.

For complete description of business rules used in determining commercial groundfish trips, see Appendix A of the CAMS documentation Relevant sections are: 9.4 Groundfish, 9.5 Other groundfish trips declaring monkfish, and 9.15 Misdeclared groundfish trips

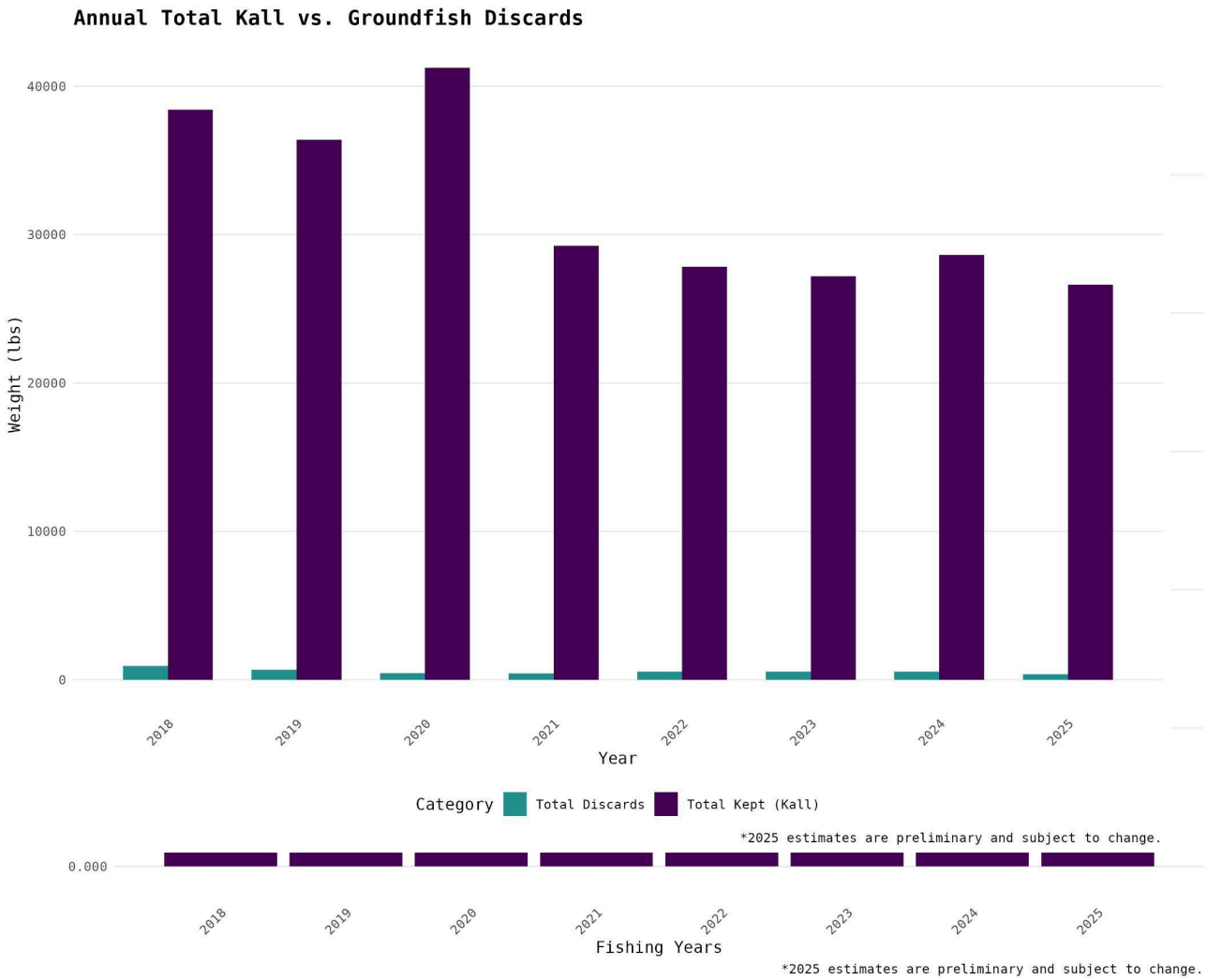
Annual discard data summarized by the source of discards. The yellow portion are discards that come from all rates (in-season, transition, broad-stock, gear, gear-mesh). Rates are calculated based on human observed (NEFOP/ASM) trips and grouped by trip characteristics (discard strata). The darkest blue and light green represent human-observed trips (ASM and NEFOP), and the teal and navy blue from reviewed EM trips and Delta model estimates respectively.



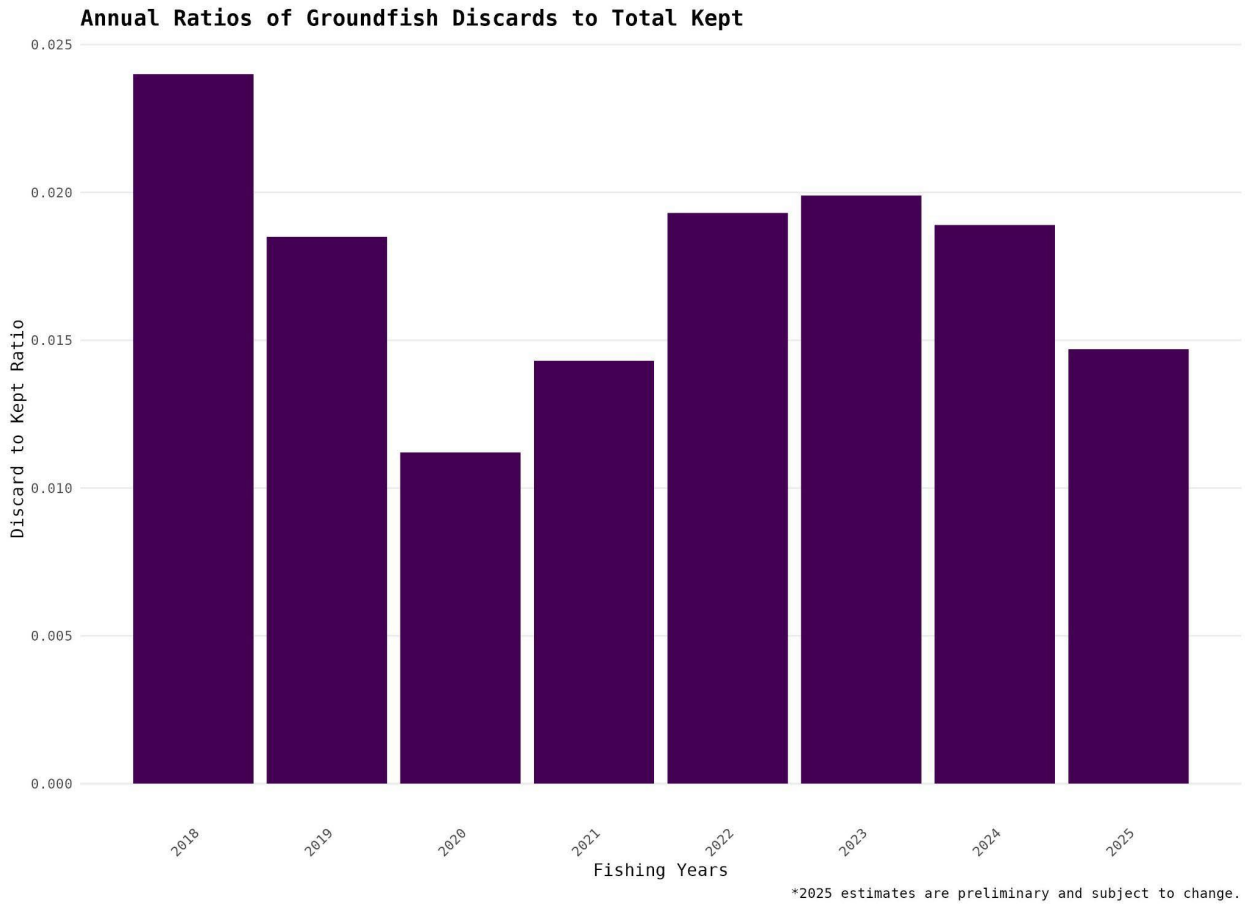
As above, discard totals stratified by discard source, and further stratified by groundfish stock.



Total annual Kall (dark blue) and groundfish species discards (teal).



Annual ratio of groundfish discards to total Kall.

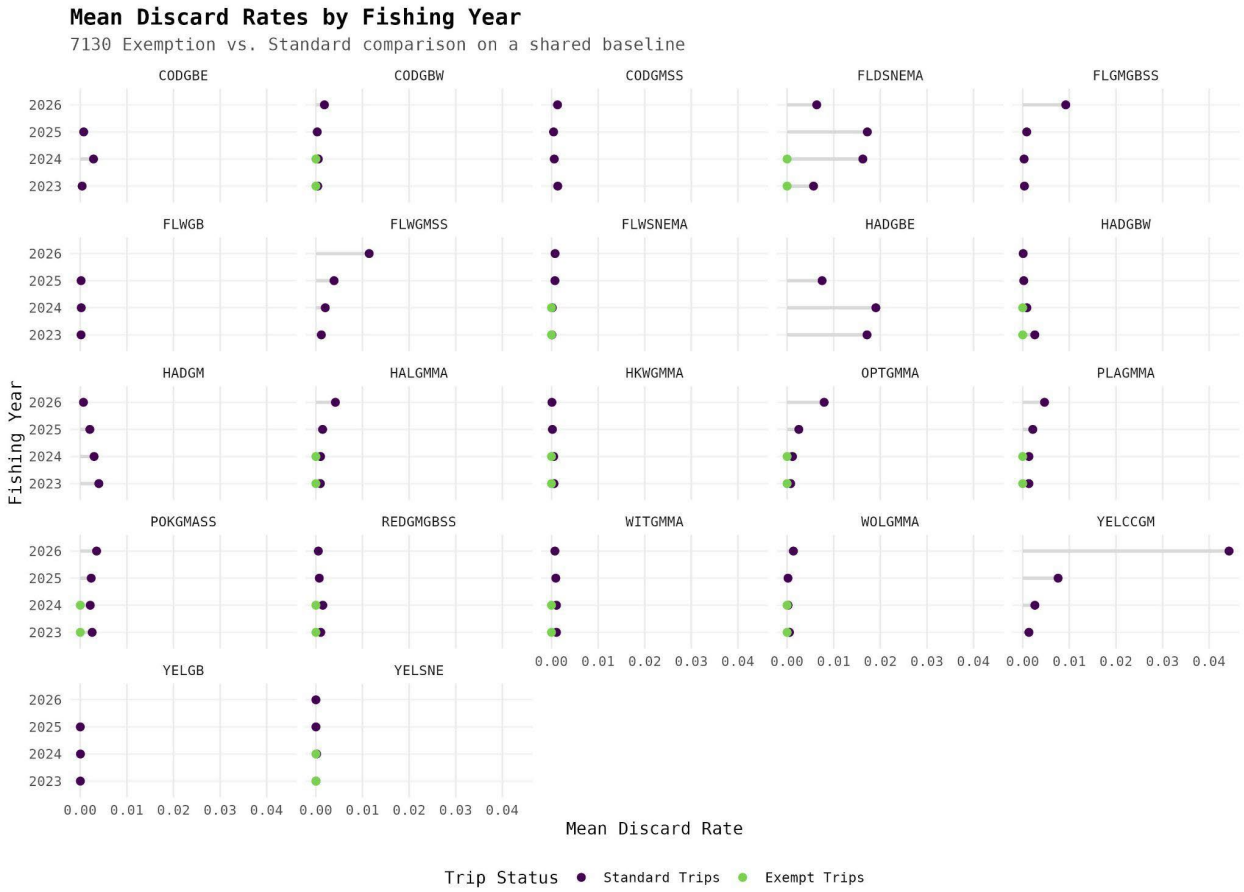


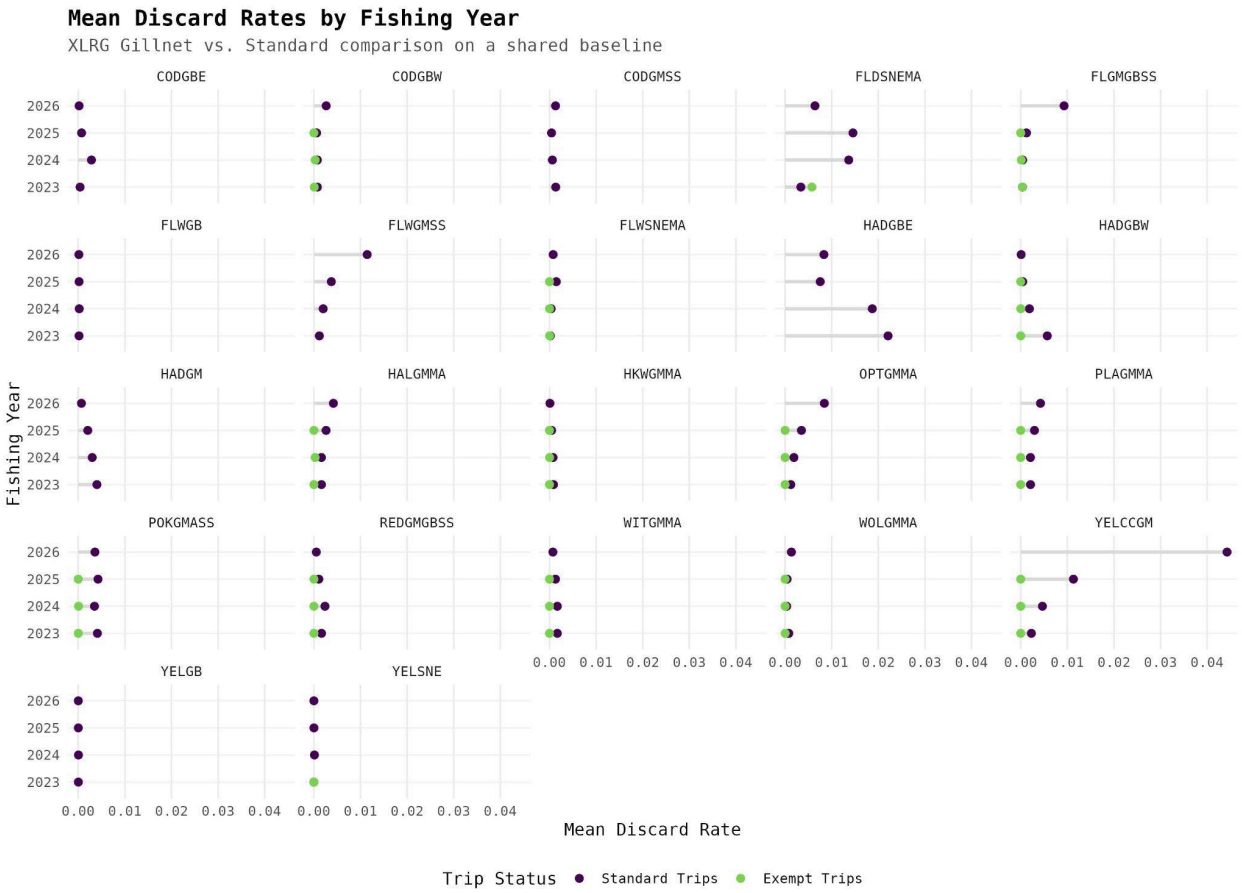
Catch Estimates for Trips Excluded from the ASM Requirement

Exemption Summaries:

7130 Exempt Status	**Fishing Year**	**Number permits**	**Number trips**	**Groundfish Discards (MT)**
Non-Exempt	2023	124	4638	539.4
Non-Exempt	2024	135	4793	539.6
Non-Exempt	2025	123	4288	390.2
Exempt	2023	6	45	0.7
Exempt	2024	4	32	0.6
Exempt	2025	8	17	0.7

Xlrg Gillnet Exemption Status	Fishing Year	Number Permits	Number Trips	Groundfish Discards (MT)
Non-Exempt	2023	124	3840	536.7
Non-Exempt	2024	137	3983	537.8
Non-Exempt	2025	126	3366	385.6
Exempt	2023	17	843	3.3
Exempt	2024	16	842	2.4
Exempt	2025	15	939	5.4


Mean Discard Rates by Fishing Year
7130 Exemption vs. Standard comparison on a shared baseline
CODGBE
CODGBW
CODGMSS
FLDSNEMA
FLGMGBSS
FLWGB
FLWGMSS
FLWSNEMA
HADGBE
HADGBW
HADGM
HALGMMA
HKWGMMA
OPTGMMA
PLAGMMA
POKGMASS
REDGMGBSS
WITGMMA
WOLGMMA
YELCCGM
YELGB
YELSNE
2026
2025
2024
2023
Fishing Year
0.00 0.01 0.02 0.03 0.04
Mean Discard Rate
Trip Status
Standard Trips
Exempt Trips


Mean Discard Rates by Fishing Year
XLRG Gillnet vs. Standard comparison on a shared baseline
CODGBE
CODGBW
CODGMSS
FLDSNEMA
FLGMGBSS
FLWGB
FLWGMSS
FLWSNEMA
HADGBE
HADGBW
HADGM
HALGMMA
HKWGMMA
OPTGMMA
PLAGMMA
POKGMASS
REDGMGBSS
WITGMMA
WOLGMMA
YELCCGM
YELGB
YELSNE
2026
2025
2024
2023
0.00 0.01 0.02 0.03 0.04
Fishing Year
Mean Discard Rate
Trip Status
Standard Trips
Exempt Trips

MUB Removal

Fishing Year	MUB Removed?	Effect[10]
2023	[11]	Groundfish Revenue, Total Revenue, and Operating Profit all below predicted levels.[12]
2024	Yes	Groundfish Revenue (+$2.2M), Total Revenue (+$4.5M), and Operating Profit (+$2.7M) all above predicted levels with or w/o MUB.[13]
2025	Yes	Groundfish Revenue (+$1.2M), Total Revenue (+$2.6M), and Operating Profit (+$1.6M) all predicted to be higher with MUB removed.[14]

Observer Bias

Catch Allocation by BSA and VMS

Catch Allocation by BSA and VMS

Data Impacts Overall Results

[10] Realized revenue vs QCM predicted revenue with MUB in place.
[11] MUB removed for white hake and GOM haddock ONLY. FW65 set threshold at ASM coverage of 90%.
[12] The fishery experienced an uptick in landings and revenue during FY2020 not predicted by the model. With moderately higher levels of revenue in FY2020 – FY2021, the QCM predicted similar results for FY2023 that did not materialize.
[13] Realized compared to predicted revenues with MUB in place.
[14] Realized revenues not yet available. FW69 QCM based on 4 new cod stocks.

Fishery Impacts

The Fishery Impacts theme looks at the costs of the program – overall, for NMFS, and for the industry. It also looks at potential changes to where fishing occurs, and which ports are used, to evaluate potential spatial observer bias.

Relevant Metrics
M12 Total Monitoring Costs
M13 Industry Monitoring Costs
M14 Cost Efficiency
M18 Spatial Observer Bias

The following sections may be reorganized by analysis.

Total Monitoring Costs

Industry Monitoring Costs

The majority of human observer (hereafter ASM) expenses are associated with seaday costs. Other expenses associated with ASM include travel, training, and meal reimbursement. By applying the terms of the sector/provider ASM contracts to ASM observed trips, the seaday portion of total costs can be calculated. This allows for aggregation along different fishery dimensions such as single day vs. multi-day trips and mobile gear vs. fixed gear, as presented in Ardini et al. (2020)[15].

ASM contracts from fishing years (FYs) 2016-2018 were previously applied to fishing activity in Ardini et al. (2020). This time period represents the before A23 part of the analysis in which sectors first started contracting directly with ASM providers. During this period, coverage rates were quite low, ranging from 15%-17% on an annual basis. A total of four ASM providers contracted with sectors in each FY from 2016 through 2018.

For the A23 period, sector/provider contracts were applied to ASM-observed trips from FYs 2023-2025. During this period, realized coverage rates ranged from 81%-87% on an annual basis. A total of four ASM providers contracted with sectors in each FY from 2023 through 2025. Three ASM providers were active in both time periods (FYs 2016-2018 and FYs 2023-2025).

[15] Ardini, G., C. Demarest, and K. McArdle. 2020. Costs of at-sea monitoring under government and private contracts in the groundfish fisheye of the northeastern United States Fish. Bull. 118(3):284-296.

The results for both periods are shown in Table 1 and Table 2. Table 1 provides at-sea costs in nominal and real (2025) USD as well as costs per ASM observed day absent. The substantial increase in costs for the A23 period can primarily be attributed to the increase in coverage rate compared to 2016-2018. Seaday costs per ASM days absent increased from $826 during FYs 2016-2018 to $879 during FYs 2023-2025, a 6% increase. At-sea costs averaged $0.7M on an annual basis during FYs 2016-2018 and $4.5M during FYs 2023-2025. Total costs for human observers are also included, where available, from the dollar amounts reimbursed to sectors.

Table 2 provides seaday costs per total day absent and ASM eligible day absent. Notably, as the number of ASM trips and days absent greatly increased during the A23 period, the number of total sector days absent decreased rather substantially. During FYs 2016-2018, the annual average number of days absent in the sector fishery was 11,318. That dropped to 8,884 during FYs 2023-2025, representing a decline of 22%.

For EM services, costs can be more difficult to disaggregate. For example, sector/provider EM contracts generally include a variety of cost categories such as data storage, data processing, field technical support, hardware installation, software development, and training. Costs associated with both the human observer component and electronic monitoring component of comprehensive monitoring can be best tracked through the dollar amounts reimbursed to sectors. These amounts include all of the costs that sectors pay to providers for human observer and EM services. For more information on ASM vs. EM costs, see the Cost Efficiency section.

	2016	2017	2018	2023	2024	2025
At-Sea Cost (Nominal)	$680,409	$450,188	$524,356	$4,579,150	$4,559,789	$4,031,528
At-Sea Cost (2025 USD)	$887,961	$577,540	$656,424	$4,789,287	$4,649,203	$4,009,381
ASM Observed Days Absent	1,113	667	791	5,417	5,313	4,574
At-Sea Cost per ASM Observed Day Absent (Nominal)	$611	$675	$663	$845	$858	$881
At-Sea Cost per ASM Observed Day Absent (2025 USD)	$798	$866	$830	$884	$875	$877
Total Cost of Human Observers (Nominal)				$6,427,856	$6,003,993	
Realized Coverage Rate	15%	17%	16%	82%	87%	81%

	2016	2017	2018	2023	2024	2025
At-Sea Cost (2025 USD)	$887,961	$577,540	$656,424	$4,789,287	$4,649,203	$4,009,381
Total Sector Days Absent	12,089	11,289	10,578	9,019	9,269	8,365
At-Sea Cost per Total Day Absent (2025 USD)	$73	$51	$62	$531	$502	$479
ASM Eligible Days Absent (filtering out exemption trips and EM trips)	11,937	11,048	9,944	7,976	7,765	6,993
At-Sea Cost per ASM Eligible Day Absent (2025 USD)	$74	$52	$66	$600	$599	$573
Realized Coverage Rate	15%	17%	16%	82%	87%	81%

Cost Efficiency

Spatial Observer Bias

Fishery Impacts Overall Results

Program Reach

The Program Reach theme looks at vessel participation in monitoring programs, EM review rates, ASM Coverage targets, achieved coverage, and details of how coverage was assigned and distributed to look at coverage equitability.

Relevant Metrics
M20 ASM Coverage Targets
M19 Achieved Coverage
M28 Waiver Counts
M29 Acceptance Rates
M31 Refusals
M32 Incidents
M33 PTNS Notification Compliance
M34 PTNS Cancellations
M27 Coverage Equitability
M38 Distribution of Vessels
M39 EM Video Review Rates

The following sections may be reorganized by analysis.

ASM Coverage Targets

Table X: ASM Coverage Targets, Achieved Coverage, and Management Uncertainty Buffer (MUB) Removal.

Fishing Year	Coverage Target (%)	Coverage Achieved (%)	Date Announced	Notes
2021	40	32[16]	1/26/2021	COVID-related waivers ended June 17, 2021.
2022	99	60	12/14/2021	99% target set to address bias and to prepare for A23. Reduced to 80% based on appropriations for NMFS' costs.
	80		11/29/2022	
2023[17]	90	81	3/16/2023	Confirmed 9/26/2023.
2024[18]	100	86	2/20/2024	A23 set coverage at 100% for 2022-2025, when federal funding can support industry and agency costs. Target defaults to 40% in 2026, but may be increased if federal funding is available.
2025[19]	100	81[20]	3/21/2025	
2026	100	[21]	3/13/2026	

[16] ASM and observer coverage was waived from March 20, 2020, through August 13, 2020. COVID-related waivers began March 20, 2020. Coverage resumed August 14, 2020, and the last waivers ended June 17, 2021.
[17] MUB removed only for Gulf of Maine haddock and white hake by FW65 on 8/18/2023.
[18] MUB removed for all stocks.
[19] MUB removed in FW69 final rule on 3/9/2026.
[20] Pending finalization.
[21] Fishing year not yet complete.

Achieved Coverage

Achieved Coverage

Waiver Counts

Acceptance Rates

Refusals

Incidents

PTNS Notification Compliance

PTNS Cancellations

Coverage Equitability

Distribution of Vessels

Number of Vessels Participating in Program by Fishing Year

Fishing Year	ASM Vessels	EM Vessels
2020	94	16
2021	109	18
2022	103	21
2023	92	22
2024	84	33
2025	73	29

Number of Vessels Participating in Program by Vessel Length & Fishing Year

Fishing Year	Vessel Length	ASM Vessels	EM Vessels
2020	<= 50.0	37	14
2020	50.1 - 75.0	28	2
2020	> 75.0	29	NA
2021	<= 50.0	48	13
2021	50.1 - 75.0	32	5
2021	> 75.0	29	NA
2022	<= 50.0	42	14

2022	50.1 - 75.0	31	7
2022	> 75.0	30	NA
2023	<= 50.0	34	15
2023	50.1 - 75.0	27	7
2023	> 75.0	31	NA
2024	<= 50.0	32	19
2024	50.1 - 75.0	24	10
2024	> 75.0	28	4
2025	<= 50.0	25	18
2025	50.1 - 75.0	23	9
2025	> 75.0	25	2

Number of Vessels by Program and Gear Type

Fishing Year	Gear Name	Gear Code	ASM Permits	EM Permits
2020	LONGLINE, BOTTOM	030	4	4
2020	HANDLINE	031	1	3
2020	TRAWL,OTTER,BOTTOM,FISH	032	74	6
2020	TRAWL,OTTER,BOTTOM,HADDOCK SEPARATOR	033	4	NA
2020	GILL NET, FIXED OR ANCHORED,SINK, OTHER/NK SPECIES	034	11	3
2021	LONGLINE, BOTTOM	035	4	3
2021	HANDLINE	036	NA	2
2021	TRAWL,OTTER,BOTTOM,FISH	037	84	10
2021	TRAWL,OTTER,BOTTOM,SCALLOP	038	1	NA
2021	TRAWL,OTTER,BOTTOM,HADDOCK SEPARATOR	039	2	NA
2021	GILL NET, FIXED OR ANCHORED,SINK, OTHER/NK SPECIES	040	17	3
2021	GILL NET,OTHER	041	1	NA
2022	LONGLINE, BOTTOM	042	4	1
2022	HANDLINE	043	NA	1
2022	TRAWL,OTTER,BOTTOM,FISH	044	79	16

2022	TRAWL,OTTER,BOTTOM,SCALLOP	045	1	NA
2022	TRAWL,OTTER,BOTTOM,OTHER/NK SPECIES	046	2	NA
2022	GILL NET, FIXED OR ANCHORED,SINK, OTHER/NK SPECIES	047	16	3
2022	GILL NET,OTHER	048	1	NA
2023	LONGLINE, BOTTOM	049	3	1
2023	HANDLINE	050	NA	1
2023	TRAWL,OTTER,BOTTOM,FISH	051	69	15
2023	TRAWL,OTTER,BOTTOM,RUHLE	052	1	NA
2023	TRAWL,OTTER,BOTTOM,HADDOCK SEPARATOR	053	1	NA
2023	TRAWL,OTTER,BOTTOM,OTHER/NK SPECIES	054	2	NA
2023	GILL NET, FIXED OR ANCHORED,SINK, OTHER/NK SPECIES	055	16	4
2023	SCOTTISH SEINE	056	NA	1
2024	LONGLINE, BOTTOM	057	2	2
2024	HANDLINE	058	NA	1
2024	TRAWL,OTTER,BOTTOM,FISH	059	64	23
2024	TRAWL,OTTER,BOTTOM,HADDOCK SEPARATOR	060	NA	1
2024	GILL NET, FIXED OR ANCHORED,SINK, OTHER/NK SPECIES	061	17	5

2024	BEAM TRAWL, OTHER/NK SPECIES	062	1	NA
2024	SCOTTISH SEINE	063	NA	1
2025	LONGLINE, BOTTOM	064	2	2
2025	HANDLINE	065	NA	2
2025	TRAWL,OTTER,BOTTOM,FISH	066	60	20
2025	TRAWL,OTTER,BOTTOM,RUHLE	067	1	NA
2025	GILL NET, FIXED OR ANCHORED,SINK, OTHER/NK SPECIES	068	10	5

Number of Vessels by Program and Hail Port

Fishing Year	Hail Port	State	ASM Vessels	EM Vessels
2020	DOVER	DE	1	NA
2020	BARNSTABLE	MA	NA	1
2020	BOSTON	MA	15	NA
2020	CHATHAM	MA	2	1
2020	GLOUCESTER	MA	29	2
2020	NEW BEDFORD	MA	11	NA
2020	NEWBURYPORT	MA	NA	1
2020	PROVINCETOWN	MA	1	NA
2020	SCITUATE	MA	5	NA
2020	SOUTH YARMOUTH	MA	NA	1
2020	WESTPORT	MA	1	NA
2020	WOODS HOLE	MA	2	NA
2020	BIDDEFORD	ME	1	NA
2020	CUNDYS HARBOR	ME	NA	1
2020	ELIOT	ME	NA	1
2020	HARPSWELL	ME	1	1

2020	KITTERY	ME	2	NA
2020	PORT CLYDE	ME	NA	1
2020	PORTLAND	ME	7	1
2020	ROUND POND	ME	NA	1
2020	SACO	ME	NA	1
2020	SOUTH BRISTOL	ME	2	NA
2020	HAMPTON	NH	1	NA
2020	PORTSMOUTH	NH	1	1
2020	RYE	NH	3	NA
2020	SEABROOK	NH	2	NA
2020	POINT JUDITH	RI	6	2
2020	NEWPORT NEWS	VA	1	NA
2021	DOVER	DE	1	NA
2021	BARNSTABLE	MA	NA	1
2021	BOSTON	MA	16	NA
2021	CHATHAM	MA	5	NA
2021	GLOUCESTER	MA	28	3
2021	HARWICH	MA	NA	1

2021	NANTUCKET	MA	1	NA
2021	NEW BEDFORD	MA	11	NA
2021	NEWBURYPORT	MA	NA	1
2021	PLYMOUTH	MA	1	NA
2021	PROVINCETOWN	MA	1	NA
2021	SCITUATE	MA	6	NA
2021	WESTPORT	MA	1	NA
2021	WOODS HOLE	MA	2	NA
2021	BASS HARBOR	ME	1	NA
2021	BIDDEFORD	ME	1	NA
2021	CAPE PORPOISE	ME	1	NA
2021	CUNDYS HARBOR	ME	1	NA
2021	HARPSWELL	ME	1	NA
2021	KENNEBUNKPORT	ME	2	NA
2021	KITTERY	ME	2	NA
2021	OWLS HEAD	ME	1	NA
2021	PORT CLYDE	ME	1	2
2021	PORTLAND	ME	7	1

2021	SACO	ME	NA	1
2021	SOUTH BRISTOL	ME	1	1
2021	HAMPTON	NH	1	NA
2021	HAMPTON FALLS	NH	1	NA
2021	PORTSMOUTH	NH	2	2
2021	RYE	NH	3	NA
2021	SEABROOK	NH	1	1
2021	HAMPTON BAYS	NY	1	NA
2021	SHINNECOCK	NY	1	NA
2021	POINT JUDITH	RI	6	4
2021	NEWPORT NEWS	VA	1	NA
2022	NEW LONDON	CT	1	NA
2022	DOVER	DE	1	NA
2022	BOSTON	MA	16	NA
2022	CHATHAM	MA	3	NA
2022	GLOUCESTER	MA	23	8
2022	GREEN HARBOR	MA	1	NA
2022	NANTUCKET	MA	1	NA

2022	NEW BEDFORD	MA	14	NA
2022	NEWBURYPORT	MA	NA	1
2022	PLYMOUTH	MA	1	NA
2022	SCITUATE	MA	4	1
2022	WESTPORT	MA	1	NA
2022	BASS HARBOR	ME	1	NA
2022	BELFAST	ME	1	NA
2022	CAPE PORPOISE	ME	1	NA
2022	CUNDYS HARBOR	ME	1	NA
2022	HARPSWELL	ME	2	NA
2022	KENNEBUNKPORT	ME	3	NA
2022	PORT CLYDE	ME	NA	1
2022	PORTLAND	ME	10	2
2022	SACO	ME	NA	1
2022	SOUTH BRISTOL	ME	2	NA
2022	TREVETT	ME	1	NA
2022	WOOLWICH	ME	1	NA
2022	HAMPTON	NH	1	NA

2022	HAMPTON FALLS	NH	1	NA
2022	PORTSMOUTH	NH	NA	2
2022	RYE	NH	3	NA
2022	SEABROOK	NH	1	1
2022	SHINNECOCK	NY	1	NA
2022	POINT JUDITH	RI	6	4
2022	NEWPORT NEWS	VA	1	NA
2023	BEVERLY	MA	1	NA
2023	BOSTON	MA	13	NA
2023	CHATHAM	MA	4	NA
2023	GLOUCESTER	MA	24	7
2023	GREEN HARBOR	MA	NA	1
2023	NANTUCKET	MA	1	NA
2023	NEW BEDFORD	MA	14	NA
2023	NEWBURYPORT	MA	NA	1
2023	NORTH TRURO	MA	1	NA
2023	PLYMOUTH	MA	NA	1
2023	SCITUATE	MA	3	1

2023	BASS HARBOR	ME	1	NA
2023	BELFAST	ME	1	NA
2023	CAPE PORPOISE	ME	1	NA
2023	CUNDYS HARBOR	ME	NA	1
2023	HARPSWELL	ME	2	NA
2023	KENNEBUNKPORT	ME	2	NA
2023	PORT CLYDE	ME	1	1
2023	PORTLAND	ME	10	3
2023	SOUTH BRISTOL	ME	1	NA
2023	TREVETT	ME	1	NA
2023	HAMPTON	NH	1	NA
2023	PORTSMOUTH	NH	1	1
2023	RYE	NH	2	1
2023	SEABROOK	NH	1	1
2023	CAPE MAY	NJ	NA	1
2023	POINT JUDITH	RI	5	2
2023	NEWPORT NEWS	VA	1	NA
2024	BEVERLY	MA	1	NA

2024	BOSTON	MA	11	1
2024	CHATHAM	MA	2	1
2024	GLOUCESTER	MA	24	9
2024	HARWICH	MA	NA	1
2024	NANTUCKET	MA	1	NA
2024	NEW BEDFORD	MA	13	3
2024	NEWBURYPORT	MA	NA	1
2024	PLYMOUTH	MA	NA	1
2024	SCITUATE	MA	3	1
2024	WESTPORT	MA	1	NA
2024	BASS HARBOR	ME	2	NA
2024	CAPE PORPOISE	ME	NA	1
2024	HARPSWELL	ME	1	NA
2024	PORT CLYDE	ME	NA	2
2024	PORTLAND	ME	10	3
2024	SOUTH BRISTOL	ME	2	NA
2024	TREVETT	ME	1	NA
2024	HAMPTON	NH	NA	1

2024	PORTSMOUTH	NH	1	1
2024	RYE	NH	3	1
2024	SEABROOK	NH	1	1
2024	CAPE MAY	NJ	NA	1
2024	POINT JUDITH	RI	7	4
2025	BOSTON	MA	11	NA
2025	GLOUCESTER	MA	22	7
2025	HARWICH	MA	NA	1
2025	NEW BEDFORD	MA	13	2
2025	NEWBURYPORT	MA	NA	1
2025	PLYMOUTH	MA	NA	1
2025	ROCKPORT	MA	1	NA
2025	SCITUATE	MA	3	1
2025	BASS HARBOR	ME	2	NA
2025	CAPE PORPOISE	ME	NA	1
2025	FREEPORT	ME	NA	1
2025	KENNEBUNKPORT	ME	NA	1
2025	PORT CLYDE	ME	NA	1

2025	PORTLAND	ME	4	4
2025	SOUTH BRISTOL	ME	2	NA
2025	TREVETT	ME	1	NA
2025	PORTSMOUTH	NH	1	1
2025	RYE	NH	2	1
2025	SEABROOK	NH	1	2
2025	POINT JUDITH	RI	9	4
2025	WAKEFIELD	RI	1	NA

EM Video Review Rates

Program Reach Overall Results

4. Summary of PDT Analyses

Summary including how the analyses relate to one another and whether results are meaningful beyond being statistically significant.

5. Conclusions

Across All Analyses

Overall Groundfish PDT Conclusions Based on Analyses

- .

6. Additional Information

Supplemental Information

This may contain appendices with formal papers for individual analyses.