North Pacific Observer Program
2025 Annual Report

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Executive Summary

This Annual Report provides information, analysis, and recommendations based on the deployment of observers and Electronic Monitoring (EM) systems by the North Pacific Observer Program (Observer Program) in the halibut and groundfish fisheries off Alaska during 2025.

Section 313 of the Magnuson-Stevens Act (16 U.S.C. 1862) authorizes the North Pacific Fishery Management Council (Council), in consultation with National Marine Fisheries Service (NMFS), to prepare a fishery research plan for the purpose of stationing observers and EM systems to collect data necessary for the conservation, management, and scientific understanding of the commercial groundfish and Pacific halibut fisheries of the Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA) management areas. Observers and EM systems collect fishery-dependent information used to estimate total catch and interactions with protected species. Managers use these data to manage groundfish and prohibited species catch within established limits and to document and reduce fishery interactions with protected resources. Scientists use fishery-dependent data to assess fish stocks, to provide scientific information for fisheries and ecosystem research and fishing fleet behavior, to assess marine mammal interactions with fishing gear, and to assess fishing interactions with habitat.

The Observer Program is the nation's largest observer program and covers vessels in both partial coverage and full coverage. In the full coverage component of the program, every trip is monitored by 1 or 2 observers and the vast majority of groundfish harvest is covered by this portion of the program. Each year, the Annual Deployment Plan (ADP) describes the science-driven method for deployment of observers and EM systems on vessels in the partial coverage component of the program (50 CFR 679.51(a)). The ADP specifies the scientific deployment design for the partial coverage fisheries and the selection rate—the portion of trips that are sampled by observers and EM. The following year, the agency provides an Annual Report with descriptive information and scientific evaluation of the deployment of observers and EM. The ADP and Annual Report process provides information to assess whether the objectives of the Observer Program have been met and a process to make recommendations to improve implementation of the program to further these objectives.

- Overall, for all federal fisheries off Alaska, 4,161 trips (47%) and 303 vessels (35% of total) were monitored by either an observer or EM system in 2025.
- During the 2025 fishing year, approximately 258 individual observers were trained, briefed, and equipped for deployment to vessels and processing facilities operating in the BSAI and GOA groundfish and halibut fisheries. Of these, 86 new observers were trained and 172 were prior observers who attended briefings in 2025.

- In 2025, observers collected data on board 203 fixed gear and trawl vessels and at 11 processing facilities for a total of 25,891 observer days (23,884 full coverage days on vessels and in plants; and 2,007 partial coverage days on vessels and in plants)[1].
- NMFS approved 176 vessels in the 2025 fixed-gear EM selection pool. Of these, 56 of those vessels were randomly selected to turn on their EM system. In 2025, there were a total of 123 selected and reviewed fixed-gear trips (57 longline trips and 66 pot trips). A total of 137 fixed gear trips were selected by ODDS for monitoring. At the end of the year, 14 trips were not reviewed. NMFS prioritized the 2025 review to eliminate any backlog and support the new regulatory Trawl EM Program.
- The 2025 fishing year was the first year of the regulated Trawl EM program. Fishing for pollock by catcher vessels using pelagic trawl gear in both the Bering Sea and Gulf of Alaska was fully regulated under 89 FR 60796 (July 29, 2024). This program uses a combination of EM at-sea and human observers shoreside to monitor catch, at-sea discards, and PSC species. The goal for EM is compliance monitoring of maximized retention. Catch accounting for the vessel's catch and bycatch is done via eLandings reports and shoreside plant observers. A total of 96 vessels from both the partial and full coverage categories participated in the Trawl EM program in 2025.
- In the Bering Sea/Aleutian Islands (BSAI), all pelagic trawl catch was on trips with 100% or 200% coverage. In the BSAI and Gulf of Alaska combined, 90% of pelagic trawl catch was on trips with 100% or 200% coverage and 10% was on trips in partial coverage. All partial coverage trips were in the Gulf of Alaska and 84% of the catch was monitored.
- In the BSAI and Gulf of Alaska combined, 96% of non-pelagic trawl catch was on trips with 100% or 200% coverage and 4% was on trips in partial coverage. Partial coverage trips occurred in both the BSAI and GOA, with 43% and 13% of their catch monitored, respectively.
- In the first year of the trawl EM regulated program, there continued to be a considerable amount of effort allocated to coordination and collaboration between FMA, AKRO, Office Of Law Enforcement, Alaska Groundfish Data Bank, United Catcher Boats, Aleutian East Borough (AEB), the Pacific States Marine Fisheries Commission, Archipelago Marine Research, and observer providers. The agency continues to find outreach to be a valuable way to share information with industry, to answer their questions, and to get their input on areas of concern and potential solutions.
- FMA and AKRO staff participated in various meetings focused on industry engagement, including annual meetings with : the Aleutians East Borough, the Freezer Longline Coalition, the Kodiak trawl fleet, and the Amendment 80 sector.

[1] Note that observer days are calculated differently from invoiced days. Observer days represent any amount of time an observer is on a vessel as part of their deployment which may be inclusive of non-fishing and standby days.

Fees and Budget

- The total invoiced amount for full coverage observer services in 2025 was $10,701,753, down 1.9% from the 2024 total of $10,908,834 and down 27% from the time-series high of $14,980,340 in 2015; continuing the decreasing trend that began in 2020.
- The expenditures for observer deployment in 2025 in the partial coverage category was $2,481,100 for 1551 invoiced days, resulting in an average cost per observer sea day in the partial coverage category of $1600. The average cost per observer sea day is a combination of a daily rate, which is paid for the number of days the observer is on a vessel or at a shoreside processing plant, and reimbursable travel costs.
- Fee billing statements for 2025 were mailed to 93 processors and registered buyers for a total of $2,975,097 in observer fees. The breakdown in contribution to the 2025 observer fees by species was: 33% Pacific halibut, 28% sablefish, 15% Pacific cod, 22% pollock, and 1% all other groundfish species.
- The EM fixed gear review of 2025 trips was completed for all hard drives received by PSMFC prior to January 1, 2026. For 2025, the annual cost for the fixed-gear EM program was $1,500,643 and the cost of trawl EM in the GOA was $1,038,972 (Table 3-1) .

Deployment Performance Review

Changes to the 2025 Deployment Scheme:

- There were no changes to the deployment method in 2025. The proximity allocation method used in 2024 was employed again in 2025 to determine the selection rates in the partial coverage categories.

Did We Meet Anticipated Deployment Goals?

Effort Predictions

- Based on simulations of annual fishing effort from the final 2025 ADP, NMFS expected to deploy at-sea observers for 1,127 days in the partial coverage category in 2025. The actual number of at-sea observer deployment days purchased in 2025 was 847.5, which was 24.9% less than budgeted (Figure 3-1). The total number of fishing trips in the at-sea observer strata was 9.1% higher than predicted (Table 3-2). A total of 121.2 base at-sea observer days were unused at the end of the partial coverage observer provider's contract year in September 2025.
- The lower-than-expected at-sea observer days in 2025 was a result of conservative overestimates in the (1) trip duration of at-sea observer assignments on selected trips, (2) cost per trip, and (3) total number of days that would be monitored.
- The overestimates in the 2025 ADP were corrected in the 2026 ADP, which more accurately estimates observed trip durations, cost per trip, and the total number of days to be monitored. We expect predicted estimates in the 2026 and subsequent Annual Reports to better reflect the true values.

Evaluation of At-sea Deployment

- At the end of 2025 the number of monitored trips was outside of the expected range in one of the six partial coverage strata subject to random trip selection: EM FIXED GOA (expected rate = 11.11%, realized rate = 8.92%; Table 3-6 and Figure 3-3). A summary of the number of vessels and trips in each strata and realized coverage rates in 2025 are as follows:

Strata	Total Vessels	Total Trips/ Deliveries	Monitored Trips/ Deliveries	Expected Coverage	Realized Coverage	Met expectations?
Full coverage						
Full*	91	969	969	100.00	100.00	Yes
EM TRW BSAI†*	63	1,871	1,871	100.00	100.00	Yes
Full coverage total	129	2,840	2,840		100.00	
Partial coverage						
OB FIXED BSAI	47	282	50	19.83	17.73	Yes
OB FIXED GOA	302	1,972	114	6.16	5.78	Yes
OB TRW BSAI	2	36	15	40.39	41.67	Yes
OB TRW GOA	30	334	53	15.45	15.87	Yes
EM FIXED BSAI	10	90	48	47.91	53.33	Yes
EM FIXED GOA	109	897	80	11.11	8.92	No - lower than expected
EM TRW GOA†	43	962	961	100.00	99.90	No - lower than expected
Partial coverage total	464	4,573	1,321		28.89	
Zero coverage						
Zero coverage*	296	1,447	0	0.00	0.00	Yes

*The expectation for full, *EM TRW*, and zero coverage strata are that coverage rates are exactly 100% and 0%, respectively. The expectation for partial coverage strata is that selection rates are within the 95% confidence intervals of realized deployment rates.

†*EM TRW* is monitored at the delivery instead of the trip level.

Dockside Monitoring

- A total of 2,870 pollock deliveries to shoreside processors were monitored by observers for salmon in 2025. Of those, 1,871 occurred in ports in the Bering Sea and 999 occurred in ports in the Gulf of Alaska (Tables 3-7 and 3-8).

Was the Coverage Representative?

Temporal Patterns

- Trips in the at-sea observer strata were selected and monitored at the expected rates throughout the year with virtually no anomalies. The *EM FIXED* strata were selected at the expected rates, but realized monitoring rates in the *EM FIXED BSAI* stratum were higher-than expected in the first half of the year.

Spatial Representativeness

- There were no notable spatial biases in the distribution of coverage in any of the partial coverage strata subject to random selection.

Spatial-Temporal Patterns

- The proximity index is an overall indication of whether the data during monitoring overlapped with fishing activity times and locations.
- The spatiotemporal distributions of monitoring coverage met expectations across most strata (Figure 3-5). While all six strata showed no significant bias when evaluated against their realized coverage rates (Figure 3-5, upper green distributions), only five met expectations when evaluated against the programmed selection rates. The single exception was the *EM FIXED GOA* stratum, which was lower than expected (0.7^{th} percentile). This outcome was likely caused by the lower than expected realized coverage rate during the latter portion of the year (Figure 3-3).

Trip Metrics

- Monitored trips in the *OB FIXED GOA* stratum were 16.0% (0.8 days) shorter in duration, landed 22.6% (0.6 species) more species, but overall the catch was 4.9% less diverse than unmonitored trips. This is an improvement from 2024, where three strata displayed signs of an observer effect (AFSC and AKRO 2025).

Compliance and Enforcement

- The Office of Law Enforcement, Alaska Division (AKD), works closely works the Observer Program, NOAA Workplace Violence Prevention and Response (WVPR), the Alaska Wildlife Troopers (AWT), the United States Coast Guard (USCG), and the industry to ensure observers are able to complete their duties in a safe environment free from assault, harassment, interference, or any behavior that may negatively impact them or the data they collect.
- In the electronic database used for observer statements deployed on July 19, 2023, each regulation has been given an informative category and subcategory that describes the

potential crime. Occurrences are reported at the appropriate "occurrence unit(s)" for each potential violation (deployment, trips, hauls, offloads, samples, deployment days, and/or observer-reported marine mammal interactions). These occurrence units were modeled to conform with the observer deployment and sampling data hierarchy and this improvement was fully implemented for all statements in 2025.

- The safety and security of observers continues to be OLE's highest priority. The rates of sexual harassment while present were relatively low (Figure 5-1) particularly when compared to rates of other safety subcategories (from highest to lowest): "Food and Accommodations", "Safety", "Hostile Work Environment", and "Marine Casualty" (Table 5-1).
- The 2025 Annual A-Season Observer Operation took place in Dutch Harbor. The operation focused on investigations involving sexual assault/sexual harassment of observers, hostile work environment, general health and safety of observers, interference/sample biasing, and failure to abide by catcher operational requirements.
- In the "high-priority" categories, notable rates were in "Safety and Work Environment" statements, reported in units of days (approximately 6% of observer deployment days in 2024 and 2025), driven by "Food and Accommodations," "Safety," and "Hostile Work Environment." subcategories.
- For "all other" statement categories, the highest rate (~20% of observed offloads in both 2024 and 2025) was consistently in the "Operational Requirements / Permits / Documents /Record Keeping and Reporting" category group, primarily due to "CMCP" statements for processing plants, with GOA plants having the highest rates (2025 rate shown in Figure 5-4). Potential violations involving CMCP (14.16% of offloads; 11.74% in the BSAI and 27.32% in GOA) and false reporting (3.32% of offloads) are of particular concern because they continue to occur despite attempts to assist industry in voluntarily complying.
- Other consistently high-rate subcategories include "False Reporting," "Marine Mammal," "GOA Salmon Bycatch," and "Catch Weighing."
- OLE continues to investigate 109 of the 285 of the statements that were received in 2025.

NMFS Recommendations

NMFS recommends the following for the 2027 Annual Deployment Plan:

Deployment Design:

- NMFS recommends the continued use of the Proximity allocation method for the partial coverage strata (with the exception of trawl EM) in 2027.
- For the Trawl EM stratum in the BSAI, all offloads from Trawl EM trips are to be sampled for salmon, halibut, and biological data, In the GOA, NMFS recommends maintaining the sampling rate where all EM deliveries are monitored for salmon and halibut PSC and 33% are sampled by shoreside fishery observers for biological data. The agency will continue to monitor the complete sorting and accounting of salmon, with specific attention in the Western GOA during the B Season and likely develop additional

mechanisms, such as CMCP modifications, for ensuring accuracy of salmon accounting in 2028.

- NMFS recommends maintaining the stratification used in the final 2026 ADP for use in the 2027 Annual Deployment Plan. As in recent years, the stratification definition would be based on monitoring method (Observer, EM Fixed Gear, EM Trawl), Fishery Management Plan (BSAI, GOA), and gear type that combines hook-and-line and pot gear (Fixed, Trawl). The 8 recommended partial coverage strata for 2026 are:
    - Observed fixed gear trips in the GOA (OB FIXED GOA)
    - Observed fixed gear trips in the BSAI (OB FIXED BSAI)
    - Observed trawl gear trips in the GOA (OB TRW GOA)
    - Observed trawl gear trips in the BSAI (OB TRW BSAI)
    - EM fixed gear trips in the GOA (EM FIXED GOA)
    - EM fixed gear trips in the BSAI (EM FIXED BSAI)
    - EM trawl gear deliveries in the GOA (EM TRW GOA)
    - Fixed-gear vessels less than 40 ft LOA and vessels fishing with handline, jig, troll and dinglebar troll gear (Zero coverage)
- Improve trip closing in ODDS for 2027.
    - Automated reminders to close or cancel pending trips that have surpassed planned fishing dates. Many trips are logged but left pending at the end of the year, making it difficult to tell whether they were actually fished. This is especially an issue for the *EM FIXED* strata because if a selected trip is left pending, it is unknown whether the hard drive for the trip should be received by reviewers.
    - NMFS is considering requiring a landing report ID, trips to be closed in the order they were logged, and/or other information to close fixed-gear strata trips to improve record keeping.

EM Video Review:

- NMFS should continue to collaborate with the PSMFC to monitor video review progress and enable a review strategy that will result in EM video review times that result in the most useful information for the most number of trips for a given cost.
- To maximize data utility, NMFS, in collaboration with PSMFC, will continue to develop specific prioritization rules that can be used to allocate review effort to the fisheries, gear types, times and areas that are the most dependent on EM data for management needs.

Fixed-gear EM:

- Maintain an EM selection pool composed of up to 176 fixed gear vessels, which would maintain the size of the EM pool from 2026. NMFS recommends prioritizing placement in the EM selection pool based on vessel size, fishing effort, minimizing data gaps, and cost efficiency.
- If a vessel operator had repeated problems with EM system reliability or video quality or has failed to comply with the requirements in their Vessel Monitoring Plan, NMFS may disapprove a Vessel Monitoring Plan and the vessel may be removed from the EM pool.

- The agency will continue to review the cost effectiveness of individual EM vessels and criteria to remove vessels from the fixed-gear EM pool or deny vessels from the trawl EM category. Criteria for continued inclusion in these EM programs will be specified in the 2027 ADP.

EM Development:

- NMFS will continue to collaborate with industry partners on EM development and cost efficiency projects. NMFS will work with Council's monitoring committees (FMAC and PCMAC) to coordinate on EM development priorities and potential grant proposals to National Fish and Wildlife Foundation.
- For budget planning during the development of the Annual Deployment Plan, NMFS needs advance notice by processing plants accepting trawl EM pollock deliveries from catcher vessels of their needs for partial coverage observers in the upcoming fishing year. Regulations at 50 CFR 679.51(b)(3)(i) require notice by November 1 of the year prior to the year in which they intend to receive deliveries from catcher vessels or tender vessels in the trawl EM category. Early notification by processing plants is necessary, and allows NMFS to plan accordingly and develop a cost-efficient shoreside monitoring plan. Shoreside processors that do not notify NMFS by November 1 will be ineligible to receive trawl EM deliveries in the upcoming fishing year. Plant operating plans for the following year can be provided to NMFS during annual meetings between the agency and industry at the annual Fisheries Monitoring Advisory Committee Meeting (April-May), the annual Partial Coverage Monitoring Advisory Committee Meeting (September), during the annual spring (May-June) or fall (Sept-Oct) NPFMC meetings, or by directly contacting the FMA Division Director and FMA Analytical Program Manager. The Annual Planning and Reporting Process for the Annual Deployment Plan and the Annual Report can be found in Chapter 1, section 1.2 of this report.

Appendices

A brief summary of each appendix is provided here.

- **Appendix A Response to SSC Recommendations from 2024 Annual Report.** Continued EM expansion and the displacement of observer coverage continues to cause data quantity and quality concerns among data users and the SSC. The impact to stock assessments or in-season management are not known. NMFS anticipates that the SAFIR project will provide one tool assessment authors could use to better understand the impacts.
- **Appendix B Multivariate Observer Effects Model.** The Multivariate Observer Effects (MOE) framework represents a significant advancement in fisheries science because it is the first of its kind to test for observer effects in the catch of multiple species in aggregate. This novel method directly addresses the core management challenge - how the entire multispecies catch differs between monitored and unmonitored trips - by providing a single, community-level p-value that is easily interpreted. This complements and improves upon the separate, single-variable tests used in Chapter 3. By

simultaneously analyzing all species, the framework achieves greater power to detect subtle patterns than when examining each species separately. In addition to identifying potentially problematic species and stratum combinations, the framework provides fishery managers a direct metric of the effect across the entire fleet, and provides a credibility score for resulting bias estimates.

- **Appendix C** introduces the interspersion index which is the proportion of fixed trips in the fixed gear EM and Zero coverage pools that were nearby observed trips in space and time. This metric will be used to quantify the extent to which the data collected by observers is representative of the fishing within other data-dependent coverage pools.
- **Appendices D and E** are reports on the EM data review and quality for the fixed-gear EM fleet (Appendix D) and trawl EM fleet (Appendix E). These reports were provided by the Pacific States Marine Fisheries Commission.

1. Introduction

This annual report provides information, analysis, and recommendations based on deployment of observers and Electronic Monitoring (EM) systems in the federal North Pacific commercial groundfish and Pacific halibut fisheries off Alaska during 2025. Section 313 of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1862) authorizes the North Pacific Fishery Management Council (Council), in consultation with National Marine Fisheries Service (NMFS), to prepare a fishery research plan. NMFS implemented the Council's fisheries research plan through the North Pacific Observer Program (Observer Program). The Observer Program provides the regulatory framework for stationing observers and EM systems to collect data necessary for the conservation, management, and scientific understanding of the commercial groundfish and Pacific halibut fisheries of the Bering Sea and Aleutian Islands (BSAI) and Gulf of Alaska (GOA) management areas.

The Observer Program is the nation's largest observer program and is responsible for monitoring a fleet of nearly a thousand vessels that fish a combination of hook-and-line, pot, and trawl gear across the Alaska Exclusive Economic Zone (EEZ) area of roughly 3.77 M km^2. Data collection through the Observer Program provides a reliable and verifiable method for NMFS to gain fishery discard and biological information on fish, and data concerning seabird and marine mammal interactions with fisheries. These data contribute to the best available scientific information used to manage the fisheries in the North Pacific and meet data collection mandates of the Magnuson-Stevens Act, Marine Mammal Protection Act, and Endangered Species Act. Observers and EM systems provide fishery-dependent information that is used to estimate total catch and interactions with protected species. Managers use these data to manage groundfish and prohibited species catch within established limits and to document and reduce fishery interactions with protected species. Much of this information is expeditiously available (e.g., daily or at the end of a trip, depending on the type of vessel) to ensure effective management. Scientists also use fishery-dependent data to assess fish stocks, evaluate marine mammal interactions with fishing gear, characterize fishing impacts on habitat, and provide data for fisheries and ecosystem research and fishing fleet behavior.

All vessels and processors that participate in federally managed or parallel groundfish and halibut fisheries off Alaska (except catcher vessels delivering unsorted codends to a mothership) are assigned to one of two categories: 1) the full observer coverage category (full coverage), or 2) the partial observer coverage category (partial coverage). Vessels and processors in the full coverage category have at least one observer present during all fishing or processing activity. Vessels and processors in the partial coverage category are assigned observer or EM coverage according to the scientific sampling plan described in the Annual Deployment Plan (ADP) developed by NMFS in consultation with the Council. Since 2013, observers have been deployed in the partial coverage category using established random sampling methods to collect data on a statistically reliable sample of fishing vessels in the partial coverage category. Some vessels and processors may be in full coverage for some trips and partial coverage for other trips, depending on the observer coverage requirements for specific fisheries.

Observer coverage in the full coverage category is industry-funded through a pay-as-you-go system whereby fishing vessels procure observer services through NMFS-permitted observer service providers. Observer coverage in the partial coverage category is funded through a system of fees collected under authority of Section 313 of the Magnuson-Stevens Act. The fee is based on the ex-vessel value of groundfish and Pacific halibut and is assessed on landings by vessels not included in the full coverage category. The system of fees fairly and equitably distributes the cost of observer coverage among all vessels and processors in the partial coverage category and is independent of the level of coverage each vessel incurs under the Annual Deployment Plan.

The current structure of the Observer Program, including the definition of full and partial coverage, random deployment methods, and the fee system has been in place since 2013 when the Observer Program was restructured and changes were implemented under Amendment 86 to the Fishery Management Plan (FMP) for Groundfish of the BSAI Management Area and Amendment 76 to the FMP for Groundfish of the GOA (Amendments 86/76)[2]. Since 2013, a series of regulatory and Fishery Management Plan (FMP) amendments have been implemented to amend the Council's fisheries research plan and make specific modifications to observer coverage requirements under the Observer Program. Past Annual Reports have more complete information on these amendments and regulatory changes, and here we identify those which took effect in 2025 and were published in 2025 (to be implemented in 2026).

- On March 27, 2025, NMFS published a final rule to implement regulations governing the use of longline pot gear by hook-and-line catcher/processors when directed fishing for Greenland turbot in the Bering Sea (90 FR 13842). This rule was effective on April 28, 2025. This action included gear marking, recordkeeping, and reporting requirements.
- On July 29, 2024, NMFS published a final rule to implement amendment 126 to the BSAI FMP and amendment 114 to the GOA FMP (89 FR 60796). This final rule implemented an EM program for pelagic trawl pollock catcher vessels and tender vessels delivering to shoreside processors and stationary floating processors in the Bering Sea, Aleutian Islands, and GOA began on January 1, 2025. As part of this regulatory package, there were modifications to observer provider regulatory responsibilities at § 679.52. Fax was removed as a form of electronic communication, frequency of updating observer logistics information to the observer program was changed, and clarifying language was added in regards to observer providers requirements to enforce their behavior and conduct policies.

[2] The final rule for Amendments 86/76 was published in the Federal Register on November 21, 2012 (77 FR 70062).

1.1. Monitoring Coverage Categories and Coverage Levels

1.1.1. Full Coverage

Vessels and processors in the full observer coverage category must comply with observer coverage requirements at all times when fish are harvested or processed. Specific requirements are defined in regulation at 50 CFR § 679.51(a)(2). The full coverage category includes the following:

- Catcher/processors (with limited exceptions);
- Motherships;
- Catcher vessels that are participating in programs that have transferable prohibited species catch (PSC) allocations as part of a catch share program;
- Catcher vessels that are using trawl gear and have requested placement in the full coverage category for all fishing activity in the BSAI for one year; and
- Inshore processors receiving or processing Bering Sea pollock

Independent estimates of catch, at-sea discards, and PSC -- among other data -- are collected aboard all catcher/processors and motherships in the full observer coverage category. Requiring at least one observer on every catcher/processor means that at-sea discards and PSC estimates are not based on self-reported data or extrapolated observer data from other vessels. Catcher vessels participating in programs with transferable PSC allocations as part of a catch share program also are included in the full coverage category. These programs include Bering Sea pollock (both American Fisheries Act and CDQ programs), the groundfish CDQ fisheries (CDQ fisheries other than Pacific halibut and fixed gear sablefish; only vessels greater than 46 ft. LOA), and the Central GOA Rockfish Program.

Independent observer data are important under these catch share programs because quota share recipients are prohibited from exceeding any allocation, including, in many cases, transferable PSC allocations. Allocations of exclusive harvest privileges can create increased incentive to misreport as compared to open-access or limited-access fisheries. Transferable PSC allocations also present challenges for accurate accounting because these species are not retained for sale and they represent a potentially costly limitation on the full harvest of the target species. To enforce a prohibition against exceeding a transferable target species or PSC allocation, NMFS must demonstrate that the quota holder had catch amounts that exceeded the allocation. Supporting a quota overage case for target species or PSC that could be discarded at sea from an unobserved vessel requires NMFS to rely on either industry reports or estimated catch based on discard rates from other similar observed vessels. These indirect data sources create additional challenges to NMFS in an enforcement action. In addition, the smaller the pool from which to draw similar observed vessels and trips, the more difficult it is to construct representative at-sea discard and PSC rates for individual unobserved vessels.

Inshore processors receiving deliveries of Bering Sea pollock are in the full coverage category because of the need to monitor and count salmon under transferable PSC allocations.

1.1.2. Partial Coverage

The partial coverage category (50 CFR 679.51(a)) in the Pacific halibut and groundfish fisheries off Alaska includes the following:

- Catcher vessels designated on a Federal Fisheries Permit when directed fishing for groundfish in federally managed or parallel fisheries, except those in the full coverage category.
- Catcher vessels when fishing for halibut individual fishing quota (IFQ) or sablefish IFQ (there are no PSC limits for these fisheries).
- Catcher vessels when fishing for halibut CDQ, fixed-gear sablefish CDQ, or groundfish CDQ using pot or jig gear; or catcher vessels less than or equal to 46 ft. LOA using hook-and-line gear fishing for groundfish.
- Catcher/processors that meet criteria that allows assignment to the partial coverage category.
- Shoreside or stationary floating processors, except those in the full coverage category.

Each year, NMFS prepares an Annual Deployment Plan (ADP) that describes the science-driven method for deployment of observers and EM systems to support statistically reliable data collection in the partial coverage category. Table 1-1 summarizes the partial observer coverage sampling strata that have been implemented through the ADP process since 2013.

1.2. Annual Planning and Reporting Process

Amendments 86/76 established an annual process of 1) developing an Annual Deployment Plan (ADP) that describes plans and goals for observer and EM systems deployment in the partial coverage category in the upcoming year, and 2) preparing an annual report providing information and evaluating performance in the prior year.

The ADP describes how observer coverage and EM systems will be assigned to vessels and processors in the partial observer coverage category in the upcoming year. NMFS develops each ADP in consultation with the Council after reviewing an evaluation of deployment performance for the previous year. NMFS and the Council created the ADP process to provide flexibility in the deployment of observers and EM to gather reliable data for estimation of catch in the groundfish and halibut fisheries off Alaska. The ADP process ensures that the best available information is used to evaluate deployment, including scientific review and Council input, to annually determine deployment methods.

In general, the timing of the ADP process enables the Council and its Advisory Panel and Scientific and Statistical Committee to review the analysis used to prepare the draft ADP as well as Plan Teams and Fishery Monitoring Committees recommendations and any input from the public in September and October of each year. In December, NMFS completed the ADP for the upcoming year by determining the final deployment design and computing the selection rates using a refined estimate of the total budget and expected fishing effort. NMFS also evaluates whether the Environmental Assessment (EA) prepared for Observer Program Restructuring (NPFMC and NMFS 2011) needs to be supplemented for the ADP. In 2014, NMFS prepared a

Supplementary Information Report explaining why the EA did not need to be supplemented. In 2015, NMFS prepared a Supplemental Environmental Assessment (NMFS 2015) in response to a Court Order to consider whether the restructured Observer Program would yield reliable, high-quality data given likely variations in costs and revenues.

The annual report provides descriptive information, analysis, and recommendations based on observer deployment in the previous year. An important component of the annual report is to evaluate deployment performance including statistical evaluation of the deployment of observers and EM in the previous year. The purpose of the deployment performance review is to evaluate whether observer and EM deployment and monitoring goals detailed in regulation and the ADP were achieved and to identify recommendations for future observer and EM deployment to promote the collection of data necessary to conserve and manage the groundfish and halibut fisheries. The annual report is an important source of information in developing the proposed ADP for the next year and informing potential regulatory changes to the Observer Program. NMFS presents the annual report to the Council (including the Council's Monitoring Committees, Advisory Panel, and Scientific and Statistical Committee) and to the public in June of each year. The Council may recommend adjustments to observer deployment to prioritize data collection based on conservation and management needs. The Council and public provide input to NMFS on the annual report and ADP. This input may be factored into the evaluation of the partial coverage sampling design, the next annual report, or other reports or analyses for the Council.

1.3. Summary of the 2025 Annual Deployment Plan

In November, 2024, NMFS released the final 2025 ADP (NMFS 2024) that created a stratification definition based on monitoring method (Observer, EM Fixed Gear, EM Trawl) and Fishery Management Plan (FMP) area (BSAI, GOA), and gear that combines Hook-and-line and pot gear (Fixed, Trawl). The 2025 fishing year represented the first year of the regulated pollock pelagic trawl EM program. There were 10 sampling strata implemented in 2025 (Table 1-1). Selection rates (rounded to the nearest whole number) were:

- Observer Trip Selection
    - Fixed-gear BSAI - 20%
    - Fixed-gear GOA - 6%
    - Trawl BSAI - 40%
    - Trawl GOA - 15%
- Fixed-Gear EM trip selection
    - Fixed-gear EM BSAI - 48%
    - Fixed-gear EM GOA - 11%
- Trawl EM
    - Trawl EM GOA - 100% EM coverage at-sea & shoreside salmon monitoring; 33% biological monitoring
    - Trawl EM BSAI - 100% EM coverage at-sea & shoreside salmon & biological monitoring

- Zero Coverage - 0%
- Observer full coverage - 100%

The final ADP implemented the Proximity allocation method to deploy observers and EM (NMFS, 2023a & b). The Proximity allocation method is designed to spread sampled trips throughout the fisheries to increase the proportion of trips that are sampled or near a sampled neighbor and to be consistent between strata within a specified budget, while also protecting against small sample sizes within a stratum. As such, the Proximity allocation method is precautionary with respect to obtaining data from all types of fishing activity (decreasing data gaps) while protecting against high variance associated with low sample sizes. This allocation method was applied to all sampled strata (i.e., does not apply to zero selection stratum) except the trawl EM category.

The trawl EM category was composed of all trips fished under a newly regulated electronic monitoring program for pollock catcher vessels using pelagic trawl gear in the Bering Sea and Gulf of Alaska. The goal for the trawl EM program is compliance monitoring of maximized retention to ensure that shoreside observers have access to complete, unsorted trip-level catch to account for PSC catch and to sample for biological data collection. Catch accounting for the vessel's catch and bycatch was done via eLandings reports and shoreside plant observers. For the Trawl EM strata in the GOA, in 2025, NMFS implemented a sampling rate of EM deliveries by shoreside fishery observers of 33% and 100% accounting of salmon. In the BSAI, NMFS implemented full coverage sampling so that all offloads from Trawl EM trips could be sampled for salmon, halibut, and biological data.

Table 1-1 -- Sampling strata and selection pools in the partial coverage category from 2013 to the present. The partial coverage selection rates set through the Annual Deployment Plan are noted and the realized coverage rates evaluated in each Annual Report are noted in parentheses. PreIm = Pre-implementation, prior to a fully regulated program; CP = catcher/processor vessel; CV = catcher vessel; GOA= Gulf of Alaska; BS = Bering Sea; H&L = hook-and-line gear; LOA = vessel length overall.

Year	Observer Trip Selection					Fixed-Gear EM trip selection pool		Trawl EM 100% EM at-sea		Observer vessel selection pool	No selection pool
	Trip-selection across all ports Observer coverage required on all randomly selected trips				Port-based Trip Selection *	EM required on randomly selected		GOA	BSAI		Observer coverage not required
2026	Fixed-gear BSAI: 53%	Fixed-gear GOA: 20%	Trawl BSAI: 29%	Trawl GOA: 10%	n/a	Fixed-gear EM GOA: 17%	Fixed-gear EM BSAI: 39%	100% shoreside salmon monitoring; & 33% collection of biologicals	100% shoreside salmon monitoring; & 100% collection of biologicals		Vessels <40' LOA and Jig gear
2025	Fixed-gear BSAI: 20% (18%)	Fixed-gear GOA: 6% (6%)	Trawl BSAI: 40% (42%)	Trawl GOA: 15% (16%)		Fixed-gear EM GOA: 11% (9%)	Fixed-gear EM BSAI: 48% (53%)				

<table>
<tr><td rowspan="2">Year</td><td colspan="4">Observer Trip Selection</td><td rowspan="2">Fixed-Gear EM trip selection pool
EM required on randomly selected</td><td colspan="2">Trawl EM
100% EM at-sea</td><td rowspan="2">Observer vessel selection pool</td><td rowspan="2" colspan="2">No selection pool
Observer coverage not required</td></tr>
<tr><td colspan="3">Trip-selection across all ports
Observer coverage required on all randomly selected trips</td><td>Port-based Trip Selection *</td><td>GOA</td><td>BSAI</td></tr>
<tr><td>2024</td><td>Fixed-gear BSAI: 44% (48%)</td><td>Fixed-gear GOA: 13% (12%)</td><td>Trawl BSAI: 72% (80%)</td><td>Trawl GOA: 21% (22%)</td><td rowspan="3"></td><td>Fixed-gear EM GOA: 24% (23%)</td><td>Fixed-gear EM BSAI: 74% (49%)</td><td rowspan="4">33% shoreside salmon monitoring;
&
33% collection of biologicals</td><td rowspan="4"></td><td rowspan="4">n/a</td><td colspan="2" rowspan="3"></td></tr>
<tr><td>2023</td><td>Trawl: 22.7% (32.3)</td><td colspan="2">H&L 17.9% (19.4)</td><td>Pot: 17.1% (17.8)</td><td colspan="2" rowspan="3">Fixed gear (H&L and Pot) EM: 30%</td></tr>
<tr><td>2022</td><td>Trawl 29.7%
(29)</td><td colspan="2">H&L 19% (14.6)</td><td>Pot 17.5%
(18.1)</td></tr>
<tr><td>2021</td><td colspan="4">Sep. 1 - Dec. 31:
Trawl: 21% (28.2) H&L 18% (17.2) Pot 18% (20.5)</td><td>Deployment in all ports</td><td colspan="2"></td><td colspan="2"></td></tr>
</table>

<table>
<tr><th rowspan="2">Year</th><th colspan="6">Observer Trip Selection</th><th rowspan="2">Fixed-Gear EM trip selection pool
EM required on randomly selected</th><th colspan="2">Trawl EM
100% EM at-sea</th><th rowspan="2">Observer vessel selection pool</th><th colspan="2" rowspan="2">No selection pool
Observer coverage not required</th></tr>
<tr><th colspan="5">Trip-selection across all ports
Observer coverage required on all randomly selected trips</th><th>Port-based Trip Selection *</th><th>GOA</th><th>BSAI</th></tr>
<tr><td></td><td colspan="5">Jan. 1 - Aug. 31: Limited waivers due to COVID-19</td><td>Deployment in 13 ports</td><td></td><td></td><td></td><td></td><td rowspan="4">Vessels <40’ LOA and Jig gear</td><td rowspan="4">EM Innovation Research
2-4 vessels</td></tr>
<tr><td rowspan="3">2020</td><td colspan="5">Mar. 26 - Jun. 30: Waivers issued due to COVID-19</td><td>Deployment in 13 ports</td><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3"></td></tr>
<tr><td colspan="5">Mar. 26 - Jun. 30: Waivers issued due to COVID-19</td><td>Deployment in Kodiak only</td></tr>
<tr><td colspan="5">Jan. 1 – Mar. 25:
Trawl: 20% (22.4) H&L: 15% (13.4) Pot: 15% (15.5)</td><td>Deployment in all ports</td></tr>
<tr><td>2019</td><td>Trawl: 24% (25.2)</td><td>Trawl Tender: 27% (35.7)</td><td>H&L: 18% (17.6)</td><td>Pot: 15% (14.0)</td><td>Tender Pot: 16% (29.5)</td><td>n/a</td><td colspan="3">n/a</td><td colspan="2"></td></tr>
</table>

<table>
<tr><th rowspan="2">Year</th><th colspan="6">Observer Trip Selection</th><th rowspan="2">Fixed-Gear EM trip selection pool
EM required on randomly selected</th><th colspan="2">Trawl EM
100% EM at-sea</th><th rowspan="2">Observer vessel selection pool</th><th colspan="2" rowspan="2">No selection pool
Observer coverage not required</th></tr>
<tr><th colspan="5">Trip-selection across all ports
Observer coverage required on all randomly selected trips</th><th>Port-based Trip Selection *</th><th>GOA</th><th>BSAI</th></tr>
<tr><td>2018</td><td>Trawl 20%
(20.3)</td><td>Trawl Tender: 17%
(35.0)</td><td>H&L: 17%
(15.5)</td><td>Pot: 16%
(15.5)</td><td>Tender Pot: 17%
(29.0)</td><td rowspan="3">n/a</td><td>H&L EM: 30%</td><td>Pot EM PreIm: 30% (not used in catch accounting)</td><td colspan="2" rowspan="3">n/a</td><td rowspan="3">n/a</td><td rowspan="3">Vessels <40’ LOA and Jig gear</td><td>EM Innovation Research
2-4 vessels</td></tr>
<tr><td>2017</td><td>Trawl 18%
(20.7)</td><td>Trawl Tender 14%
(18.8)</td><td>H&L 11%
(12.0)</td><td>H&L Tender 25%
(0)</td><td>Pot: 4%
(7.7)</td><td>Pot Tender 4%
(5.3)</td><td colspan="2">n/a</td><td rowspan="2">EM PreIm
60 vessels</td></tr>
<tr><td>2016</td><td colspan="2">Trawl: 28%
(28.0)</td><td colspan="2">H&L: 15%
(15.0)</td><td colspan="2">Pot: 15%
(14.7)</td><td colspan="2">n/a</td></tr>
</table>

<table>
<tr><td rowspan="2">Year</td><td colspan="3">Observer Trip Selection</td><td rowspan="2">Fixed-Gear EM trip selection pool
EM required on randomly selected</td><td colspan="2">Trawl EM
100% EM at-sea</td><td rowspan="2">Observer vessel selection pool</td><td colspan="2" rowspan="2">No selection pool
Observer coverage not required</td></tr>
<tr><td colspan="2">Trip-selection across all ports
Observer coverage required on all randomly selected trips</td><td>Port-based Trip Selection *</td><td>GOA</td><td>BSAI</td></tr>
<tr><td>2015</td><td>Large Vessel: 24% (23.4)
Trawl CVs, Small CPs,
H&L/Pot CVs ≥ 57.5’</td><td>Small Vessel: 12% (11.2)
H&L/Pot CVs >40’ and <57.5’</td><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3" colspan="2"></td><td></td><td rowspan="2"></td><td>EM PreIm 12 vessels</td></tr>
<tr><td>2014</td><td colspan="2">All Trawl CVs and H&L/Pot vessels ≥ 57.5’ LOA: 16% (15.1)</td><td>H&L/Pot CVs >40’ and <57.5’: 12% (15.6)</td><td>Voluntary EM</td></tr>
<tr><td>2013</td><td colspan="2">All Trawl CVs and H&L/Pot vessels ≥ 57.5’ LOA: 14.5% (14.8)</td><td>H&L/Pot CVs >40’ and <57.5’: 11% (10.6)</td><td colspan="2">Vessels <40’ LOA and Jig gear</td></tr>
</table>

*Observer coverage on randomly selected trips in specific ports. This protocol was implemented in response to the COVID-19 pandemic when travel and lodging conditions in specific ports allowed observers to meet and maintain applicable health mandates for deployment into the commercial fisheries.

2. Fees and Budget

2.1. Budget for Partial Coverage Category in 2025

Section 313(d) of the Magnuson-Stevens Act authorizes the creation of the North Pacific Fishery Observer Fund ("Observer Fund") within the U.S. Treasury. The Observer Fund has been collected and tracked every year since 2013. The following section provides information on the amount of fees that accrued on landings made in 2025 that are anticipated to be collected in 2026, as well as the amount of fees collected in 2024 that were obligated to the partial coverage contract to pay for sea days in 2025.

Fee billing statements for 2025 were needed for 93 processors and registered buyers in January 2026. A total of $2,975,097 in observer fees were billed. At the time of this publication, two processors or registered buyers had not yet paid observer fees totaling $166,316. To collect delinquent fees, three 30-day notices were mailed in March and additional notices will be mailed as needed. Processors submitting late fee payments were charged a one-time administrative fee of $25 plus interest on the observer fees with each notice.

The sequestration of funds initiated under the 2011 Budget Control Act continues to affect the Observer Fund. Each year, the Observer Fund is subject to sequestration, meaning a percentage of the fee revenue is held in the Fund. NMFS tracks sequestered funds and has typically received the previous year's sequestered funds. NMFS continues to track these expected funds allocations and will continue to work with the Department of Treasury to receive these.

Table 2-1 describes the amounts from the Observer Fund used to support the observer deployment contract in the 2015–2025 fishing years. The 2024 Annual Report contains the data from years earlier than 2015. Revenue from the Observer Fund is also used to support the partial coverage fixed-gear Electronic Monitoring (EM) program consistent with the NMFS Policy Directive on Cost Allocation in Electronic Monitoring Programs. In 2025, the Observer Fund was also used to support the regulated partial coverage trawl EM program.

2.2. Summaries of Fees Collected from 2025

2.2.1. Partial Coverage Fee

Observer coverage and electronic monitoring (EM) for the partial coverage category is funded through a system of fees based on the ex-vessel value of groundfish and Pacific halibut, with potential supplements from federal appropriations. The "observer fee" pays for the following: at-sea observers, shoreside observers, the deployment and support of EM equipment on selected vessels in small fixed-gear (nontrawl) EM and in GOA pollock pelagic trawl EM, and EM video review and data storage for trips in the partial coverage category. The observer fee is assessed on landings accruing against a federal total allowable catch (TAC) for groundfish or a commercial halibut quota made by vessels that are subject to federal regulations and not included in the full coverage category. Therefore, a fee is only assessed on landings of groundfish from vessels

designated on a Federal Fisheries Permit or from vessels landing IFQ halibut, CDQ halibut, or IFQ sablefish. Within the subset of vessels subject to the observer fee, only landings accruing against the federal TAC are included in the fee assessment.[3]

The observer fee equal to 1.65% of the ex-vessel value is assessed on the landings of groundfish and halibut subject to the fee.[4] Ex-vessel value is determined by multiplying the standard price for groundfish by the round weight equivalent for each species, gear, and port combination, and the standard price for halibut by the headed and gutted weight equivalent. The standard ex-vessel prices used for 2025 fee assessments were published in the *Federal Register* on December 26, 2024 (89 FR 104997).[5] Tables 2-2, 2-3, and 2-4 summarize the observer fees that accrued for 2025 for all areas, the Gulf of Alaska, and the Bering Sea/Aleutian Islands, respectively. Fees are $521,215 lower in 2025 than the amount assessed in 2024. A decrease in fees is seen for halibut, sablefish, and "other species" landings. The decrease in these fees are due to lower standard prices, on average, in 2025, and a decrease in the amount of halibut catch subject to fees. The fees increased in 2025 for Pacific cod and pollock landings, predominately due to an increase in the amount of catch subject to the fee.

Table 2-5 also summarizes fees by area, but differentiates the type of monitoring the vessel was subject to and which selection pool or strata the vessel was in when the fees accrued. In 2025, trips with at-sea observers contributed $1,635,214 (54.9%) to the fees; those with electronic monitoring $1,117,530 (37.6%), and trips with no monitoring $222,353 (7.5%). The proportion of fees paid by trips with at-sea observers is a decrease from 57.7% in 2024 and is an increase for trips with electronic monitoring (35.0% in 2024).

2.2.2. BSAI Trawl Electronic Monitoring Video Review Fee

The owner or operator of a vessel in the full coverage trawl EM category is responsible for contracting with a permitted EM hardware service provider to procure, install, and maintain EM equipment on their vessel. However, a new full coverage EM review fee was implemented with the regulated Trawl EM program (89 FR 60796, July 29, 2024)[6] to pay for video review services for vessels in the full coverage trawl EM category. This new fee will be used by NMFS to pay for the costs of data review, storage, and transmission of EM data for vessels in the full coverage trawl EM category. NMFS will divide the cost for the year equitably among full coverage participants in the trawl EM category based on each vessel's pollock catch. The video review fee for 2025, the first year as a regulated program, was $226,378. It was billed to 44 vessel owners in

[3] A table with additional information about which landings are and are not subject to the observer fee is in NMFS regulations at 679.55(c) (CFR 679.55 Observer Fees) and shown on page 2 of an informational bulletin available online at: Observer Fee Collection

[4] Final Rule: Fee Adjustment to 1.65% (85 FR 41424, July 10, 2020). Available online at: 85 FR 41424

[5] Available online at: 89 FR 104997

[6] Available online at: 89 FR 60796

2026. The full coverage EM review fee was 0.12% of the ex-vessel value of the fishery, which is less than 2%, as required under section 313 of the Magnuson-Stevens Act.

2.3. Cost

2.3.1. Program Structure

The Fisheries Monitoring and Analysis Division (FMA) at the Alaska Fisheries Science Center (AFSC) oversees the Observer Program and is responsible for a suite of activities that support the overall observer data collection in the groundfish and halibut fisheries in Alaska, inclusive of EM programs which supplement or are used in lieu of observer coverage. FMA has staff located in Seattle, Washington, and in Anchorage, Kodiak and Dutch Harbor, Alaska. The AFSC allocates a budget to FMA each fiscal year to support these activities. FMA staff are responsible for training, briefing, debriefing, and oversight of observers who collect catch data on board fishing vessels and at shoreside processing plants. FMA is also responsible for quality control/quality assurance of observer data and EM, conducting research and development of fishery monitoring technologies, and providing a host of fishery-dependent data products and services.

The FMA Division is organized into a Directorate and five programs: Observer Training and Curriculum Development; Debriefing and Data Quality Control; Information and Monitoring Technologies; Analytical Services; and Field and Operations Management

Observer Training and Curriculum Development ensures that observers are properly trained and equipped for their deployments. Observers are trained to follow FMA's established data collection procedures while deployed on commercial fishing vessels or stationed at processing facilities. Training materials are updated annually in response to changes in regulations and data needs for fishery management, stock assessment, and ecosystem-based fishery modeling efforts. Training methods are routinely updated to best convey the complex topics and concepts to the observer workforce. Program staff also manage FMA's extensive sampling gear inventory to ensure a sufficient supply for observers throughout the year at all FMA office locations and develop inventory control systems and policies to maintain safety equipment, provide sampling equipment readiness, and monitor equipment losses.

Debriefing and Quality Control assures observers are provided support throughout their deployment and that FMA's established data collection procedures were properly followed during observer deployments. Staff members assist at-sea observers through communications (referred to as in-season advising) through secure software for answering questions, correcting data errors, and ensuring safety concerns are addressed. Data quality control activities, both in-season and post-deployment include data entry, data validation, and observer support, as well as industry, interagency, and interdivisional support. Staff members install and maintain the custom software (ATLAS) which is used to transmit observer information and data, ensure observers are trained on the use and configuration of software, and provide near real-time data quality control and guidance for observers using these systems. In addition, they document and evaluate each

observer's data collection methodologies through interviews, electronic vessel surveys, and written descriptions submitted by the observer. Staff conduct data quality control checks on data collected by fishery observers by verifying the accuracy of recorded data, identifying errors, and ensuring observers make the necessary corrections.

Information and Monitoring Technologies develops custom software that supports the recording of fishing effort, location, species composition and biological data collected by fishery observers from North Pacific commercial fisheries. This software enables the transmission, validation, and loading of those data, the editing and reporting of current and vetted data sets; observer logistics and contract management; and the recording of bird and marine mammal data collections for both internal and external use. Staff also support the ingestion of EM data into FMA's data structure and develop data quality control measures within these databases. In collaboration with FMA analysts, staff working under this activity developed and continue to support ODDS which allows vessel owners to register, edit, and close fishing trips. This application was developed with independent modules for FMA management, the partial coverage observer services provider — including the ODDS call center, EM service providers, and each vessel owner.

Analytical Services collaborates with scientists throughout the AFSC to ensure that observer data meet the needs of stock assessment and ecosystem-based fishery modeling efforts. In addition, analysts perform independent research aimed at identifying bias and variances associated with fishery-dependent sampling. Analysts work closely with the Alaska Regional Office and Council staff to ensure that FMA provides relevant, high-quality information for fisheries management and in support of requests from the Council and other stakeholders.

Field and Operations Management runs field stations in Anchorage, Dutch Harbor, and Kodiak to provide support to observers and industry members in-season. Staff strategically stationed in these locations provide a wide variety of assistance in the field. The Operations Management Program also oversees the partial coverage deployment and funding to ensure the infrastructure and contracts are in place to meet the observer deployment requirements of BSAI Amendment 86 and GOA Amendment 76. FMA staff provide oversight of the fishery observer services provider contract, serving as the primary point of contact for the contract provider and FMA. The contract provider and FMA staff coordinate with industry, schedule vessel inspections as needed, and participate in decision-making for partial coverage vessels that are selected for coverage but request a release from the requirement.

Program Field Offices

The Anchorage Field Office maintains an inventory of complete sampling and safety gear sets for observers redeploying directly from the Anchorage office along with all debriefing infrastructure. The FMA Anchorage Field office also serves as the FMA Electronic Monitoring operational center that oversees the operations of the Fixed Gear Electronic Monitoring Program, assists with the Trawl EM program, and the Alaska Marine Mammal Observer Program. This is due to its proximity to Alaskan ports, the North Pacific Fisheries Management Council offices, access to Alaska Regional Office EM colleagues, the Anchorage Alaska Department of Fish and

Game offices and allows for an extended hour to conduct services and outreach due to being in Alaska.

The Kodiak Field Office provides support to observers primarily assigned to vessels and processing plants in the GOA. Support includes conducting pre-cruise briefings with vessel representatives and observers prior to the observer's first trip onboard, conducting mid-cruise debriefings with observers to address any safety concerns on their vessels, reviewing their data collection methodology and recorded data, providing in situ problem resolution, and issuing sampling and safety equipment. In addition, staff receive, track, and ship biological samples that are collected by observers in support of resource management, scientific research, and observer training. Staff also serve as the primary FMA contact for observed vessels and processing facilities in the GOA and therefore played a key role in coordinating on the GOA portion of the pelagic trawl EM program since 2020.

The Dutch Harbor Field Office provides support primarily to observers assigned to vessels and processing facilities in the Bering Sea and Aleutian Islands. Support includes conducting pre-cruise briefings with vessel representatives and observers prior to the observer's first trip onboard, conducting mid-cruise debriefings with observers to address any safety concerns on their vessels, reviewing data collection methodology and recorded data, providing in situ problem resolutions, and issuing sampling and safety equipment. In addition, staff conduct observer sample station and scale inspections on board commercial fishing vessels to ensure the sample stations meet the standards required in federal regulations. Staff also serve as the primary FMA contact for observed vessels and processing facilities in the Bering Sea and Aleutian Islands and have supported the BSAI portion of the pelagic trawl EM regulated program since 2020.

EM was formed as a unique activity within FMA under Field and Operations Management starting in 2013 and has continued to dedicate staff time to the development and integration of electronic technologies in Alaska fisheries. More information about the EM innovation results is provided in section 3.4.

Division Directorate staff emphasize coordinating and prioritizing resources across programs and activities, as well as managing links between the programs and overall costs. In addition, overall management and supervision of staff, budget, and contracting is required to ensure resources are appropriately allocated and staff understand their responsibilities and priorities. Staff provide advice to support policy development, decision-making, and regulatory and program development by NMFS and the Council. They also provide guidance and advice on policy issues, monitoring programs, and related topics at the regional, national, and international level.

2.3.2. Contract Costs for Partial Coverage

NOAA's Acquisition and Grants Office (AGO) secures and administers contracts for NMFS. FMA staff participate in contracting by initiating requirements documents, providing funding, and participating in the contract review and award process through formal source evaluation boards. The processes for federal contracts follow the Federal Acquisition Regulations (FAR)

and Commerce Acquisition Regulations (CAR). NMFS receives legal guidance on the FAR and CAR through NOAA contract attorneys and AGO staff.

After NOAA awards a contract, FMA staff participate by assigning a Contracting Officer Representative (COR) to the contract. The COR provides direct technical oversight of the contract by monitoring contract performance, identifying and resolving operational issues, and reviewing and approving invoices. While FMA is directly involved in day-to-day contract management through its assigned COR, NOAA retains full authority over the contract through their appointed Contract Officer (CO). The NOAA CO can modify, extend, cancel, and award contracts.

Contracts for observer services are awarded through a competitive process, allowing any company that provides these services to bid. The observer coverage for the first 2 years (2013 and 2014) of the partial coverage program was procured through a two-year contract awarded to AIS Inc. A second contract was awarded for the subsequent five years of the program to AIS, Inc. in April 2015. A third contract was awarded for the subsequent five years of the partial coverage program to AIS, Inc. in July of 2019. In 2024, a fourth contract was competed and subsequently awarded for up to five years of the program to AIS Inc. in September 2024.

Table 2-1 provides a summary of funds expended and observer days used since 2015. Note that past Annual Reports used funds obligated instead of funds expended to calculate an average sea day cost. An obligation of funds is a legal liability to disburse funds upon receiving the service — in this case the provision of observer coverage. Obligations of funds therefore reflect the potential quantities of service, not the cost of the realized service. Expenditures are the disbursement of funds and are directly related to the service.

In 2025, the average cost per observer sea day in the partial coverage category was $1,600 (based on the cost of $2,481,100 for 1,551 observer days; Table 2-6). The average cost per observer sea day is a combination of a daily rate, which is paid for the number of days the observer is on a vessel or at a shoreside processing plant, and reimbursable travel costs. Note that travel costs have increased over the years, and the contractor does not have control over these costs. Travel costs are reimbursed as actuals (e.g., transportation) and government established per diem rates (e.g., lodging, meals, and incidental expenses). The contractor also needs to recoup their total costs and profit through the daily sea day rate, which includes costs for days the observers are not on a boat. These days include training, travel, deployment in the field but not on a boat, and debriefing.

The average annual cost per sea day in partial coverage has ranged between $895 and $1,638 since 2014 (Table 2-6). Much of this variation is associated with the total number of sea days used, as the cost of “optional” sea days are less expensive than “guaranteed” sea days under the federal contract. Additionally, there is variation from year-to-year in travel costs which, for Alaska, tend to be higher per trip than other regions of the country.

2.3.3. Costs for Full Coverage

The costs associated with the full coverage category are paid by the commercial fishing industry directly to certified observer providers. This cost structure is referred to as a pay-as-you-go model because payment is invoiced at, or shortly after, the time of service. The services carried out by observer providers include paying observers, deploying observers to vessels and shoreside processors, recruiting, training and debriefing. There are currently three active certified full-coverage providers in Alaska: Alaskan Observers Inc. (AOI); Saltwater, Inc. (SWI); and AIS, Inc.

Since 2011, certified observer providers have been required to submit to NMFS copies of all invoices for observer coverage. Regulations require the submission of the following:

- vessel or processor name;
- dates of observer coverage;
- information about any dates billed that are not observer coverage days;
- rate charged for observer coverage in dollars per day (the daily rate);
- total amount charged (number of days multiplied by daily rate);
- the amount charged for air transportation; and
- the amount charged for any other observer expenses with each cost category separated and identified.

The invoice data were used to calculate the average cost of observer coverage in the full coverage category for 2025. The observer invoice data are confidential under section 402(b)(1) of the Magnuson-Stevens Act. Therefore, summarized information may be provided in this report only when the cost data used in the summary statistic derives from invoices submitted by at least three observer providers. This confidentiality requirement limits the detail of the average cost data that may be reported to the public, as noted below.

Billed observer days, billed vessels/plants, and fleetwide annual costs have all trended strongly downward since 2020. Daily costs per vessel/plant were up 11% in 2025 from 2024 marking the first double-digit increase year-over-year in the time-series. Figure 2-1 shows costs per day per vessel, costs per year per vessel, total fleetwide costs, total billed days, and billed vessel/plants in the full-coverage sectors 2014-2025.

In 2025:

- 98 vessels and processing facilities were billed for observer coverage in the full coverage sectors. This represents a 14% decrease from the 114 that were billed in 2024 and a 36% decrease from the time-series high of 179 in 2016. Overall this continues the recent trend that began in 2020 wherein there has been a sharp decrease in the number of vessels carrying full coverage observers (Note that the at-sea component of full coverage trawl EM costs are not reported to NMFS and therefore are not included in amounts reported here.)

- The total invoiced amount for full coverage observer services in 2025 was $10,701,753, down 1.9% from the 2024 total of $10,908,834 and down 27% from the time-series high of $14,980,340 in 2015; continuing the decreasing trend that began in 2020.
- The total number of observer days represented by these invoices was 23,789[7], an 11.7% decrease from the 26,953 that were billed in 2024 and down 30% from the time-series high of 39,963 in 2015. This continues the overall trend of reduced full observer deployment coverage days that began in 2020.

The continued decrease in billed vessels and the decreases in billed observer coverage days and total costs are, in part, due to participation in the pelagic trawl electronic monitoring (EM) program by American Fisheries Act pollock catcher vessels in the BSAI. The trawl EM program operated under an Exempted Fishing Permit (EFP) 2020–2024, and in 2025 it became a regulated program in which the participating vessel list was largely unchanged from the previous years' EFP. These vessels carried electronic monitoring in lieu of a full-coverage observer. Under the regulated trawl EM program, observers were deployed to shoreside processors to collect prohibited species and biological data from catch delivered by vessels participating in the trawl EM program. However, the number of observers that were not deployed to trawl EM vessels which were exempted from carrying an observer greatly outnumbered the observers deployed to processing plants, a significant factor contributing to the long-term overall decline in billed observer coverage days.

Thus, the overall costs of observer coverage in full coverage trawl catcher vessel fleets have been greatly reduced by participation in trawl EM. Since 2019 (the year before trawl EM was implemented as an EFP in 2020), there has been a 42% decrease in the number of billed vessels and plants, a 35% decrease in the number of billed full coverage days, a 25% decrease in total base costs, a 14% decrease in total incidental costs, and a 24% decrease in fully-loaded costs to the full-coverage sectors. The smaller decrease in costs relative to billed days (24% vs. 35% respectively) is because the costs of providing observers to plants tend to be less than the costs associated with providing observers to catcher vessels[8]. It must also be noted that observer sampling of pollock deliveries at shoreside processors is not at all equal to at-sea sampling on vessels in terms of the data outputs that are available to scientists and managers.

The average "fully-loaded" cost per day of observer coverage in the full coverage category in 2025 was $450, up 11.6% from 2024 when it was $405, and 15% higher than the time-series

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[7] This value differs from the total full coverage deployment days calculated by FMA of 25,891 days (see Chapter 4) in part because FMA's method of counting total deployment days for that chapter is computed for the "manual year" (or "fishing year"), which is the timeframe a given observer sampling manual protocol is valid. Manual year 2025 spanned from 1 December 2024 to 28 November 2025. Whereas, full coverage invoice data are produced for the actual calendar year. In addition, occasionally some non-fishing days and non-delivery days are recorded as deployment days by FMA but may not have been invoiced by the Provider.

[8] A detailed cost comparison of full coverage plant vs. full coverage vessel invoices is not provided in this report due to confidentiality restrictions - fewer than 3 observer provider companies provided observers to shoreside processors in 2025.

mean of $391. This 'fully-loaded' average combines invoiced amounts for the daily rate per observer day ("daily cost") plus all other costs for transportation and other expenses ("incidental costs"). The overall average percentage of incidental costs per day to the total cost per day across all gear types and sectors was 10.7%[9], flat from 2024, and slightly above the time-series mean of 9.8%.

Previous annual reports have shown figures and data summarizing the average costs to fishing vessels and processing facilities for full coverage observers by vessel type and gear type. In 2025 most full coverage fishery sectors were provided observers by fewer than three observer provider companies and therefore those cost breakdowns have been removed from this report to meet confidentiality requirements. However two full coverage sectors were covered by at least three companies (non-pelagic trawl CV's and pelagic trawl CV's) and those cost-breakdowns are shown in Table 2-7, along with a summary of the billed days only in each of the other fishery sectors.

More information about the comparison of costs per observer day for full and partial coverage is described in Section 2.4.3.

2.3.4. Costs for Electronic Monitoring

The costs of the fixed-gear EM program are dependent on the number of vessels participating in the program, the number of systems that need to be purchased and/or replaced on an annual or recurrent basis, deployment rates, field support services, video review, and other factors. The costs of EM paid for by the partial coverage fees includes project coordination, data storage, review, processing and analysis, and equipment maintenance. External funding supported the costs of EM equipment installation and replacements. The total 2025 fixed-gear EM program annual cost was $1,500,643 (Table 3-1).

The costs of the trawl EM program differ between the full-coverage portion in the BSAI and the partial coverage portion in the GOA. Costs for EM monitoring by vessels fishing in the BSAI, including equipment, EM footage review, and shoreside observers, are paid directly by those participants, and those costs are not reported here. The costs of monitoring in the GOA are paid by funds generated by the 1.65% ex-vessel fee assessed on all landings within the partial coverage category. Similar to the fixed-gear EM program, these costs include project coordination, data storage, review, processing and analysis, and equipment maintenance, and totaled $333,731. In addition, the cost of monitoring by partial coverage observers at GOA processing plants was $485,302, which includes billed plant days, travel, lodging, food, and per diem costs. Therefore, the partial coverage fee paid a total of $819,033. An additional $219,939 of external funds supported the costs of EM equipment installations and replacements. In total, trawl EM in the GOA cost $1,038,972 in 2025 (Table 3-1).

[9] Calculated as total incidental costs divided by the total cost of coverage.

2.4. Cost Savings and Efficiencies

2.4.1. Partial Coverage

The current observer service provider contract was awarded on 01 October 2024. The rates that NMFS currently pays the observer services contractor were established through a competitive bidding process. This contract has several components designed to improve efficiency and reduce costs. For example, the new contract requires an hourly rate of 1/24 the fixed price daily rate will be paid for each partial observed sea day completed by the Contractor. A partially observed sea day is one in which the vessel leaves port on or after 00:30 AM or returns to port before 11:30 PM. The contractor is responsible for submitting departure and landing times rounded to the nearest hour, meaning that times ending with minutes 01–29 should be rounded down and times ending with minutes 30–59 should be rounded up.

Similar to the last contract, NMFS included the provision for observers to participate in NMFS fishery-independent surveys using funds made available through AFSC. This allows AIS, Inc. to provide additional work to their employees during the summer season when observer opportunities as part of the ADP are more limited. This provides their employees continuity in employment, additional experience, and may help to reduce employee turnover, thereby increasing overall efficiency. NMFS benefits from trained observers with at-sea experience to help conduct their survey fieldwork.

The current observer services contract base year expires 30 September 2025 and has option years available through 30 September 2029.

2.4.2. Full Coverage

The majority of full coverage business is conducted by two of the three NMFS-permitted observer providers. NMFS has implemented regulations that govern the terms of observer deployment (e.g., limiting deployment duration, setting minimum qualifications, requiring specific experience for observers assigned to certain deployments, etc.). Efficiencies could potentially be gained by increasing competition, reducing constraints, or increasing efficiency of activities supported by NMFS.

2.4.3. Full Versus Partial Coverage Costs

There are several factors that impact how comparable the average observer coverage costs per day are between the partial coverage category and the full coverage category.

- The partial coverage contract is a federal contract between NMFS and the observer provider company, whereas the full coverage observer providers do not operate under a federal contract. Instead, full coverage observer providers are permitted by NMFS and contract observer services directly with vessels and processing plants, a model known as ‘pay-as-you-go’.

- Federal contracts, such as the partial coverage contract, are subject to Federal Acquisition Regulations, Fair Labor Standards Act, and Service Contract Act requirements, and applicable Department of Labor Wage Rate Determination which establish, among other things, minimum wage and benefits for observers, including overtime. Some of these same regulations and requirements may also apply to full coverage observer providers operating under pay-as-you-go, depending on the size of the company.
    - The Service Contract Act (SCA) is applicable to all federally contracted positions, and the Department of Labor sets minimum wages, overtime pay requirements, and fringe benefits including health insurance, paid sick leave, paid vacation, and holiday pay. Some of these same benefits may not be provided under the pay-as-you-go model, where a day-rate pay scale is more frequently used than hourly rates plus benefits. The SCA wage determinations are periodically updated, with the last increase on June 30, 2023. The partial coverage contract holder does not have control over these wage and benefit requirements.
- All travel costs and expenses incurred in partial coverage fisheries are reimbursed in accordance with the Government's Travel Regulations, including per diem rates which are paid regardless of actual expenses. Full coverage providers have more flexibility as to how they invoice travel expenses, and can use non-invoiced travel options such as having observers ride a vessel to Alaska and/or be carried aboard a chartered flight paid for by a fishing vessel company.
- The costs associated with the partial coverage component are a daily fee NMFS pays for each sea day, and a reimbursable cost for travel as defined in the NOAA contract. Because NMFS only pays for sea days, the daily rate charged to NMFS must factor in an estimate for the contractor's fixed costs for unobserved days. Note that since 2020, "sea days" include observer days at shoreside processing plants in support of the trawl EM program. Increasing the proportion of time spent at sea or at plants increases the efficiency of the overall program because it lowers fixed costs to the contractor and allows for a negotiated lower daily rate charged to NMFS. Higher coverage rates equate to greater efficiency and lower costs per day, while lower coverage costs equate to lower efficiency and greater costs per day.
- Observers in the partial coverage category are typically deployed out of many small, remote port locations which increases travel and lodging costs. Travel costs are also increased due to the short time frame in which partial coverage observers are required, due to the 72 hour timeframe in which partial coverage vessels log trips. This is markedly different from full coverage vessels which may have longer lead time for sailing schedules and operate from fewer ports.
- Observers in the partial coverage category are often only deployed on a vessel for one trip which is significantly shorter (one to five days) than the typical vessel deployment for full coverage observers (60 to 90 days). Thus, partial coverage observers often travel more, and therefore, incur greater travel costs than full coverage observers.
- Partial coverage by its very nature is less efficient on a cost per unit basis compared to full coverage. Partial coverage requires a random selection model to ensure statistically reliable data and predicting how many observers and where they will be deployed is

difficult with random selection procedures. The risk and uncertainty regarding the number of observed days is borne solely by the partial coverage observer provider and increases costs on a per unit (daily rate) basis.

Despite the inherent differences between the full and partial coverage categories, NMFS is frequently requested to compare these costs. When doing this, the most salient comparison of costs is a "fully loaded" daily rate, which is calculated as the total funds expended divided by the number of observed days.

The fully loaded rate for each year of the partial coverage contract is shown in Table 2-6. For example, in 2025, the fully loaded rate was $2,481,100 ÷ 1551 days = $1600 per day. This calculation is appropriate for partial coverage because most partial coverage trips have a similar duration ranging between one and five days.

The average daily observer rate (variable costs only) for full coverage in 2025 was approximately $450 per day (Figure 2-1). Compared to a partial coverage observer that may be deployed onto multiple vessels for one to five days at a time, an observer deployed onto a full coverage vessel typically boards once and may stay on that vessel for months (up to 90 days). Assuming the costs of paying an observer for a day and maintaining an observer provider infrastructure are constant, the incidental costs are likely to be dominated by travel and temporary housing. These incidental costs as a proportion of the total cost for an observer deployment will decline with increased deployment duration. Therefore, the fully loaded rate of an observer day will also decline with an increase in the number of invoiced days for a given vessel in a given month. We can illustrate this phenomenon using the full coverage invoice database maintained by FMA (Figure 2-2). The per-day base rate for observer coverage per permitted provider is known. Therefore, this value multiplied by the total number of invoiced days yields the total base invoice cost. Since the total invoice amounts are known, a subtraction of the total base invoice from the total invoice amount will either yield a zero, or a positive value. Only those invoices that included travel costs, and therefore "fully loaded", were included for comparisons. The fully loaded invoice value was divided by the number of days on the invoice, yielding a fully loaded daily rate for each invoice. The fully loaded rate as a function of the total number of observed days in the invoice (Figure 2-2) does in fact decline as expected: for the first 3 days, the median fully-loaded daily cost is near or more than double the overall average fully-loaded daily costs as presented in Figure 2-1. The average fully-loaded full coverage daily costs as presented in Figure 2-1 are therefore dominated by long deployments which as previously noted are the norm in full coverage and greatly reduce overall costs.

This chapter of the 2024 report contained additional information regarding the fact that full coverage costs had not kept up with inflation. At the time, through 2024 the largest increase year-over-year (YOY) in any given year was 4.5% (in 2022) — with several years at, near, or even below 0% increase YOY. However as previously noted, in 2025 the fully-loaded cost per day increased by 11% over the 2024 value marking the first double-digit-percentage jump in the time-series (since 2014). While this value is still well below the inflation-adjusted expected value

of $513 per day (calculated by applying the average inflation rate for each year[10] to the 2014 daily costs as the baseline), it does indicate that full coverage costs may be coming back inline with inflation. Note that the figure has been removed from this year's report for brevity.

[10] Inflation rate source: US Bureau of Labor Statistics (https://www.bls.gov/cpi/data.htm)

Table 2-1 -- Summary of the fees and federal funding for partial coverage observer sea days from 2015 to 2025

Calendar year	Funding category	Observer fees received	Funds sequestered	Prior year sequester funds received	Funds obligated to contract	Observer sea days at start of the year	Observer sea days purchased during year	Total observer sea days used during year
2015	Fees Federal Funds	$3,451,478	($251,958)	$306,105	$3,058,036 $2,700,000	2,710	5,330	5,318
2016	Fees Federal Funds	$3,775,522	($256,735)	$251,958	$5,144,983 $390,800	2,722	5,277	4,749
2017	Fees Federal Funds	$3,592,750	($247,900)	$256,735	$3,542,196 $1,398,531	3,322	5,285	2,591
2018	Fees Federal Funds	$3,799,560	($250,771)	$247,900	$2,396,040 $0	5,858	2,350	3,207
2019	Fees Federal Funds	$3,244,801	($201,178)	$250,771	$997,845 $412,307	5,001	4,600	3,316
2020	Fees Federal Funds	$2,894,448	($170,772)	$201,178	$4,990,546 $1,905,169	2,266	5,784	1,977[11]
2021	Fees Federal Funds	$3,043,516	($140,267)	$170,798	$1,841,346 $814,654	3,680[12]	Confidential	3,193
2022	Fees Federal Funds	$3,073,779	($178,802)	$140,267	$1,484,481 $905,000	1,014	Confidential	2,968
2023	Fees Federal Funds	$3,728,622	($229,120)	$ 178,802	$3,024,427 $810,973	2528	Confidential	3126
2024	Fees Federal Funds	$3,993,888	($242,047)	$ 0	$4,410,367 $0	2062	Confidential	2,325
2025	Fees Federal Funds	$3,644,984	($220,361)	$ 0	$2,216,735 $1,420,000	1947	2350	1,551

[11] Includes sea days, shoreside processing plant days, and quarantine days.

[12] For 2021, NMFS modified the contract to move funds from sea days to travel. This modification reduced available sea days for the start of the fishing year.

Table 2-2 -- Observer fees[13] in 2025 by gear, vessel size category, and species or species group for all areas combined.

Gear	Vessel Length Category	Halibut	Sablefish	Pacific Cod	Pollock	All Other Species	Total All Species
Hook and Line	<40	$204,741	$4,095	$10,763	$5	$410	$220,014
	40 - 57.5	$424,704	$70,822	$22,002	$14	$5,883	$523,425
	>57.5	$357,389	$47,749	$3,447	$10	$2,261	$410,857
	Gear Subtotal	$986,833	$122,666	$36,212	$29	$8,554	$1,154,295
Jig	<40	$579	$0	$2,922	$0	$2	$3,503
	40 - 57.5	$375	$0	$1,629	$3	$188	$2,196
	>57.5	$13	$0	$0	$0	$0	$13
	Gear Subtotal	$968	$0	$4,551	$3	$190	$5,712
Pot	<40	$0	$6,406	$260	$0	$3	$6,670
	40 - 57.5	$185	$219,892	$18,996	$4	$1,414	$240,490
	>57.5	$1,418	$486,079	$292,042	$1	$2,288	$781,828
	Gear Subtotal	$1,603	$712,377	$311,299	$5	$3,705	$1,028,988
Trawl	>57.5	$0	$675	$107,912	$658,231	$19,285	$786,102
	Gear Subtotal	$0	$675	$107,912	$658,231	$19,285	$786,102
Total All Gear		$989,404	$835,718	$459,974	$658,268	$31,734	$2,975,097
Percent by Species		33%	28%	15%	22%	1%	100%

Rounding error sometimes results in slight differences in row and column totals.

[13] The unpaid portion of the observer fees are included. Administrative fees and interest charged for late fee payments are not included

Table 2-3. -- Observer fee[14] in 2025 by gear, vessel size category, and species or species group in the Gulf of Alaska.[15]

Gear	Vessel Length Category	Halibut	Sablefish	Pacific Cod	Pollock	All Other Species	Total All Species
Hook and Line	<40	$181,702	$4,095	$10,763	$5	$410	$196,975
	40 - 57.5	$392,803	$69,551	$21,992	$14	$5,875	$490,235
	>57.5	$315,053	$47,628	$3,421	$10	$2,253	$368,365
	Gear Subtotal	$889,558	$121,274	$36,176	$29	$8,538	$1,055,575
Jig	<40	$579	$0	$2,922	$0	$2	$3,503
	40 - 57.5	$375	$0	$1,629	$3	$188	$2,196
	>57.5	$13	$0	$0	$0	$0	$13
	Gear Subtotal	$968	$0	$4,551	$3	$190	$5,712
Pot	<40	$0	$6,406	$260	$0	$3	$6,670
	40 - 57.5	$185	$215,729	$7,673	$4	$647	$224,237
	>57.5	$540	$437,897	$85,276	$1	$698	$524,412
	Gear Subtotal	$725	$660,032	$93,209	$5	$1,348	$755,319
Trawl	>57.5	$0	$675	$85,514	$657,736	$19,285	$763,209
	Gear Subtotal	$0	$675	$85,514	$657,736	$19,285	$763,209
Total All Gear		$891,251	$781,981	$219,450	$657,773	$29,360	$2,579,815
Percent by Species		35%	30%	9%	25%	1%	100%

Rounding error sometimes results in slight differences in row and column totals.

[14] The unpaid portion of the observer fees are included. Administrative fees and interest charged for late fee payment are not included.

[15] The Gulf of Alaska includes Pacific halibut regulatory areas 2C, 3A, and 3B; and sablefish regulatory areas Western GOA, Central GOA, West Yakutat, and Southeast Outside

Table 2-4 -- Observer fees[16] in 2025 by gear, vessel size category, and species or species group in the Bering Sea/Aleutian Islands.[17]

Gear	Vessel Length Category	Halibut	Sablefish	Pacific Cod	Pollock	All Other Species	Total All Species
Hook and Line	<40	$23,039	$0	$0	$0	$0	$23,039
	40 - 57.5	$31,900	$1,271	$11	$0	$8	$33,189
	>57.5	$42,336	$121	$26	$0	$9	$42,492
	Gear Subtotal	$97,275	$1,393	$36	$0	$16	$98,720
Pot	40 - 57.5	$0	$4,163	$11,323	$0	$767	$16,253
	>57.5	$878	$48,181	$206,767	$0	$1,590	$257,416
	Gear Subtotal	$878	$52,345	$218,089	$0	$2,357	$273,669
Trawl	>57.5	$0	$0	$22,398	$495	$0	$22,893
	Gear Subtotal	$0	$0	$22,398	$495	$0	$22,893
Total All Gear		$98,153	$53,737	$240,524	$495	$2,373	$395,282
Percent by Species		25%	14%	61%	<1%	1%	100%

Rounding error sometimes results in slight differences in row and column totals.

[16] The unpaid portion of the observer fees are included. Administrative fees and interest charged for late fee payment are not included.

[17] The Bering Sea/Aleutian Islands includes Pacific halibut regulatory areas 4A, 4B, 4C, and 4D; and sablefish regulatory areas Bering Sea and Aleutian Islands

Table 2-5 -- Observer Fees[18] in 2025 by monitoring type, strata or selection pool, and area.[19]

Monitoring	Strata/Selection Pool	GOA	BSAI	All Areas
At-Sea Observers	Fixed Gear	$1,109,915	$274,820	$1,384,735
	Trawl	$227,586	$22,893	$250,479
	Observer Trip Selection	$1,337,501	$297,713	$1,635,214
Electronic Monitoring	Fixed-Gear EM	$502,967	$78,940	$581,907
	Trawl EM	$535,623	$0*	$535,623
	EM Subtotal	$1,038,590	$78,940	$1,117,530
No Monitoring	No Selection	$203,724	$18,629	$222,353
All Monitoring	All Partial Coverage	$2,579,815	$395,282	$2,975,097

* Beginning with the regulated program in 2025, an EM review fee will be assessed in the full coverage trawl EM fisheries. See section 2.2.2 for additional details on the full coverage trawl EM video review fee.

[18] The unpaid portion of observer fees are included. Administrative fees and interest charged for late fee payments are not included.

[19] The Gulf of Alaska includes Pacific halibut regulatory areas 2C, 3A, and 3B; and sablefish regulatory areas Western GOA, Central GOA, West Yakutat, and Southeast Outside. The Bering Sea/Aleutian Islands includes Pacific halibut regulatory areas 4A, 4B, 4C, and 4D; and sablefish regulatory areas Bering Sea and Aleutian Islands.

Table 2-6 -- Average annual observer partial coverage sea day costs from 2014 to 2025

Year	Funds expended	Number of observer sea days realized	Average sea day cost
2014	$4,937,414	4,573	$1,080
2015	$5,758,268	5,318	$1,083
2016	$4,186,303	4,677	$ 895
2017	$3,146,111	2,749	$1,144
2018	$4,425,144	3,207	$1,380
2019	$4,342,098	3,316	$1,309
2020	$2,729,486	1,977	$1,381
2021	$4,448,612	3,193	$1,393
2022	$4,428,624	2,968	$1,492
2023	$4,801,704	3,126	$1,536
2024	$3,809,373	2,325	$1,638
2025	$2,481,100	1551	$1,600

Table 2-7 -- Mean billed observer days, base daily rate, fully-loaded daily rate (including incidental costs), and percent incidental costs per vessel or plant with mean standard error (SE) in each gear and vessel type in the **full** coverage category in 2025. *Note that costs are only shown for the two trawl catcher vessel (CV) sectors as the Catcher-Processor/Mothership (CP/MS) and PLANT sectors were only covered by two provider companies and therefore do not meet the minimum confidentiality requirements.

Vessel Type	Gear Type	Days (#)		Base Daily Rate ($)		Fully-Loaded Daily Rate ($)		Incidental costs (%)	
		Mean	SE	Mean	SE	Mean	SE	Mean	SE
CP/MS	Hook-and-Line	278	18.5						
	Non-Pelagic Trawl	516	29.9						
	Pelagic Trawl	262	29.8						
	Pot	75	27.5						
CV	Non-Pelagic Trawl	20	2.4	$442	10.5	$543	12	18%	1.9
	Pelagic Trawl	20	2.1	$489	16.2	$540	11.4	10%	1.7
PLANT	Pelagic Trawl	488	77.8						

Figure 2-1 -- Costs per day per vessel, costs per year per vessel, total fleetwide costs, total billed days, and billed vessel/plants in the **full**-coverage sectors 2014-2025. The 2025 values, along with the peak value from the time-series (if the peak value is not from 2025), are shown in bold.

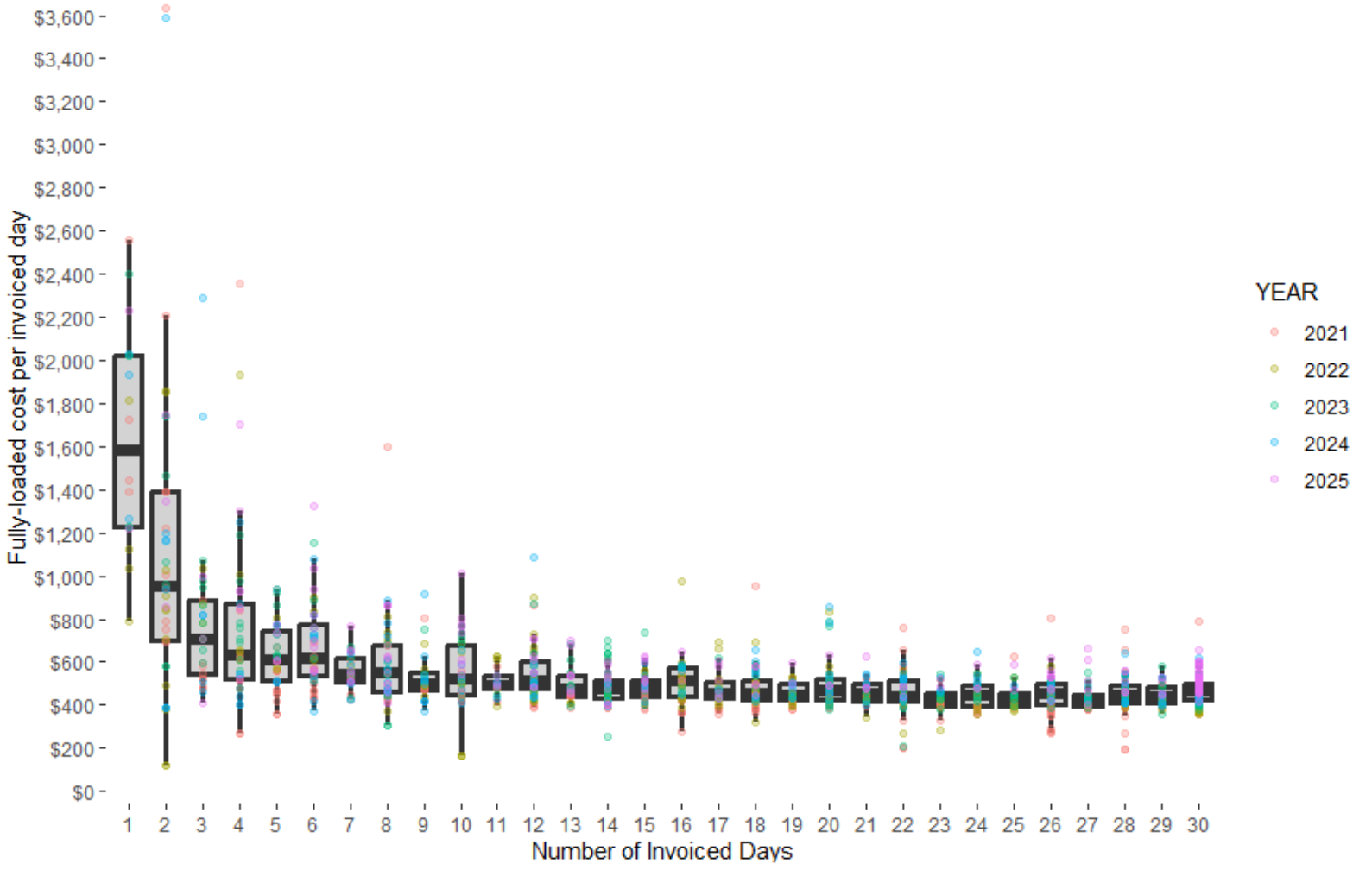

Figure 2-2 -- Relationship between the fully loaded cost per invoiced day for **full** observer coverage as a function of the number of days invoiced, which is a proxy for the duration of the deployment. The fully-loaded cost per day is calculated as the invoice total divided by the number of days on the invoice. Includes all vessel/gear types.

3. Deployment Performance Review of the 2025 North Pacific Observer Program

3.1. Introduction

The goal of the Observer Program is to achieve a random deployment of observers and electronic monitoring (EM) into Federal fisheries off Alaska to collect representative data used to estimate catch and bycatch, assess stock status, collect fishery-dependent biological information used in population and ecosystem modeling efforts, and make salmon bycatch stock-of-origin determinations, among other objectives. This chapter contains a review of the deployment of observers and EM in 2025 relative to the intended sampling plan and goals of the 2025 Annual Deployment Plan (ADP; NMFS 2024). Consistent with its purpose, this chapter focuses on the randomization of observer and EM deployments into primary sampling units (PSUs) and how departures from a random sample affect data quality. This review identifies where possible biases exist and provides recommendations for further evaluation, including potential improvements to the deployment process that should be considered during the development of the 2027 ADP.

This review is performed by staff from the Fisheries Monitoring and Analysis/Analytical Services Program (FMA) of the Alaska Fisheries Science Center (AFSC) and the Sustainable Fisheries Division/Catch Analysis and Data Quality Branch of the Alaska Regional Office (AKRO). Catch and monitoring data from the 2025 calendar year as of 9 March 2026 were used in analyses. The ADP and Annual Report process is scheduled for review by the Center for Independent Experts (CIE) in the second quarter of 2026.

3.1.1. The Sampling Design of the Observer Program

Since 2013, the Observer Program has used a stratified hierarchical sampling design with randomization at all levels (Cahalan and Faunce 2020). Stratification increases the efficiency of sampling by observers and monitoring by EM and helps address logistical issues associated with deployment. By grouping similar fishing activities into deployment strata and sampling those strata appropriately, sampling efficiency increases and the estimated variance decreases relative to unstratified sampling. Deployment strata are defined in the ADP and are designed such that each unit of deployment (e.g., trip) is assigned to only one stratum.

Randomization helps ensure that the data collected from a sample will be representative of the entire fishing fleet such that monitored trips are similar to unmonitored trips within a stratum. In each stratum, observers or EM are deployed randomly to either: (1) vessels for a predetermined period of time (termed ‘vessel-selection’) or (2) to individual fishing trips or shoreside deliveries of catch (termed ‘trip-selection’). In both cases, this initial deployment to the fishery is the first level of the sampling hierarchy and defines the PSU. The list of all PSUs in a stratum defines the sampling frame and should equate to the population of interest for that deployment stratum (e.g., all trips taken by trawl vessels fishing in the Alaska Exclusive Economic Zone). If the sampling

frame does not contain all elements of the stratum, the resulting information may be biased. The magnitude and direction of the bias will depend on how different the fishing activities in the sample frame are from actual fishing activity.

Although this chapter evaluates whether monitoring goals were met, we include a brief summary of the full sampling hierarchy here for context. For each monitored trip, if all hauls cannot be sampled for logistical reasons, hauls are randomly selected to be sampled. This is the next level in the hierarchy; the secondary sampling units are defined as hauls within a trip. Randomization of haul selection is designed to allow observers time to record and transmit data, attend to other non-sampling responsibilities, and time to sleep and eat. Randomization of haul selection also gives Pacific States Marine Fisheries Council (PSMFC) EM video reviewers the ability to optimize the amount of video that can be reviewed from each trip. Haul selection is determined using the random sampling tables and random break tables provided by NMFS. For each haul, regardless of monitoring status, fishing location and effort (e.g., number of hooks) are recorded, while marine mammal and seabird interactions are primarily recorded on hauls randomly selected for monitoring. The ability of EM to capture marine mammal and seabird interactions is less than that of observers due to the fixed location in which EM equipment is installed. Sampling at the haul level does not occur in strata where the PSU is the delivery.

Samples of catch are the third level of the sampling hierarchy. For randomly selected hauls, a random sample of the catch is collected (at-sea observers) or selected for video review (fixed-gear EM) and data from those samples are used to determine the species composition and amount of discarded catch. In strata where the PSU is the delivery, samples are only used to determine the species composition. While observers are trained to collect multiple large samples of catch, the number and size of samples taken from each haul or delivery will depend on the vessel/plant configuration, fishing/plant operations, and diversity of catch. The size of EM samples is largely determined by the number of video reviewers available relative to the amount of video to be reviewed.

At the fourth level of the sampling hierarchy, a predetermined number of individual fish of specified species are randomly selected from the species composition sample and measured. Lastly, at the fifth sampling level, a random selection of fish is used to collect otoliths, reproductive maturity assessments, stomach contents, genetic tissues, and other biological specimens. The number and species of fish selected for measurement and biological specimen collection is specified each year by the AFSC's stock assessment scientists. Sampling rates for genetic tissue collection by observers (e.g., 1 in 10 Chinook salmon [*Oncorhynchus tshawytscha*] caught as bycatch) are set each year by the AFSC's Auke Bay Laboratory. Sampling at the fourth and fifth levels of the sampling hierarchy does not occur on fixed-gear vessels using EM.

3.1.2. The 2025 Annual Deployment Plan

The Observer Program is structured according to regulatory coverage categories found in *50 CFR § 679.51(a)*, within which we define deployment strata. For clarity, we distinguish between these coverage categories and our deployment strata. Coverage categories refer to regulatory groupings that determine monitoring requirements:

- Full coverage: 100% monitoring required.
- Partial coverage: selection rates for monitoring assigned under the ADP.

Coverage categories are subdivided into deployment strata for logistic and sampling design purposes. Each fishing trip or delivery is assigned to a single stratum. Within the partial coverage category, strata are defined by monitoring method (at-sea observer or EM), gear type (fixed-gear [hook-and-line and/or pot gear] or trawl) and the Fisheries Management Plan (FMP) area the vessel intends to predominantly fish in — either the Bering Sea and Aleutian Islands (BSAI) or Gulf of Alaska (GOA). Although not a separate regulatory category, the zero coverage stratum, in which all trips have a selection rate of zero, is treated independently from the partial coverage category in this report for clarity in evaluation.

The majority of the catch taken from the Federal waters off Alaska is completely monitored at the level of the trip or delivery. Vessels and processors in the full coverage category must comply with observer coverage requirements at all times when fish are harvested or processed. Specific requirements are defined in regulation at *50 CFR § 679.51(a)(2)*. The full coverage category includes the following:

- Catcher/processors (with limited exceptions);
- Motherships;
- Catcher vessels participating in programs that have transferable Prohibited Species Catch (PSC) allocations as part of a catch share program;
- Catcher vessels using trawl gear that have requested placement in the full coverage category for all fishing activity in the BSAI for one year; and
- Inshore processors receiving or processing Bering Sea walleye pollock (*Gadus chalcogrammus*, hereafter "pollock").

The deployment design for the partial coverage category of the program involves three elements: (1) the selection method to accomplish random sampling; (2) division of the population of partial coverage trips or deliveries into deployment strata; and (3) the allocation of deployment among strata. Although the partial coverage strata account for a small fraction (approximately 9%) of the total catch tonnage in the Federal fisheries off Alaska, the majority of this chapter is focused on these partial coverage strata to evaluate whether costs and monitoring adhered to the ADP.

In 2025, at-sea observers and EM were deployed into the partial coverage category using the trip-selection model in all ports throughout Alaska. The Observer Declare and Deploy System (ODDS) was used to randomly select trips to be monitored; vessel operators and owners log their trips and are notified by ODDS if the trip was selected for coverage.

Vessels participating in the Fixed-gear EM program log trips in the corresponding EM strata. In the Fixed-gear EM program, initiated by the Council in 2018, vessels use EM equipment to capture location and video information which is then subsequently analyzed by human reviewers who count and identify species. Weights for catch estimation are obtained from data collected in the at-sea observer strata.

In 2025, EM was implemented as a fully regulated monitoring program for trips on trawl catcher vessels fishing exclusively with pelagic trawl gear and targeting pollock in both the BSAI and GOA. The framework for the Trawl EM program developed under an Exempted Fishing Permit (EFP) that ran from 2020 through 2024. Trawl catcher vessels must apply for participation in the program on a yearly basis. Vessels participating in this program use EM equipment for compliance monitoring of maximized retention of catch at sea and are monitored shoreside by observers during the delivery of catch, primarily for salmon accounting. Under the regulated program, if vessels plan to fish using non-pelagic trawl gear during a trip, they are subject to at-sea observer coverage. Trawl EM trips in the BSAI require monitoring by a full coverage observer and trips in the GOA must be logged in ODDS for random selection. Note that unlike other strata that use the trip as the PSU, the Trawl EM strata instead define the PSU as the shoreside delivery, as that is where the observer applies their sampling design.

The proximity allocation algorithm was used to determine the selection rates of the partial coverage strata to reduce data gaps and impacts caused by small sample sizes. As an exception, Trawl EM in the GOA was excluded from the allocation algorithm as it had a 100% selection rate set by policy.

The deployment strata used in 2025 (with abbreviation and selection rate rounded to the nearest whole number) are organized by coverage category and defined as:

- Full coverage category
    - Trips by vessels in the full coverage category, but not participating in Trawl EM (*Full coverage*: 100%).
    - Shoreside deliveries by trawl vessels exclusively using pelagic trawl gear to target pollock, listed under the Trawl EM program, monitored 100% at-sea by EM systems, monitored shoreside by observers, and fishing in the BSAI (*EM TRW BSAI*: 100% shoreside).
    - Partial coverage category
    - Trips by fixed-gear vessels using hook-and-line and/or pot gear greater than or equal to 40 ft length overall (LOA) monitored with at-sea observers predominantly fishing in the BSAI (*OB FIXED BSAI*: 20%).
    - Trips by fixed-gear vessels using hook-and-line and/or pot gear greater than or equal to 40 ft LOA monitored with at-sea observers predominantly fishing in the GOA (*OB FIXED GOA*: 6%).
    - Trips by trawl vessels not participating in Trawl EM monitored with at-sea observers predominantly fishing in the BSAI (*OB TRW BSAI*: 40%).
    - Trips by trawl vessels not participating in Trawl EM monitored with at-sea observers predominantly fishing in the GOA (*OB TRW GOA*: 15%).
    - Trips by fixed-gear vessels using hook-and-line and/or pot gear listed under the Fixed-gear EM program monitored at-sea by EM systems and predominantly fishing in the BSAI (*EM FIXED BSAI*: 48%).

- Trips by fixed-gear vessels using hook-and-line and/or pot gear listed under the Fixed-gear EM program monitored at-sea by EM systems and predominantly fishing in the GOA (*EM FIXED GOA*: 11%).
- Shoreside deliveries by trawl vessels exclusively using pelagic trawl gear to target pollock, listed under the Trawl EM program, monitored 100% at-sea by EM systems, monitored shoreside by observers, and fishing in the GOA (*EM TRW GOA*: 100% shoreside).
- Zero coverage
- Fixed-gear vessels using hook-and-line and/or pot gear less than 40 ft LOA and all vessels of any LOA fishing with handline, jig, troll, or dinglebar troll gear (*Zero coverage*: 0%).

More information on the sampling design used by observers and the relationship between the sample design and catch estimation can be found in Cahalan and Faunce (2020) and the 2025 Observer Sampling Manual (AFSC 2024). Bycatch estimates of Chinook salmon in the GOA are estimated using methods described in Cahalan et al. (2014). In the event that a delivery cannot be, or is not, monitored (e.g., the case in a tendered delivery from a trip in an at-sea observer stratum or a non-pollock delivery), then estimation of salmon bycatch comes by applying salmon bycatch rates from monitored trips to landed catch. Estimates of stock-of-origin from salmon bycatch are produced by the AFSC's Auke Bay Laboratory.

3.1.3. Performance Review Objectives

The following items from the 2025 ADP have been identified as objectives for evaluation in this report:

1. Deploy for the planned number of sea days at the costs specified in the 2025 ADP: This objective will be considered to be met if the realized number of monitored sea days and costs expended falls within the range of values from simulated sampling.
2. Deploy at the selection rates specified in the 2025 ADP: For the full coverage category and zero coverage stratum, coverage rates are expected to equal 100% or 0%, respectively. For strata under partial selection, selection rates are expected to be within a 95% confidence interval calculated from the realized coverage rates. Trawl EM in the GOA is assigned a rate of 100% by policy, therefore the realized rate should equal 100%.
3. Collect tissue samples from Chinook and chum (*Oncorhynchus keta*) salmon as specified in the 2025 Observer Sampling Manual to support the goal of collecting genetic samples from salmon caught as bycatch in groundfish fisheries to identify stock-of-origin: The sampling protocol established in the 2014 ADP (NMFS 2013, Faunce 2015) was used in 2025. Under this protocol, observers on vessels delivering to shoreside processors in the GOA pollock trawl fishery monitor the delivery to enumerate salmon bycatch and obtain tissues for genetic analysis. For trips in the *OB TRW* strata outside of the pollock fisheries, observers obtain salmon counts and tissue samples from all salmon found within at-sea samples of the total catch. For Trawl EM, 100% of deliveries are monitored by shoreside observers in both the BSAI and the GOA, including those from tenders.

4. Randomize deployment of monitoring into the partial coverage strata of fishing activities: Evaluation of this objective is focused on the randomization of observer and EM deployments into PSUs, and how departures from a random sample affect data quality.

3.1.4. Observer Deployment Performance Metrics

Performance metrics have been developed to assess whether the trip-selection process provides a representative sample of fishing trips in the North Pacific in 2025. These metrics reflect four mechanisms that can impact the quality of the data: (1) realized sample size, (2) non-response, (3) spatiotemporal representativeness, and (4) differences in trip characteristics.

The performance metrics used in this evaluation are as follows:

1. Deployment rates for each stratum: This section assesses the following:
    a. Realized versus expected coverage rates: an evaluation of realized coverage rates relative to the expected rates specified in the ADP.
    b. Non-response rates: Non-response occurs when randomly selected trips or vessels are selected for monitoring but then are not monitored. If these trips or vessels have different fishing behavior (e.g., catch, areas fished) than the rest of the population, the data collected will not represent the entire fleet, introducing a non-response bias.
2. Representativeness of the sample: Randomized sampling is a method used to ensure that the results of sampling reflect the underlying population. Departures from randomization can lead to non-representative data and hence potential bias in estimates of the parameters of interest. A randomized sample design is expected to achieve a rate of monitored events that is similar across both space and time. Representativeness of the sample was evaluated across four separate components:
    a. Temporal representativeness: We use plots of expected versus realized coverage rates over time. Periods where these rates deviate highlight the potential for temporal bias, where the timing of fishing and monitoring do not overlap.
    b. Spatial representativeness: Maps provide a visual representation of the spatial distribution of monitoring relative to fishing effort, highlighting areas where more or fewer trips were monitored than expected.
    c. Spatiotemporal distribution of coverage: The neighborhood index provides the proportion of trips monitored (or near a monitored trip) in time and space. Realized neighborhood indices are compared to distributions of simulated indices to determine whether the realized coverage was distributed evenly in both time and space, and whether this coverage met the expectations of the selection rates prescribed by the ADP.
    d. Representativeness of trip characteristics: We evaluate the consistency of trip characteristics between monitored and unmonitored portions of the stratum. These metrics are based, in part, on the availability of data for both monitored and unmonitored fishing activities (e.g., data that are reported for all trips on landing reports).

Although these metrics can identify places where observed results differ from expectations, determining whether or not these differences are substantial enough to have management implications ultimately requires expert judgement. This holds true even for tests that have associated *p*-values.

3.2. Changes to this report from last year

The evaluations performed in this chapter are largely unchanged from 2024, except as noted below.

- The 2025 ADP budget and the actual 2025 costs paid for by the ex-vessel fee are summarized for the partial coverage monitoring pools: at-sea observers, fixed-gear EM, and trawl EM. Additional costs for the EM strata that were supported by external funding sources are also provided (Table 3-1).
- *EM TRW GOA* is now monitored during 100% of shoreside deliveries and was excluded from all sample quality evaluations.

3.3. Evaluation of Deployment in 2025

The monitoring expenditures and number of monitored trips in each stratum that are actually realized could differ from the ADP's projections as a result of discrepancies between the expected and realized fishing effort in each stratum, the random nature of ODDS, or both. This section compares the ADP's projections with the realized outcomes.

3.3.1. Evaluating Monitoring Costs and Effort Predictions

Each year, NMFS sets an annual budget in the ADP for the deployment of observers and EM into the partial coverage strata. The partial coverage budget for 2025, funded via the ex-vessel fee by all participants in the partial coverage category, was set at $4.189 M. Approximately $2.314 M and 1,127 days were allocated to monitoring by at-sea observers, $0.964 M and 733 monitored days for the Fixed-gear EM program, and $0.911 M and 782 shoreside observer days for the Trawl EM program in the GOA (Table 3-1, Table 3-2).

In 2025, FMA deployed at-sea observers for 847.5 days, which was 24.9% lower than the budgeted value and in the 0.02^{th} percentile of the simulated outcomes in the 2025 ADP (Figure 3-1, top panel). Although the total number of fishing trips in the at-sea observer strata was 9.1% higher than predicted (Table 3-2), ultimately, fewer at-sea observer days were used than expected and 121.2 base at-sea observer days were left unused at the end of the partial coverage observer provider's contract year in September 2025. With fewer days monitored than expected, the expenditures for partial coverage at-sea observers were under budget by 4.7% (Figure 3-1, bottom panel).

There are two primary reasons why the total number of at-sea observer days was lower than expected. First, the duration of at-sea observer assignments on selected trips (trip duration) was overestimated in the 2025 ADP, which, in turn, overestimated the number of projected observed

days. Monitored fishing trips usually have shorter durations than unmonitored trips, which we have demonstrated in prior Annual Reports. For example, in 2023 and 2024, monitored trips were 10–16% shorter than unmonitored trips in the *OB FIXED* strata, which comprises the majority of fishing effort in the at-sea observer pool (AFSC and AKRO 2024, 2025). The 2025 and prior ADPs did not account for this observer effect because its impact was masked by other sources of uncertainty. The 2026 ADP formally accounts for this effect on trip duration and therefore we do not expect this to be an issue in the 2026 or subsequent Annual Reports.

The second factor that contributed to the overestimation of observer days was a shift in the billing structure of observer assignments. Beginning in October 2024, billing of at-sea and plant observer assignments changed from the half-day to the hour, resulting in shorter average assignment durations. Because the 2025 ADP was developed before this hourly data was available, it relied on historical half-day estimates. As a result, the 2025 ADP overestimated both the cost per trip and the total number of days that would be monitored. Beginning with the 2026 ADP, we account for this hourly billing structure, leveraging the increased purchasing power to more accurately estimate costs.

Fee funds spent monitoring the *EM FIXED* strata totaled $1.015 M, 5.3% higher than the $0.964 M budgeted in the 2025 ADP (Table 3-1). However, the number of trip days reviewed was 15.6% less than expected in the ADP (619 trip days reviewed; 733 budgeted; Table 3-2). Fee funds were spent on project coordination, data storage, processing and analysis for EM video review, and equipment maintenance. An additional $485,883 of external funds were spent on EM equipment installations and replacements (Table 3-1).

Of the $0.911 M of fee funds budgeted for the *EM TRW GOA* stratum, $0.819 M was spent, or 10.1% less than anticipated (Table 3-1). This was largely because 9.0% fewer days of monitoring were required (782 shoreside observer days expected; 711.7 days monitored). Fee funds were spent on project coordination, data storage, processing and analysis for EM video review, and equipment maintenance. An additional $219,939 of external funds were spent on EM equipment installations and replacements (Table 3-1).

Congressionally appropriated funding that has been used for new EM equipment installations and replacements is expected to be fully spent by the end of 2026.

3.3.2. Performance of the Observer Declare and Deploy System in Trip-Selection

Fishers are required to log anticipated fishing trips into ODDS before embarkation. The ODDS determines the deployment stratum based on the type of fishing declared (gear type and FMP area) and the presence or absence of a Vessel Monitoring Plan before facilitating random selection for monitoring. The ODDS generates a random number for each logged trip, compares it to the programmed rate from the ADP, and assigns each logged trip to either ‘selected to be monitored’ (selected) or ‘not selected to be monitored’ (not selected) categories. The *EM TRW GOA* stratum is excluded from the following summaries because ODDS is not used to select which deliveries are to be monitored by shoreside observers. Additionally, this analysis excludes trips that requested coverage to fulfill monitoring requirements when fishing Community

Development Quota (CDQ)/Individual Fishing Quota (IFQ) in multiple reporting areas, as these trips are not subject to random selection by ODDS.

Every logged trip in ODDS begins with a pending status and is ultimately either closed upon completion of fishing or canceled. The preferred method is that fishers close completed trips in ODDS. Fishers can close a completed trip by (1) selecting landing reports from a menu or (2) manually entering the end of trip information. Additionally, fishers can change the dates of a pending logged trip regardless of selection status prior to, or in lieu of, cancellation. The closure or modification of trips selected for monitoring by at-sea observers are performed by the partial coverage observer provider. Finally, to prevent 2025 ODDS trips from affecting the selection rates set for the 2026 ADP year, any trips left open at the end of the calendar year were automatically canceled by ODDS ('canceled by system'). Typically, the disposition of a trip canceled by the system is unknown. Beginning this year, analysts cross-referenced logged trips with landing reports to determine whether trips that were canceled by the system were completed. These trips were relabeled as completed for subsequent analyses.

Across all partial coverage strata, if a trip selected for monitoring is canceled, its selected status is automatically transferred to the vessel's next logged trip in that stratum (termed an "inherited trip"). However, cancellation permissions differ between monitoring types. While fishers in the EM strata can cancel trips directly, fishers in the at-sea observer strata can no longer do so as of 2025. In the at-sea observer strata, cancellations can only be done by the partial coverage observer provider when a vessel changes strata or when a vessel tells the provider they are done fishing for the year.

The number of trips logged in ODDS in 2025 and their dispositions is summarized in Table 3-3. Of the 3,800 total trips logged, 388 were randomly selected and 21 inherited monitoring from a previously selected trip that was cancelled. In total, 264 (6.9%) of trips were canceled: 118 by ODDS (3.1%) and 146 by users (3.8%). Note that the user cancellation rates between the not selected, randomly selected, and inherited trips differed greatly between strata. The randomly selected trips in the *OB FIXED GOA* stratum were cancelled by users at a rate 7.4 times higher than trips that were not selected by ODDS for monitoring.

The number of completed trips that were randomly selected for monitoring, monitored through inheritance, or waived are summarized in Table 3-4. The inheritance system is necessary to compensate for trip cancellations to achieve ADP selection rates. In ODDS prior to 2025, the next newly logged trip (i.e., after any existing logged trips in the vessel's queue) in the at-sea observer strata inherited monitoring when there was a cancellation. These inherits resulted in delaying monitoring to a later trip and thus, introduced biased trip selection. In contrast, in the *EM FIXED* strata, the inheritance system was applied to the next trip in the vessel's queue, which maintains the ordinality of trip selection. In 2025, ODDS inheritance rules were unified across all strata (NMFS 2024) by assigning monitoring to the next trip in the queue, minimizing the bias introduced by non-random selection. In addition, trips logged in the at-sea observer strata could no longer be cancelled by vessel users. Therefore, inherited trips no longer result in delayed monitoring. The effectiveness of these changes in ODDS is evidenced by the much

lower number and percentage of trips monitored via inheritance in 2025 compared to prior years. The percentage of trips monitored via inheritance in the *OB TRW GOA* stratum was higher than in the other strata because many of these vessels also participate in the *EM TRW GOA* stratum and frequently change fishing plans. Any trip selected for monitoring in the *OB TRW GOA* stratum that is changed to the *EM TRW GOA* stratum results in the next *OB TRW GOA* trip by the vessel that was randomly assigned the not-selected status to immediately inherit the monitoring status.

The extent to which trip-selections are changed from the time they are entered can be determined by comparing the rate of trip monitoring expected from (1) random selection of all logged trips (initial random selection) and (2) random selection of remaining trips after cancellations, inherits, and waivers. The rates obtained in the initial selection process by ODDS were within expected ranges for all strata (Table 3-5). Moreover, all strata realized final coverage rates within the expected ranges after cancellations, inherits, and waivers. The *OB FIXED BSAI* and *EM FIXED GOA* strata had low initial selection rates by ODDS, although not statistically significant. A time series of ODDS initial selection rates and final realized coverage rates is presented in Figure 3-2.

3.3.3. Evaluation of Realized Coverage Rates

This section compares the coverage rates realized against what was expected from the ADP. Data used in this evaluation are stored within the Catch Accounting System (CAS; managed by the AKRO), the Observer Program database (NORPAC; managed by the AFSC), and eLandings (under joint management by the Alaska Department of Fish and Game, the International Pacific Halibut Commission, and NMFS). Separate rate evaluations are conducted depending on whether the unit of deployment was at-sea fishing trips or dockside deliveries of pollock.

Here, trips in the *EM FIXED* strata are considered successfully monitored if at least some video of the trip was reviewed. The rationale for defining monitored trips this way is that it is most similar to the way in which trips in other strata are considered monitored (i.e., irrespective of whether or not haul information or usable species composition data were collected). Deliveries in the *EM TRW* strata were considered successfully monitored if an observer was able to collect salmon information from a delivery.

In combination across all strata, coverage categories, and fishery monitoring tools, 4,161 trips/deliveries (47.0%) and 303 vessels (35.5%) were successfully monitored out of all fishing effort in the Federal fisheries off Alaska in 2025 (Table 3-6). This compares to a total of 3,863 trips/deliveries (43.9%) and 421 vessels (48.4%) monitored in 2024 (AFSC and AKRO 2025).

Evaluations for the *Full coverage* stratum, both *EM TRW* strata, and the *Zero coverage* stratum are straightforward — either the coverage realized was equal to 100% (*Full*, *EM TRW BSAI*, and *EM TRW GOA*) or 0% (*Zero*), or it was not. The program realized 100.00% coverage in the *Full coverage* and *EM TRW BSAI* strata. In the *EM TRW GOA* stratum, the coverage rate was less than expected because of the acceptance of deliveries after the release of an observer from a

processing plant. The program did not monitor any trips in the *Zero coverage* stratum (Table 3-6).

For the partial coverage strata subject to random selection, under the assumption that the deployment was randomized, a 95% confidence interval calculated from the realized coverage rates will contain the actual coverage rate 95% percent of the time. If expected coverage levels were within the 95% confidence intervals, then we conclude that realized coverage rates did not deviate from what was expected.

Coverage rates were consistent with expected values in five of the six partial coverage strata subject to random selection, indicating that the deployment of monitoring as intended by the 2025 ADP was mostly successful. The realized coverage rates in the at-sea observer strata were all within the expected confidence intervals. The changes to the programming in ODDS for these strata in 2025 removed the necessity for inherited monitoring to span across years, so the realized coverage followed closely with the results of selection by ODDS. However, the coverage rate for the *EM FIXED GOA* stratum was lower than expected for several reasons: (1) the selection rate by ODDS was on the low end of expectations, (2) three selected trips had monitoring requirements waived, (3) three hard drives for selected trips were not received for review, and (4) two cases where video quality was too poor to be used (Table 3-6).

Note that there are several reasons why the total number of trips and the final coverage rates presented in this section differ from estimates based on ODDS. First, as previously mentioned, trips fishing CDQ/IFQ in multiple NMFS areas were excluded from the ODDS selection rates evaluation because they are required to be monitored (i.e., not randomly selected). Second, there is no robust link between the ODDS database and eLandings. Trips in ODDS cannot be linked directly to realized landings in eLandings, the latter of which inform the trip identification numbers created by CAS. The Fisheries Monitoring and Science Committee has recommended in past reports that an ODDS-eLandings link be established. Third, vessels occasionally fish without logging their trips into ODDS. While these trips are not included in ODDS, they are captured in the CAS when catch is landed. Because CAS captures these physical landings regardless of whether or not the trip was logged in ODDS, total trip counts may differ from ODDS. This compliance issue is tracked by NOAAs Office of Law Enforcement (see Chapter 5). Finally, if trips in the *EM FIXED* strata are monitored but are either not reviewed or lack the video quality necessary for data collection, discrepancies will occur between the selection rates in ODDS and the realized coverage rates of completed trips.

Coverage Rates for Dockside Monitoring of Pollock Fisheries

For this analysis, pollock deliveries in the *OB TRW* strata were defined as any delivery where the predominant species was pollock in eLandings, catch was processed at a shoreside plant, and the management program was American Fisheries Act (for the BSAI) or Open Access (for the GOA). Pollock deliveries in the *EM TRW* strata were defined as any delivery where the vessel was fishing under the Trawl EM program, including deliveries to a tender vessel that subsequently offloaded at a shoreside plant. In 2025, no full coverage catcher vessels landed

pollock in the observer stratum and 100% of full coverage pollock deliveries were monitored for salmon in Trawl EM, meeting expectations (Table 3-7, Table 3-8).

Evaluations of the partial coverage category for dockside monitoring are not straightforward. Tender deliveries were not monitored in the *OB TRW* strata (policy). Furthermore, it should not be assumed that the expected coverage rate for non-tendered deliveries within the *OB TRW GOA* stratum is equal to the programmed trip selection rate (15.45%). First, observers are deployed into the entire trawl fishery, not specifically into the GOA pollock fishery. Second, the relationship between the number of deliveries and trips is not expected to be constant, especially when measured across ports. Therefore, we present the dockside coverage rates for non-tendered *OB TRW GOA* pollock deliveries but make no comparison to the expected coverage rate (Table 3-7). In contrast to *OB TRW,* tender deliveries in the *EM TRW GOA* stratum are monitored and included in reporting. For *EM TRW GOA* deliveries, we present dockside coverage rates for both tendered and non-tendered pollock deliveries which can be compared to the expected coverage rate for shoreside deliveries in the *EM TRW GOA* stratum (Table 3-8). In 2025, 99.9% of *EM TRW GOA* deliveries were monitored for salmon, which was lower than expected because at least one processing plant accepted pollock deliveries when no observer was assigned. There were no tender deliveries in the *EM TRW GOA* stratum during 2025.

3.4. Sample Quality

3.4.1. Temporal Patterns in Trip-Selection

The cumulative number of fishing trips in each stratum was multiplied by the stratum-specific selection rate to obtain the expected number of monitored trips. On each day, under the assumptions that there is no temporal bias in monitoring coverage and the expectation of a binomial distribution of sampling outcomes, realized selection rates should fall within the 95% confidence band. At the end of 2025 the number of monitored trips was outside of this expected range in one of the six partial coverage strata subject to random trip selection: *EM FIXED GOA* (expected rate = 11.11%, realized rate = 8.92%; Table 3-6 and Figure 3-3). The *EM FIXED GOA* stratum was below the expected range for a brief period in September and then for the remainder of the year beginning in November. This was due to a combination of three monitoring waivers that were granted (Table 3-4), random selection by ODDS that was on the low end of the expected distribution, and instances where hard drives for selected trips were never received for review. Coverage rates were within their expected ranges for 100% of the year for most other strata, with the exception of *EM FIXED BSAI* which was above the expected range for the first half of the year.

3.4.2. Spatial Patterns in Trip-Selection

Under a random selection of trips and deliveries, the spatiotemporal distribution of monitoring in a stratum should reflect the spatiotemporal distribution of all trips in the stratum. To evaluate this, we use the neighborhood index (formerly the proximity index, as described in the 2024 Draft ADP [NMFS 2023]). The neighborhood index is defined as the proportion of trips in a

stratum that were either monitored or near a monitored trip in space and time. By considering trips that were neither monitored nor neighboring a monitored trip as a gap in monitoring, the neighborhood index quantifies the spatiotemporal extent of monitoring coverage for each stratum, and these results are provided in section 3.4.3. However, the spatiotemporal extent of monitoring can also be summarized spatially within a stratum to indicate whether there were spatial patterns in the distribution of the realized coverage. The method described below applies to both analyses.

To calculate the neighborhood index, trips were placed into spatiotemporal blocks defined by 200-km wide hexagonal spatial cells (cells) and 1-week time periods. Trips that spanned multiple spatiotemporal blocks and/or fished different gear types were split, contributing equally to each block (e.g., a trip that crossed three blocks was counted as 0.33 trips in each block). Trips were identified as monitored or unmonitored using realized or simulated outcomes. Blocks that either contained a monitored trip or were immediately adjacent to a block with a monitored trip with the same gear type in both space and time were identified. The number of trips either inside or adjacent to monitored blocks were then summed. Simulations of random sampling were repeated 10,000 times for each stratum using the programmed selection rates and realized coverage rates. The spatial analyses quantified the proportion of trips in each spatial cell that were either monitored or adjacent to a monitored trip whereas the spatiotemporal analyses calculated this total across the entire stratum (i.e., the neighborhood index).

Under a random selection of trips the spatial distribution of monitored trips should reflect the spatial distribution of all trips. To evaluate whether the realized spatial distribution of monitoring matched what would be expected given the coverage rates that were actually realized, for each cell, the proportion of sampling iterations that were more extreme than the realized value was calculated to indicate the likelihood of the realized outcome. By mapping out these deviations, regions where either more or less coverage was realized than expected were identified.

There were no notable spatial biases in the distribution of coverage in any of the partial coverage strata subject to random selection. Most strata had a few spatial cells where the fishing effort was either over- or under-represented by the sampled trips, but no clear spatial patterns were apparent to indicate biases. Additionally, comparisons with results from 2024 did not reveal any repeated patterns. This result suggests there is no persisting spatial bias from the previous year and that any spatial imbalances are due to random year-to-year fluctuations rather than a systematic bias in the deployment process (Figure 3-4).

3.4.3. Spatiotemporal Distribution of Monitoring Coverage

In the 2025 ADP, the proximity allocation algorithm calculated the expected neighborhood indices of each stratum as a weighting factor to determine the selection rates necessary to reduce spatiotemporal data gaps. To summarize whether the realized spatiotemporal extent of monitoring coverage in each stratum met expectations, the neighborhood indices realized by monitoring were compared to those derived from sampling simulations. The methods for this analysis were described in the previous section, 3.4.2.

The *OB TRW BSAI, OB TRW GOA,* and *EM FIXED BSAI* strata all realized neighborhood indices of approximately 0.94 and above, meaning at least 94% of trips were either monitored or within 200 km and one week of a monitored trip. The *OB FIXED BSAI and OB FIXED GOA* strata realized neighborhood indices of 0.84 and 0.74, respectively. The *EM FIXED GOA* stratum realized the lowest neighborhood index of 0.68.

The spatiotemporal distributions of monitoring coverage met expectations across most strata (Figure 3-5). While all six strata showed no significant bias when evaluated against their realized coverage rates (Figure 3-5, upper green distributions), only five met expectations when evaluated against the programmed selection rates. The single exception was the *EM FIXED GOA* stratum, which was lower than expected (0.7^{th} percentile). This outcome was likely caused by the lower than expected realized coverage rate during the latter portion of the year (Figure 3-3).

While the neighborhood index evaluates the spatiotemporal coverage within individual strata, it does not capture the data dependencies that exist across different monitoring pools. Because the fixed-gear EM and zero coverage pools rely on data collected by at-sea observers to estimate average fish weights and discard rates, it is critical to evaluate the spatiotemporal overlap between these pools. Appendix C introduces the interspersion index, which was developed to quantify this cross-pool representativeness.

3.4.4. Trip Metrics

This section assesses whether monitored trips are similar to unmonitored trips using a permutation test (a.k.a., randomization test). This test evaluates the core question: "How likely is the observed difference if these two groups actually share the same distribution (in the metric we are comparing)?" Permutation tests answer this by comparing the actual difference found between two groups to the distribution of differences derived by randomizing the labels defining the two groups (i.e., monitored and unmonitored). By randomizing group assignments, the resulting combined distribution of randomized differences represents the sampling distribution under the null hypothesis that the two groups are equal.

In this report, 1,000 randomized trials were run for the permutation test. In each trial, difference values were calculated by subtracting the mean metric value for the 'No' condition from the mean metric value for the 'Yes' condition. For example, the difference between vessel lengths in a permutation test for a monitoring effect would be the mean value for unmonitored trips subtracted from the mean value for all monitored trips. The *p*-value from the test is calculated as the number of randomized trials with greater absolute differences than the actual difference divided by the number of randomized trials.

Similar to the other statistical tests used in this report, low *p*-values indicate unlikely events under the hypothesis of equality and are therefore considered evidence against that hypothesis. However, unlike other statistical tests used in this report, a Bonferroni adjustment was applied to the significance threshold of 0.05 to account for multiple comparisons. Dividing this threshold by the number of metrics being tested results in an adjusted significance threshold of 0.00833 (0.05 / 6). The *p*-values are then compared to the adjusted significance threshold. In an attempt to

improve clarity, three values are calculated for each metric: (1) the difference between groups, (2) the difference expressed as a percentage of the metric's mean value, and (3) the *p*-value.

Six trip metrics were examined in the permutation test: the number of NMFS Areas visited, trip duration (days), weight of landed catch (t), vessel length (ft), species richness (the number of species in the landed catch), and the proportion of the total catch that is made up of the most predominant species (pMax). The metric 'vessel length' is used to help interpret the results from 'weight of landed catch' because fishing power is positively correlated to vessel length. Specifically, differences in landed weight and vessel length are interpreted as a failure to achieve a random sample of vessels of different sizes, whereas differences in landed weight only lend more evidence that there was a monitoring effect. Our pMax metric follows the concepts behind Hill's diversity number N_1 that depicts the number of abundant species (Hill 1973) and is a measure of how "pure" catch is because a value of one would indicate that only the predominant (and presumed desirable) species was landed.

The six trip metrics were chosen for analyses of observer effects in part because they are available for both monitored and unmonitored trips. However, the actual catch composition has not directly been compared. Traditional comparisons of multivariate catch composition data are often compromised by the confounding of location (changes in mean abundance) and dispersion (changes in variability). Analysts at FMA have overcome these obstacles with a multivariate Tweedie generalized linear model. Results are presented in Appendix B. It is envisioned that this model's results will be incorporated in this section in future versions of the Annual Report.

Were monitored trips similar to unmonitored trips?

The sample sizes available and the results of permutation tests are presented in Table 3-9. A visual depiction of individual results of this permutation test is given in Figure 3-6 for illustration purposes. Monitored trips in the *OB FIXED GOA* stratum were 16.0% (0.8 days) shorter in duration, landed 22.6% (0.6 species) more species, and catch was less diverse (4.9%) than unmonitored trips. This is an improvement from 2024, where three strata displayed signs of an observer effect (AFSC and AKRO 2025). However, *OB FIXED GOA* has had differences between monitored and unmonitored trips in multiple years.

3.5. Data Timeliness

The coverage rates calculated in this report are based on trips with monitoring information available to analysts in CAS at the time of writing. Data timeliness is the duration between the completion of a trip or delivery and when the data are available to analysts in CAS and is generally very rapid for trips monitored with at-sea observers (typically less than 24 hours). However, data timeliness for EM, and by extension the coverage rate is, in part, based on when data from PSMFC are provided to CAS. In 2025 for *EM FIXED BSAI*, the median data timeliness was 53 days and the mean was 60 days (Figure 3-7). For *EM FIXED GOA*, the median data timeliness was 101 days and the mean was 122 days (Figure 3-7).

Data timeliness values for *EM FIXED* strata in 2025 are not reflective of how long it took for video to be reviewed, and should not be compared to values from prior years. In the process of compiling the 2026 ADP, we discovered that fixed-gear EM data were missing from CAS. Upon further investigation, we identified, and subsequently fixed, a coding error that prevented those data from being transferred from the Alaska Fisheries Information Network (AKFIN) to the AFSC (and subsequently CAS). Therefore, we have included Figure 3-8, which shows review timeliness for *EM FIXED* strata. Review timeliness differs from data timeliness in that it describes the time between a trip ending and data being reviewed by PSMFC staff (in contrast to data timeliness, which describes the time between a trip ending and data being available in CAS). There was a similar data transmission error in 2024, but prior to 2024, review timeliness and data timeliness were approximately equal. The coding error discovered in the process of compiling this report resulted in a delay between when the trip was reviewed by PSMFC staff and when it appeared in CAS. Thus, review timeliness for these strata is much shorter than data timeliness. Median and mean review timeliness for *EM FIXED BSAI* was 33 days and 37 days, respectively (Figure 3-8). Median and mean review timeliness for *EM FIXED GOA* was 19 days and 24 days, respectively. Data need to be in CAS within two weeks of a trip ending to be usable for inseason quota management. Although the difference between data timeliness and review timeliness was not as large for *EM FIXED BSAI*, most fixed-gear EM trips take place in the *EM FIXED GOA* stratum. Staff at AKFIN have remedied the coding error responsible for this delay, so we do not expect a similar delay for fixed-gear EM data in 2026.

3.6. Response to Council and SSC Comments

The SSC offered the following comments during the June 2025 NPFMC meeting in response to the 2024 Annual Report:

- The SSC continues to be concerned about the potential impacts of EM use over observers on species identification, bycatch, collection of biological data and tissue samples, interactions with marine mammals and seabirds, and the downstream effects on information support for management decisions. The SSC recommends that going forward the analysts work with assessment authors to characterize and report EM-related changes in data quantity (sample sizes) and quality (e.g., precision and accuracy) of the biological data and catch metrics used in stock assessments, by-catch and Prohibited Species Catch (PSC) estimation. The SSC suggests the analysts prioritize salmon, crab, and halibut PSC and Tier 6 stocks (e.g., sharks/ skates), which use catch information exclusively for management.
    - This is the second year the SSC has included this type of concern from the Annual Report. NMFS is making progress on this issue and has dedicated a response in Appendix A.
- The SSC appreciated efforts by the analysts to capture program performance metrics in appropriate figures and tables and requests (as in Table 3-4) clear indication of whether program expectations were realized, not realized or unknown. We understand that in many instances these determinations may be qualitative or subjective. The SSC requests a brief written synopsis including tables or figures of performance metrics to allow a

holistic look at program performance. Where possible the SSC requests input from the analysts indicating high-priority areas of concern relative to unachieved ADP objectives.
    - A summary of chapter 3 evaluations will be provided in the presentation of this report. We may consider providing a similar table in future versions of this report.
- The SSC finds the permutation tests used to compare monitored and unmonitored trips effective and recommends the analysis be expanded to other metrics including depths fished, and catch rates of species of concern (e.g., PSC, Tier 6 stocks).
    - Analysts have added a multivariate Tweedie generalized linear model with permutation, enabled through the development of a new R software package, to the suite of tools used to detect observer effects. This method was first introduced as Appendix A in the 2024 Annual Report. Appendix B of this year's Annual Report includes an assessment of whether or not the catch of multiple species differed between monitored and unmonitored trips while controlling for differences in fishing effort, target fishery, tendering status, gear type, and FMP Area fished.
- The SSC…recommends the analysts include the full color ramp on maps of positive and negative differences in coverage rate expectations.
    - The maps presented in this analysis are meant to illustrate unusual patterns in the spatial arrangement of sampled trips within strata. The color range is used to illustrate regions that achieved higher- or lower-than expected representation in the sample. The author of this figure decided against coloring regions with outcomes that fell within the expected range as this would shift the focus of the results away from the unusual outcomes.
- The SSC notes that the temporary staffing shortage of EM video reviewers resulted in failure to meet effort allocation and coverage rate expectations in the EM FIXED BSAI strata. This resulted in temporal and spatial biases, as well as reduced spatiotemporal proximity, and differing vessel lengths for monitored and unmonitored trips. While the outcome is unfavorable, the SSC views this situation as a confirmation of performance metric responsiveness. Understanding that staffing shortages may not be predictable going forward, the SSC recommends that the analysts consider how to selectively review EM data to prevent outsized impact on one stratum, and consider how to representatively select trips for review to reduce temporal imbalance across the season.
    - NMFS and PSFMC jointly collaborated on developing a statistically sound plan for ensuring fixed-gear review is not temporally biased. A similar plan is being developed for the Trawl EM program.

The NPFMC offered the following comments during the October 2025 NPFMC meeting in response to the Draft 2026 ADP:

- Confirmation that vessels operating in partial coverage can deliver to and have their harvest observed by a full coverage observer at an AFA shoreplant. No partial coverage shoreside observers need to be stationed at full coverage AFA plants.
    - NMFS has confirmed that partial coverage shoreside observers do not need to be stationed at full coverage AFA plants.

    - For budget planning during the development of the Annual Deployment Plan, NMFS needs advance notice by processing plants accepting trawl EM pollock deliveries from catcher vessels of their needs for partial coverage observers in the upcoming fishing year. Regulations at 50 CFR 679.51(b)(3)(i) require notice by November 1 of the year prior to the year in which they intend to receive deliveries from catcher vessels or tender vessels in the trawl EM category. Early notification by processing plants is necessary, and allows NMFS to plan accordingly and develop a cost-efficient shoreside monitoring plan. Shoreside processors that do not notify NMFS by November 1 will be ineligible to receive trawl EM deliveries in the upcoming fishing year. Plant operating plans for the following year can be provided to NMFS during annual meetings between the agency and industry at the annual Fisheries Monitoring Advisory Committee Meeting (April-May), the annual Partial Coverage Monitoring Advisory Committee Meeting (September), during the annual spring (May-June) or fall (Sept-Oct) NPFMC meetings, or by directly contacting the FMA Division Director and FMA Analytical Program Manager. The Annual Planning and Reporting Process for the Annual Deployment Plan and the Annual Report can be found in Chapter 1, section 1.2 of this report.
- Continued outreach to the fleets on 1) the deadlines to opt in or opt out of the EM pool for 2026, and 2) any changes to, or potential disruptions with, the ODDS system to log trips for coverage.
    - Engagement between NMFS and industry constituents is valuable for developing cost-efficient monitoring programs that meet management and scientific needs as well as for building trust. In addition to FMAC, PCFMAC, and NPFMC meetings, NMFS is typically invited to participate annually in the Aleutians East Borough annual meeting and the Kodiak Trawl fleet meetings to inform the fleet of important deadlines as they relate to EM participation and changes to ODDS. Additionally, in December 2025, to finalize monitoring for the 2026 Annual Deployment Plan, NMFS requested an ad-hoc meeting with industry representatives of the Trawl EM fleet to discuss industry's needs for shoreside monitoring in 2026. Such planning sessions are necessary to ensure cost-efficiency within the partial coverage program. These plans were not actualized in 2026 leading to some cost-inefficiencies.
- Consistent with the Trawl EM Council action, the cost of housing and feeding observers was not to be directly paid for by processors and should be included in the ADP. There may be specific cases where processors can continue to house and feed observers, and these can be excluded.
    - In 2025, arrangements were made between the partial coverage observer provider and plant processing operators to provide affordable lodging and meals for shoreside observers. FMA, which ultimately reimburses the partial coverage observer provider for these costs, included these details in the cost estimates for the 2026 ADP.

- The Council reiterates its support for agency efforts to revise the zero selection pool (currently <40' fixed gear catcher vessels and jig gear) for cost efficiency purposes to evaluate including fixed gear catcher vessels with 1-2 annual trips and/or low annual quota/volume.
    - NMFS staff have initiated work to evaluate potential revisions to the zero selection pool for cost efficiency purposes, including consideration of fixed-gear catcher vessels with low annual participation. Initial exploratory analyses have been completed, and additional analysis and synthesis are ongoing. A summary of this work is planned for inclusion in the Draft 2027 Annual Deployment Plan as an appendix, with recommendations anticipated for presentation to the PCFMAC and NPFMC in September and October 2026 (respectively).

The NPFMC offered the following comments during the NPFMC October 2024 meeting with respect to the Draft 2025 ADP:

- Inclusion of shoreside observers and electronic monitoring (EM) service/maintenance support for tenders such that the Western Gulf pollock fleet can fully participate in the pelagic trawl EM program in 2025.
    - In both the 2025 and 2026 ADPs, NMFS received information from trawl EM representatives that tendering was planned for the following year. In both cases, this information was received well after the draft budget for monitoring was published in the draft ADPs. NMFS responded by modifying these ADPs under very tight deadlines to ensure that these requests for tendering were appropriately reflected in the final ADP budgets. Yet, in 2025, no tendering occurred in the WGOA which has resulted in some cost-inefficiencies. NMFS remains committed to being responsive to industry needs and looks forward to continued coordination. Strengthening our communication on operational shifts will help us ensure that monitoring resources are used as effectively as possible to support the entire fleet.
- Change to the fishing trip cancellation policy in ODDS such that a person must edit (and not cancel) a trip selected for observer coverage to reduce temporal bias. NMFS should provide significant outreach to the fleet prior to 2025 to convey these changes.
    - In late 2024 and early 2025 NMFS conducted several outreach events to publicize the change to the trip cancellation policy in ODDS. The new policy was implemented in January 2025 and eliminates the ability of vessel operators to cancel trips, while preserving the ability of vessel operators to change the date and location of trips. This new ODDS policy appears to be working well as we report in this chapter, there was very little discernible temporal bias in the at-sea observer strata in 2025.
- The Council supports additional fixed gear EM vessels in the EM pool in 2025 (up to 200 total vessels) provided they opt-in prior to November 1, 2024, funding is available, and they meet the criteria in the ADP.
    - In 2025, 178 vessels were approved to participate in the fixed-gear EM pool, up from 177 vessels in 2024.

- The Council supports the agency pursuing steps to remove EM systems from vessels that have not fished for multiple years (e.g., 3, 4, or 5 years).
    - In October 2023, the Council passed a motion supporting the development of a mechanism to remove fixed-gear vessels which have not fished nor used their EM systems for 3 or more years from the EM stratum.
    - NMFS is currently developing criteria for removal of fixed-gear vessels from EM and will publish those criteria in the upcoming 2027 ADP. This will provide more opportunities for vessels that would like to, but have not yet been able to, participate in the fixed-gear EM program. In addition, this should also bring some cost-efficiency to this program.
    - Additionally, congressionally mandated funds provided to NMFS to support the installation and repair of EM equipment on vessels will be fully expended sometime in 2026. At this time, NMFS is not aware of any new funds to support installations of new systems and thus such costs will need to come from the partial coverage landings fee.
- Additional outreach to fleets such that they understand all associated agency deadlines and the opportunity to opt-out of the fixed gear EM pool if not fishing such that the equipment can be used elsewhere.
    - Prior to the 2026 ADP, from September through October 2025 a banner was added to the ODDS webpage reminding users of the EM opt-in and opt-out period of September 1st to November 1st. One fixed-gear EM vessel opted out of the pool for the 2026 year. This banner will be posted every fall.

3.7. References

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Table 3-1 -- Partial coverage budgeted and actual monitoring costs in 2025 funded via the partial coverage ex-vessel fee for each monitoring pool. The costs of electronic monitoring system installations and replacements were supported by external funding and are totaled separately.

	Fee funds					
Partial coverage monitoring pool	2025 ADP Budget ($)	Actual cost ($)	Difference ($)	Difference (%)	External funds ($)	Total cost ($)
At-sea Observer	2,314,000	2,205,683	-108,317	-4.68	0	2,205,683
EM Fixed-Gear	964,000	1,014,760	50,760	5.27	485,883	1,500,643
EM Trawl GOA	911,000	819,033	-91,967	-10.10	219,939	1,038,972
Total	4,189,000	4,039,476	-149,524	-3.57	705,822	4,745,298

Table 3-2 -- Comparison between predicted and realized fishing effort (by number of catcher vessel trips, *N*) and monitored days at sea (*d*) for the partial coverage strata in 2025. Predicted values come from Table B-3 of the 2025 Annual Deployment Plan.

	Total trips (*N*)				Monitored/reviewed days (*d*)			
Strata	Predicted	Realized	Difference	Percent	Predicted	Realized	Difference	Percent
OB FIXED BSAI	264	282	18	6.8	311	226	-85	-27.5
OB FIXED GOA	1,923	1,972	49	2.5	687	445	-242	-35.2
OB TRW BSAI	26	36	10	38.5	27	34	7	25.3
OB TRW GOA	192	334	142	74.0	102	122	20	19.8
At-sea observer total	2,405	2,624	219	9.1	1,127	827	-300	-26.7
EM FIXED BSAI	51	90	39	76.5	175	205	30	17.1
EM FIXED GOA	904	897	-7	-0.8	558	414	-144	-25.8
EM fixed-gear total	955	987	32	3.4	733	619	-114	-15.6
EM TRW GOA	926	956	30	3.2	2,989	2,255	-734	-24.6
Total	4,286	4,567	281	6.6	4,849	3,701	-1,148	-23.7

Table 3-3 -- Trip cancellation rates in the Observer Declare and Deploy System (ODDS) for 2025. Trips were either not selected, randomly selected ("Random"), or inherited selection from a previously selected trip that was cancelled ("Inherited"). A trip is canceled by the system if the user did not identify whether fishing had occurred by the end of the year. "Paper" indicates that a trip was logged when ODDS was not available.

Strata	Selection outcomes	Logged (*a*)	Canceled by system (*b*)	Trips remaining (*c* = *a* - *b*)	Canceled by user (*d*)	Paper	% user cancellation (*d*/*c* × 100)
OB FIXED BSAI	Not selected	266	8	258	9	0	3.5
	Random	57	2	55	4	0	7.3
	Inherited	1	0	1	0	0	0.0
OB FIXED GOA	Not selected	1,891	76	1,815	21	0	1.2
	Random	123	0	123	11	0	8.9
	Inherited	2	0	2	0	0	0.0
OB TRW BSAI	Not selected	22	3	19	0	0	0.0
	Random	16	0	16	0	0	0.0
	Inherited	0	0	0	0	0	0.0
OB TRW GOA	Not selected	348	6	342	66	0	19.3
	Random	58	0	58	12	0	20.7
	Inherited	8	0	8	0	0	0.0
EM FIXED BSAI	Not selected	49	1	48	4	0	8.3
	Random	50	0	50	3	0	6.0

	Inherited	1	1	0	0	0	0.0
EM FIXED GOA	Not selected	815	20	795	11	0	1.4
	Random	84	1	83	4	0	4.8
	Inherited	9	0	9	1	0	11.1
Total	Not selected	3,391	114	3,277	111	0	3.4
	Random	388	3	385	34	0	8.8
	Inherited	21	1	20	1	0	5.0

Table 3-4 -- Number of completed trips in each trip-selection stratum in 2025, including counts of trips that were selected for monitoring randomly or via inheritance from previously selected trips that were cancelled. The count and relative impact of selected trips that had monitoring waived ("Waived trips", "% reduction of selected trips due to waivers") are also shown.

Strata	Total completed trips	Selection type	Selected trips	Waived trips	Total final selected	% selected from inherits	% reduction of selected trips due to waivers
OB FIXED BSAI	301	Random	51	3	49	2.0	5.8
		Inherit	1	0			
OB FIXED GOA	1,908	Random	112	4	110	1.8	3.5
		Inherit	2	0			
OB TRW BSAI	35	Random	16	1	15	0.0	6.2
		Inherit	0	0			
OB TRW GOA	330	Random	46	1	53	15.1	1.9
		Inherit	8	0			
EM FIXED BSAI	91	Random	47	1	46	0.0	2.1
		Inherit	0	0			
EM FIXED GOA	871	Random	79	3	84	9.5	3.4
		Inherit	8	0			
Total	3,536		370	13	357	5.3	3.8

Table 3-5 -- Number of logged trips in each partial coverage stratum in 2025 that were selected using the initial random number generator ("Initial random selection") and those that remained after user input ("After cancellations"). The relative impact of inherits and waivers in trip-selection are also shown ("With inherits", "After waivers").

Strata	Trip disposition	Selected trips	Total trips	Realized (%)	Programmed (%)	*p*-value
OB FIXED BSAI	Initial random selection, *a*	57	323	17.65	19.83	0.364
	After cancellations, *b (a - b)*	51	301	16.94	19.83	0.220
	With inherits, c (a - b + c)	52	301	17.28	19.83	0.279
	After waivers, d (a - b + c - d)	49	301	16.28	19.83	0.129
OB FIXED GOA	Initial random selection, *a*	123	2,014	6.11	6.16	0.963
	After cancellations, *b (a - b)*	112	1,908	5.87	6.16	0.634
	With inherits, *c (a - b + c)*	114	1,908	5.97	6.16	0.775
	After waivers, d (a - b + c - d)	110	1,908	5.77	6.16	0.505
OB TRW BSAI	Initial random selection, *a*	16	38	42.11	40.39	0.869
	After cancellations, *b (a - b)*	16	35	45.71	40.39	0.606
	With inherits, *c (a - b + c)*	16	35	45.71	40.39	0.606
	After waivers, d (a - b + c - d)	15	35	42.86	40.39	0.864
OB TRW GOA	Initial random selection, *a*	58	406	14.29	15.45	0.583

	After cancellations, *b (a - b)*	46	330	13.94	15.45	0.493
	With inherits, *c (a - b + c)*	54	330	16.36	15.45	0.648
	After waivers, d (a - b + c - d)	53	330	16.06	15.45	0.761
EM FIXED BSAI	Initial random selection, *a*	50	99	50.51	47.91	0.616
	After cancellations, *b (a - b)*	47	91	51.65	47.91	0.529
	With inherits, *c (a - b + c)*	47	91	51.65	47.91	0.529
	After waivers, d (a - b + c - d)	46	91	50.55	47.91	0.675
EM FIXED GOA	Initial random selection, a	84	899	9.34	11.11	0.100
	After cancellations, *b (a - b)*	79	871	9.07	11.11	0.059
	With inherits, c (a - b + c)	87	871	9.99	11.11	0.306
	After waivers, d (a - b + c - d)	84	871	9.64	11.11	0.178

Table 3-6 -- Number of total vessels (*V*), monitored vessels (*v*), total trips/deliveries (*N*), and monitored trips/deliveries (*n*) for each stratum in 2025. The coverage and 95% confidence interval columns are expressed as percentages of the total number of trips taken/deliveries made within each stratum.

					Coverage		95% confidence interval		
Strata	V	v	N	n	Expected	Realized	Lower limit	Upper limit	Realized meets expected?
Full coverage									
Full	91	91	969	969	100.00	100.00			Yes
EM TRW BSAI*	63	63	1,871	1,871	100.00	100.00			Yes
Full coverage total	129	129	2,840	2,840		100.00			
Partial coverage									
OB FIXED BSAI	47	26	282	50	19.83	17.73	13.46	22.70	Yes
OB FIXED GOA	302	89	1,972	114	6.16	5.78	4.79	6.90	Yes
OB TRW BSAI	2	2	36	15	40.39	41.67	25.51	59.24	Yes
OB TRW GOA	30	18	334	53	15.45	15.87	12.12	20.24	Yes
EM FIXED BSAI	10	9	90	48	47.91	53.33	42.51	63.93	Yes
EM FIXED GOA	109	40	897	80	11.11	8.92	7.14	10.98	No - lower than expected
EM TRW GOA*	43	43	962	961	100.00	99.90			No - lower than expected
Partial coverage total	464	200	4,573	1,321		28.89			
Zero coverage									
Zero coverage	296	0	1,447	0	0.00	0.00			Yes
Total	854	303	8,860	4,161		46.96% trips/deliveries; 35.48% vessels			

*indicates where *N* and *n* represent deliveries

Table 3-7 -- The number of shoreside pollock deliveries made by catcher vessels in the *OB TRW* strata during 2025, separated by port and coverage category. Trips that made a delivery to a tender have been excluded.

FMP	Coverage category	Port	Total deliveries (*N*)	Deliveries monitored for salmon (*n*)	% monitored
GOA	Partial	Akutan	10	4	40.00
		Kodiak	209	34	16.27
GOA total			219	38	17.35

Table 3-8 -- The number of pollock deliveries made by catcher vessels in the *EM TRW* strata during 2025, separated by coverage category and port. Tender and non-tender denote whether or not a catcher vessel delivered its catch to a tender.

FMP	Coverage category	Port	Total deliveries (*N*)	Deliveries monitored for salmon (*n*)	% monitored
BSAI	Full	Akutan	680	680	100.00
		Dutch Harbor	1,191	1,191	100.00
BSAI total			1,871	1,871	100.00
GOA	Partial (non-tender)	Akutan	55	55	100.00
		Kodiak	772	771	99.87
		Sand Point	135	135	100.00
GOA (non-tender) total			962	961	99.90
GOA total			962	961	99.90

Table 3-9 -- Results of permutation tests between monitored and unmonitored trips in the 2025 deployment strata. OD: Observed difference (monitored - unmonitored). Monitored and unmonitored columns are in units of trips. Statistically significant results are in bold. The Bonferroni correction was applied to the significance tests.

Strata	Monitored	Unmonitored	Metric	NMFS areas	Days fished	Vessel length (ft)	Species landed	pMax species	Landed catch (t)
OB FIXED BSAI	50	232	OD	-0.058	-0.649	-2.596	0.005	0.001	-8.228
			OD (%)	-4.863	-12.267	-3.416	0.267	0.115	-19.403
			p-value	0.490	0.236	0.561	1.000	0.894	0.378
OB FIXED GOA	114	1,858	OD	0.031	-0.839	0.290	0.640	-0.046	-1.244
			OD (%)	2.885	-16.028	0.518	22.585	-4.859	-11.785
			p-value	0.307	< 0.001*	0.825	< 0.001*	< 0.001*	0.337
OB TRW BSAI	15	21	OD	0.038	-0.105	-0.457	0.343	-0.014	1.957
			OD (%)	2.162	-3.235	-0.492	8.182	-1.531	5.652
			p-value	1.000	0.802	1.000	0.378	0.258	0.739
OB TRW GOA	53	281	OD	0.159	-0.258	-0.845	0.160	0.008	4.209
			OD (%)	12.646	-8.524	-1.024	1.933	0.978	3.586

		p-value	0.016	0.357	0.678	0.809	0.732	0.633
EM FIXED BSAI 48	42	OD	-0.071	-0.396	2.661	-0.220	0.020	1.147
		OD (%)	-6.667	-8.482	2.780	-9.737	2.140	2.872
		p-value	0.095	0.517	0.664	0.410	0.330	0.823
EM FIXED GOA 80	817	OD	0.024	0.070	0.291	0.427	0.003	1.125
		OD (%)	2.243	1.366	0.542	13.007	0.277	11.167
		p-value	0.516	0.787	0.834	0.105	0.841	0.420

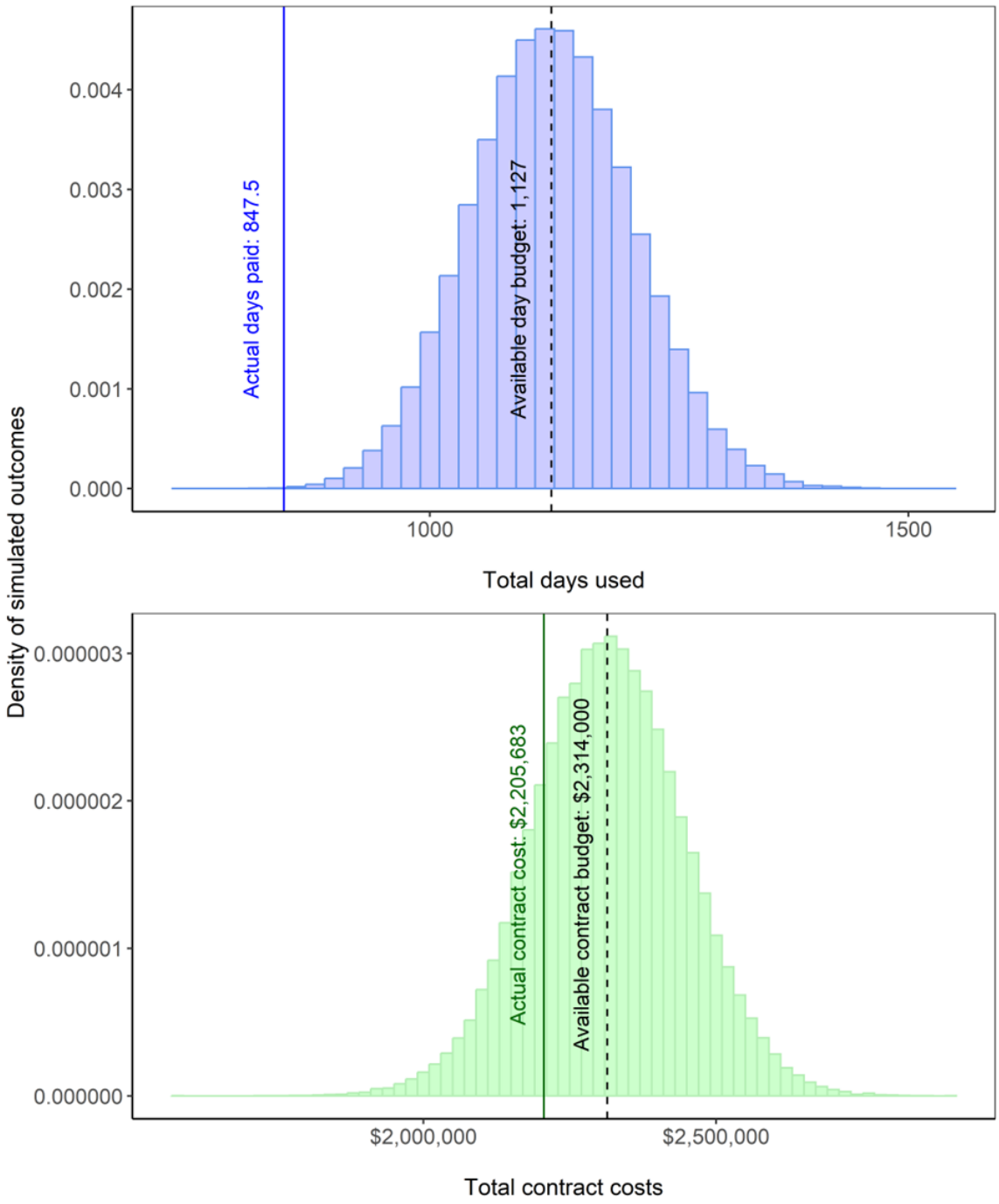

Figure 3-1 -- Total number of observer sea days purchased (top panel) and total cost of monitoring those sea days (bottom panel). Vertical bars signify the range of potential outcomes expected by the 2025 Annual Deployment Plan. Dashed lines signify expected outcomes. Solid lines signify what actually occurred in 2025.

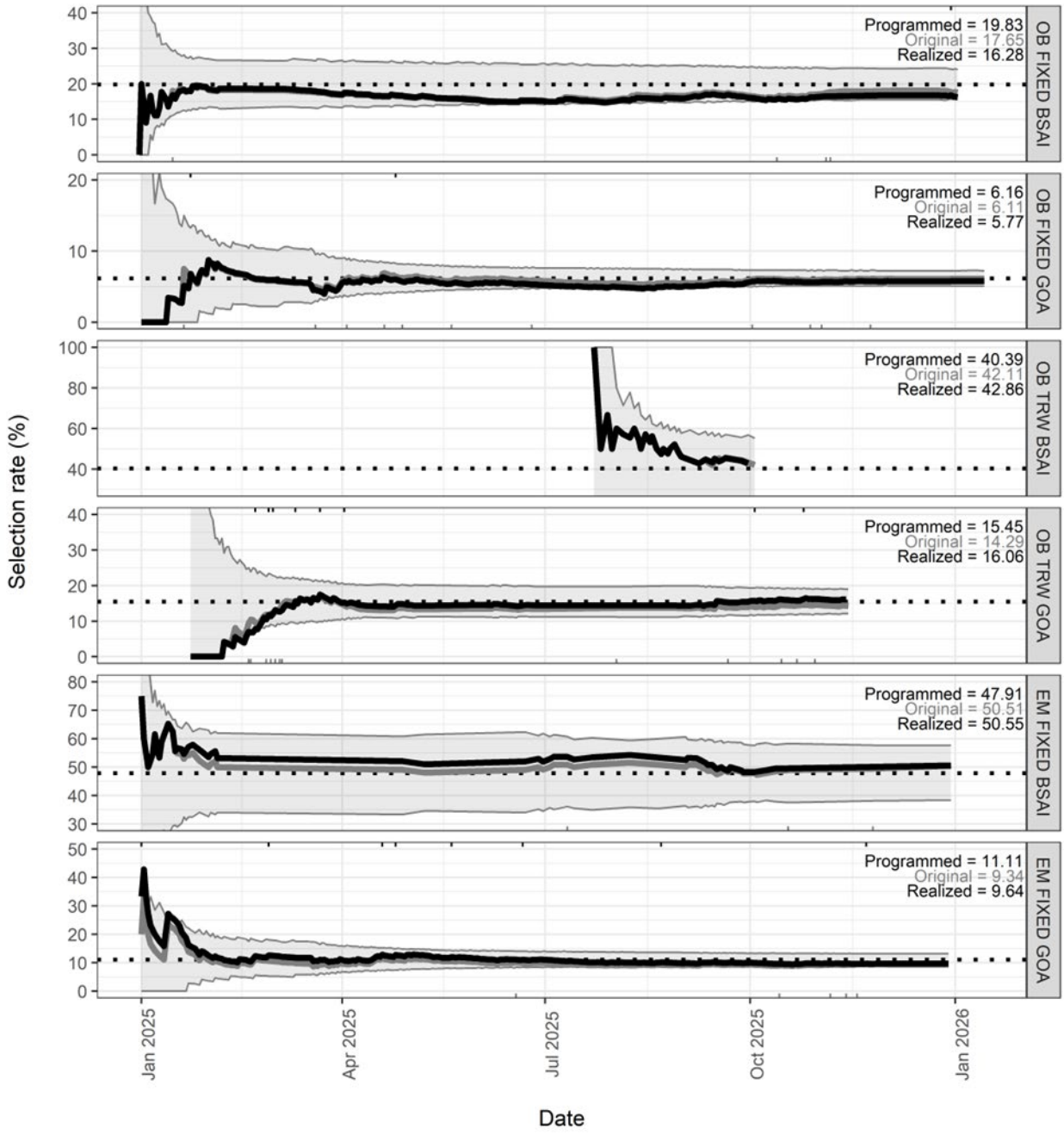

Figure 3-2 -- Time series of selection rates of trips logged into the Observer Declare and Deploy System during 2025, ordered by each trip's planned embark date. The programmed selection rate (dotted line) is bounded by expected 95% confidence intervals based on a binomial distribution (gray shaded area). The original rate (gray line and gray text) represents the rate at which ODDS selected trips for monitoring, including trips that were canceled. The realized rate (black line and black text) is the selection rate of completed trips after accounting for inherited trips and waivers. Vertical tick marks on the x-axis depict dates when selected trips were canceled (gray, bottom) and when inherited trips were monitored (black, top).

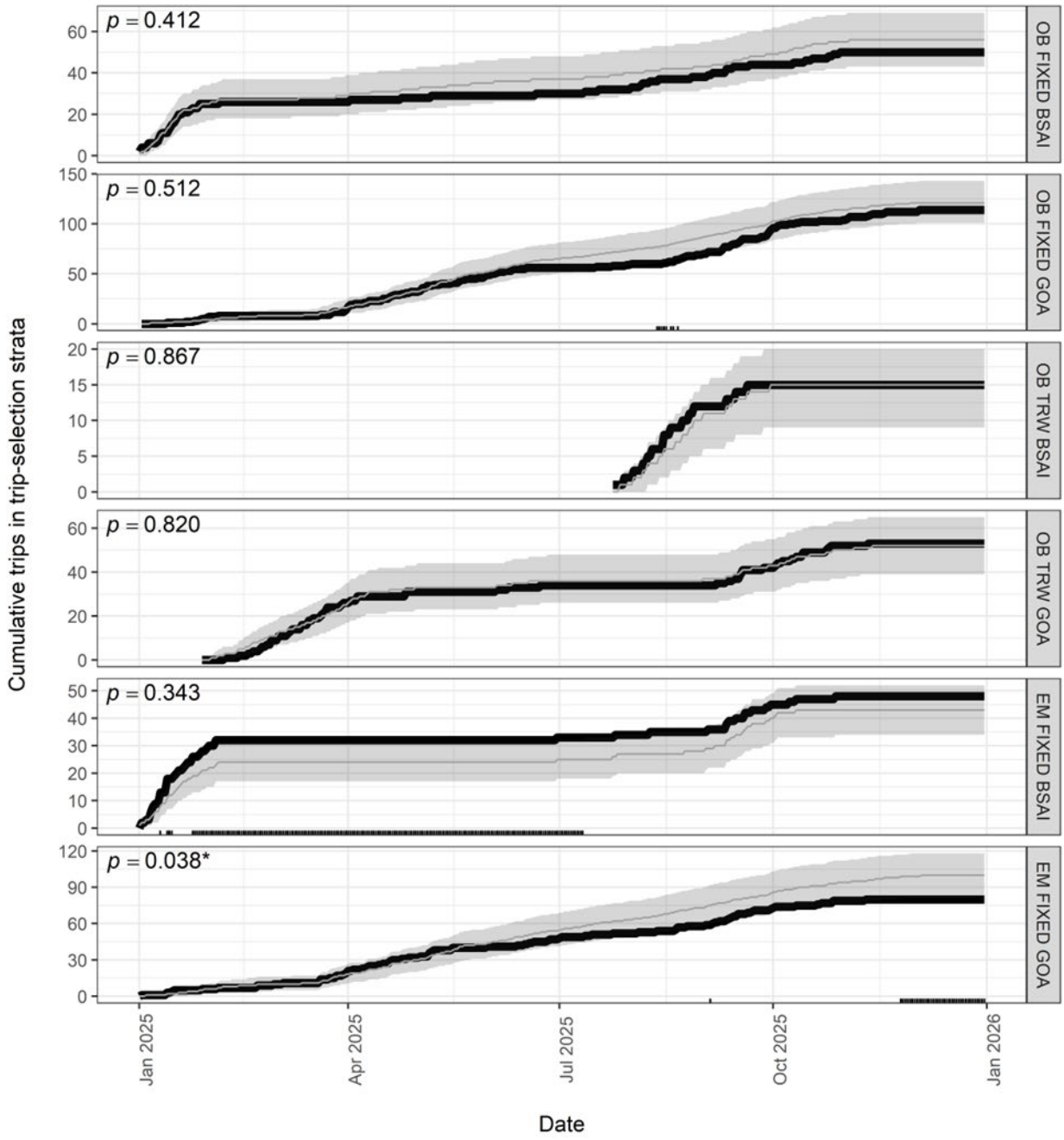

Figure 3-3 -- Cumulative number of trips monitored during 2025 (black line) compared to the expected range of monitored trips (shaded ribbon) given fishing effort and selection rates. Dates where the monitored number of trips is outside of expected (less or more than the range) are depicted as tick marks on the x-axis. Test results (using a binomial distribution) determining if the realized rate was sampled at the selection rate are denoted as *p*-values.

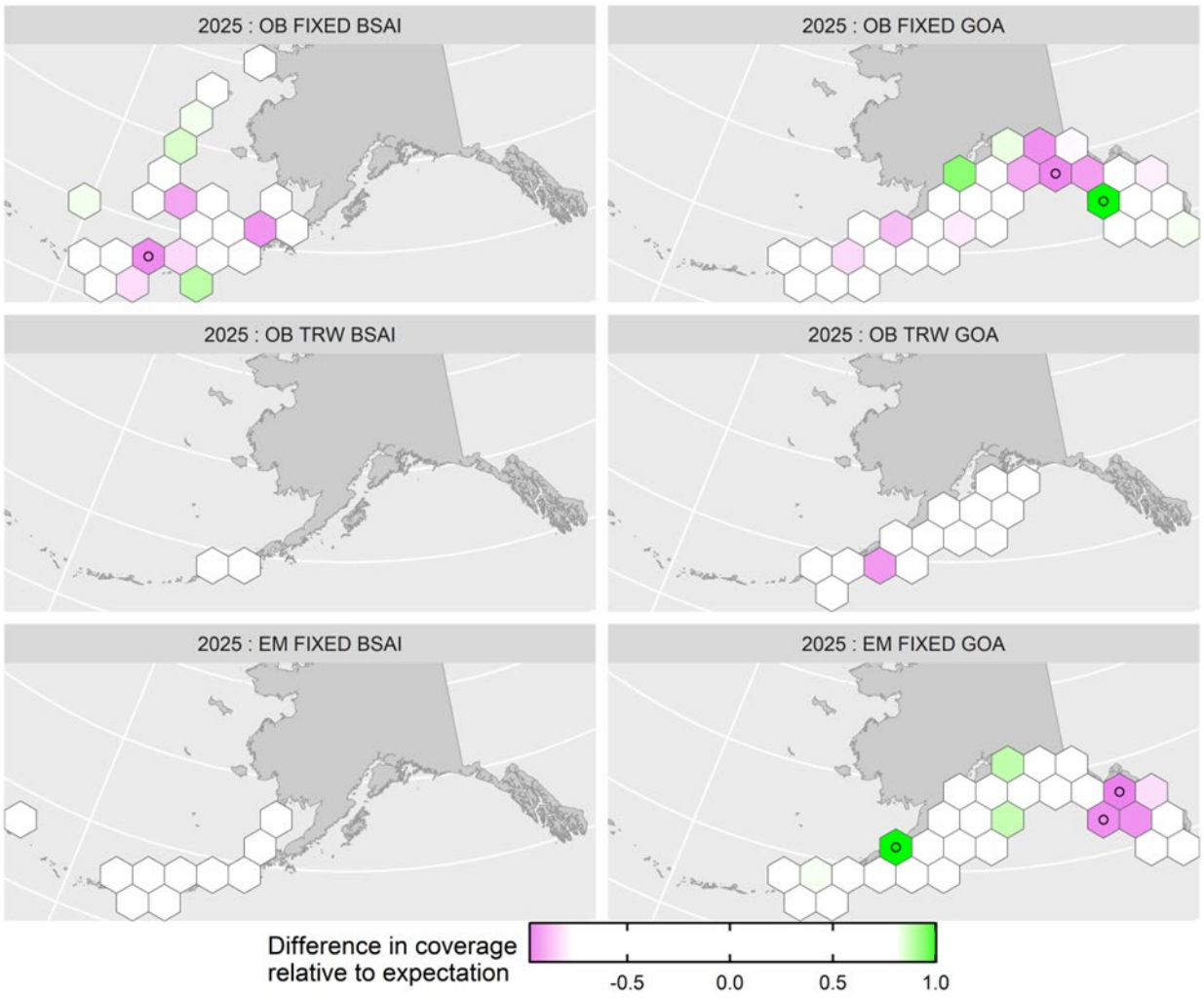

Figure 3-4 -- Spatial patterns of the distribution of monitoring in the partial coverage strata during 2025 relative to the distribution created from 10,000 simulations of random sampling at each stratum's realized coverage rate. Each hexagonal spatial cell is 200 km wide. The degree of monitoring in each cell was quantified as the proportion of trips that were monitored or neighboring a monitored trip in both space and time. Cells where the degree of monitoring was more extreme than 90% of simulated outcomes are filled violet (less) or green (more), and those cells with a more extreme outcome than 97.5% of simulated outcomes are additionally marked with a circle.

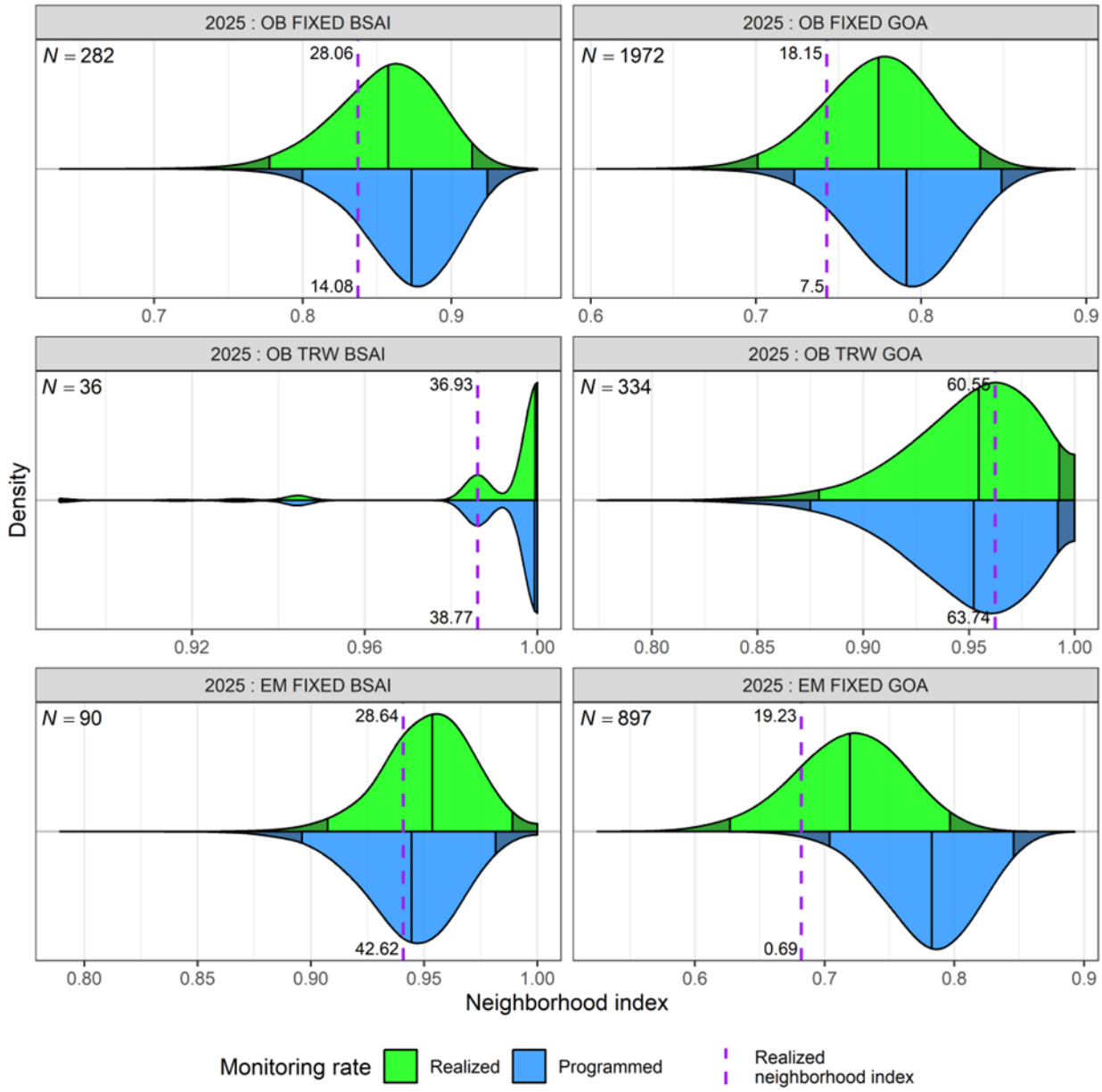

Figure 3-5 -- Stratum-level neighborhood indices in partial coverage strata in 2025. The distributions show the neighborhood values obtained from 10,000 simulations of random sampling, where the upper (green) distribution sampled using the realized coverage rate and the lower (blue) distribution used the programmed selection rate. The 2.5% tails of the distributions are shaded darker to represent unlikely outcomes. The percentiles of the realized neighborhood indices (purple vertical dashed lines with annotations) are shown for each distribution. The number of trips in each stratum (*N*) is displayed in the upper-left of each facet. Note the varying scales of the x-axes between facets.

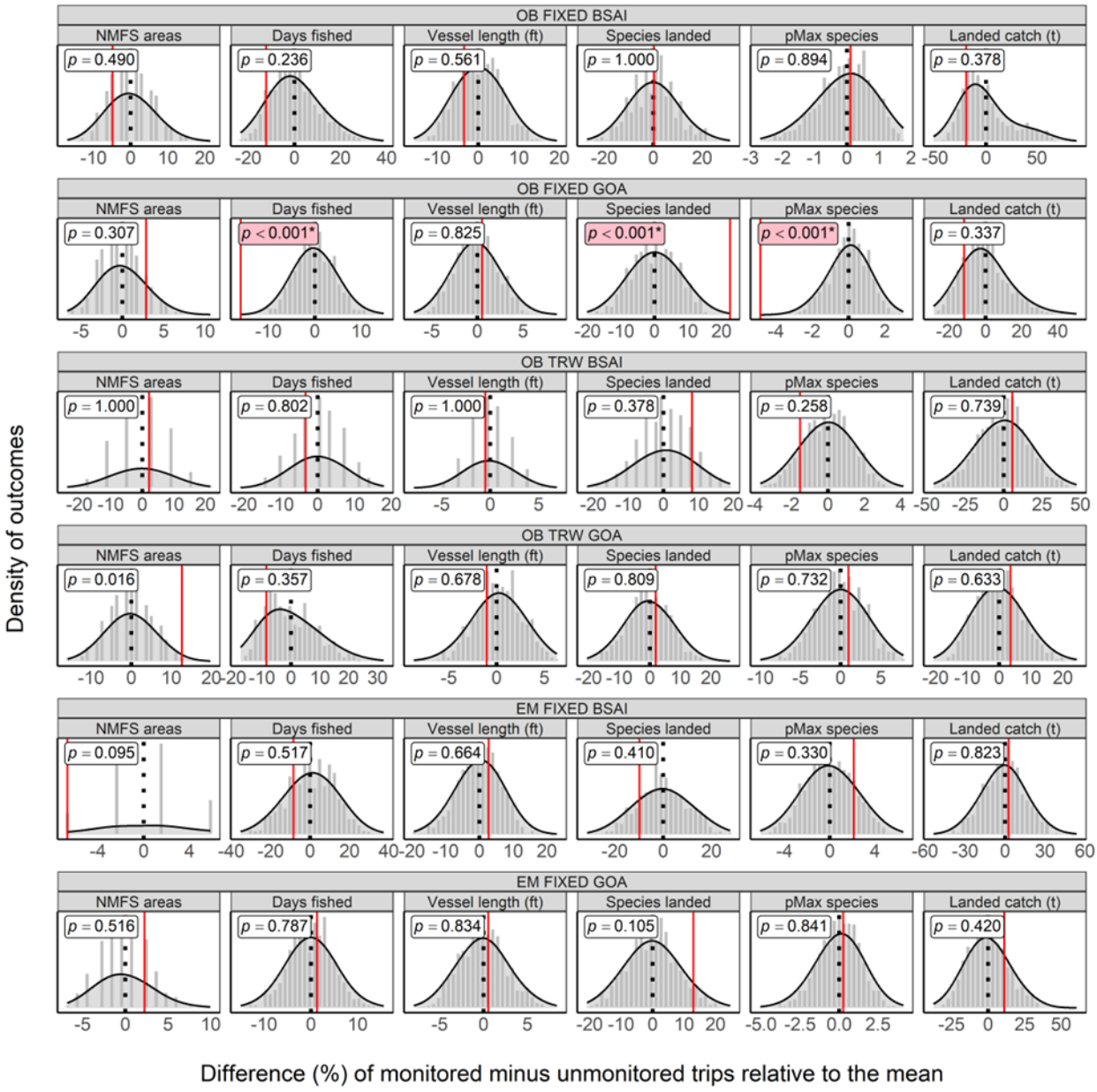

Figure 3-6 -- Illustrative results from permutation tests depicting percent differences between monitored and unmonitored trips by strata in the partial coverage category. Gray bars depict the distribution of differences between monitored and unmonitored trips when the assignment of monitoring status has been randomized (this represents the sampling distribution under the null hypothesis that monitored and unmonitored trips are the same). The vertical red solid line denotes the actual difference between monitored and unmonitored trips. Values on the x-axis have been scaled to reflect the relative (%) differences in each metric. The *p*-value for each test is denoted in the upper left corner. Low *p*-values (shaded pink) are reason to reject the null hypothesis and conclude that there is an observer effect.

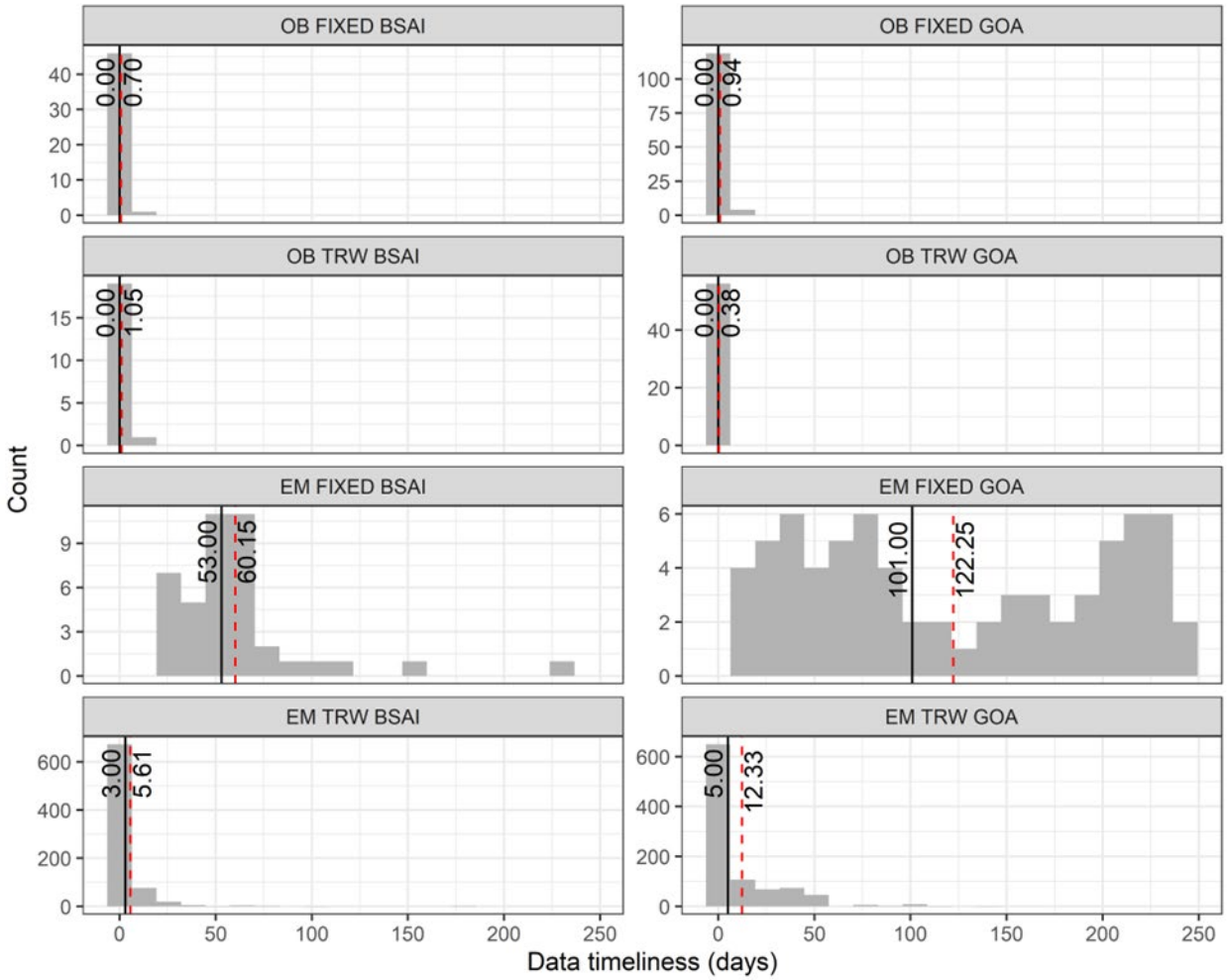

Figure 3-7 -- Distributions of data timeliness (the time between a trip or delivery ending and those monitoring data being available for catch accounting) by stratum. Solid black lines and annotations to the left show median data timeliness. Dashed red lines and annotations to the right show mean data timeliness.

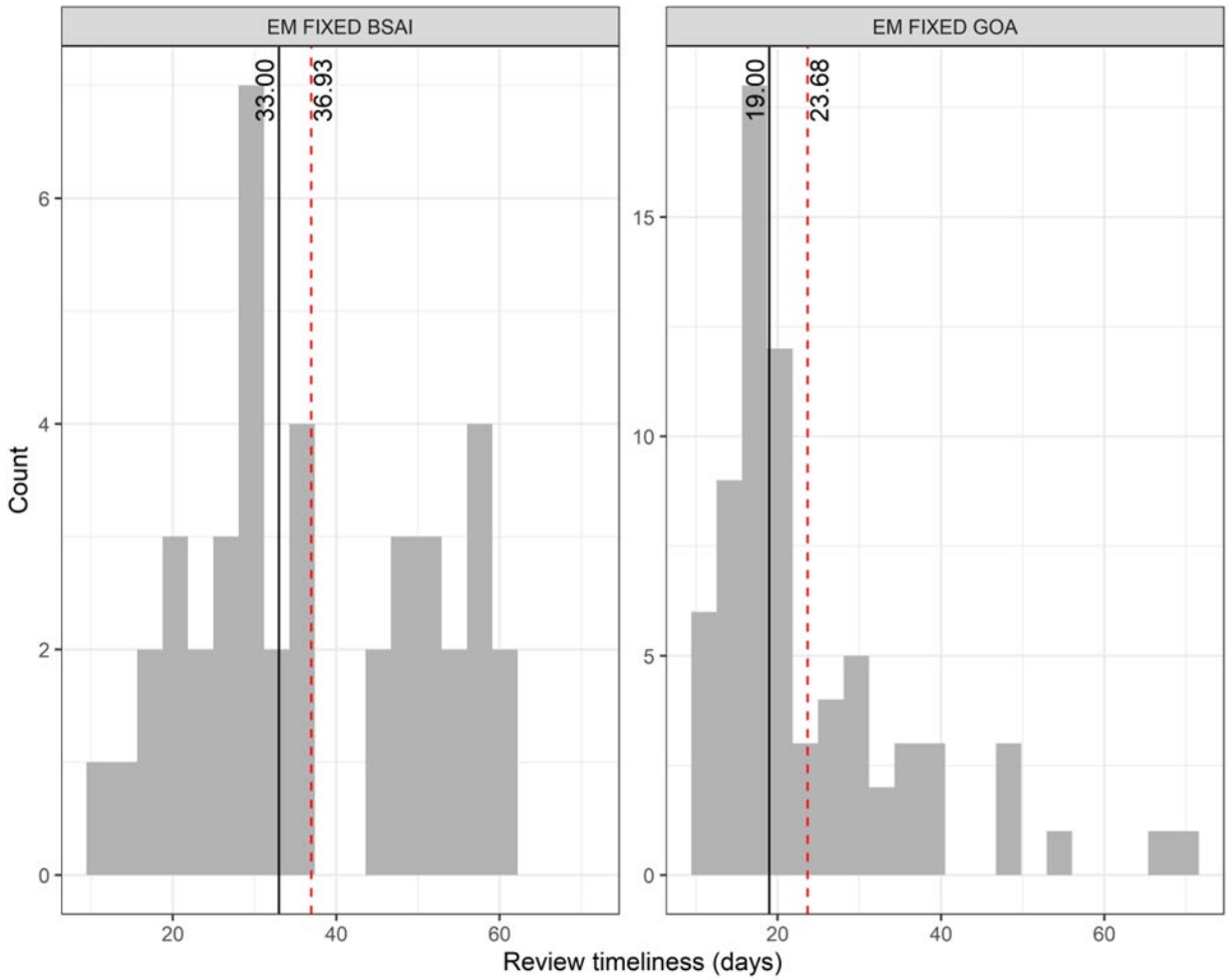

Figure 3-8 -- Distributions of review timeliness (the time between a trip or delivery ending and those trips being reviewed) by stratum. Solid black lines and annotations to the left show median review timeliness. Dashed red lines and annotations to the right show mean review timeliness.

4. Descriptive Information

4.1. Number of Trips and Vessels by FMP Area, Strata, Gear, and Vessel Length

In Chapter 3, Table 3-6 provides trip or delivery and vessel counts based on coverage type and strata. The Council has previously requested a summary of trip and vessel counts based on criteria that are not, or are no longer, considered when deploying observers on trips (e.g., vessel length). Table 4-1 and Table 4-2 summarize the number of vessels, total trips or deliveries, and monitored trips or deliveries by FMP area, strata, gear type, and vessel length category within the full and partial coverage categories. Monitored indicates trips with an observer, fixed-gear EM trips if at least some video was reviewed, or trawl EM deliveries where biological samples and census counts of salmon and Pacific halibut PSC were collected at shoreside processors. All trawl EM category trips are required to have cameras on for 100% of their trips for compliance monitoring (not shown in Tables 4-1 or 4-2). Table 4-1 summarizes trips or deliveries in the Bering Sea/Aleutian Islands (BSAI) and Table 4-2 summarizes trips or deliveries in the Gulf of Alaska (GOA). Both tables can contain BSAI and GOA observer and EM fixed-gear trip selection strata, however. Vessel owners or captains declare in ODDS where they intend to harvest the majority of catch on the trip, which determines the FMP area of the strata, but they may fish in both FMP areas.

The most notable change in monitoring from 2024 to 2025 was the increase in the percentage of GOA trawl EM deliveries that were sampled shoreside (35.7% to 99.9%, respectively). This is the result of changing the frequency of trawl EM offloads selected for sampling from 33% in the 2024 Annual Deployment Plan (NMFS 2023b) to 100% in the 2025 Annual Deployment Plan (NMFS 2024). Despite increasing the shoreside sampling rate to 100%, trawl EM in the GOA remains part of the partial coverage category according to regulations.[20]

Vessels and trips may be counted more than once in a vessel length category in Tables 4-1 and 4-2 if a vessel is in more than one stratum, fishes in more than one FMP area, or uses more than one gear type on a trip or within the year. The unique number of vessels and trips or deliveries are included as subtotals for full coverage, partial coverage, and zero coverage in the tables for each FMP area for the first time in 2025. The tables also contain the number of unique vessels and trips or deliveries in each vessel length category and FMP area as the "BSAI Subtotal" and "GOA Subtotal" rows. The total number of unique vessels and trips or deliveries for each vessel length category across the BSAI and GOA areas, combined, is also included.

[20] See: 50 CFR 679.51(g)(1)(i)(A)(1)

4.2. Total Catch and Discards and Amount of Catch Monitored

The ADP does not assign observers or EM coverage by fisheries as the fishery cannot be defined before fishing occurs. Instead, observers or EM are deployed on trips and vessels across all fisheries. However, there has been interest in comparing observer and EM coverage across resulting fisheries, so this section includes summaries of monitored and total catch by area, gear type, and sector. The total catch of groundfish and halibut (retained and discarded) for 2025 was summarized from the NMFS Catch Accounting System (CAS) in Tables 4-3 and 4-4. These tables allow for comparisons of the metric of catch weight derived from CAS. Catch estimation methods are described in detail in Cahalan et al. (2014).

The proportion of catch weight monitored for a subset of fishing activity (i.e., a fishery) should not *a priori* be expected to equal the deployment rates specified in the ADP (i.e., proportion of trips selected for observer or EM coverage). If there are differences in fishing characteristics between subsets of fishing activity, specifically differences in catch weights or discard rates per trip, those differences will be reflected in the relative proportions of catch monitored. For example, within the partial coverage trawl stratum, trips in the pollock fishery will have very different total catch weights and discard characteristics than trips in flatfish fisheries. In addition, there are several other factors that will contribute to the apparent inconsistencies between proportion of catch monitored, the proportion of trips monitored, and the deployment rate specified in the ADP. These include the actual number of trips selected for monitoring (sample size), variability in deployment due to random chance, the ratio of number of trips in each of the fisheries, and lack of independence between the coverage rates within a sampling stratum.[21]

In Tables 4-3 and 4-4, "M" indicates monitored catch that occurred on trips where an observer was present, on EM fixed-gear trips for which some video was reviewed, or on trawl EM deliveries where biological samples and census counts of salmon or Pacific halibut PSC were observed at the shoreside processors. The trawl EM trips are also required to have cameras turned on for 100% of their trips for compliance monitoring of maximized retention requirements, but this monitoring strategy is not used to define monitored catch in Tables 4-3 and 4-4. In Table 4-3 and Table 4-4, "T" represents estimates of all catch from all trips regardless of whether it was monitored. The rows titled "Ret" indicate retained catch that was offloaded (minus dockside discard). The rows titled "Disc" are estimates of at-sea discards.

All catch and discard information, including halibut, summarized in these tables are in round weight metric tons. If species were landed in a condition other than round weight, then standard product recovery rates (PRRs) were used to obtain round weight. Halibut that were landed in ice and slime were additionally corrected for ice and slime using a standard 2% correction.

In Table 4-3 the catch of full coverage catcher vessels participating in the Central Gulf of Alaska Rockfish program is distinguished from the catch of catcher vessels in partial coverage.

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[21] More trips monitored in one subpopulation (fishery) equates to fewer monitored trips in the other subpopulations since all the trips across the different subpopulations must add to the total number of trips selected.

Beginning in 2025, the catch from trips on catcher vessels in partial coverage EM strata, both fixed-gear and trawl, has been differentiated from trips in partial coverage observer strata. Although the shoreside sampling rate for trawl EM in the GOA was increased to 100% in 2025, the strata remains part of the partial coverage category in regulation. Table 4-4 also differentiates the catch of catcher vessels in full coverage from those in partial coverage. The full coverage catcher vessels fishing non-pelagic trawl gear participated in the Pacific Cod Trawl Cooperative (PCTC) program and those fishing pelagic trawl gear participated in the American Fisheries Act (AFA) pollock fishery. For the BSAI table, the catch on catcher vessels in partial coverage may be from trips in observer or EM strata. These tables can be used to compare the proportion of catch that occurred in full coverage or the partial coverage categories or the proportion of catch that was monitored for trips in partial coverage. For example, in the:

- BSAI and GOA combined, 89.9% of pelagic trawl catch was on trips in the full coverage category and 10.1% was on trips in partial coverage. All partial coverage trips were in the GOA and 83.6% of their catch was monitored.
- BSAI and GOA combined, 95.9% of non-pelagic trawl catch was on trips in full coverage category and 4.1% was on trips in partial coverage. Partial coverage trips occurred in both the BSAI and GOA with 42.7 and 13.4% of their catch monitored, respectively.

Additional retained and discarded catch information, broken down by species for the GOA and BSAI, are available online for 2025 as well as prior years.[22]

4.3. Electronic Monitoring Video Review

This section provides metrics of the EM video review, including information on reliability and image quality. EM footage collected in 2025 from vessels participating in the fixed-gear EM program was sent to the Pacific States Marine Fisheries Commission (PSMFC) for review and incorporated into the CAS for catch estimation to support in-season management of the fisheries and for use in fishing mortality estimates in stock assessments. Video collected from Pollock trawl vessels participating in Pelagic Trawl EM was sent to PSMFC for review for compliance with discard limitations and logbook report verification. A detailed description of video review methods, and a comparison of review time across gear types, can be found in Appendices D and E.

4.3.1. EM Data from fixed-gear vessels

The fixed-gear EM program includes vessels that fish with longline (hook-and-line) and/or pot gear (traditional/single or slinky), which are indicated separately on the VMP to differentiate the catch handling protocols. In 2025, there were 176 NMFS-approved vessels in the fixed-gear EM selection pool. Of those vessels, 125 submitted fixed-gear Electronic Monitoring Vessel Monitoring Plans (VMPs) that were approved by NMFS. Due in part to lower selection rates in

[22] Available online at: Monitored Catch Tables.

2025, just 51 of those vessels with approved VMP's were selected to turn their EM system on for one or more fishing trips.

In 2025, 137 fixed-gear EM trips were selected for monitoring using the ODDS. Hard drives from 123 trips were reviewed by PSMFC video reviewers for fixed-gear EM, 66 of which were pot gear and 57 were longline gear. Of the selected trips, 14 were not reviewed by the end of the year. There is no single reason we can point to for this: some hard drives were not received by PSMFC; other trips were not logged correctly in ODDS; at least one trip was flipped into a different stratum after it was updated by the user; and 2025 staffing reductions reduced FMA's ability to track and resolve some of these issues in real-time. See chapter 3 for a detailed analysis of selection rates.

In 2025 more fishing effort was in the single pot sector proportionally, with the total number of reviewed hauls increasing from 4,724 reviewed hauls in 2024 up to 6,957 hauls in 2025. As noted in Section 4.4.5, increased effort with this gear type directly impacts review times due to the complexity. EM review staff are trained by PSMFC staff working closely with the North Pacific Observer Program to record species to the lowest identifiable taxonomic level or grouping.

4.3.2. Trawl EM

An Exempted Fishing Permit (EFP) was issued in January 2020 to evaluate the efficacy of electronic monitoring systems and shoreside observers for pollock catcher vessels (CVs) using pelagic trawl gear in the Bering Sea (BS) and Gulf of Alaska (GOA). At their October 2022 meeting, the NPFMC took final action to implement the trawl EM program. In January 2023, the EFP was extended through 2024, and the proposed rule for the trawl EM category (89 FR 7660) published on February 5, 2024. The final rule for the trawl EM category was published on July 29, 2024 and the regulated program came into effect January 1, 2025 (89 FR 60796). The objectives of the trawl EM program are: (1) improve salmon accounting; (2) reduce monitoring costs; and (3) improve the quality of monitoring data. The EM systems onboard trawl vessels ensure compliance monitoring objectives are met while providing a chain of custody for prohibited species catch (PSC). Catch accounting for the vessel's catch and bycatch is achieved via eLandings reports and observers at the shoreside processors. Of the 112 unique total vessels in 2025, 55 unique vessels participated in the BS, 37 unique vessels participated in the GOA, and 20 unique vessels participated in both the BS and GOA.

See Section 3.1 for specifics on monitoring and shoreside observer coverage for participating vessels in the trawl EM program.

Pacific States Marine Fisheries Commission (PSMFC) conducted the video review under the regulated trawl EM program. Table 4-7 provides a summary of video review data for the trawl

EM program for 2025. As of April 22, 2026, PSMFC has completed 74 percent of trawl datasets from 2025. PSMFC has prioritized review of all trips for vessels new to the trawl EM program for 2025 and the first 2025 trips for returning trawl EM vessels.

4.3.3. EM Problems and Issues

Problems with EM systems are logged into the EM Service Provider / Observer Declare and Deploy System (EMSP ODDS) application and PSMFC database. Occasionally captains and vessel owners "self-report" issues to the EM Service Provider who then logs them into the system, but most often, issues are not reported until the EM video review team reviews the hard drives. Problems encountered during EM video review can prevent adequate review and annotation of the video. Automated emails are sent in response to each logged issue, which alert the vessel and EM Service Provider and provide instructions on potential solutions to the issue. The EM hardware service provider then contacts the vessel to assist with resolving the issue remotely or, if necessary, with an on-site visit. Issues may result in the limited ability to log trips, including a 72 hour waiting period if required for repair. It may also be necessary for OLE to contact the vessel or take enforcement action depending on the nature, severity, or frequency of the reported issue.

EM review staff look for issues relating to the completeness of video and sensor data, overall image quality and visibility, system functionality (including GPS, monitors, continuous power, hydraulic sensors), insufficient lighting, insufficient storage, and deployment of streamer lines. To ensure management needs are being met, EM review staff verify camera views and catch handling information are consistent with the NMFS-approved VMP.

The total number of issues reported is correlated with the number of reviewed EM trips which can vary for a number of reasons. To account for year-to-year differences in the number of trips, we calculate the rate of issues per selected trip (or per 100 selected trips). Issues can be "self-reported" by the captains/crews and/or the EM Service Provider technicians prior to the video review process; however the majority of issues are reported by the EM video reviewers. The overall "self-report rate" for longline, pot, and trawl issues in 2025 was 6.9%, 5.6%, and 8.0% respectively. The total number of trips with logged issues, issues per 100 selected trips, and the "self-report rate" for each issue type in longline, pot, and trawl EM are shown in Table 4-5.

EM Issues Specific to Pot Vessels

Vessels using pot gear, either traditional rigid or slinky, present unique challenges for EM review staff. Crab are unable to be identified to the species level by EM review staff, and must be assigned a group code such as (e.g., "King Crab unidentified, " or "Tanner Crab unitidentified"). Estimates for crab species ratios are calculated using at-sea observer data. There is potential for bias of EM review data in situations where organisms are too numerous, and catch handling is insufficient, for staff to fully enumerate, resulting in them skipping review of that pot. EM

review staff resume their standard sample frame once they are able to count all organisms in a given pot.

For vessels that use single pot gear, EM review staff consider each individual pot to be its own haul and reviews every third haul (pot). If a vessel uses longline, slinky, or string pots (strung together), all pots are considered to be a single haul and all pots are reviewed. Review of these pots is more time consuming than single pot gear. The speed of review for pot gear tends to be 1:1, where one hour of catch handling could be reviewed in just under one hour, assuming review was not slowed down by any of the following:

- Large amounts of bycatch;
- Expanded use of longline, slinky, or string pots across the fleet;
- New EM program participants that are inexperienced; and
- Catch handling that is not consistent with the VMP, which impacts data quality.

Trends in Reported EM Issues

Although there was an increase in total fixed-gear EM issues reported from 2024–2025, in general the proportion of fixed-gear vessels with 1 or more issues per selected trip has been generally decreasing since the inception of the fixed-gear EM program in 2018 (Figure 4-3). 2018–2022 showed a general trend of a decreasing proportion of fixed-gear vessels with multiple issues per selected trip, and an increasing proportion of vessels with 0–1 issues per selected trip. This trend continued 2023–2025 for pot vessels. Longline vessels flattened this trend 2023–2024, but in 2025 the trend was regained.

This decrease in issues per selected trip in fixed-gear EM is the result of a deliberate process of continued outreach by agency staff paired with open communication and hard work by all participants. Each year, VMPs must be approved by NMFS staff prior to any fishing activity. This provides an additional opportunity for outreach in combination with the automated emails and communication with the EM hardware service provider. Vessels are encouraged to contact NMFS staff as needed to clarify logged issues and to assist with compliance. The EM hardware service provider also directly contacts the vessel for all logged issues where the automated notification is not sufficient. Additionally, OLE provides outreach and education to the fleet as warranted which allows vessels to ask questions directly to enforcement officers. Finally, the ODDS application was updated for 2025 to include a list of each vessel's logged EM issues that are readily visible to the vessel owner when they log in to the application, providing an access portal for the vessel owner to keep up with and resolve any issues.

Trends in issues per selected trip for trawl EM are not available because 2025 was the first year of the regulated program. Notably, the majority of trawl EM vessels had between 0 and 1 issues per selected trip in 2025. Issues with the EM system may impact the ability of the agency to

ensure compliance with program requirements (*e.g.*, discards at sea are prohibited outside of limited circumstances). In 2025, the trawl EM program was nearly 100% monitored (Table 3-6). To achieve 100% monitoring requires functioning EM systems and compliance with a suite of VMP requirements (Table 4-5). A total of 6,098 hauls were reviewed in 2025, with 99% of those hauls having medium or high data quality (Appendix D). The most common reason for low data quality was video completeness. Of the 1,994 fishing trips in 2025, 96% of those trips had complete video. Malfunctioning EM systems during an EM trip or not meeting VMP requirements (Table 4-5) may compromise the agency's ability to ensure compliance with regulations. Video gaps were present in 4% of trawl EM trips, and 2.4% of hauls had video gaps that occurred during fishing activity (Appendix D). Most often these gaps resulted from no video recorded on one or more cameras, or intermittent gaps in video coverage. The agency has developed a successful model (see section 4.3.4) for working with EM fleets to improve their compliance with VMP requirements and video quality. This model has proved very effective in reducing issues from year to year in the fixed-gear EM fleet (Figure 4-2) and is also being applied to the trawl EM fleet to ensure that trends in EM issues decline as the fleet adopts this technology.

The issues per selected trip trend plot in Figure 4-3 also highlights another notable trend: the proportion of vessels with no realized trips or no selected trips in 2025 remained high and continues to increase. In 2025, 39% of fixed-gear EM pot vessels, 27% of fixed-gear EM longline vessels, and 13% of trawl EM vessels did not have any realized trips in EM strata. Most of the trawl vessels participated in the full- or partial-coverage observer fisheries such as the Pacific Cod Trawl Cooperative in the BSAI or non-pelagic trawl fisheries in the GOA. EM vessels that incur equipment maintenance and replacement costs but do not take enough trips to reliably use their equipment on monitored trips represent a significant cost burden to the agency. Moreover, any vessel in an EM category that does not fish in the EM strata is taking away an EM "slot" from another vessel who could participate. Therefore, in 2026 and beyond, the agency will review the cost effectiveness of individual EM vessels and reserve the right to remove vessels from the fixed-gear EM pool or deny vessels from the trawl EM category.

4.3.4. Improving EM data review timeliness and data quality

Protocols for 2025 review priorities emphasized:

1. Review of 2025 data for the first trip of the year for each vessel (to give immediate feedback).
2. Review of 2025 non-first trip data.
3. Complete review of any remaining data from 2024.

This allowed the prioritization of data that could be used to impact inseason management, as data remaining from previous years would not directly impact the fisheries in the current fishing year.

NMFS and OLE are using the information from the logged issues to work with the industry to improve EM data. Methods to improve data quality include:

- **Issuing Notice of Improvements**: If a vessel is not meeting management needs, they are provided a Notice of Improvement. This notice serves to alert the vessel to performance issues that were noted during EM review. If a vessel does not improve their performance, they are removed from the EM program. Figure 4-4 shows the number of EM issues per trip for vessels in the Notice of Improvement (NOI) pool and those vessels not in the NOI pool.
- **Working with Vessels and Crew to Resolve Issues**: Many data quality issues can be addressed by working with vessels to improve EM set-up, views, and use and encourage operational changes, such as cleaning cameras and lenses to improve image quality. Continue to encourage use of the ODDS problems list for each vessel, and monitoring automated emails sent when EM issues are logged.
- **Distributing EM Systems to Ensure Cost-Efficency**: Ensure EM systems are deployed on vessels with the most fishing effort to improve the cost efficiency of the EM program. An EM system on a vessel that fishes once per year costs approximately the same to maintain as an EM system on a vessel fishing on a weekly basis. In addition, vessels that have a limited number of trips tend to have a higher rate of issues and more recurring issues.
- **Continuing Outreach Efforts**: Compliance assistance in 2026 will focus on increasing compliance with the VMP and regulations to ensure that management needs are met. Vessel operators must complete daily tests of their EM system and ensure that all cameras and sensors are functioning prior to each haul. The emphasis in 2026 will be to educate vessels that an issue must be found at sea and not during video review. The VMP malfunction matrix requires notification to the assigned EMSP who then logs the issue. Most EM issues are found during video review, and this decreases the effectiveness and cost efficiency of EM programs.
- **Link eLandings and ODDS:** to better track all trip selections and automate procedures.

4.4. Observer Training and Debriefing

In 2025, observers collected data on board 203 fixed-gear and trawl vessels and at 11 processing facilities for a total of 25,891 observer days (20,287 full coverage days on vessels and 3,597 at shoreside processors; and 1,127 partial coverage days on vessels and 880 at shoreside processors).[23]

[23] Note that observer days are calculated differently from invoiced days presented in chapter 2. FMA's method of counting total deployment days is computed for the "manual year" (or "fishing year"), which is the timeframe a given observer sampling manual protocol is in use for a fishing year. Manual year 2025 spanned from December 1, 2024 to November 28, 2025. In addition, observer days represent any amount of time an observer is on a vessel as part of their deployment which may be inclusive of non-fishing and standby days. Whereas, full coverage invoice

During the 2025 fishing year, approximately 258 individual observers were trained, briefed, and equipped for deployment to vessels and processing facilities operating in the BSAI and GOA groundfish and halibut fisheries. The Observer Program continues to use a hybrid of virtual and in-person environments to train and brief observers. All training required hands-on interactive activities that benefit from in-person interactions such as the 3-week, fixed-gear lead level two, and annual briefings were conducted in-person, while the fish and crab identification and 1-day briefings were conducted within a hybrid asynchronous environment.

New observer candidates must complete a 3-week training class with 120 hours of scheduled class time and additional training by FMA staff as necessary. The FMA Division conducted training for 86 new observers for 2025 deployments in addition to the 172 prior observers who attended a briefing of some type (Table 4-6). Portions of FMA's 3-week observer training class were attended by observer providers, FMA staff, NOAA Fisheries Office of Law Enforcement and General Counsel, and NOAA Workplace Violence Prevention and Response staff.

During their first two deployments, observers must complete a mid-cruise debriefing while in the field. During the mid-cruise debriefing, the observer and FMA staff assess data collection methods and quality, troubleshoot challenges, and discuss future vessel assignments. After successfully completing two contracts, mid-cruise debriefings are only required on an individual basis if recommended by FMA staff.

Mid-cruise debriefings can be completed in person, over the phone, electronically, by fax, or by a combination of methods. In 2025, the majority of all mid-cruises were performed in person, with a total of 3 mid-cruise debriefings in Anchorage, 108 in Dutch Harbor, 13 in Kodiak, and 9 in Seattle. Mid-cruise debriefings require extensive coordination and communication between field staff, observers, observer providers, and industry members to ensure that observers receive the valuable feedback that mid-cruise debriefings provide.

In-person support received by observers from the FMA field offices in Dutch, Kodiak and Anchorage, is further increased by the ability to communicate with FMA inseason advisors while at sea. Inseason advisors ensure quality data are collected, and allows observers to inform NMFS of safety concerns or health issues that arise while the observer is deployed. In 2025, FMA inseason advisors addressed a total of 8,514 messages sent by observers. This process ensures high quality data is used to manage and support Alaska's vital seafood economy.

Observers must go through the debriefing process after each deployment, where FMA staff members assess the data collection methods used by the observers. Once these data have undergone a thorough quality control check, the data are then finalized by the FMA staff member. In 2025, a total of 351 debriefings were completed either in person or remotely by 15 FMA staff located in the Seattle and Anchorage offices. In 2025, the core debriefing team reviewed the evaluation and scoring of observers, resulting in a new quantitative scoring system and refined the performance definitions to ensure greater consistency, transparency, and data

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data are produced for the actual calendar year. Number of observer training classes and number of observers trained/briefed is also for manual year 2025 (December 1, 2024 to November 28, 2025).

integrity across the program. The new observer evaluation and scoring system will be implemented in 2026.

After debriefing is completed, the performance of the observer is assessed by the FMA staff member. This assessment determines whether observers must attend a 1-day briefing prior to their next deployment. In some cases, a focused training (FCT) and/or a species identification training are necessary. In rare cases, an observer that demonstrates major deficiencies may be required to retake the full 3-week training to ensure the data collection and species identification methods are fully understood.

Regardless of the specific training recommendation from their most recent debriefing, all returning observers must complete an annual briefing prior to their first deployment of each calendar year. These sessions serve as a critical refresher on vessel and shoreside safety practices, including the latest U.S. Coast Guard (USCG) requirements. Additionally, briefings provide updates on evolving duties such as modified sampling methods, Office of Law Enforcement (OLE) training, research projects, and biological data collections.

The 2025 curriculum was expanded to reflect the transition of the regulated Trawl Electronic Monitoring (EM) program, new requirements for sampling aboard Pacific Cod Trawl Cooperative vessels, specialized research project data collections, and standardized salmon retention protocols for all EM and observed trip deliveries in the GOA. To remain eligible for deployment, observers must demonstrate continued proficiency by passing a comprehensive briefing exam, a seabird identification test, and various in-class assessments.

The 2025 training season required responsiveness to staffing shortages following the dismissal of the AFSC's seabird expert in the spring. For the remainder of the year, the training program successfully integrated seabird identification into the newly branded Species Identification training, formally the Fish and Crab ID training.

Due to broader staff reductions, many guest subject matter experts were no longer available to support the program. Consequently, the training team pivoted mid-season to directly instruct specialized modules previously handled by external guests, specifically covering USCG safety information, seabird identification, and regulatory and compliance elements.

The FMA Training team also provided essential instruction on marine safety, ergonomic lifting techniques, and marine mammal identification for AFSC staff heading to sea. As part of the Marine Instructor Safety Training (MSIT) cross-training requirements, several FMA team members assisted the Northwest Fisheries Science Center (NWFSC) At-Sea Hake Observer Program with their annual safety training. In light of travel restrictions, due to the mission critical nature of observer safety, FMA hosted the MSIT course at the Western Regional Center Campus. This event brought together staff from five regional observer programs as well as RACE AFSC personnel to ensure standardized safety instruction across the agency.

While this year was marked by high levels of change and challenges, elevated levels of cooperation and collaboration supported successful and safe deployments of North Pacific fisheries observers.

4.5. Outreach

Regular communication is a standard component of our operations between the AFSC, AKR, OLE, the NPFMC, and industry constituents; this section highlights noteworthy situations with elevated communications.

In the first full year of the regulated program for EM in the Bering Sea and Gulf of Alaska pollock fisheries for catcher vessels using pelagic trawl gear, there continued to be a considerable amount of effort allocated to coordination and collaboration between the FMA, AKRO, OLE, Alaska Groundfish Data Bank, United Catcher Boats, Aleutian East Borough (AEB), the Pacific States Marine Fisheries Commission, and Archipelago Marine Research. Periodic meetings were held with Agency staff to discuss the new requirements and how the CMCPs were meeting the needs.

Agency staff participated in assorted meetings focused on industry engagement: the AEB annual meeting, the Freezer Longline Coalition annual meeting, and the Kodiak Trawl fleet meetings. Engagement with our industry constituents proves to be valuable and necessary for NMFS staff and the fishing communities.

Observer providers continue to be an essential component of the safe and efficient observer deployments in the Alaska fisheries. On an annual basis, FMA meets with the observer providers one to two times per year. In summer 2025, meetings with individual providers were held. These meetings focused on FMA staffing updates and impacts short- and long-term to division operations, OLE engagement with observer issues, and changing fishery dynamics in AK and its impacts to provider and industry needs. The December observer provider meeting's focus was directed on recalibrating operations after the government shutdown, the strategy to debrief observers that returned from the field during the shutdown, and the plan forward for the 2026 fishing season start up. These meetings are beneficial to keep lines of communication open, discuss solutions to the challenges, and supporting providers to provide continuous and safe observer coverage to Alaskan fishing fleets.

Table 4-1 -- Number of vessels (V), total trips/deliveries (N), monitored trips/deliveries (n)[1], and percent of trips/deliveries monitored (%) in 2025 in the BSAI by strata, gear type (hook-and-line [HAL], non-pelagic trawl [NPT], pelagic trawl [PTR], pot, and jig), and vessel length category (based on length overall, in feet) for the full and partial coverage categories.

			Vessel length category											
			<40'				40-57.4'				>=57.5'			
Area	Strata	Gear	V	N	n	%	V	N	n	%	V	N	n	%
BSAI	FULL	HAL									17	186	186	100.0
	FULL	NPT									42	456	456	100.0
	FULL	POT									4	14	14	100.0
	FULL	PTR									12	140	140	100.0
	EM TRW BSAI[2]	PTR									63	1,871	1,871	100.0
	FULL Coverage Subtotal[3]										116	2,663	2,663	100.0
	EM FIXED BSAI	HAL					2	8	2	25.0	4	4	3	75.0
	EM FIXED BSAI	POT					1	6	3	50.0	6	72	40	55.6
	EM FIXED GOA	HAL					1	2	0	0.0	2	2	1	50.0
	OB FIXED BSAI	HAL					9	21	5	23.8	10	18	5	27.8
	OB FIXED BSAI	POT					7	32	5	15.6	27	212	35	16.5
	OB FIXED GOA	HAL					4	6	0	0.0	2	2	1	50.0
	OB TRW BSAI	NPT									2	36	15	41.7
	PARTIAL Coverage Subtotal[3]						17	75	15	20.0	43	345	100	29.0
	ZERO	HAL	23	236	0	0.0								
	ZERO Coverage Subtotal[3]		23	236	0	0.0								
	BSAI Subtotal[3]		23	236	0	0.0	17	75	15	20.0	157	3,008	2,763	91.9

[1] Monitored reflect either trips with an observer, fixed-gear EM trips for which some video was reviewed, or trawl EM deliveries where observers sampled shoreside to collect biological samples and census counts of salmon and halibut PSC. Trawl EM trips also require 100% at-sea video monitoring for compliance with maximized retention requirements, but that monitoring is not reflected in this table.
[2] For the trawl EM stratum, shoreside sampling occurs at the delivery level, so the values in the table for N, n, and % reflect deliveries rather than trips.
[3] A unique count of vessels and trips or deliveries are provided for each of the subtotals.

Table 4-2 -- Number of vessels (V), total trips/deliveries (N), monitored trips/deliveries (n)[1], and percent of trips/deliveries monitored (%) in 2025 in the GOA and overall, by strata, gear type (hook-and-line [HAL], non-pelagic trawl [NPT], pelagic trawl [PTR], pot, and jig), and vessel length category (based on length overall, in feet) for the full and partial coverage categories.

			Vessel length category											
			<40'				40-57.4'				>=57.5'			
Area	Strata	Gear	V	N	n	%	V	N	n	%	V	N	n	%
GOA	FULL	HAL									6	7	7	100.0
	FULL	NPT									25	74	74	100.0
	FULL	POT									1	5	5	100.0
	FULL	PTR									22	118	118	100.0
	FULL Coverage Subtotal[3]										35	184	184	100.0
	EM FIXED GOA	HAL					73	452	38	8.4	31	147	15	10.2
	EM FIXED GOA	POT					28	190	19	10.0	19	169	10	5.9
	EM TRW GOA[2]	PTR									43	962	961	99.9
	OB FIXED BSAI	HAL					1	1	0	0.0	1	1	1	100.0
	OB FIXED BSAI	POT									1	1	0	0.0
	OB FIXED GOA	HAL					176	854	46	5.4	81	367	22	6.0
	OB FIXED GOA	POT					51	296	15	5.1	82	582	36	6.2
	OB TRW GOA	NPT									29	250	39	15.6
	OB TRW GOA	PTR									21	226	39	17.3
	PARTIAL Coverage Subtotal[3]						258	1,710	113	6.6	182	2,458	1,096	44.6
	ZERO	HAL	245	1,090	0	0.0								
	ZERO	JIG	20	54	0	0.0	17	34	0	0.0	1	1	0	0.0
	ZERO	POT	7	38	0	0.0								
	ZERO Coverage Subtotal[3]		259	1,182	0	0.0	17	34	0	0.0	1	1	0	0.0
	GOA Subtotal[3]		259	1,182	0	0.0	266	1,744	113	6.5	197	2,643	1,280	48.4
Total Unique Across BSAI and GOA[3]			278	1,412	0	0.0	270	1,810	128	7.1	306	5,638	4,033	71.5

[1] Monitored reflect either trips with an observer, fixed-gear EM trips for which some video was reviewed, or trawl EM deliveries where observers sampled shoreside to collect biological samples and census counts of salmon and halibut PSC. Trawl EM trips also require 100% at-sea video monitoring for compliance with maximized retention requirements, but that monitoring is not reflected in this table.

[2] For the trawl EM stratum, shoreside sampling occurs at the delivery level, so the values in the table for N, n, and % reflect deliveries rather than trips.

[3] A unique count of vessels and trips or deliveries are provided for each of the subtotals.

Table 4-3 – Monitored catch[1] (M; in metric tons), total catch (T), and percent monitored (%) of groundfish and halibut retained (Ret) and discarded (Disc) in the groundfish and halibut fisheries in 2025 in the Gulf of Alaska. Empty cells indicate that no catch occurred.

		Catcher/Processor			Catcher vessel: Partial Observer			Catcher vessel: Partial EM			Catcher vessel: Rockfish program			Gear total		
Gear[2]	Catch	M	T	%	M	T	%	M	T	%	M	T	%	M	T	%
HAL	Ret	1,778	1,877	95%	229	8,492	3%	335	3,458	10%				2,342	13,827	17%
	Disc	505	528	96%	165	8,478	2%	350	4,193	8%				1,020	13,199	8%
JIG	Ret				0	312	0%							0	312	0%
	Disc															
NPT	Ret	28,407	28,407	100%	1,781	13,321	13%				2,441	2,441	100%	32,628	44,168	74%
	Disc	2,046	2,046	100%	247	1,866	13%				174	174	100%	2,468	4,086	60%
POT	Ret	360	462	78%	834	14,160	6%	558	5,656	10%				1,753	20,277	9%
	Disc	15	29	51%	17	353	5%	31	226	14%				63	608	10%
PTR	Ret	454	454	100%	4,634	26,024	18%	107,028	107,138	>99%	12,591	12,591	100%	124,706	146,207	85%
	Disc	64	64	100%	126	686	18%	434	434	100%	78	78	100%	702	1,261	56%

[1] Monitored reflects either trips with an observer, fixed-gear EM trips for which some video was reviewed, or trawl EM deliveries where observers sampled shoreside. Trawl EM trips also require 100% at-sea video monitoring for compliance with maximized retention requirements, but that monitoring is not reflected in this table.

[2] The gears fished are hook-and-line (HAL), jig, non-pelagic trawl (NPT), pot, and pelagic trawl (PTR).

Table 4-4 – Monitored catch[1] (M; in metric tons), total catch (T), and percent monitored (%) of groundfish and halibut retained (Ret) and discarded (Disc) in the groundfish and halibut fisheries in 2025 in the Bering Sea/Aleutian Islands. Empty cells indicate that no catch occurred.

		Catcher/Processor			Mothership			Catcher vessel: Partial			Catcher vessel: Full			Gear total		
Gear[2]	Catch	M	T	%	M	T	%	M	T	%	M	T	%	M	T	%
HAL	Ret	76,557	76,557	100%				83	483	17%				76,690	77,137	99%
	Disc	16,346	16,346	100%				40	200	20%				16,415	16,605	99%
JIG	Ret															
	Disc															
NPT	Ret	308,096	308,096	100%	14,077	14,077	100%	549	1,276	43%	17,505	17,505	100%	340,226	340,954	>99%
	Disc	16,640	16,640	100%	682	682	100%	86	212	41%	767	767	100%	18,175	18,300	99%
POT	Ret	2,860	2,860	100%				1,621	11,196	14%				6,406	17,618	36%
	Disc	57	57	100%				11	109	10%				113	292	39%
PTR	Ret	622,024	622,024	100%							562,126	562,126	100%	1,184,150	1,184,150	100%
	Disc	943	943	100%							551	551	100%	1,494	1,494	100%

[1] Monitored reflects either trips with an observer, fixed-gear EM trips for which some video was reviewed, or trawl EM deliveries where observers sampled shoreside. Trawl EM trips also require 100% at-sea video monitoring for compliance with maximized retention requirements, but that monitoring is not reflected in this table.

[2] The gears fished are hook-and-line (HAL), jig, non-pelagic trawl (NPT), pot, and pelagic trawl (PTR).

Table 4-5 -- Issues types, the number reported to NMFS, and the number reported per 100 reviewed trips in each gear type in 2025. While it is possible that a vessel has more than one issue, across all gear types, the majority of vessels had between 0 and 2 issues logged in 2025 (see Figure 4-3). **Denotes a 'High' priority issue type - these must be resolved before a new trip can be logged in ODDS. † N ote: all trawl EM trips were selected in 2025.*

Problem Type	Longline			Pot			Trawl		
	N trips with issue	Issues per 100 selected trips	Self-Report Rate	N trips with issue	Issues per 100 selected trips	Self-Report Rate	N trips with issue	Issues per 100 selected † trips	Self-Report Rate
Additional Camera required for review	0	0	0%	1	1.49	0%	10	0.38	0%
Camera Inactive	0	0	0%	2	2.99	50%	36	1.38	53%
Camera Lens Dirty	6	12.50	0%	16	23.88	0%	29	1.11	7%
Camera out of focus	1	2.08	0%	1	1.49	0%	181	6.95	1%
Camera Reposition Required	4	8.33	0%	1	1.49	0%	123	4.72	1%
Camera view Obstructed	0	0	0%	9	13.43	0%	5	0.19	80%
Catch handling inconsistent with VMP	11	22.92	0%	24	35.82	0%	5	0.19	0%
Complete Logbook not submitted	3	6.25	0%	0	0	0%	18	0.69	0%
Continuous Power*	1	2.08	0%	0	0	0%	3	0.12	100%
Crew catch handling goes beyond camera time duration	2	4.17	0%	0	0	0%	0	0	0%
Deck / Discard Camera*	0	0	0%	2	2.99	100%	0	0	0%

Drive contains more trips than allowed under VMP	0	0	0%	0	0	0%	22	0.84	0%
Drive does not contain the ODDS selected trip	2	4.17	0%	0	0	0%	0	0	0%
EM - interruption in offload recording	0	0	0%	0	0	0%	10	0.38	10%
GPS*	0	0	0%	1	1.49	0%	4	0.15	100%
Hard Drive Data is Incomplete	1	2.08	0%	2	2.99	0%	0	0	0%
Hauling camera not activated before haul started	1	2.08	0%	0	0.00	0%	0	0	0%
Hauling Camera*	3	6.25	100%	1	1.49	100%	0	0	0%
Hydraulic Sensor	1	2.08	0%	0	0	0%	4	0.15	100%
Insufficient Storage*	0	0	0%	0	0	0%	2	0.08	100%
Intermittent camera gaps	2	4.17	0%	1	1.49	0%	5	0.19	20%
Other System Problem	2	4.17	0%	5	7.46	0%	177	6.80	7%
Poor image quality	0	0	0%	1	1.49	0%	1	0.04	100%
Prohib mishandling/Careful release issues	5	10.42	0%	2	2.99	0%	0	0	0%
Seabirds not presented to camera	0	0	0%	1	1.49	0%	0	0	0%
Streamer Line Camera	5	10.42	20%	0	0	0%	0	0	0%
Streamers lines not used- note in comment if bad weather	7	14.58	0%	0	0	0%	0	0	0%
System not activated prior to beginning trip	1	2.08	0%	2	2.99	0%	20	0.77	0%
All Issues	58	120.83	6.9%	72	107.46	5.6%	655	25.15	8.0%

Table 4-6 -- Number of observer training classes and number of observers trained/briefed from December 1, 2024 to November 28, 2025.

Training classes	Number of classes	Number of observers trained/briefed
3 week training	8	95
Annual briefing	19	167
Focused briefing	3	4
1-day briefing	36	191
Lead Level 2	7	25
Fish and Crab ID Training	21	123
Total	94	605

Table 4-7 -- Video review information for the trawl EM program for 2025 as reported by the video review entities. Note that in 2025, Pacific States Marine Fishery Commission did not conduct video review for GOA tenders and Saltwater Inc. did not conduct video review for BS CVs. CV trips for the purposes of trawl EM video review end at the delivery of catch to a tender vessel or shoreside processor. There are no partial deliveries in the trawl EM program. Data from 2025 was deprioritized and is being reviewed as time allows once 2025 data are complete.

Pacific States Marine Fishery Commission	BS CV	GOA CV	GOA tender
Trips not yet reviewed (as of 05/01/2026)	357	368	N/A
Trips Reviewed	1489	583	N/A
Hauls Reviewed	4938	1160	N/A
Unique Vessels Reviewed	63	43	N/A
Of reviewed trips, video was incomplete	60	17	N/A

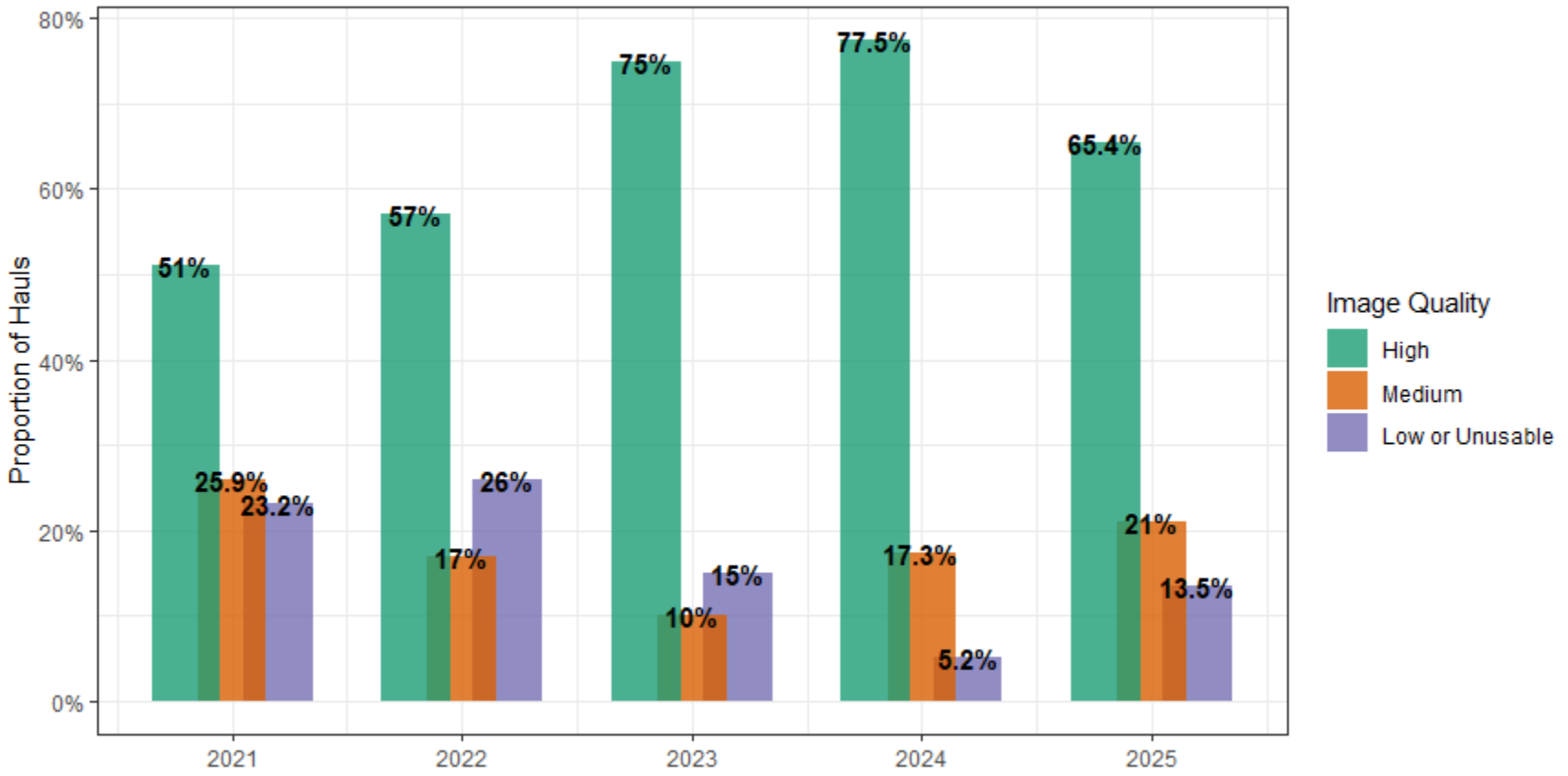

Figure 4-1 -- Image quality of EM video for reviewed fixed-gear hauls 2021–2025, as reported to NMFS by PSMFC reviewers. The image quality of each haul is assessed as either high, medium, low, or unusable. The improving trend seen in previous years was somewhat reversed in 2025.

Figure 4-2 -- Proportion of EM vessels with at least one issue reported 2020–2025, as reported to NMFS by PSMFC reviewers, EM service provider companies, or vessel self-reports.

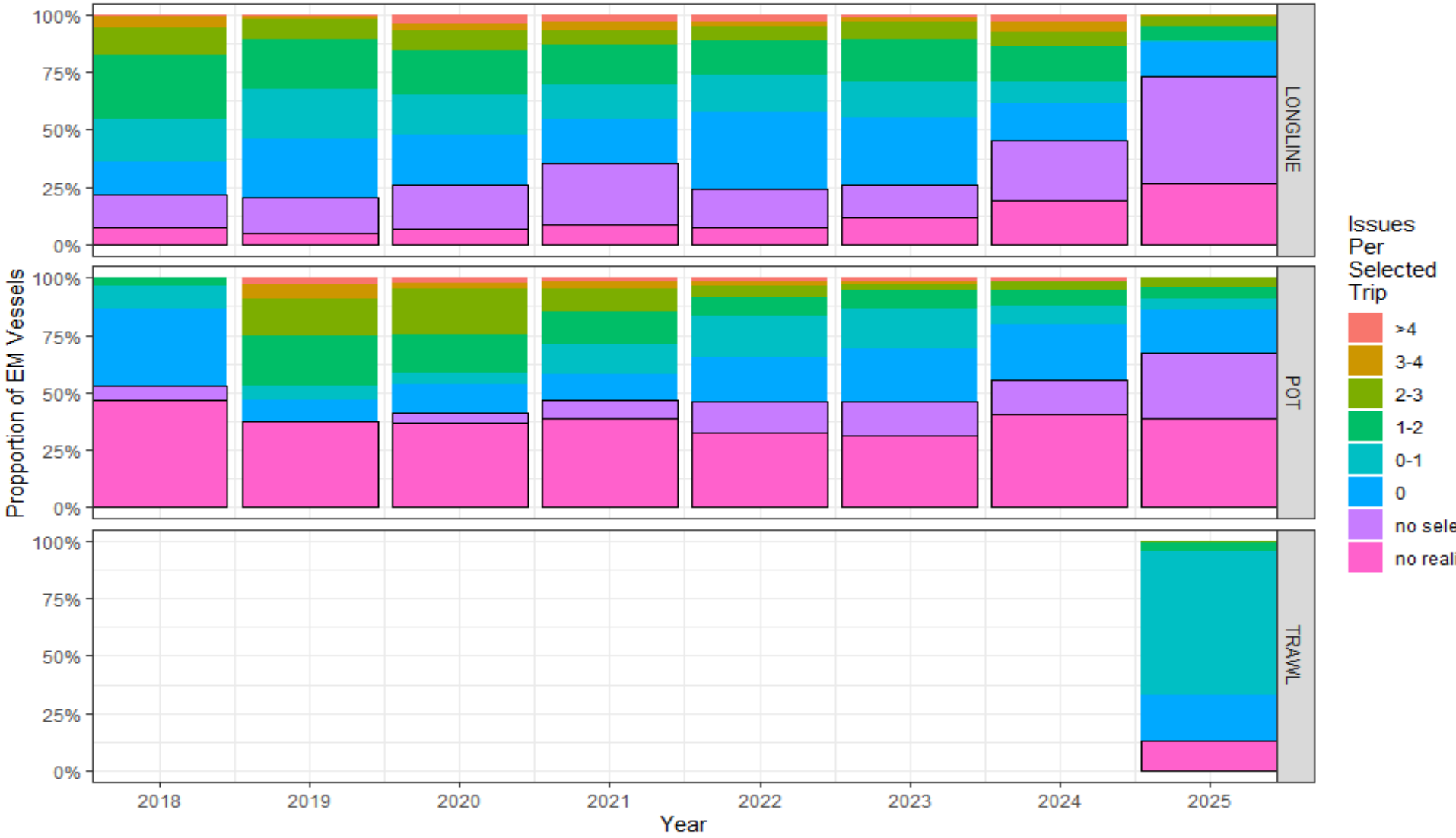

Figure 4-3 -- Proportion of pot, longline, and trawl vessels in each bin of EM system logged issues per selected trip since regulated programs began (2018 for fixed-gear and 2025 for trawl).

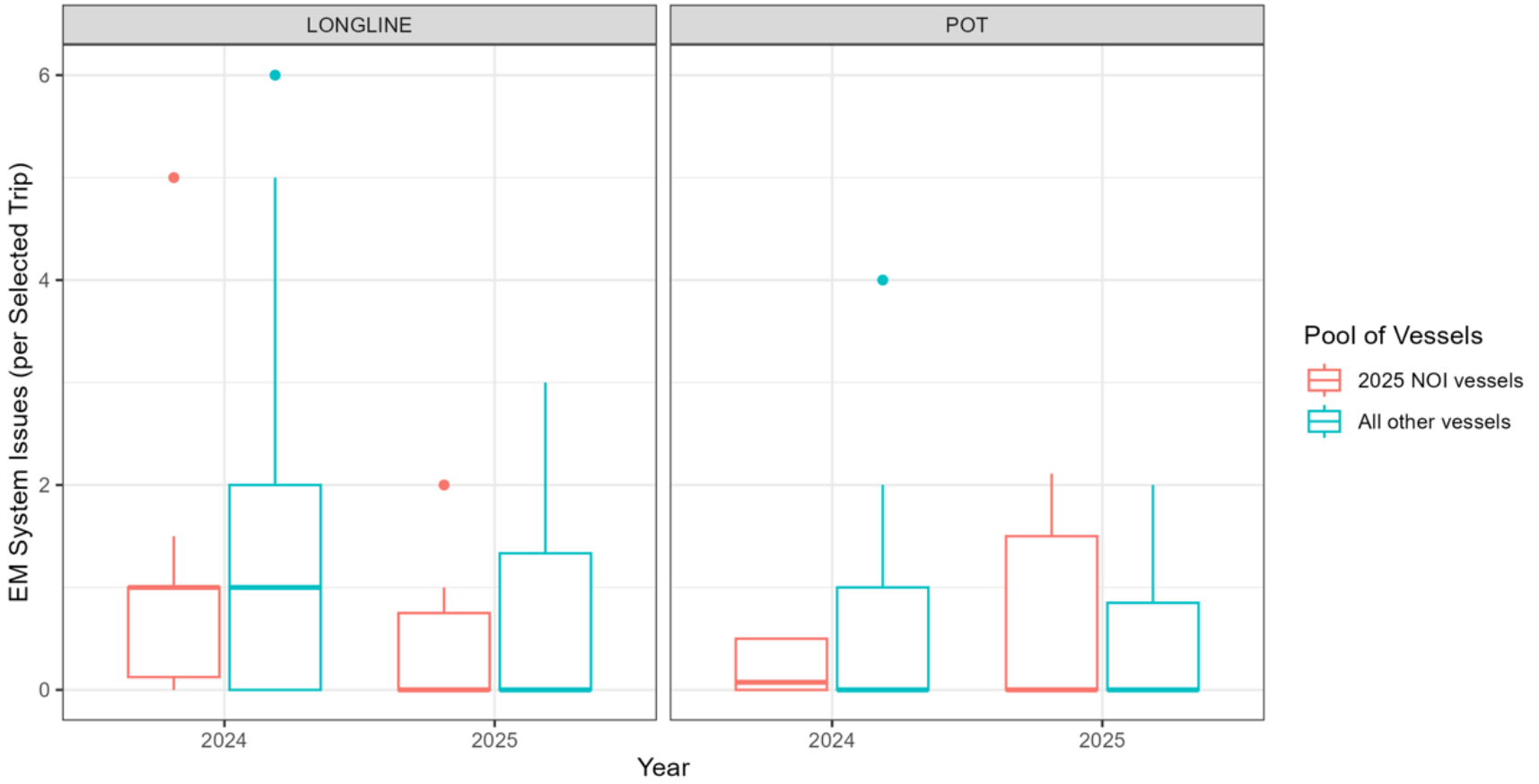

Figure 4-4 -- EM system issues per selected trip for 2025 Notice of Improvement Pool (NOI) vessels and all other vessels.

5. Compliance and Enforcement

This chapter provides a review of the collaborative efforts between NOAA's Office of Law Enforcement Alaska Division (OLE), the Fisheries Monitoring and Analysis Division of the Alaska Fisheries Science Center (FMA), the fishing industry, and other partners in 2025. It is concerned with reports of potential and prosecuted law violations associated with fishing under federal jurisdiction in the Alaska Exclusive Economic Zone.

5.1. Background

5.1.1. Reporting process

Observer reports of potential violations contained in statements are the primary report type described in this chapter. These statements are completed during an observer's debriefing, which is a data review and methods validation process that completes the observer's cruise. Accurately reporting any suspected violations that occurred during an observer's cruise has been a required component of an observer's data collection since 1990. Additionally, observers are trained in compliance monitoring prior to being deployed into the commercial fisheries off Alaska. Completed statements have been stored by FMA in an electronic database since 1999 (hereafter "statements database"). Process improvements led to the redesign of the statements database which was implemented in July 2023 (AFSC and AKRO 2024, section 5.3).

Each potential violation that an observer witnesses and documents may have multiple occurrences. In the redesigned statements system, occurrences are reported at the appropriate "occurrence unit(s)" for each potential violation. These occurrence units were modeled to conform with the observer deployment and sampling data hierarchy and this improvement was first fully implemented for all statements in 2024. When writing statements in the redesigned system observers select the data "unit(s)" where each potential violation occurred based on their own deployment information. This provides specific references to the actual events where a potential violation occurred during an observer's assignment on a vessel or at a processing plant. For example, a statement written for the action of "failure to notify" the observer prior to bringing fish on board may be recorded for each haul during a three-day period the observer was on a partial coverage vessel. In this case the observer would report the specific haul numbers from their haul data in the statement and each haul is an occurrence with the unit of "haul".

Some statement categories are broad in definition and may therefore have multiple unit types. For example, a violation coded as "Interference With Duties" (category)→"Sampling Interference" (subcategory) can be recorded at different operational levels, such as deployment days, hauls, samples, or offloads, depending on where the sampling interference occurred within the observer's deployment.

The OLE works closely with the FMA and observer providers to address incidents that affect observer safety, sampling, and work environments. The electronic format of observer statements allows for efficient transfer of information to the appropriate authorities (OLE and the U.S. Coast

Guard [USCG]). Every statement received by the OLE is first evaluated and prioritized. Then, OLE Officers and Agents investigate the most flagrant complaints to identify if violations have occurred and to determine the appropriate level of response. Some investigations become "cases" that are pursued further by the OLE. Observer statement data are also used by the OLE to track compliance trends and make subsequent adjustments to training, outreach, and operations.

A detailed description of the enforcement partners in Alaska and their respective roles — including the OLE, the USCG, and the Alaska Wildlife Troopers (AWT) — can be found in the 2021 version of this report (AFSC and AKRO 2022, section 4.2).

A review of the type, frequency, magnitude, and drivers of observer-derived statements of potential violations with maritime law during 1999–2020 has been completed and provides a historical account of these data in the North Pacific (Faunce et al. 2023).

5.1.2. Partnerships

In addition to working with FMA, OLE also works with NOAA Workplace Violence Prevention and Response (WVPR), AWT, and USCG to ensure observers are able to complete their duties in a safe environment free from assault, harassment, interference, or any behavior that may negatively impact them or the data they collect. If an observer reports sexual assault and/or sexual harassment (SASH), assault, or any other form of harassment, the observer is offered contact information for the WVPR regional coordinator who will put them in contact with local victim advocacy services. WVPR also assists observers in managing conflicts that may not yet rise to the level of a crime so as to come to a resolution before an issue escalates. AWT works collaboratively with OLE under a Joint Enforcement Agreement. In 2025, OLE conducted 14 at-sea patrols with the AWT. AWT also assisted OLE agents and officers during dockside boardings, interviews, and operations. In areas where an OLE agent or officer is not readily available, AWT may respond. The AWT have larger patrol vessels and routinely visit ports where no OLE persons are stationed such as King Cove, Akutan, and Adak. FMA forwards statements written by observers directly to USCG for investigation. OLE works collaboratively with USCG during cutter patrols and also will forward information to USCG. In 2025, OLE deployed on 22 patrols on USCG cutters or small boats. OLE also briefs USCG on OLE mission priorities, such as the protection of observers, SASH, and Catcher Processor Operational Requirements. OLE also forwards statements to the Environmental Protection Agency or to the Alaska Occupational Safety and Health Administration as necessary for issues such as ammonia leaks or safety issues at shoreside processors.

5.1.3. Training

During the 2025 calendar year, OLE participated in seven 3-week initial observer training sessions. The OLE portion of the training is split into two main parts, the first focusing on identifying, documenting, and reporting suspected violations relevant to the conservation of marine resources and their environment. Observer trainees are encouraged to speak with vessel management if they identify a potential violation to build a collaborative relationship between observers and the fishing industry, and to resolve behavior that may negatively impact the

fisheries. The second part of the training focuses on observer safety and ensuring a safe work environment for observers, free from any form of harassment. WVPR and an attorney from the Office of General Council also participated during the training. The training includes activities where the observer trainees use their knowledge and their communication and conflict resolution skills to work through different scenarios based on past observers' deployments.

OLE participated in 19 annual observer training sessions. The OLE portion of the training focuses on providing observers an understanding of the trends in violations from previous years and how OLE addressed those violations. It also serves as a reminder for emerging trends, new regulations, and OLE's current focus. Observers also test their knowledge and their communication and conflict resolution skills by engaging in scenarios involving potential violations. With the loss of Dennis Jaszka, OLE's liaison to the Observer Program, these training sessions were all attended remotely.

5.1.4. In-Season Support and Self-Reports

In addition to notifying vessel management, observers are encouraged to communicate with FMA staff, WVPR, OLE, and their observer provider to provide early notification of potential violations. This enables the observer to be provided additional support if the need arises. Early communication of potential violations is desired so the industry has the opportunity to come into voluntary compliance. In 2025, OLE received dozens of self-reports from industry detailing potential violations brought to their attention by one of their observers, or self-identified. In many of the self-reports, the observers and vessel management worked collaboratively to address the issue, preventing it from escalating to a more serious matter. The information provided in self-reports can often be used to help investigators gain a better understanding of a potential violation and may provide mitigating circumstances.

5.2. Data Analysis

5.2.1. Data Preparation and Summaries

The observer statements database was used to obtain statements from potential law violations that occurred during 2025. When an observer statement is generated, the observer is asked about the nature of the violation (the regulation) and the units (deployment, trips, hauls, offloads, samples, deployment days, and/or observer-reported marine mammal interactions) that were affected by this potential violation. A statement may reference multiple regulations and thus contain multiple units and unit types. Since regulations are assigned to a broad category and more detailed subcategory that describe the nature of the potential violation, categories and subcategories represent a logical way to provide summaries of potential violations reported by observers in statements. Summaries were excluded to protect the identity of individual observers or vessels when there were fewer than three observer vessel/plant assignments available.

The sum total of each observer unit was calculated for the year (Table 5-1) and then again for "factors" that allow for a more detailed analysis of when and where potential violations occurred

within the fleet. The factors associated with each unit here were “coverage type” (full or partial); “vessel type” (CP/MS, CV, or PLANT); and “FMP Area” (GOA or BSAI), although the factors “gear type” (Hook-and-Line, Non-Pelagic Trawl, Pelagic Trawl, and Pot or Trap), and “Management Program Code” (A80, AFA, CDQ, IFQ, OA, PCTC, RPP, SMO, SMPC, SMS, TEST) are also available.

5.2.2. Occurrence Rates

The number of statements, occurrences, and occurrence units reported by observers for each statement category in 2025 is presented in Table 5-2. These values by themselves are a) strongly correlated with our deployment levels overall (i.e., more observer deployment days in a given year will likely have more statements and occurrences); and b) likely biased to reflect the nature of potential violations that occur on fishing activities with the most monitoring. Therefore, it is critical that we present occurrences of potential violations as *rates* that a) account for differences in coverage rates and observer deployments year-over-year and between fishery sectors; and b) are documented in the appropriate “unit” of occurrence applicable to the specific potential violation type.

Occurrence rates for each statement category/subcategory were calculated as the percentage of the total units reported in the observer fishery and/or deployment data that were selected as occurrences in observer statements. The number of units monitored by observers and the percentage of those selected in statements as potential violation occurrences are presented in Table 5-1. This table provides a way to gauge the relative number of sample units affected by potential violations with regulations. It is worth noting that half of observed vessels and nearly all observed dockside processing plants were reported for potential violations. Twenty-one percent of all monitored offloads were associated with a potential violation while less than half a percent of samples were associated with a potential violation (Table 5-1).

The rates shown in Table 5-1 (“% Selected” column) provide a broad-scale representation of how often observers experienced each kind of potential violation relative to the amount of fishery data they collected and the total days they were deployed. To better understand these occurrence rates within the specific sectors where they occurred, we decomposed them into the different factors of coverage type, vessel type, and FMP area. For brevity, these more-granular rates are only shown for the highest-priority, highly-sensitive statement subcategories sexual harassment and sexual assault, as well as for the subcategories with the highest overall occurrence rates; more discussion on this follows.

Visualization of resulting rates for OLE high-priority statement categories are presented in Figure 5-1. The greatest rate in this group was in the “Observer Sampling Station” subcategory of the “Gear/Equipment Requirements” category. Statements in this subcategory can have a unit of “days” or “trips” because observer sampling station regulatory requirements may be required daily (as in the case of daily scale tests) or for each trip (as in the case of sampling station layout requirements). In 2025, 5.24% of all observer-reported trips and 1.19% of observer deployment days had a potential violation reported in this statement group. Higher rates were also reported in the “Observer Safety and Work Environment” category in the “Food and Accommodations”,

"Safety", and "Hostile Work Environment" subcategories, where 2.42%, 1.23%, and 1.17% (respectively) of observer deployment days were reported with a potential violation.

As previously noted, we decomposed this rate for Observer Sampling Station (since it was the highest in the group) into factors and combined it with the highly sensitive subcategories of sexual harassment and sexual assault. The factor combinations we grouped by were "coverage type" (full or partial), "vessel type" (CP/MS, CV, or PLANT), and "FMP Area" (GOA or BSAI). Figure 5-2 illustrates that the highest rate of Observer Sampling Station potential violations experienced by observers occurred in the full-coverage CP/MS BSAI sector where 9.5% of trips were selected as occurrences of observer sampling station potential violations in observer statements. Notably, the rates of sexual assault — while low in all groups (0.36% of days) — was higher than the rate of sexual harassment.

The highest rate for all other statement categories/subcategories was in the "Operational Requirements" category where nearly 15% (14.6 %) of observer-reported offloads had reports of "CMCP" subcategory potential violations (Figure 5-3). High rates were also reported in the "False Reporting" subcategory (3.32% of offloads), the "Marine Mammal" subcategory (2.26% of reported marine mammal interactions), the "GOA Salmon Bycatch" subcategory (2.01% of offloads), and the "Catch Weighing" subcategory (1.51% of hauls).

The very high rate in the "CMCP" subcategory category — the highest rate in the "other" categories group — was also decomposed into the factors of "coverage type", "vessel type", and "FMP Area". "CMCP" potential violations occurred on 11.74% of offloads reported in the BSAI at Full Coverage processing plants, while 27.32% of offloads at GOA partial coverage processing plants were reported for potential "CMCP" violations (Figure 5-4).

"CMCP" (for "Catch Monitoring Control Plan") potential violations are specific to pollock deliveries. CMCP regulations govern the processor's handling of, observer access to, and accounting of salmon bycatch. Each processor's CMCP is approved by NMFS prior to the season and the processor is required to adhere to the specific processes and equipment outlined in the CMCP. Observers may report potential CMCP violations for offloads when the CMCP is not followed. Some examples include not accurately sorting and counting all salmon off the belt during the delivery or not notifying the observer of a delivery in time to adequately monitor it. These kinds of issues were present in 2024 when trawl EM was still administered under an Exempted Fishing Permit (EFP) and have continued into 2025 after trawl EM became a regulated program. Additionally, these rates do not include at least one known incident of an unmonitored trawl EM delivery in the GOA where the observer was released from duty and flown home before the delivery occurred. No CMCP statement was written for this because no observer was on duty. Thus, this rate may in fact be biased low in the GOA.

5.3. Trends in Reports of Potential Violations

Selection rates for observer statements have remained generally stable and below 3% across most unit types and categories from the system's mid-2023[24] redesign through 2025, establishing a reasonable compliance baseline (Figures 5-5 and 5-6). Higher rates consistently appear in the same category groups and subcategories.

In the "high-priority" categories (Figure 5-5), the highest rates were consistently in "Safety and Work Environment" statements reported in units of days (approximately 6% of observer deployment days in 2024 and 2025), driven by "Food and Accommodations," "Safety," and "Hostile Work Environment" subcategories. The second-highest rate was consistently in "Gear / Equipment Requirements" reported at the "trip" unit. This rate increased from ~2% of trips in 2024 to over 5% in 2025, driven by the "Observer Sampling Station" subcategory, which had a higher rate in 2025 than in 2024.

For "all other" statement categories (Figure 5-6), the highest rate (approximately 20% of observer offloads in both 2024 and 2025) was consistently in the "Operational Requirements / Permits / Documents / Record Keeping and Reporting" category group, primarily due to "CMCP" statements for processing plants, with GOA plants having the highest rates (2025 rate shown in Figure 5-4). Other consistently high-rate subcategories include "False Reporting," "Marine Mammal," "GOA Salmon Bycatch," and "Catch Weighing."

5.4. Ongoing Investigations and Enforcement Concerns

5.4.1. Ongoing Investigations

OLE continues to investigate 109 of the 285 statements that were received in 2025. These statements span over all statement category types. Twenty-seven of these statements still under investigation involve Observer Safety and Work Environment. Table 5-3 details the investigative status of statements received in 2025[25] .

[24] Note: Rates from the partial year 2023, following the July 2023 database overhaul, are excluded from this time-series analysis.

[25] Statements received by OLE in 2025 include some statements written for potential violations that occurred in 2024, and do not include all statements written for potential violations that occurred in 2025. This lag is due to the fact that observers typically do not write statements until the final debriefing process for the deployment which can be several weeks after the incidents actually occurred during the deployment.

5.4.2. Enforcement Concerns

Figure 5-2 highlights the occurrence rates for alleged sexual assault (0.36% of days) and sexual harassment (0.23% of days). Until there are zero occurrences, reported or unreported, crimes against observers will always be OLE's highest priority. OLE wants to acknowledge that observers are reporting improved work environments and there is cooperation from most companies when incidents occur. Figure 5-3 depicts the occurrence rates for all other statement categories. Potential violations involving CMCP (14.16% of offloads; 11.74% in the BSAI and 27.32% in GOA) and false reporting (3.32% of offloads) are of particular concern because they continue to occur despite attempts to assist industry in voluntarily complying. Additionally, as seen in Figure 5-3, the occurrence rate for potential violations relating to GOA salmon bycatch was 2.01% of offloads compared to BSAI salmon bycatch at 0.74% of offloads, suggesting OLE needs to reallocate more time and effort in the GOA.

5.5. Enforcement Operations

5.5.1. Annual A-Season Observer Operation

The 2025 Annual A-Season Observer Operation took place in Dutch Harbor in collaboration with WVPR, FMA, and AWT. Initially, there were nine investigations involving sexual harassment/sexual assault that were ongoing; an additional two were opened during the duration of the operation. Other investigations included hostile work environment, interference and sample biasing, failure to abide by operational requirements, and general health and safety concerns. Approximately 40 interviews were conducted during the course of the operation and 25 vessels were boarded.

5.6. Outreach and Compliance Assistance

5.6.1. Outreach

Prior to the start of the 2025 fishing year, OLE held several individual outreach meetings with various vessel companies. OLE also provided multiple Ensuring a Safe Work Environment for Observers training sessions. These meetings and sessions were completely voluntary and highly encouraged. There were fewer meetings in 2025 than in 2024.

5.6.2. Compliance Assistance

In 2025, there were 50 statements submitted that resulted in compliance assistance provided rather than the issuance of a formal enforcement action. Compliance assistance was found to be acceptable due to several mitigating factors such as single isolated incidents with no priors, self-identification of the potential violations and immediate steps to resolve, and collaborative efforts to immediately resolve the issues when notified by an observer.

5.7. Enforcement Actions

5.7.1. Written Warnings

There were seven Written Warnings issued in 2025, four of these being in the Observer Safety and Work Environment statement category. These occurrences were single isolated incidents with fact patterns that suggested that they were unlikely to repeat but it was still deemed necessary to hold the subject accountable for their actions.

5.7.2. Summary Settlements

There were nine Summary Settlements issued in 2025, in various statement categories. There are still ongoing cases from 2025 that may be resolved with Summary Settlements.

5.7.3. Adjudicated Cases

AK2201034; F/V Carlynn – Owner Carlynn, Inc. and Owner/Operator Robert Becker were charged jointly and severally under the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) with failing to maintain safe conditions for the protection of observers, failing to provide adequate accommodations for observers, and intimidating and harassing observers. A $28,500 NOVA was issued.

AK2301659; C/P Frontier Mariner – Factory Manager Edgar Estuardo De Los Reyes was charged under the Magnuson-Stevens Act with sexually harassing and harassing a female observer. A $9,500 NOVA was issued, and the case settled for $4,000.

5.8. References

AFSC and AKRO. 2024. North Pacific Observer Program 2023 Annual Report. AFSC processed report 2024-10. https://doi.org/10.25923/zbt1-v967.

AFSC and AKRO. 2022. North Pacific Observer Program 2021 Annual Report. AFSC processed report 2022-06. https://doi.org/10.25923/qnbj-nt98.

Faunce, C. H., J. Smith, A. Kingham and D. Jaszka. 2023. Fisheries observers as enforcement assets: 21 Years of lessons from the North Pacific. Marine Policy 158, 105868. https://doi.org/10.1016/j.marpol.2023.105868.

Table 5-1 -- Units in which observer-reported occurrences of potential violations were recorded in 2025. Note that Marine Mammal Interactions are reported by observers regardless of whether a potential violation occurred or not.

Occurrence Unit	Total Units (#)	Selected in Statements (#)	Selected (%)
Samples	101,358	518	0.5
Hauls	32,958	1,218	3.7
Days	25,830	3,325	12.9
Offloads	3,524	726	20.6
Trips	2,098	152	7.2
Deployments	428	7	1.6
Marine Mammal Interactions	221	7	3.2
Vessels*	204	84	41.2
Plants*	11	10	90.9

*Vessels and plants are not used as occurrence units but are provided here for additional information.

Table 5-2 -- Number of statements and occurrences reported by observers in 2025 for each statement category with the units in which occurrences were reported.

Category	Statements (#)	Regs Selected (#)	Occurrences (#)	Occurrence Units
Safety-USCG: Marine Casualty	96	1	138	Days
Observer Safety and Work Environment	83	9	1,480	Days
Prohibited Species/Marine Mammals/Seabirds	62	30	450	Offloads, Days, Hauls, Marine Mammal Interactions, Trips
Interference with Duties	44	10	837	Hauls, Days, Samples, Offloads
Operational Requirements	40	18	1,248	Hauls, Days, Trips, Offloads
Safety-USCG: Fail to Conduct Drills and/or Safety Orientation	33	1	490	Days
Gear/Equipment Requirements	30	21	654	Trips, Days, Hauls
Permits/Documents/Record Keeping and Reporting	30	11	431	Offloads, Hauls, Days
MARPOL/Oil Spill	20	2	26	Trips, Days
Safety-USCG: Equipment	13	5	143	Days
Sustainable Fisheries	12	5	38	Hauls
Contractor Requirements	7	6	18	Deployments, Days
Total	470	119	5,953	Hauls, Days, Offloads, Trips, Deployments, Samples, Marine Mammal Interactions

Table 5-3 Statements received by OLE in 2025 (excludes USCG statements) and their investigative status as of April 6, 2026.

STATEMENT CATEGORIES	Investigation Continues	Transferred to Another Agency	Summary Settlement	Written Warning	Compliance Assistance	Closed; No Additional Information	Lack of Evidence	Lack of Resources	No Violation	Total
Contractor Requirements	3				1				2	6
Gear/Equipment Requirements	7		2		4	2	3		9	27
Interference with Duties	19		1		7	2	4		7	40
Observer Safety and Work Environment	27	7		4	9	1	5		16	69
Operational Requirements	13	1	1	2	9	3	3	3	3	38
Permits/Documents/ Record Keeping and Reporting	10		2		8	1	3	2	4	30
Prohibited Species/Marine Mammals/Seabirds	26		2	1	12	5	3	7	6	62
Sustainable Fisheries	4		1				3		5	13
Total	109	8	9	7	50	14	24	12	52	285

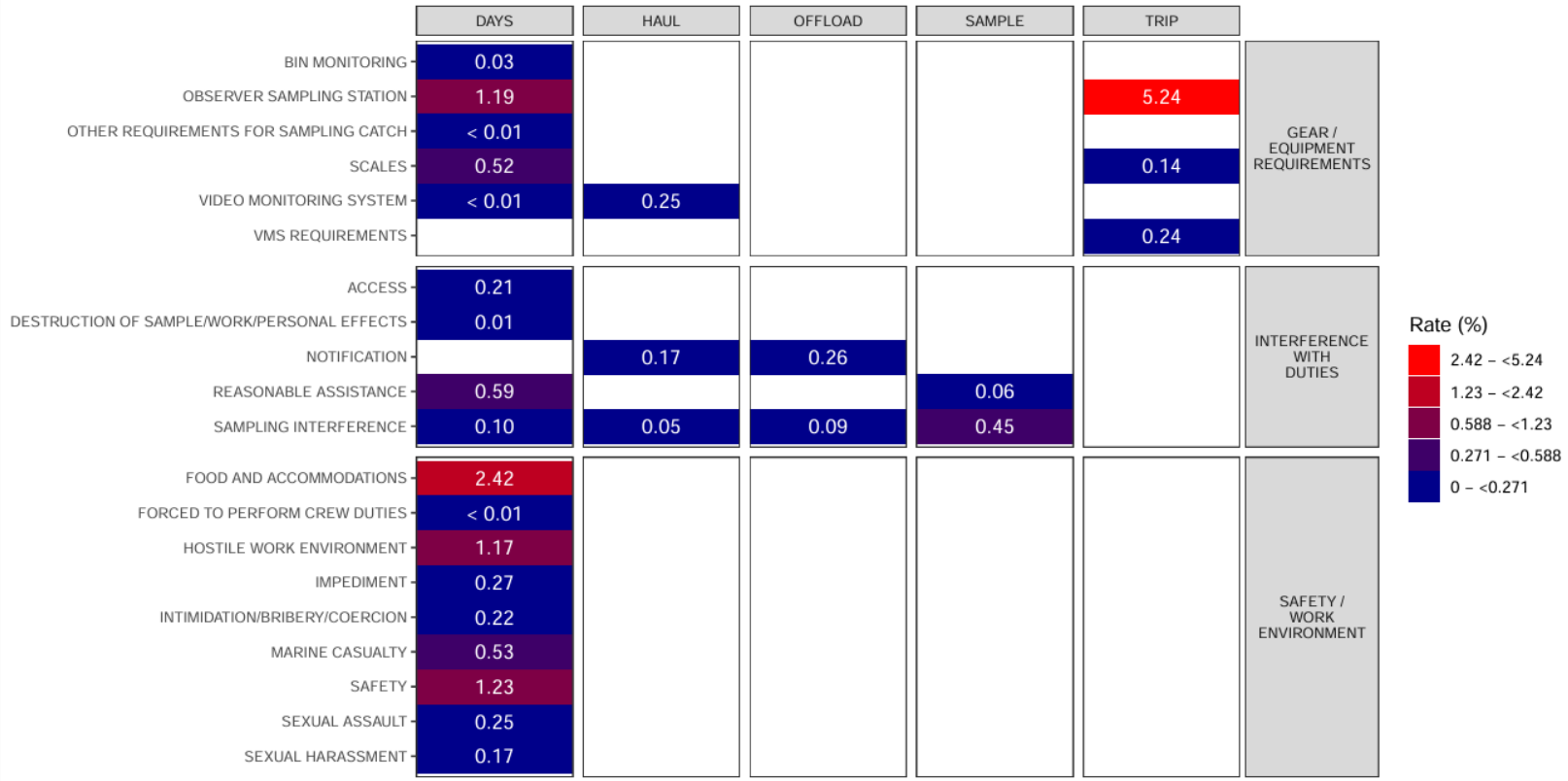

Figure 5-1 -- The 2025 occurrence rate of high priority statement subcategories in their reported occurrence units (top). Subcategories (on the left) are grouped by their parent categories (on the right).

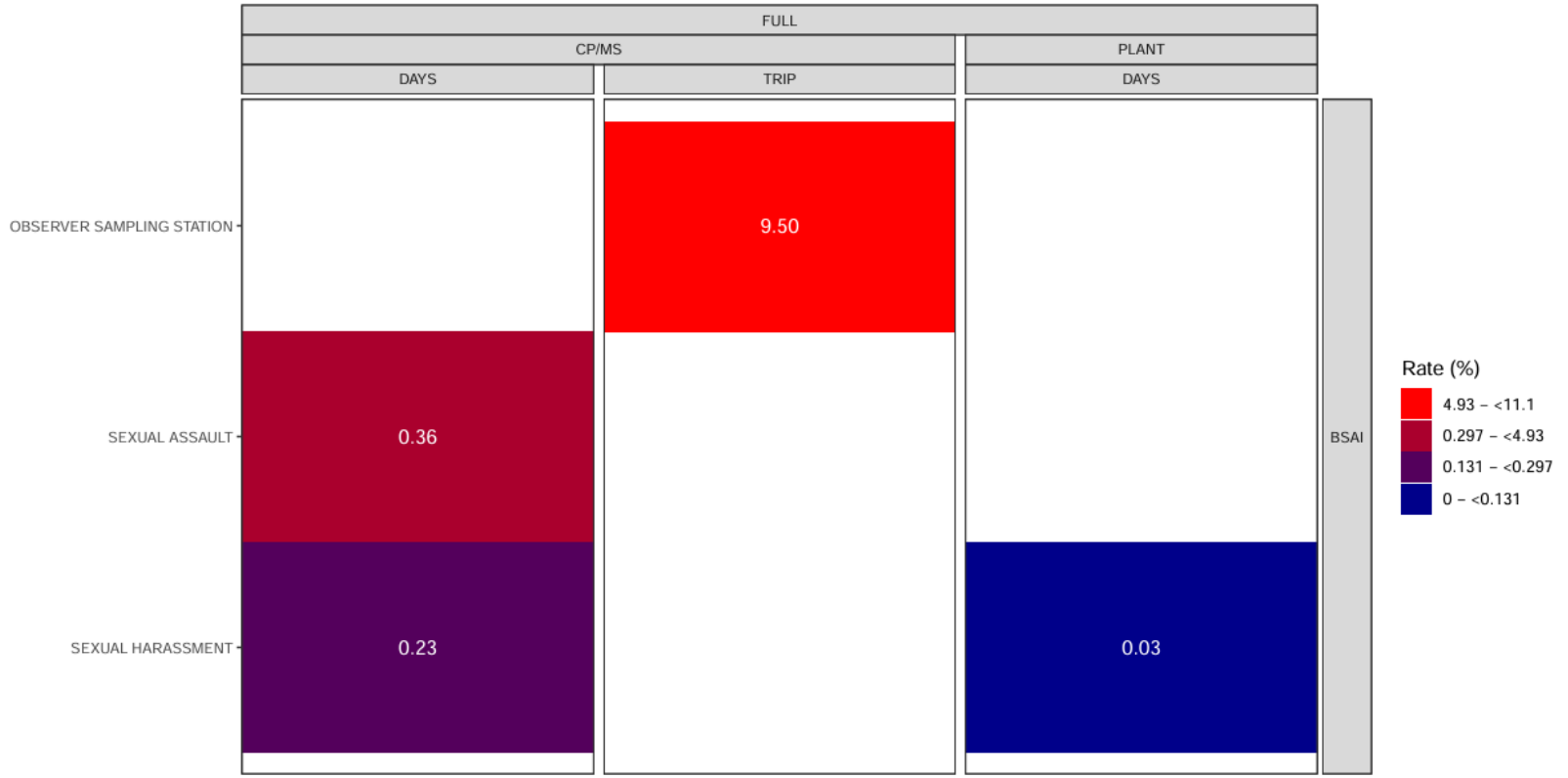

Figure 5-2 -- The 2025 occurrence rate by factor combination for the highest-rate subcategory ("Observer Sampling Station") of all the high-priority statement subcategories and the highest OLE priority statement categories of sexual assault and sexual harassment. Note that only BSAI subcategories are shown because these subcategories did not appear in the GOA in 2025.

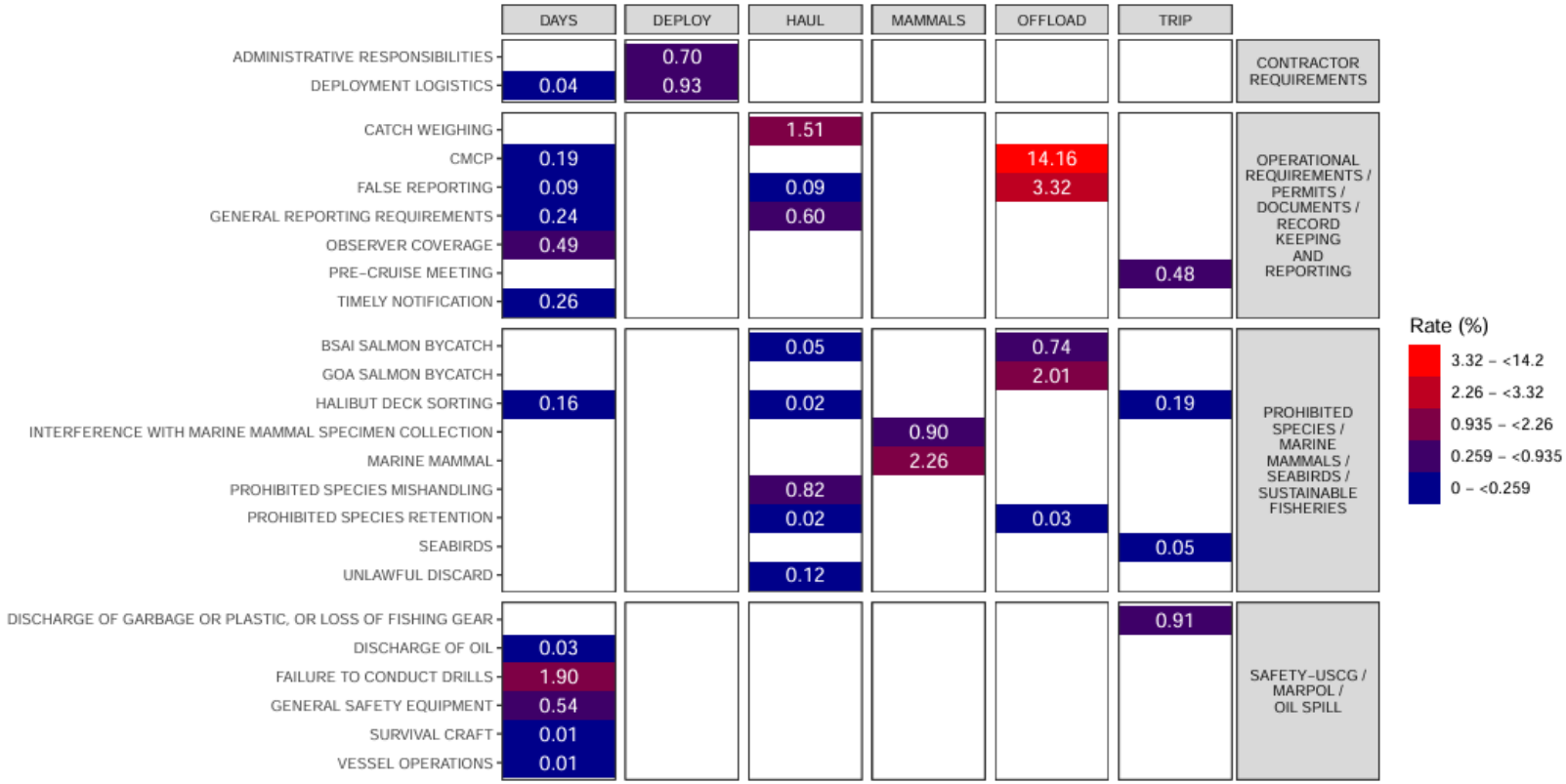

Figure 5-3 -- The 2025 occurrence rate for all other statement subcategories in their reported occurrence units. Subcategories (on the left) are grouped by their parent categories (on the right). The highest rate was in the “CMCP” subcategory in the “offload” occurrence unit, where 14.16% of observer-reported offloads were selected as occurrences of potential violations. This was followed by the “False Reporting” subcategory in the offload occurrence unit where 3.32% of all observer-reported offloads were selected as occurrences of potential violations.

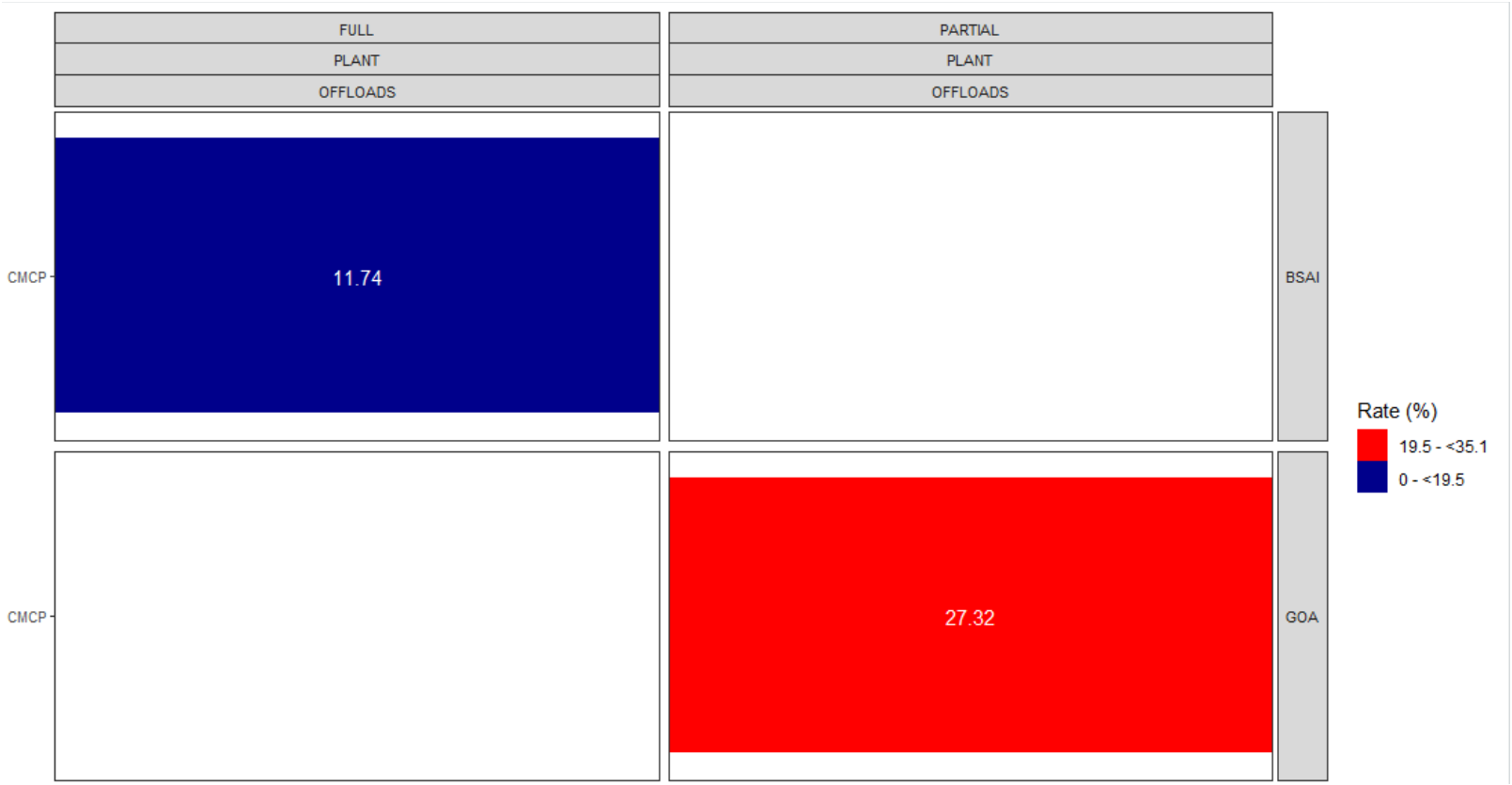

Figure 5-4 -- 2025 occurrence rate by factor combination for the highest-rate subcategory (“CMCP”) of all other statement subcategories.

Figure 5-5 -- Percent of observer data types that were selected as "occurrence units" of potential violations in each of the "Priority" statement super-categories for each full year since the statement system re-design.

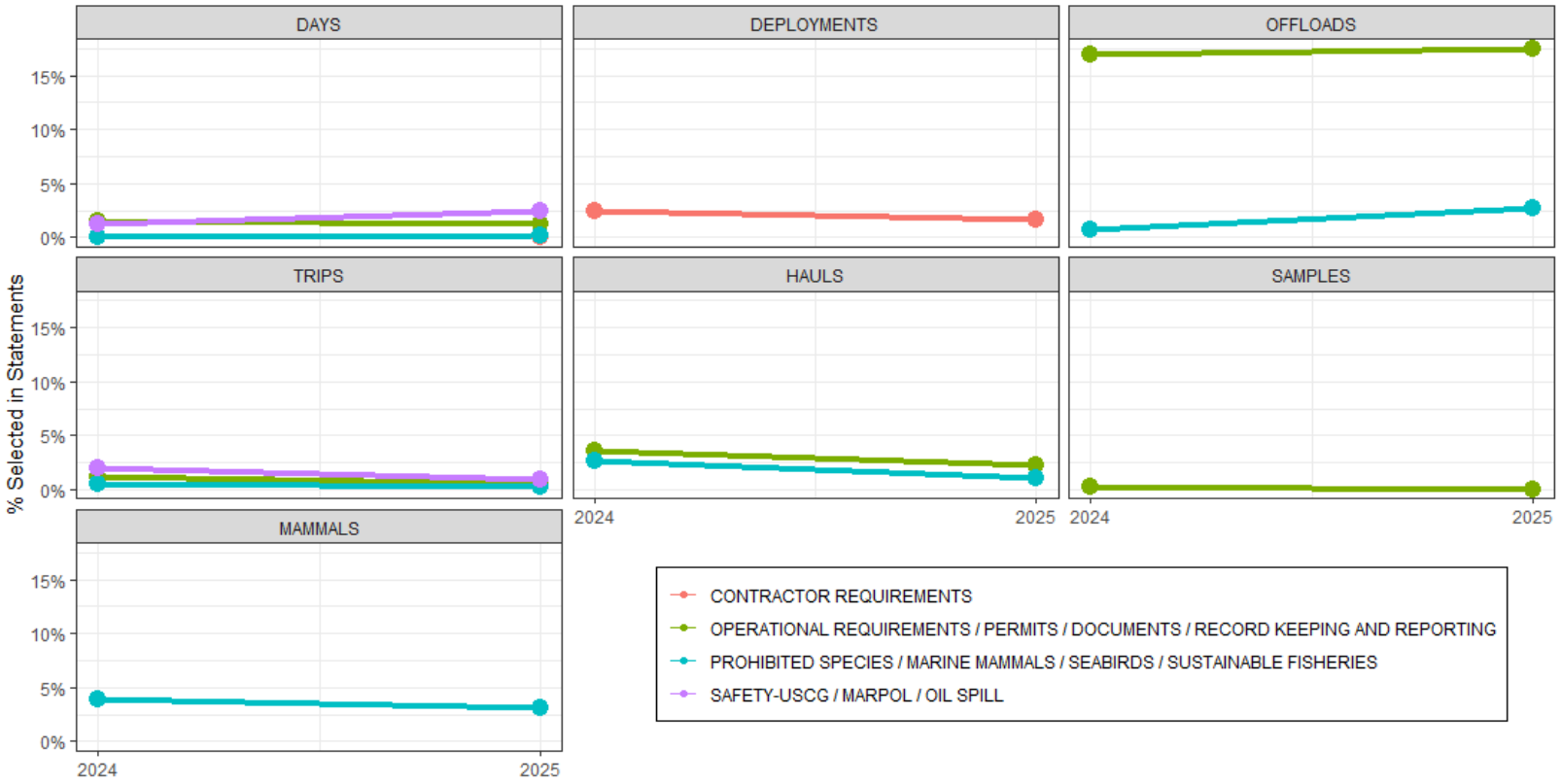

Figure 5-6 -- Percent of observer data types that were selected as "occurrence units" of potential violations in each of the "other" statement super-categories for each full year since the statement system re-design.

6. NMFS Recommendations

NMFS recommends the following for the 2027 Annual Deployment Plan:

Deployment Design:

- NMFS recommends the continued use of the Proximity allocation method for the partial coverage strata (with the exception of trawl EM) in 2027.
- For the Trawl EM stratum in the BSAI, all offloads from Trawl EM trips are to be sampled for salmon, halibut, and biological data, In the GOA, NMFS recommends maintaining the sampling rate where all EM deliveries are monitored for salmon and halibut PSC and 33% are sampled by shoreside fishery observers for biological data. The agency will continue to monitor the complete sorting and accounting of salmon, with specific attention in the Western GOA during the B Season and likely develop additional mechanisms, such as CMCP modifications, for ensuring accuracy of salmon accounting in 2028.
- NMFS recommends maintaining the stratification used in the final 2026 ADP for use in the 2027 Annual Deployment Plan. As in recent years, the stratification definition would be based on monitoring method (Observer, EM Fixed Gear, EM Trawl), Fishery Management Plan (BSAI, GOA), and gear type that combines hook-and-line and pot gear (Fixed, Trawl). The 8 recommended partial coverage strata for 2026 are:
    - Observed fixed gear trips in the GOA (OB FIXED GOA)
    - Observed fixed gear trips in the BSAI (OB FIXED BSAI)
    - Observed trawl gear trips in the GOA (OB TRW GOA)
    - Observed trawl gear trips in the BSAI (OB TRW BSAI)
    - EM fixed gear trips in the GOA (EM FIXED GOA)
    - EM fixed gear trips in the BSAI (EM FIXED BSAI)
    - EM trawl gear deliveries in the GOA (EM TRW GOA)
    - Fixed-gear vessels less than 40 ft LOA and vessels fishing with handline, jig, troll and dinglebar troll gear (Zero coverage)
- Improve trip closing in ODDS for 2027.
    - Automated reminders to close or cancel pending trips that have surpassed planned fishing dates. Many trips are logged but left pending at the end of the year, making it difficult to tell whether they were actually fished. This is especially an issue for the *EM FIXED* strata because if a selected trip is left pending, it is unknown whether the hard drive for the trip should be received by reviewers.
    - NMFS is considering requiring a landing report ID, trips to be closed in the order they were logged, and/or other information to close fixed-gear strata trips to improve record keeping.

EM Video Review:

- NMFS should continue to collaborate with the PSMFC to monitor video review progress and enable a review strategy that will result in EM video review times that result in the most useful information for the most number of trips for a given cost.
- To maximize data utility, NMFS, in collaboration with PSMFC, will continue to develop specific prioritization rules that can be used to allocate review effort to the fisheries, gear types, times and areas that are the most dependent on EM data for management needs.

Fixed-gear EM:

- Maintain an EM selection pool composed of up to 176 fixed gear vessels, which would maintain the size of the EM pool from 2026. NMFS recommends prioritizing placement in the EM selection pool based on vessel size, fishing effort, minimizing data gaps, and cost efficiency.
- If a vessel operator had repeated problems with EM system reliability or video quality or has failed to comply with the requirements in their Vessel Monitoring Plan, NMFS may disapprove a Vessel Monitoring Plan and the vessel may be removed from the EM pool.
- The agency will continue to review the cost effectiveness of individual EM vessels and criteria to remove vessels from the fixed-gear EM pool or deny vessels from the trawl EM category. Criteria for continued inclusion in these EM programs will be specified in the 2027 ADP.

EM Development:

- NMFS will continue to collaborate with industry partners on EM development and cost efficiency projects. NMFS will work with Council's monitoring committees (FMAC and PCMAC) to coordinate on EM development priorities and potential grant proposals to National Fish and Wildlife Foundation.
- For budget planning during the development of the Annual Deployment Plan, NMFS needs advance notice by processing plants accepting trawl EM pollock deliveries from catcher vessels of their needs for partial coverage observers in the upcoming fishing year. Regulations at 50 CFR 679.51(b)(3)(i) require notice by November 1 of the year prior to the year in which they intend to receive deliveries from catcher vessels or tender vessels in the trawl EM category. Early notification by processing plants is necessary, and allows NMFS to plan accordingly and develop a cost-efficient shoreside monitoring plan. Shoreside processors that do not notify NMFS by November 1 will be ineligible to receive trawl EM deliveries in the upcoming fishing year. Plant operating plans for the following year can be provided to NMFS during annual meetings between the agency and industry at the annual Fisheries Monitoring Advisory Committee Meeting (April-May), the annual Partial Coverage Monitoring Advisory Committee Meeting (September), during the annual spring (May-June) or fall (Sept-Oct) NPFMC meetings, or by directly contacting the FMA Division Director and FMA Analytical Program Manager. The Annual Planning and Reporting Process for the Annual Deployment Plan and the Annual Report can be found in Chapter 1, section 1.2 of this report.

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Appendix A. Addressing Data Concerns from Continued EM Expansion

This Appendix is provided in response to the Council's Science and Statistical Committee's (SSC) ongoing concerns about the quantity and quality of fisheries monitoring data due to the expansion of Electronic Monitoring (EM; SSC Recommendations June 2025). This document characterizes the impact of this expansion to demonstrate meaningful progress in addressing these issues. The SSC has repeatedly requested analysts characterize and report EM-related changes in:

- Spatial coverage and species composition of biological samples.
- Data quantity and quality (e.g., precision and accuracy) for stock assessment metrics.
- Bycatch and Prohibited Species Catch (PSC) estimation, particularly for priority stocks (salmon, crab, halibut PSC, and Tier 6 stocks).

Underlying Causes of SSC Concern

The SSC's concerns stem from four key factors related to the current monitoring structure and the rapid expansion of Electronic Monitoring (EM):

- EM and observer monitoring have historically been mutually exclusive in Annual Deployment Plans (ADP).
- EM systems do not collect critical biological data (length, tissues) needed for stock assessments, nor do they collect information on interactions with marine mammals and seabirds.
- The timeliness of EM catch data is insufficient for in-season quota management.
- EM participation has grown dramatically, expanding from a pilot program of 13 vessels in 2013 to 223 approved vessels in 2026, with EM spending now exceeding observer coverage spending (Table 3-1).

The continuous growth of the EM vessel pool leads to an ever-decreasing observer-monitored pool, which drives up observer costs and risks creating an EM-only fishery monitoring program that cannot support stock assessments or in-season management. This possibility mirrors the 'joint-venture' years in the late 1980s, when only foreign flagged vessels were monitored, which necessitated the development of a domestic observer program in subsequent years.

In light of the increasing use of EM to monitor fisheries, NMFS analyzed an alternative deployment design that included partial coverage at-sea EM *with* some at-sea observer coverage for the same EM vessels. This proposal, intended to maintain data collection while achieving cost efficiencies, was discussed by the Council's partial coverage fisheries monitoring advisory committee (PCFMAC) in January 2023 (PCFMAC Report January 2023). However, NMFS dropped the design from further development in May 2023, citing *Initial analyses indicate*

minimal gain under current fishing and size of EM pool and *concerns that low sampling rates could increase observer effects*. This design could help mitigate the current trend. At the time,analysts noted the design could be re-examined if *future increases in EM pool size or changes to fishing patterns should occur*.

Technical Consequences and Mitigation Approaches

The expansion of Electronic Monitoring (EM) systems introduces fundamental challenges to fisheries data by creating spatial and temporal differences between where samples are collected and where fishing occurs, which affects both catch estimation and stock assessments.

For catch estimation and in-season quota management, EM systems present two major difficulties. First, EM systems do not collect catch by weight information, requiring catch estimation for fixed-gear trips to rely on average weight information collected elsewhere. Second, a considerable lag exists between the time EM hard drives are received, video is reviewed, and data becomes available, making the data insufficient for timely in-season quota management.

For stock assessments, the primary issues are data gaps and sampling bias. The displacement of observers immediately reduces the total sample size (n) because EM systems do not collect critical biological data, such as length or tissue samples, required to estimate parameters like growth and length at age. Moreover, EM participation in partial coverage is non-random, creating potential bias in the biological data used in assessments where fish are differently distributed by age or sex across time and space (e.g., Punt et al. 2021). These differences diminish the *effective sample size* (the relative amount of new information added to the model by each subsequent sample) of observer-collected information, introducing increased uncertainty and biases of unknown magnitude into stock assessments.

Fortunately, the negative effects caused by the displacement of observers can be effectively mitigated through statistical methods, including post-stratification in catch estimation and differential data weighting in stock assessments (Francis 2011; Thorson 2014). A suite of metrics has been developed to identify where potential biases result from non-random deployment (deployment effects) and non-representative fishing (observer effects - Chapter 3; Appendix B; Appendix C). While these metrics help identify the type and magnitude of potential biases, their precise effect on the Catch Accounting System and subsequent stock assessments is unknown apart from simulation experiments. Therefore, Annual Deployment Plan (ADP) designs must continue to adhere to first principles like random selection, and Annual Reports must continue to identify the type and magnitude of potential biases.

The Stock Assessment Fisheries Information Rubric (SAFIR)

NMFS has embarked on a project, the Stock Assessment Fisheries Information Rubric (SAFIR), to systematically map monitoring metrics (like those used in this report) *to individual stock assessments*. SAFIR is a statistical assessment of data quality and reliability (quality over time) that quantifies evidence, not just a categorical score. It breaks down "data-limitation" into specific components to help users understand why and where limitations exist in a given fishery building upon NMFS (2004) and Cope et al. (2023). SAFIR addresses data quality for an assessment author by identifying where, when, and how much monitored catch, lengths, and otoliths are collected from trips relevant to a defined stock assessment. While precursors to SAFIR have evaluated tissue collection vs. catch over time (e.g., Rodgveller et al. 2023), SAFIR expands on this idea of throughput, though it is **not** an evaluation of the overall impacts of Electronic Monitoring (EM).

The central purpose of SAFIR is to provide stock assessment authors with an assessment of fishery data quality and reliability that will aid their completion of the data inputs section of assessment concerns in annual risk tables (Dorn and Zador 2020). This process alerts the author to issues in the quality and quantity of fisheries-dependent data used in their assessment. Because stock assessments and their associated risk table results are reviewed by the Council's Groundfish Plan Teams, SAFIR ensures that monitoring quality is integrated into the Council public review process. This links the monitoring program directly to the harvest advice and future fishing opportunities, which are critical interests for constituents.

Feedback from assessment authors suggests that stocks anticipated to have data issues may differ from the SSC's prioritized list, which tends to focus on catch estimation metrics for bycatch and PSC. One example is the Pacific cod assessment in the Aleutian Islands, which recently moved to Tier 3 and now necessitates reliable age and length data. Although coverage rates were high in 2025 due to low anticipated effort, the long-term lack of full coverage in this fishery will likely result in insufficient data to support Tier 3 status in perpetuity. Another concern arose from the displacement of all at-sea observers from the Gulf of Alaska pollock fishery. The switch to a full retention catch fishery with EM compliance monitoring has reduced the spatial resolution of data, as shoreside observers collect trip- or delivery-level data, while at-sea observers previously collected haul-level data (Gredzens et al. 2026). Finer-scale evaluation of length and tissue information in this fishery will now depend on self-reported location data. Finally, the potential observer effects found in Appendix B warrant some investigation of fisheries monitoring deployments in space and time in the sablefish fishery.

NMFS will continue to work collaboratively with the assessment authors to ensure that the metrics generated by SAFIR are used to inform model exploration and potential changes to

Acceptable Biological Catch (ABC) advice, providing a clear path forward for integrating monitoring concerns into the management cycle.

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Appendix B. - Detection of Observer Effects From Catch

Craig H. Faunce

Introduction

For effective fisheries management, we rely on data collected during fishing trips to be unbiased and representative of the entire fishing population. In fisheries without complete monitoring by an observer or a camera system (EM), data from a monitoring sample of fishing trips must be used to infer aspects of unmonitored fishing. Even though our monitoring program uses randomization, the presence of a monitoring system on board can unintentionally change how fishers operate - a problem known as the "observer effect". If this effect is present, the data from monitored trips are not representative of the whole fleet, which ultimately compromises the accuracy of catch accounting and stock assessments used for fishery management.

Despite the importance of accurate data, and nearly two decades of research into the issue, there is still no widely accepted method for reliably identifying observer effects in fishery monitoring programs. Chapter 3 of this report uses permutation tests to compare single factors like vessel size and trip duration between observed and unobserved trips. While these tests are useful, interpreting the results can be challenging because analyzing multiple different factors separately can result in some tests that show a difference while others do not. Crucially, these single-variable tests do not directly address the primary management question: how different is the entire catch (including all species) when a trip is monitored versus when it is not.

This appendix reports the results from the Multivariate Observer Effects (MOE) framework; a novel method to test for differences in the catch of multiple species from between monitored and unmonitored trips. This work presents complete results from partial-coverage fishing in 2025 and follows a preview of the method from last year's Annual Report (AFSC and AKRO 2025).

Methods

Data preparation

Data preparation prioritized the minimization of statistical Type I errors (false positive results) to prevent the accidental identification of an observer effect where none existed. Chapter 3 contains the trip-level information from the 2025 partial coverage fleet used in this analysis. Stratum definitions used in this analysis follow those presented in Chapter 3. Fishery labels called *blocks* were created for each trip from combinations of: if the trip was monitored (Y or N), the fishery management plan area (GOA or BSAI), the gear code (HAL, POT, or TRW), predominant species caught (trip target code), and if the trip was tendered (Y or N). Thus, trips defined in Chapter 3 that had more than one gear code would have their catch split into separate blocks - one for each gear type.

Trip duration was calculated in days. In cases where trip duration was not always available - for example when a catcher vessel acted as catcher processor - the average trip durations from catcher vessel trips belonging to the same fishery:stratum were used.

The resulting data set was evaluated against a minimum sample size needed for the MOE permutation test. Since the test relies on randomizing observed and unobserved labels to compare differences in catch, few replicates severely limit the total number of unique data combinations. To ensure a confident estimate of the test statistic, the number of unique combinations must exceed the planned 10,000 permutations. Therefore, six trips were chosen as the minimum number of monitored or unmonitored trips per stratum and block combination because six trips yield 40,000+ unique combinations, while five trips only yield ~3,000 unique combinations.

Strata and block combinations greater than the minimum sample size were passed to a three-step species vetting process. First, all records associated with species that are not required to be recorded on fish tickets (the source for retained weight catch) were removed. Second, remaining species weights that were associated with estimates of discarded catch from the catch accounting system were removed. Landed catch was selected as the target metric because discarded catch for unmonitored trips represents estimates derived from another model, making it inappropriate for direct modeling. The third step of the species vetting process was to select only species that were relatively common and in high biomass. The frequency of occurrence among trips and log transformed total biomass were calculated for each species within each stratum. To identify the threshold for rare species inclusion, linear models of log biomass and untransformed frequency of occurrence were compared against segmented regressions for each stratum. The choice of log transformation of biomass and untransformed frequencies exacerbated any differences in the relationship between these variables for the segmented model. The segmented model was given a starting breakpoint of the median species frequency to help identify the optimal single breakpoint at which the relationship between frequency and log biomass changed among species. The choice of the model to use for rare species vetting was determined through a Davies test, which statistically verifies the presence of a non-constant slope (Davies, 1987). If the model chosen in the Davies test was the linear model, or if the breakpoint from the segmented model when chosen was less than six trips, or if only two species from the segmented model were in the second segment, the value of the breakpoint for the stratum was updated to equal the greater of 1% of the total frequency of occurrence or six. Species with a frequency of occurrence less than the revised breakpoint for the stratum were removed from the model data set.

Performing models

The necessary inference models were performed using the R statistical language with the package *mvobservr* (R Core Team 2025, Mayhew and Faunce 2026). The package takes as input a file consisting of *trips*, *strata*, *blocks*, *observed* - a column for observation (Y or N), and an optional additional variable (*add_var*; in this case *trip duration*). The first step of the analysis was to determine the modelling distribution of the response variable (biomass). Because fisheries catch data are typically zero-inflated and continuously distributed, the models were fitted using a multivariate generalized Tweedie linear model - a type of MvGLM. The optimal variance power parameter for the Tweedie distribution was estimated prior to model fitting using maximum likelihood profiling over a candidate vector of values (by default ranging from 1.2 to 1.8 by 0.01) with the model formulation *biomass ~ species + block + duration + observed + 1*. Note that the factor *species* was in this model and 1 is the intercept (*mvobservr* will drop the factor *block* if there is only one factor level). The value for the Tweedie power parameter *xi.max* was obtained from the function *fast_tweedie_profile* in the *mvobservr* package. If a value for *block* and *add_var* are provided, *mvobservr* will run models of different complexities to see if the interaction term between *block* and *add_var* contributes substantially to model fit. An analysis of variance (ANOVA) F-test was used to evaluate a generalized Tweedie linear model fit to the

data using the interaction term formula and the main effects formula. These models were univariate because the response variable was biomass and *species* was included as a factor in the models. The most parsimonious fitting model form was passed on as the *full model formula*, and the *reduced model formula* was simply the full model with the factor *observed* removed.

Once a *full model formula* was determined, the next step of the modelling process was to reformat the data from long-form, where the biomass of each species, each trip was in the same column, to wide-form, where the biomass of each species was in separate columns, and a universal column for biomass no longer existed. From these data we performed generalized multivariate Tweedie models for each strata to test for an observer effect. This was accomplished by running successive univariate MvGLM models for each species using the *full model formula* and then using the *reduced model formula*. In both model formulas, the response was a matrix of rows belonging to trips, and columns belonging to the biomass from each species. The full model formulation no longer had the factor *species* because it was contained in the multivariate response.

For each species, a likelihood ratio (LR) statistic was calculated by comparing the log-likelihood of the full model (containing *observed*) against a reduced (null) model. To evaluate the multivariate effect across all species, these univariate LR statistics were summed across all species to generate a multivariate 'sum-of-LR' test statistic for each stratum. To determine the significance of the statistics from real data, an empirical null distribution was generated via permutation. The observer labels were randomly permuted (10,000 iterations), constrained within blocks to preserve the experimental design. For each iteration, the univariate and multivariate LR statistics were recalculated. The global p-value for the stratum was defined as the proportion of permuted sum-of-LR statistics equal to or greater than the observed value. This process makes the significance of the p-value identical to the permutation tests performed in Chapter 3.

Calculating bias

The observer effect can be summarized statistically by the p-values from each species in each stratum and by the aggregate multivariate p-values from each stratum. The goal is to quantify the impact of the bias introduced by an observer effect (if present) over the entire fleet. The observer effect was determined through marginal standardization. The generalized tweedie linear model was used to predict what the biomass of each species on each trip would have been if all trips were observed and then sum over all trips (G_Y), and repeat the process as if all trips were unobserved (G_N). From these two values, for each species, we obtain a percent of bias from $P = 100((G_Y - G_N) - 1)$. From this formula values are referenced against the monitored condition; positive values denote greater monitored biomass, while negative values denote greater unmonitored biomass. This bias was then applied in two ways to the actual biomass (weight) in the fishery data for each species included in the models summed across all stratum (Wi). The first was *confirmed bias* ($\widehat{B_c}$) where P was only calculated on the species:stratum combination having a p-value < 0.05 (P_c), or $\widehat{B_c} = W_i P_c$. The second was *estimated bias* where P was calculated across all species and stratum; $\hat{B} = W_i P$.

Impact of missing data

The biomass of strata:block:species excluded from models (W_x) was summed across all species and included in final bias summaries, and a percent coverage ratio (CR) was calculated from $CR = 100\frac{Wi}{Wi + Wx}$. The CR functions as a credibility score for how much weight to give the modelled bias for a given species.

Results

The number of strata and block combinations with less than the minimum sample size (17) was roughly equal to the number of combinations that had sufficient sample size (20). However, the relative effort was much greater in combinations included in the model than those that were excluded (3,236 to 348 unobserved trips and 210 to 22 observed trips respectively; Appendix Table B-1). Stratum block combinations with relatively high fishing effort (more than 20 unobserved trips) that were excluded include the Pacific Cod target fishery caught with longline in the Gulf of Alaska and the Pacific cod target fishery caught with trawl gear in the Gulf of Alaska (Appendix Table B-1).

The process of species removal from models identified a segmented model for five of six strata (Appendix Figure B-1). The OB FIXED BSAI stratum segmented model had only selected two species, so a minimum frequency of six trips was used to update the breakpoint raising the number of species in the upper break to seven. The OB FIXED GOA model resulted in a linear model. To avoid including all species, a 1% minimum frequency of occurrence requirement was applied which dropped the number of species from 36 to 15.

Model formulations included an interaction term between trip duration and fishery block in three of six strata, indicating that for these strata, duration changes with fishery (Appendix Table B-2). None of the six strata had p-values below the traditional statistical value for 'significant' effects of 0.05, however three strata had p-values less than 0.1. This indicates that observer effects among all species that were larger than 90% of the observer effects from randomly labelled data (Appendix Table B-3). Species-specific significance tests, relative frequencies, and estimated biases are presented in Appendix Tables B-4:9. Detailed results will focus on the three strata with relatively low p-values from Appendix Table B-3; OB FIXED BSAI, OB FIXED GOA, and OB TRW GOA.

The OB FIXED BSAI stratum predominantly caught Pacific Cod (82.8%; Appendix Table B-6). The estimated bias of this species was 13.5%, meaning models estimate more Pacific Cod on observed trips than unobserved trips. The modelled catch on observed trips was smaller than unobserved trips for Pacific Ocean perch (Estimated bias of -100%; Appendix Table B-6) and greater than unobserved trips for sculpins (Estimated bias of 385.4%; Appendix Table B-6). The biomass of Pacific Ocean perch and sculpins did not account for more than 0.1% of the total biomass in this stratum (Appendix Table B-6). The OB FIXED GOA stratum predominantly caught sablefish (62.4%; Appendix Table B-7) with an estimated bias of -19.3%, meaning models estimate more sablefish from unobserved trips than observed trips. The modelled catch on observed trips was larger than unobserved trips for rougheye rockfish (Estimated bias of 119.8%) and giant grenadier (Estimated bias of 861.8%; Appendix Table B-7). Rougheye rockfish and giant grenadier did not account for more than 0.3 % of the total biomass in this stratum (Appendix Table B-7). The OB TRW GOA stratum predominantly caught pollock (73.5%; Appendix Table B-9) with an estimated bias of -1.1 %. The modelled catch on observed trips was less than unobserved trips for shortraker rockfish (Estimated bias of -92.4 %) and greater than unobserved trips for sablefish (Estimated bias of 427.4%; Appendix Table B-9). Catch of shortraker rockfish and sablefish did not account for more than 0.2 % of the total biomass in this stratum (Appendix Table B-9).

Confirmed and estimated bias among all stratum combined and the confidence ratio are presented in Appendix Table B-10. A total of seven species had very different modelled biomass between monitored and unmonitored states in at least one stratum. Of these species, the model coverage for sablefish, Pacific Ocean perch, shortraker rockfish, rougheye rockfish and dusky rockfish was 99% or greater, indicating that the results in Appendix Table B-10 can safely be regarded as estimates for the total population caught in partial

coverage strata in 2025. However for giant grenadier and sculpins, there is potentially sizable, but unknown, bias from fishing activities too rarely monitored to model. Of species that were among the cumulative 99th percentile of modelled catch, three species were highlighted as unusual between monitored and unmonitored models so far. Sablefish was the third largest species in terms of catch modelled and had a model coverage of 100%. This species had a confirmed bias of less than 1% and an estimated bias of -20%, indicating that this species was caught more on unmonitored trips than monitored trips. Like sablefish, the confirmed bias for Pacific Ocean Perch was less than 1% and the estimated bias among all stratum was 5% more on monitored trips. The confirmed and estimated bias of shortraker rockfish were -58% and -49% respectively.

Discussion

The Multivariate Observer Effects (MOE) framework, reported here, represents a significant advancement in fisheries science. It is the first of its kind to test for observer effects in the catch of multiple species in aggregate. This novel method directly addresses the core management challenge - how the entire multispecies catch differs between monitored and unmonitored trips - by providing a single, community-level p-value that is easily interpreted. This complements and improves upon the separate, single-variable tests used in Chapter 3.

The statistical foundation of the MOE framework provides substantial advantages over past methods used to detect observer effects. The use of the multivariate generalized Tweedie model, implemented via the new *mvobservr* R package, is uniquely capable of evaluating fisheries biomass data. This is because the Tweedie distribution can model the data's specific properties, which are unique to fisheries biomass data: a large number of zeros (zero-inflation) and right-skewed continuous positive values (a compound Poisson-gamma process). By specifying the family and linkage in the model, the mean and variance relationship of the data is preserved, eliminating the need for data transformation. Furthermore, the model accounts for the natural correlation between species, which is not possible with standard generalized linear modeling tools. By simultaneously analyzing all species, the framework achieves greater power to detect subtle patterns than when examining each species separately. Jupke and Shafer (2020) found that among different ecological tools to evaluate community and environmental variables, a multivariate generalized linear model (MvGLM) performed best for false positive rates (incorrectly detecting an observer effect when there was not one present) and showed the best performance when all community types are considered. The false negative rate was also low and all false negatives occurred in communities with the smallest sample size. While MvGLM is still susceptible to low power at low sample sizes, it has been shown to outperform other resampling techniques such as PERMANOVA (Wharton et al. 2012). To ensure that any detected observer effects are robust and warrant further investigation, the MOE framework was explicitly designed to prioritize the minimization of statistical Type I errors. To further reinforce the framework’s resistance to false positives, robust data preparation steps were incorporated, specifically removing low-effort fisheries and identifying rare species to mitigate the potential negative effects of small numbers of observations on model power.

The MOE framework provides critical quantification of bias. The marginal standardization technique calculates Confirmed Bias and Estimated Bias, giving fishery managers a direct metric for the potential impact of an observer effect across the entire fleet. The Model Coverage Ratio (CR) provides a credibility score for these bias estimates. For sablefish, Pacific Ocean perch, shortraker rockfish, rougheye rockfish, and dusky rockfish, CR values were at least 99%, confirming that the results can safely be regarded as population estimates for the total catch in partial coverage strata. However, for species like giant grenadier and sculpins,

there is potentially sizable unknown bias from fishing activities too rarely monitored to quantify through models.

Of the species among the cumulative 99th percentile of modeled catch, sablefish, Pacific Ocean perch, shortraker rougheye and rougheye rock stood out as unusual. Of these, sablefish biomass was relatively large - magnifying the potential impact of found biases. Sablefish was the third largest species caught in biomass and had a Model Coverage of 100%. This species had an Estimated Bias of -21%, indicating a greater catch occurred on unmonitored trips than on monitored trips across all strata combined.

Observer effects of concern

Since the findings here are the first of their kind to be reported, it is necessary to avoid making sweeping statements about the integrity of monitoring data or the information used to estimate catches and manage quotas. No quota's p-value was below 0.05 - a traditional critical threshold in statistics - indicating that the catch in its entirety was not 'significantly' different when monitored than when not. Where species-specific observer effects were found in stratum, their relative biomass was low. With all caution and caveats considered, the results from this analysis, particularly the species-specific metrics in Appendix Table B-10, will be used as one of a suite of metrics - including some from Chapter 3 - to assist stock assessment authors in completing risk tables. Within this management context, the calculated observer effect and estimated bias for sablefish warrants scrutiny of fishery - dependent data used by assessment authors.

In the OB FIXED GOA stratum, which predominantly caught sablefish, the estimated bias was -19%. Sablefish is an economically valuable species managed by an Individual Fishing Quota (IFQ) without complete monitoring. Since fishers are paid more for larger fish, the likelihood of high-grading - wherein only small fish are discarded, would result in larger fish landed than are caught overall. An observer effect could manifest in this fixed-gear context if the practice is illegal. However, the Council has allowed this practice in response to a large year class and terms the practice "voluntary discarding". This fact makes the presence of greater catch of sablefish when unmonitored than monitored more puzzling.

In the OB TRW GOA trawl stratum, sablefish biomass was four times greater on monitored trips than on unmonitored trips. This effect suggests the exploitation of allowable bycatch quotas or sideboards to maximize economic value, a practice widely known to result in the "Gulf of Alaska Sablefish Trawl fishery" listed in bycatch reports (Benaka et al. 2019). Although the relative total biomass here is small (<0.1%), the relative economic value of this discrepancy is likely larger.

Advances, challenges and Future Development

Analytic efficiency has been greatly improved compared to last year. The new *mvobservr* package implements C++ code and parallel processing, reducing the analysis time for 10,000 permutations to 45 minutes on a 16-core cloud instance, compared to the nine hours it previously took to complete 1,000 permutations. The 15x gain in computing power and 8x gain in computing efficiency increased total throughput (time per permutation) by 120x.

Despite these advances, several challenges remain. Appendix Table B-1 shows that there are still quite a few fishing sectors that did not have the minimum sample size of six monitored and unmonitored trips required for the permutation test, indicating that dealing with low fishing effort remains a practical challenge.

The size and novelty of this analysis warranted its inclusion as an appendix to the Annual Report. Future iterations will focus on how to streamline the MOE framework for future inclusion in Chapter 3.

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Appendix Table B-1 -- Factors used in constructing fishery blocks for analysis with MvGLM by number of trips (N) and monitoring status. The last column denotes whether the block (row) was included in models.

Strata	Gear Type	Tender	Target	N Unobserved	N Observed	Modelled
OB FIXED GOA	HAL	N	Halibut	788	49	Yes
OB FIXED GOA	POT	N	Sablefish	712	41	Yes
EM FIXED GOA	HAL	N	Halibut	365	38	Yes
OB FIXED GOA	HAL	N	Sablefish	280	13	Yes
EM FIXED GOA	POT	N	Sablefish	280	22	Yes
OB TRW GOA	TRW	N	Pollock	180	39	Yes
OB FIXED BSAI	POT	N	Pacific Cod	134	31	Yes
EM FIXED GOA	HAL	N	Sablefish	117	6	Yes
OB FIXED GOA	POT	N	Pacific Cod	96	9	Yes
OB FIXED GOA	**HAL**	**N**	**Pacific Cod**	**79**	**4**	**No**
EM FIXED GOA	HAL	N	Pacific Cod	63	9	Yes
OB FIXED BSAI	POT	N	Sablefish	54	8	Yes
OB TRW GOA	TRW	N	Arrowtooth Flounder	44	8	Yes
EM FIXED GOA	POT	N	Pacific Cod	41	7	Yes
OB TRW GOA	**TRW**	**N**	**Pacific Cod**	**26**	**4**	**No**
OB FIXED BSAI	HAL	N	Halibut	26	10	Yes
OB TRW BSAI	TRW	N	Pacific Cod	21	15	Yes
EM FIXED BSAI	POT	N	Pacific Cod	20	34	Yes
OB FIXED BSAI	**POT**	**Y**	**Pacific Cod**	**16**	**1**	**No**
EM FIXED BSAI	POT	Y	Pacific Cod	15	9	Yes
OB TRW GOA	**TRW**	**N**	**Shallow Water Flatfish - GOA**	**13**	**2**	**No**
OB TRW GOA	**TRW**	**Y**	**Pacific Cod**	**12**	**0**	**No**
OB FIXED GOA	**POT**	**N**	**Halibut**	**12**	**1**	**No**
OB FIXED GOA	**POT**	**Y**	**Pacific Cod**	**7**	**0**	**No**
EM FIXED BSAI	**HAL**	**N**	**Halibut**	**7**	**5**	**No**
OB FIXED GOA	**HAL**	**N**	**Halibut**	**7**	**1**	**No**
OB TRW GOA	**TRW**	**Y**	**Pollock**	**7**	**0**	**No**
EM FIXED GOA	**POT**	**N**	**Halibut**	**5**	**0**	**No**
EM FIXED GOA	**POT**	**Y**	**Pacific Cod**	**4**	**0**	**No**
OB FIXED GOA	**HAL**	**N**	**Rockfish**	**4**	**1**	**No**
EM FIXED GOA	**HAL**	**N**	**Halibut**	**3**	**1**	**No**
OB FIXED BSAI	**HAL**	**N**	**Sablefish**	**3**	**0**	**No**
OB FIXED GOA	**HAL**	**Y**	**Halibut**	**2**	**0**	**No**
OB FIXED BSAI	**POT**	**N**	**Pacific Cod**	**1**	**0**	**No**
OB FIXED BSAI	**HAL**	**N**	**Halibut**	**1**	**1**	**No**
EM FIXED GOA	**HAL**	**N**	**Rockfish**	**1**	**0**	**No**
OB FIXED GOA	**HAL**	**Y**	**Sablefish**	**0**	**1**	**No**

Appendix Table B-2 -- Comparison of Model Fit (F-test) Between Interaction Term and Main-Effects Only Models. Bold font indicates the model with the interaction term had greater explanatory power.

Stratum	Formula	Resid. df	Resid. Dev.	F value	p-value
EM FIXED BSAI	**biomass ~ species + observed + 1 + days.fished + BLOCK**	**228**	**373**		
	biomass ~ species + observed + 1 + days.fished * BLOCK	**227**	**348**		
	ANOVA	**1**	**25**	**14.640**	**<0.001**
EM FIXED GOA	**biomass ~ species + observed + 1 + days.fished + BLOCK**	**13,252**	**36,379**		
	biomass ~ species + observed + 1 + days.fished * BLOCK	**13,248**	**36,198**		
	ANOVA	**4**	**180**	**6.295**	**<0.001**
OB FIXED BSAI	biomass ~ species + observed + 1 + days.fished + BLOCK	1,830	8,032		
	biomass ~ species + observed + 1 + days.fished * BLOCK	1,828	8,031		
	ANOVA	2	1	0.106	0.900
OB FIXED GOA	**biomass ~ species + observed + 1 + days.fished + BLOCK**	**29,800**	**62,895**		
	biomass ~ species + observed + 1 + days.fished * BLOCK	**29,797**	**62,651**		
	ANOVA	**3**	**244**	**10.477**	**<0.001**
OB TRW BSAI	biomass ~ species + observed + 1 + days.fished	No ANOVA - only main effects			
OB TRW GOA	biomass ~ species + observed + 1 + days.fished + BLOCK	5,127	19,867		
	biomass ~ species + observed + 1 + days.fished * BLOCK	5,126	19,862		
	ANOVA	1	5	0.892	0.345

Appendix Table B-3 -- Multivariate ‘sum of L-R’ test statistic p-values from each stratum and the number of successful permutations from 10,000 trials. Low p-values indicate rare outcomes relative to the null hypothesis of no observer effects.

Stratum	Model formula	p-value	nBootSuccess
EM FIXED BSAI	abund ~ observed + 1 + days.fished * BLOCK	0.511	10,000
EM FIXED GOA	abund ~ observed + 1 + days.fished * BLOCK	0.575	9,947
OB FIXED BSAI	abund ~ observed + 1 + days.fished + BLOCK	0.064	10,000
OB FIXED GOA	abund ~ observed + 1 + days.fished * BLOCK	0.080	9,998
OB TRW BSAI	abund ~ observed + 1 + days.fished	0.980	10,000
OB TRW GOA	abund ~ observed + 1 + days.fished + BLOCK	0.062	9,988

Appendix Table B-4 -- Species-specific L-R p-values, frequency of occurrence, biomass, cumulative biomass and estimated bias in the EM FIXED BSAI stratum. Bold values indicate significant departures from expected values under the null hypothesis of no observer effects.

Species	p	Sig.	Frequency (%)	Biomass (t)	Biomass (%)	Estimated Bias (%)
Pacific Cod	0.21		100.0	3,542.0	99.4	17.3
Octopus	0.41		44.9	18.1	0.5	52.8
Pollock	0.63		20.5	1.5	< 0.1	54.7
Three dropped species				0.1	< 0.1	
Stratum Total				3,561.8	100	

Appendix Table B-5 -- Species-specific L-R p-values, frequency of occurrence, biomass, cumulative biomass and estimated bias in the EM FIXED GOA stratum. Bold values indicate significant departures from expected values under the null hypothesis of no observer effects.

Species	p	Sig.	Frequency (%)	Biomass (t)	Biomass (%)	Estimated Bias (%)
Sablefish (Blackcod)	0.34		53.0	4,320.1	50	-18.7
Pacific Cod	0.76		30.3	2,549.3	29.5	6.3
Pacific Halibut	0.59		61.0	1,578.9	18.3	-8.6
Yelloweye Rockfish	0.69		39.9	87.0	1	16.5
Shortraker Rockfish	0.71		20.3	19.7	0.2	-19.5
Rougheye Rockfish	0.37		29.0	18.0	0.2	-34.0
Thornyhead Rockfish (Idiots)	0.69		23.7	14.8	0.2	22.8
Skate, Longnose	0.14		6.4	12.1	0.1	62.2
Redbanded Rockfish	0.88		18.3	9.5	0.1	13.0
Skate, Big	0.43		4.9	8.8	0.1	51.2
Quillback Rockfish	0.52		14.6	5.8	0.1	-36.3
Octopus	0.33		5.0	4.8	0.1	-58.5
Silvergray Rockfish	0.18		7.2	1.2	< 0.1	208.4
Dusky Rockfish	**0.04**	*	**6.7**	**0.8**	**< 0.1**	**258.9**
Fifteen dropped species				12.2	0.1	
Stratum Total				8,642.9	100	

Appendix Table B-6 -- Species-specific L-R p-values, frequency of occurrence, biomass, cumulative biomass and estimated bias in the OB FIXED BSAI stratum. Bold values indicate significant departures from expected values under the null hypothesis of no observer effects.

Species	p	Sig.	Frequency (%)	Biomass (t)	Biomass (%)	Estimated Bias (%)
Pacific Cod	0.31		72.2	6,979.7	82.8	13.5
Sablefish (Blackcod)	0.43		26.6	1,144.9	13.6	-28.0
Pacific Halibut	0.24		16.3	265.7	3.2	-42.9
Octopus	0.57		22.4	31.1	0.4	28.8
Sculpins	**0.01**	*	**18.3**	**3.6**	**< 0.1**	**385.4**
Pollock	0.58		11.0	0.3	< 0.1	-33.1
Pacific Ocean Perch	**0.04**	*	**3.4**	**0.1**	**< 0.1**	**-100.0**
Ten dropped species				1.6	< 0.1	
Stratum Total				8,427.0	100	

Appendix Table B-7 -- Species-specific L-R p-values, frequency of occurrence, biomass, cumulative biomass and estimated bias in the OB FIXED GOA stratum. Bold values indicate significant departures from expected values under the null hypothesis of no observer effects.

Species	p	Sig.	Frequency (%)	Biomass (t)	Biomass (%)	Estimated Bias (%)
Sablefish (Blackcod)	0.14		59.6	11,400.6	62.4	-19.3
Pacific Cod	0.49		23.1	3,299.4	18.1	18.7
Pacific Halibut	0.55		56.3	3,257.5	17.8	-8.6
Yelloweye Rockfish	0.75		30.5	127.8	0.7	-12.9
Rougheye Rockfish	**0.02**	*	**26.1**	**48.9**	**0.3**	**119.8**
Octopus	0.91		5.0	40.6	0.2	-8.3
Shortraker Rockfish	0.36		17.4	37.9	0.2	50.3
Thornyhead Rockfish (Idiots)	0.60		24.3	24.2	0.1	26.4
Redbanded Rockfish	0.27		14.9	15.4	0.1	75.7
Quillback Rockfish	0.64		5.8	4.1	< 0.1	43.0
Giant Grenadier	**0.00**	*	**1.9**	**3.3**	**< 0.1**	**861.8**
Silvergray Rockfish	0.76		4.8	1.2	< 0.1	27.2
Dusky Rockfish	0.39		1.9	0.2	< 0.1	144.0
Canary Rockfish	0.21		1.2	0.1	< 0.1	576.4
Tiger Rockfish	0.88		1.8	0.1	< 0.1	-14.5
Twenty-one dropped species				4.3	< 0.1	
Stratum Total				18,265.8	100	

Appendix Table B-8 -- Species-specific L-R p-values, frequency of occurrence, biomass, cumulative biomass and estimated bias in the OB TRW BSAI stratum. Bold values indicate significant departures from expected values under the null hypothesis of no observer effects.

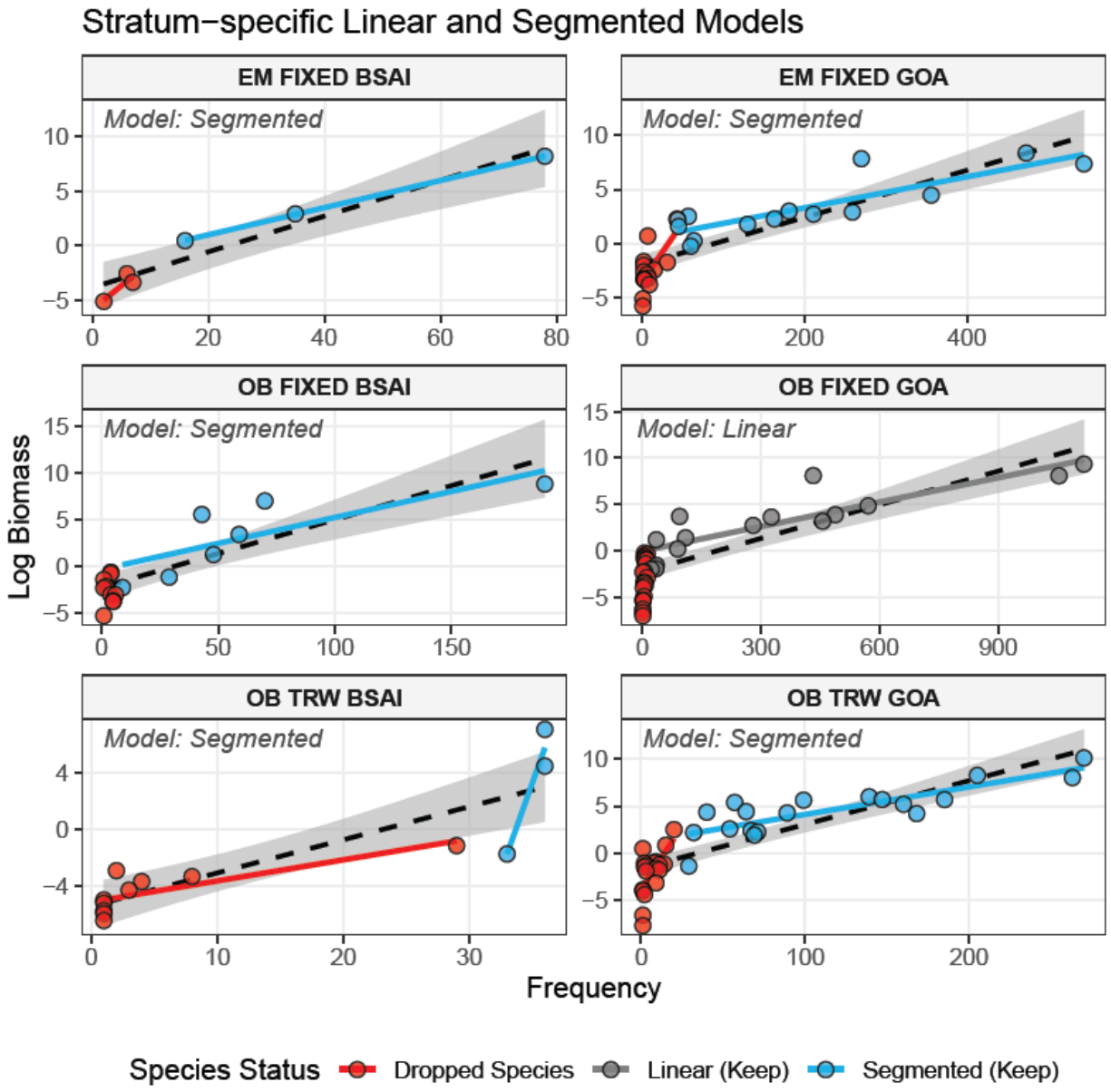
Species	p	Sig.	Frequency (%)	Biomass (t)	Biomass (%)	Estimated Bias (%)
Pacific Cod	0.85		100.0	1,169.1	93	3.2
Pollock	0.86		100.0	87.5	7	6.0
Flathead Sole	0.81		91.7	0.2	< 0.1	5.0
Ten dropped species				0.5	< 0.1	
Stratum Total				1,257.2	100	

Appendix Table B-9 -- Species-specific L-R p-values, frequency of occurrence, biomass, cumulative biomass and estimated bias in the OB TRW GOA stratum. Bold values indicate significant departures from expected values under the null hypothesis of no observer effects.

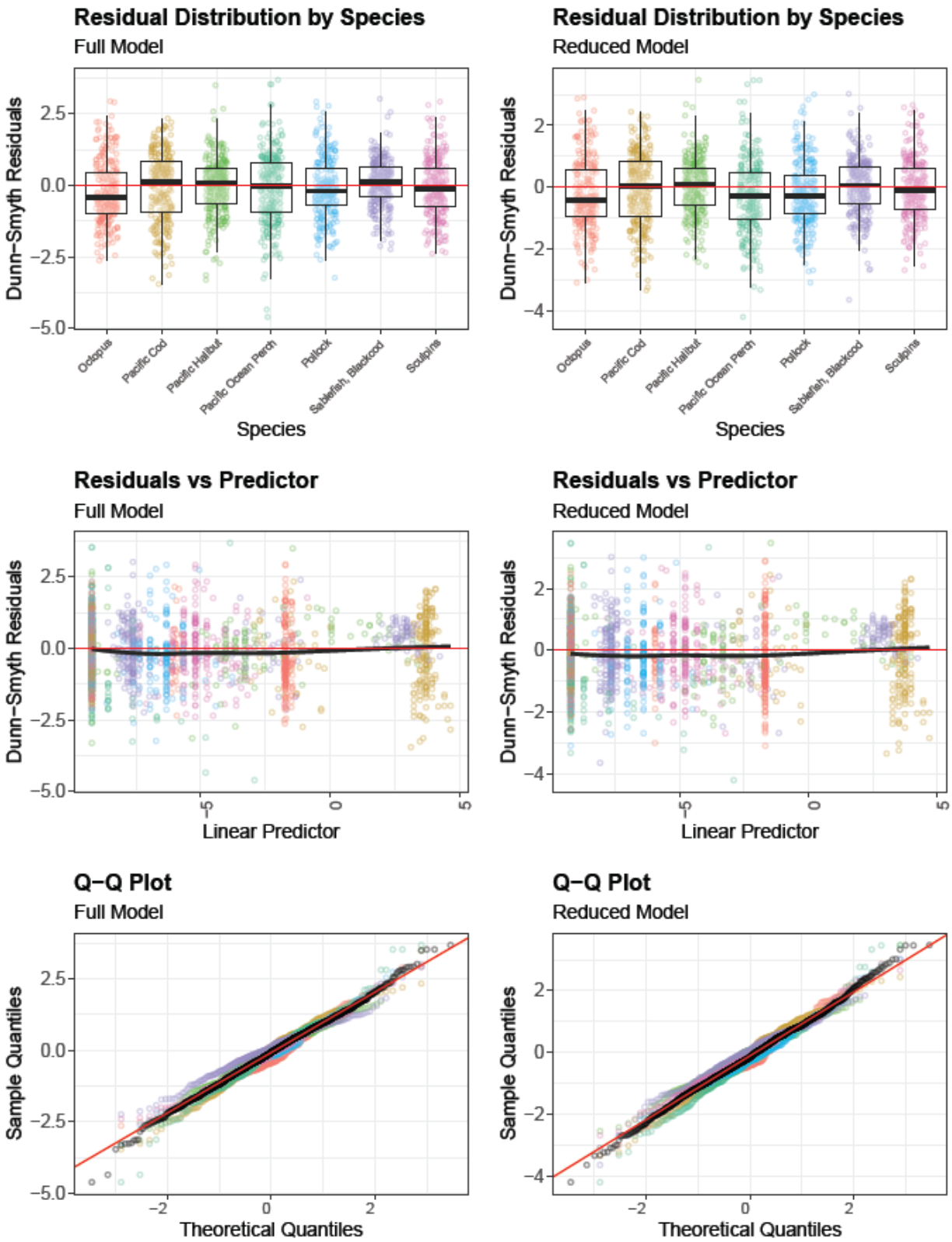
Species	p	Sig.	Frequency (%)	Biomass (t)	Biomass (%)	Estimated Bias (%)
Pollock	0.84		99.6	24,699.1	73.5	-1.1
Arrowtooth flounder	0.86		75.6	3,836.4	11.4	7.8
Pacific Cod	0.77		97.0	3,036.9	9	4.2
Flathead Sole	0.09		51.3	396.1	1.2	-62.4
Rock Sole	0.54		54.2	296.8	0.9	29.3
Skate, Big	0.33		68.3	295.7	0.9	-21.6
Rex Sole	0.77		36.5	277.2	0.8	-11.0
English Sole	0.28		21.0	217.4	0.6	-58.2
Pacific Ocean Perch	0.89		59.0	179.4	0.5	4.7
Shortraker Rockfish	**0.00**	*	**23.6**	**82.5**	**0.2**	**-92.4**
Butter Sole	0.58		14.8	77.4	0.2	-53.8
Skate, Longnose	0.70		32.8	71.6	0.2	26.9
Squid	0.12		62.0	66.6	0.2	98.6
Sablefish (Blackcod)	**0.03**	*	**19.9**	**13.1**	**< 0.1**	**427.4**
Smelt, Eulachon	0.19		24.7	11.1	< 0.1	166.4
Rougheye Rockfish	0.57		26.2	9.4	< 0.1	-28.7
Dover Sole	0.73		11.8	8.9	< 0.1	-32.3
Dusky Rockfish	0.99		25.5	6.8	< 0.1	0.7
Shark, Spiny Dogfish	0.58		10.7	0.3	< 0.1	-30.9
Nineteen dropped species				18.9	0.1	
Stratum Total				33,601.5	100	

Appendix Table B-10 -- Species-specific bias from marginal standardization across all partial coverage strata. Bold values indicate species with significant departures from expected values under the null hypothesis of no observer effects in at least one stratum.

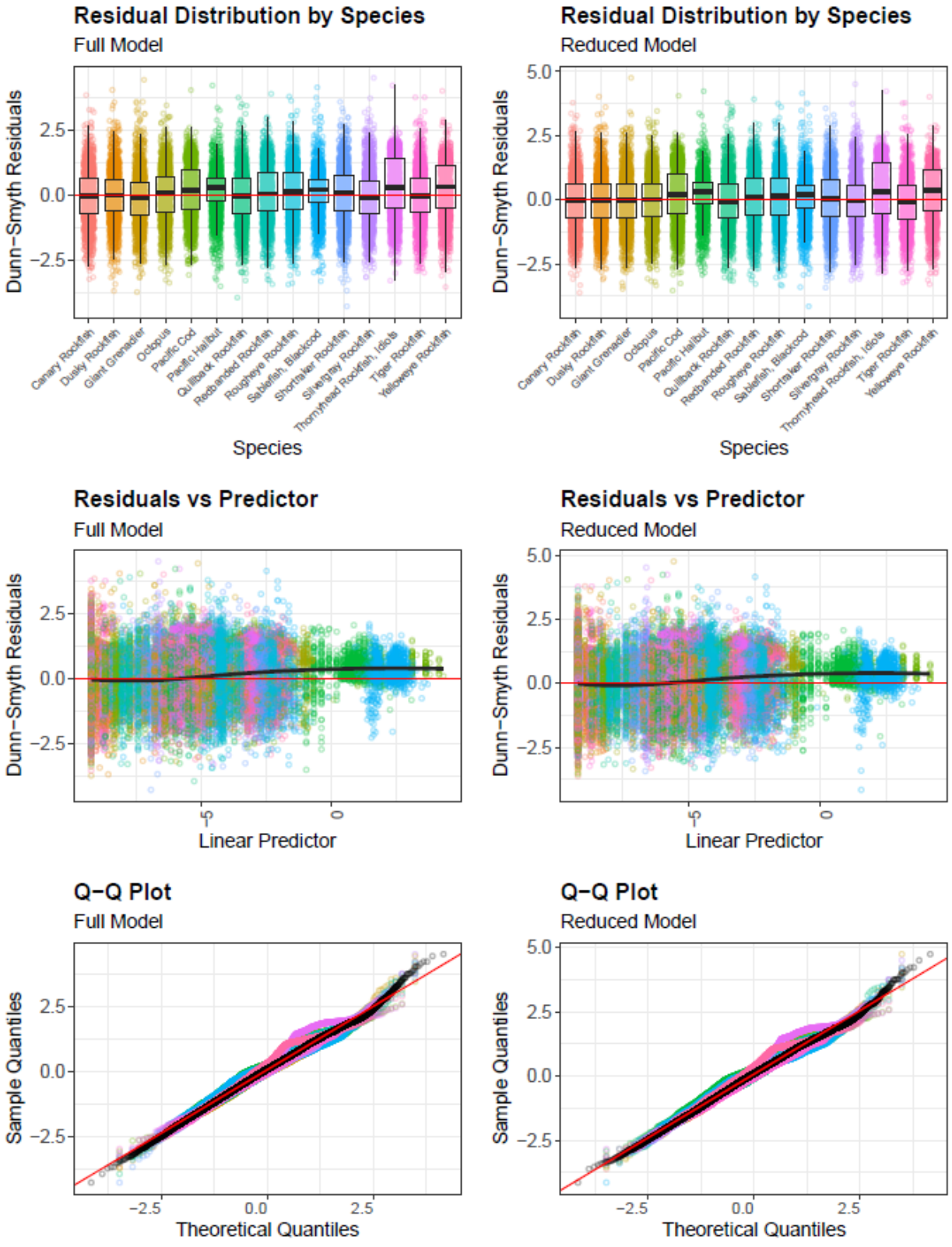
Species	Biomass (t)	Cumulative Biomass (%)	Model Coverage	Confirmed Bias (%)	Estimated Bias (%)
Pollock	24,798	34	100	0	-1
Pacific Cod	20,576	62	100	0	12
Sablefish (Blackcod)	**16,879**	**84**	**100**	**< 1**	**-20**
Pacific Halibut	5,102	91	100	0	-11
Arrowtooth flounder	3,838	97	100	0	8
Flathead Sole	396	97	100	0	-62
Skate, Big	305	97	100	0	-20
Rock Sole	297	98	100	0	29
Rex Sole	277	98	100	0	-11
English Sole	217	99	100	0	-58
Yelloweye Rockfish	215	99	100	0	-1
Pacific Ocean Perch	**180**	**99**	**100**	**> -1**	**5**
Shortraker Rockfish	**140**	**99**	**100**	**-58**	**-49**
Octopus	95	99	100	0	7
Skate, Longnose	84	100	99	0	32
Butter Sole	77	100	100	0	-54
Rougheye Rockfish	**77**	**100**	**99**	**71**	**58**
Squid	67	100	100	0	99
Thornyhead Rockfish (Idiots)	39	100	99	0	25
Redbanded Rockfish	25	100	100	0	51
Starry Flounder	12	100	0	-	-
Smelt, Eulachon	11	100	100	0	166
Quillback Rockfish	10	100	100	0	-5
Dover Sole	9	100	100	0	-32
Dusky Rockfish	**8**	**100**	**99**	**20**	**24**
Giant Grenadier	**5**	**100**	**62**	**862**	**862**
Sculpins	**4**	**100**	**81**	**385**	**385**
Remaining 28 species (4 species modeled - all non-confirmed bias)	12	100		-	-



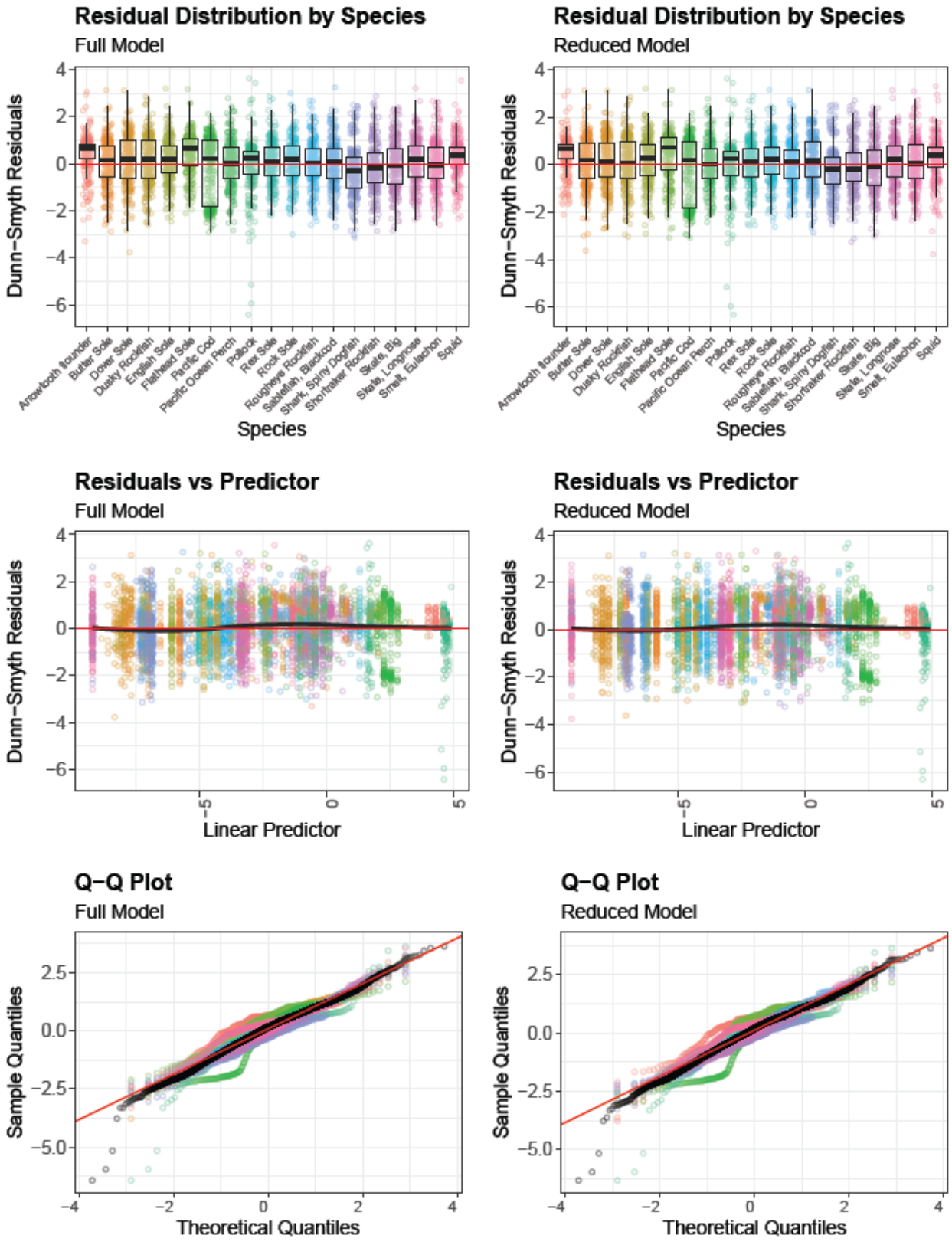
Appendix Figure B-1 -- Results of linear and segmented regressions for each stratum. Each point represents a summary for a species across all trips with sufficient monitored and unmonitored status.



Appendix Figure B-2 -- Model diagnostic plots for the fit of the generalized Tweedie linear model to the data for the OB FIXED BSAI stratum.



Appendix Figure B-3 -- Model diagnostic plots for the fit of the generalized Tweedie linear model to the data for the OB FIXED GOA stratum.



Appendix Figure B-4 -- Model diagnostic plots for the fit of the generalized Tweedie linear model to the data for the OB TRW GOA stratum.

Appendix C. Interspersion of observed partial coverage trips with data-dependent monitoring pools

To compute catch and bycatch information for the partial coverage fixed-gear EM monitoring pool (*EM FIXED BSAI* and *EM FIXED GOA* strata) and zero coverage monitoring pool, the CAS relies on data collected within the partial coverage at-sea observer fixed-gear monitoring pool (*OB FIXED BSAI* and *OB FIXED GOA* strata). Specifically, species count data from the fixed-gear EM pool require average fish weight estimates from observer samples to convert those counts to tonnage, while the zero coverage pool uses observer data to estimate discard rates. Furthermore, because no biological data are collected from the EM or zero coverage pools, stock assessments depend on length, age, and other biological information collected by at-sea observers. Because these analyses use observed fixed-gear trips as a proxy for the EM and zero coverage pools, it is important that the data collected by at-sea observers are representative of these data-dependent monitoring pools.

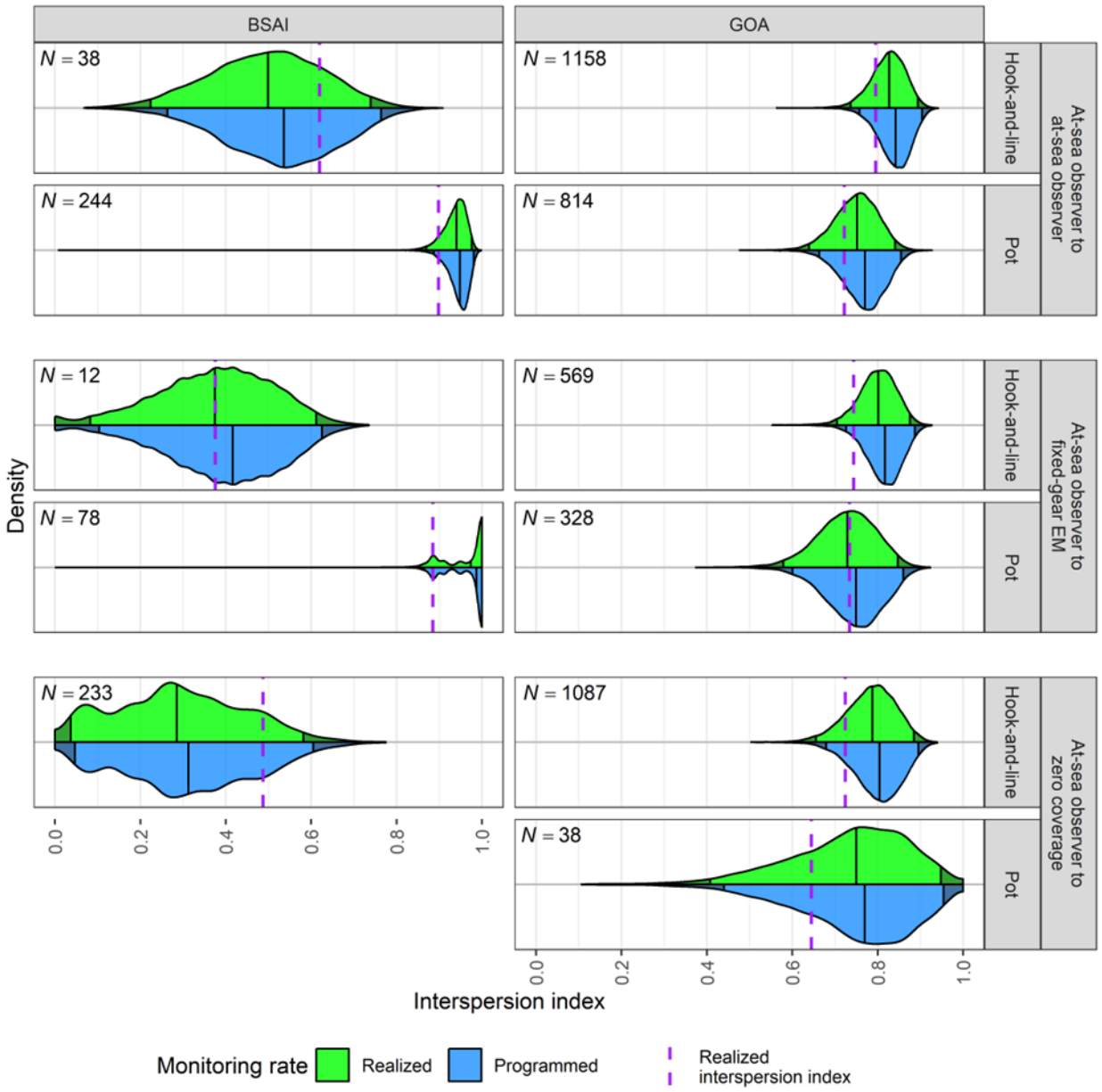
To evaluate whether the observer data are spatially and temporally representative of the other pools, we developed the interspersion index. This metric measures the spatiotemporal overlap between trips monitored by at-sea observers and trips that rely on that data, including trips in other monitoring pools (e.g., EM or zero coverage). The interspersion index is calculated similarly to the neighborhood index used in the sample quality evaluations in Chapter 3, but with one key difference. The neighborhood index is strictly stratum-specific, whereas the interspersion index evaluates the spatiotemporal proximity of observed trips both within and across monitoring pools (e.g., comparing observed hook-and-line trips to EM hook-and-line trips). Ultimately, the interspersion index calculates the proportion of trips within a specific domain, here defined by monitoring type (at-sea observer, EM, or zero), FMP (BSAI or GOA), and gear type (hook-and-line or pot) that were either directly monitored by an at-sea observer or were spatially and temporally near an observed trip.

Similar to the neighborhood index, all trips were binned into spatiotemporal blocks defined by a 200-km hexagonal grid and a 1-week period. Domain definitions included FMP areas to account for regional differences in at-sea observer selection rates. However, trips in blocks spanning the FMP boundary were allowed to neighbor one another and were not separated. To evaluate the extent of spatiotemporal overlap between observed trips and unobserved trips (both within and across monitoring pools), simulations were used to randomly select trips in the at-sea observer pool at both the realized and programmed selection rates. Next, for each gear type, the blocks containing at least one observed trip were identified, as well as any neighboring blocks in both space and time. Within each simulation iteration, the interspersion indices were calculated for each domain to generate distributions. Finally, these simulated distributions were compared to the realized interspersion index calculated from the trips that were actually monitored. The realized interspersion indices were expected to fall within the middle 95% of the simulated distributions.

Appendix Figure C-1 presents the realized interspersion indices and the simulated distributions. Overall, the realized interspersion indices fell within the distributions generated from simulated sampling based on the realized selection rate (upper, green distribution in Fig C-1). These results indicate that observed trips were distributed throughout space and time in an expected manner. Similarly, the realized interspersion indices were within the distributions generated from simulated sampling at the programmed rate (lower, blue distribution in Fig C-1), indicating that the expectations of the ADP were met.

When looking at these results regionally, realized interspersion indices of domains within the GOA were between 0.64 and 0.79, where interspersion indices in the hook-and-line domains were slightly higher than in

the pot gear domains. This difference is due, in part, to the greater proportion of at-sea observer trips that fished with hook-and-line gear in the GOA. Conversely, within the BSAI's at-sea observer and fixed-gear EM pools, pot gear trips outnumbered hook-and-line trips. Coupled with a higher selection rate in the *OB FIXED BSAI* stratum than in the *OB FIXED GOA* stratum, the interspersion indices within the BSAI pot gear domains were between 0.88 and 0.90, indicating a higher degree of spatiotemporal overlap. However, overlap was lesser for hook-and-line domains in the BSAI. While the at-sea observer pool had an internal interspersion of 0.62 in the BSAI with hook-and-line gear, it had only 0.38 interspersion with the 12 trips in the fixed-gear EM pool, and 0.49 interspersion with the 233 trips in the zero coverage pool. Therefore, we recommend restricting the number of hook-and-line vessels in the BSAI within the Fixed-gear EM program to prevent further declines in interspersion.



Appendix Figure C-1 -- Interspersion indices for fixed-gear partial coverage monitoring pools in 2025, subdivided into domains by gear type (hook-and-line or pot) and region (BSAI or GOA), depicting the spatiotemporal overlap with monitored trips in the at-sea observer strata. The purple vertical dashed line represents the realized indices. The distributions show the interspersion values obtained from 10,000 random sampling simulations; the upper (green) distribution represents sampling at the realized coverage rate and the lower (blue) distribution represents sampling at the programmed selection rate. The 2.5% tails of the distributions are shaded darker to represent unlikely outcomes. The number of trips (*N*) in each domain is displayed in the upper-left of each facet.

Appendix D. Alaska Fixed Gear Electronic Monitoring Report for the 2025 Season

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Introduction

Electronic monitoring (EM) programs use video monitoring to track fishery activities. EM can be a practical alternative to carrying an on-board observer, particularly when the space or cost of an observer is prohibitive. The North Pacific Fisheries Management Council (NPFMC) established an intent to incorporate electronic monitoring (EM) as a tool of the North Pacific Observer Program for catch estimation in the fixed gear groundfish and halibut fisheries. In 2018, the NPFMC EM program fully incorporated EM in regulation as a monitoring option for fixed gear vessels in the partial coverage category of the North Pacific Observer Program.

The Pacific States Marine Fisheries Commission (PSMFC) began developing the Electronic Monitoring program in 2012 to evaluate the efficacy of using EM in the West Coast Trawl Rationalization Program. This effort ultimately led to the implementation of the current West Coast EM regulatory program in 2024. PSMFC has participated in the NPFMC working group and has conducted EM data review for the Alaska fixed gear EM program since 2014.

The vessels in the partial coverage category using EM are small boats (<60' LOA) fishing with longline or pot gear and targeting sablefish (Anoplopoma fimbria), Pacific cod (Gadus macrocephalus) and Pacific halibut (Hippoglossus stenolepis). Archipelago Marine Research (AMR) and Saltwater Inc. (SWI) provided and installed the EM systems, and PSMFC conducted the EM data review. This report outlines the EM data collected throughout 2025.

Vessel Participation

Vessels in the partial coverage category that use fixed gear have the option to use EM instead of carrying an onboard observer. Vessel operators must register each fishing trip in ODDS before departure and will receive notification via ODDS if the trip is selected for EM trip coverage and review. Vessels made landings in ports including Homer, Kodiak, Sand Point, and Sitka.

Electronic Monitoring Systems

AMR and SWI were contracted to provide and install EM systems, and to provide technical and logistical support. The on-board systems included a sensor to capture hydraulic pressure activity; a GPS to capture locations from which the speed of the vessel was calculated; and 3-5 cameras.

Sensor data (GPS and hydraulics) were collected at 10-second intervals when the EM system was fully powered on. Video began recording when the hydraulic pressure exceeded a trigger threshold set by the EM technician and specific to each vessel. In order to capture all catch handling, video recording continued for two hours past the last point when pressure was above the trigger threshold.

Video feed and system information were displayed on the user interface (typically installed in the wheelhouse) providing vessel operators with a live update of system performance, and continuous video feeds (even when not recording).

Effort Logs

Effort logs were distributed to all of the participating vessels. Images of effort logs were transmitted to PSMFC. Longline and Pot effort log examples are provided in Appendix D1.

Electronic Monitoring Video Review

PSMFC reviewers used FishVue Interpret™ software from AMR. The software integrates the hydraulic sensor and GPS data with the synced video output. GPS data, dates and times are automatically recorded and reviewers added annotations to identify trips, hauls, and catch data. A configuration of this software allows review of both the AMR and SWI EM data.

The start and end locations, dates, and times of all trips and hauls were annotated. Other metadata such as the vessel information, ports, and fishery were either recorded by the hardware or annotated by the reviewer.

Reviewers recorded whether a streamer line, used as a seabird deterrent, was present or absent for each longline gear trip. Reviewers would randomly check at least 2 setting events to determine if streamer lines were used or not, and would record use as 'partial' if streamer lines were used on one haul, but not the other.

Reviewers recorded whether sensor and video data were complete for each haul based on the quantitative data from the sensor readings. Reviewers also assessed data quality and image quality for each haul. "Data Quality" was defined as the overall ability of the reviewer to effectively quantify and accurately identify catch data. Data quality could be impacted by a diversity of factors such as the image quality, catch handling, and camera angles or operation. Reviewers also gave specific ratings of the image quality and reasons for decreases in image quality (e.g. water spots on the camera, night lighting, etc.)

Species and counts of catch were recorded for a subset of hauls. In 2025, one of every three hauls were reviewed for trips with three or more hauls, and all hauls were reviewed for trips with less than three hauls. Catch was defined as anything seen by an EM reviewer, excluding free-moving marine birds and mammals alongside the vessel. The reviewers were instructed to record species to the lowest identifiable taxonomic level or grouping as required by the Alaska region.

Catch that was kept on the vessel (excluding use as bait or food) was considered retained; otherwise, catch was recorded as discarded[26]. Discards included marine organisms that fell off or out of fishing gear before it came onboard the vessel, or that were free-floating on the surface. For cases where the

[26] If camera views were not sufficient to see the whole deck, fish were recorded as retained or discarded based on whether they were retained or discarded at the rail. It is possible that some fish were brought onboard and later discarded out of view of the rail cameras; these fish would be recorded as retained in the EM data since the discard was not visible to the EM reviewer. In instances where fish were initially retained and later discarded in view of the rail cameras, the fish were recorded as discarded.

video stopped recording before catch handling was completed, fish that were onboard at the time of the video ending were reported as retained.

Discards were categorized as intentional or unintentional depending on the method of discard. Any fish that dropped off the gear (i.e., without visible shaking or other interaction by a crew member, or without hitting the roller) was defined as unintentional. All other discards were categorized as intentional. If a halibut was discarded, reviewers assessed the release method and condition when longline gear was used, and the condition only when pot gear was used.

Video reviewers recorded the number of minutes it took to review each haul. On-deck sort time was calculated from the start and end times of catch handling in the video. Review rate was calculated as review minutes divided by sort minutes.

Results

In 2025, there were 51 fixed gear vessels that participated in the EM program, completing 57 longline trips and 66 pot trips. By target species, there were 43 halibut trips, 54 Pacific cod trips, and 26 sablefish trips (Appendix Table D-1). The data spanned 305 halibut sea days, 235 Pacific cod sea days, and 131 sablefish sea days for a total of 671 sea days with trips averaging 6 days across all fisheries.

There were 21,699 total hauls that comprised the reviewed trips, with 7,230 of these hauls reviewed for catch-level data collection. All catch data presented is from this subset of hauls.

Appendix Table D- 1. -- Summary of EM monitored fishing activity for 2025.

		Halibut Target		Pacific Cod Target			Sablefish Target				All Fisheries
		Fixed Hook Longline	Snap Longline	Fixed Hook Longline	Snap Longline	Single Pot - Rigid	Fixed Hook Longline	Snap Longline	String Pot - Rigid	String Pot - Slinky	
Reviewed EM	Vessels	17	18	2	5	10	4	2	3	11	**72**
	Trips	20	23	2	6	46	4	2	5	15	**123**
	Hauls	390	247	53	73	20,719	19	37	30	131	**21,699**
	Reviewed Hauls	130	82	18	23	6,901	8	12	13	43	**7,230**
	Sea Days	170	135	20	30	185	14	15	22	80	**671**
	Average Trip Length (Days)	8.5	5.9	10.0	5.0	4.0	3.5	7.5	4.4	5.3	**6.0**

Effort Log

A complete logbook (either the EM effort log, or an alternative such as the IPHC logbook) was submitted with the video data for 120 of the 123 trips (98%; Appendix Table D-2). There were 3 trips without a logbook submitted.

Appendix Table D-2. -- Logbook submissions.

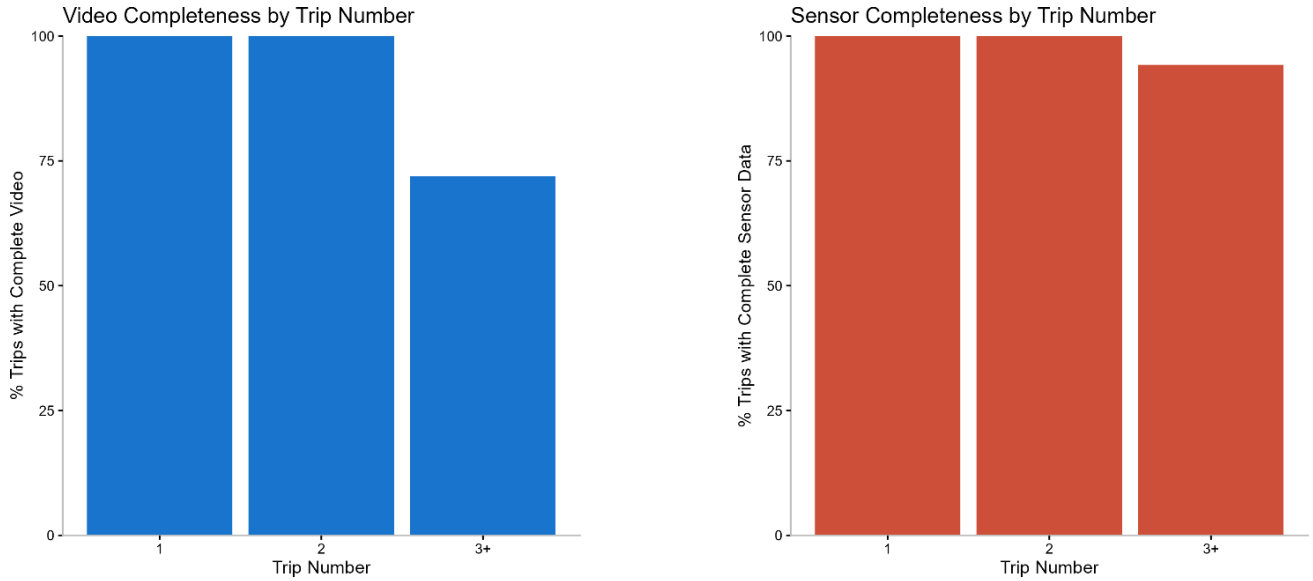
	Halibut Target		Pacific Cod Target			Sablefish Target					
Logbook Submitted	Fixed Hook Longline	Snap Longline	Fixed Hook Longline	Snap Longline	Single Pot - Rigid	Fixed Hook Longline	Snap Longline	String Pot - Rigid	String Pot - Slinky	**Total**	**%**
Yes	18	23	1	6	46	4	2	5	15	**120**	**98%**
No	2	-	1	-	-	-	-	-	-	**3**	**2%**
Total	**20**	**23**	**2**	**6**	**46**	**4**	**2**	**5**	**15**	**123**	**100%**

Data Quality

Aspects of data quality including video and sensor completeness, overall data quality, and image quality were noted by reviewers for every reviewed haul (Appendix Table D-3).

Video gaps were present in 28% of fixed gear trips, and 6% of hauls had video gaps that occurred during reviewed fishing activity; most often these gaps resulted from intermittent gaps in video coverage, from one or more cameras not working, or the video ending before catch handling ended. All of these issues suggest technical problems relating to the set-up of the EM system. Prior to 2024, video data was somewhat more likely to be incomplete during a vessel's first trip of the year, but this has not been the case in recent years (Appendix Figure D-1).

Data quality was rated as high or medium for 87% of the 7,230 reviewed hauls. The most common reason for low data quality was dirty cameras, followed by video completeness and water spots.



Appendix Figure D-1. – Video and sensor completeness in relation to the number of trips the electronic monitoring system had been on a specific vessel.

Appendix Table D-3. -- Data quality including video and sensor completeness, data quality, and image quality.

Trip Level Data Quality

	Halibut Target		Pacific Cod Target			Sablefish Target				
Video Complete	Fixed Hook Longline	Snap Longline	Fixed Hook Longline	Snap Longline	Single Pot - Rigid	Fixed Hook Longline	Snap Longline	String Pot - Rigid	String Pot - Slinky	**Total**
Number of trips	11	18	2	6	29	4	1	5	13	**89**
Percent of trips	*55%*	*78%*	*100%*	*100%*	*63%*	*100%*	*50%*	*100%*	*87%*	***72%***
Sensor Data Complete										
Number of trips	19	22	2	4	44	4	2	5	14	**116**
Percent of trips	*95%*	*96%*	*100%*	*67%*	*96%*	*100%*	*100%*	*100%*	*93%*	***94%***

Haul Level Data Quality

Haul Video Completeness (number of hauls)	Halibut Target: Fixed Hook Longline	Halibut Target: Snap Longline	Pacific Cod Target: Fixed Hook Longline	Pacific Cod Target: Snap Longline	Pacific Cod Target: Single Pot - Rigid	Sablefish Target: Fixed Hook Longline	Sablefish Target: Snap Longline	Sablefish Target: String Pot - Rigid	Sablefish Target: String Pot - Slinky	Total
Video complete - Entire haul recorded	114	72	18	23	6,496	8	7	13	42	**6,793**
Intermittent gaps in video	3	-	-	-	3	-	-	-	1	**7**
Video ends before catch handling ends	12	10	-	-	107	-	5	-	-	**134**
Video ends before fish stowed (handling complete)	1	-	-	-	4	-	-	-	-	**5**
1+ cameras not working	-	-	-	-	291	-	-	-	-	**291**

Catch Video Completeness (number of hauls)										
Complete - All catch recorded	130	82	18	23	6,826	8	12	12	43	**7,154**
Incomplete	-	-	-	-	75	-	-	1	-	**76**

Data Quality from Video (Number of Hauls)										
High	112	65	10	15	5,011	8	7	9	42	**5,279**
Medium	13	7	3	8	987	-	5	-	1	**1,024**
Low	5	10	5	-	828	-	-	3	-	**851**
Unusable	-	-	-	-	75	-	-	1	-	**76**
No Video	-	-	-	-	-	-	-		-	-

Image Quality (Number of Hauls)										
High	99	56	8	8	4,507	7	7	7	34	**4,733**
Medium	22	12	5	11	1,461	1	-	2	9	**1,523**
Low	9	14	5	4	898	-	5	4	-	**939**
Unusable	-	-	-	-	35	-	-	-	-	**35**
No Video	-	-	-	-	-	-	-		-	-

Primary Reason for Medium Image Quality (Number of Hauls)										
Banding/Scrambling/Color	-	-	-	-	-	-	-	-	1	**1**
Condensation	-	1	-	-	96	-	-	-	1	**98**
Dirty Cameras	2	1	-	3	254	-	-	-	-	**260**
Glare	-	-	-	-	137	-	-	-	1	**138**
Night Lighting	-	-	-	-	13	-	-	-	-	**13**
Obstruction	-	-	-	-	2	-	-	-	-	**2**
Poor Camera Angles	9	2	-	2	142	-	-	-	-	**155**
Video completeness	6	-	-	-	58	-	-	-	1	**65**
Water Spots	5	8	5	6	759	1	-	2	5	**791**

Primary Reason for Low Image Quality (Number of Hauls)										
Condensation	-	-	-	-	59	-	-	-	-	**59**
Dirty Cameras	2	2	-	3	407	-	-	-	-	**414**
Glare	-	-	-	-	14	-	-	-	-	**14**
Night Lighting	-	-	5	-	1	-	-	-	-	**6**
Obstruction	-	-	-	-	93	-	-	-	-	**93**
Poor Camera Angles	-	1	-	1	12	-	-	4	-	**18**
Video Completeness	7	10	-	-	177	-	5	-	-	**199**
Water Spots	-	1	-	-	131	-	-	-	-	**132**
NA	-	-	-	-	4	-	-	-	-	**4**

Review Rate

Review rate for halibut and sablefish target fisheries ranged from 0.53 to .97 minutes of review per minute of video (Appendix Table D-4). The review rate in the Pacific cod target fishery for snap-longline and single pot gear was slower and close to real time (e.g., one hour of catch handling could be reviewed in just under an hour).

Appendix Table D-4. -- Review rate by target fishery. Review of both retained and discarded catch included.

	Halibut Target		Pacific Cod Target			Sablefish Target			
	Fixed Hook Longline	Snap Longline	Fixed Hook Longline	Snap Longline	Single Pot - Rigid	Fixed Hook Longline	Snap Longline	String Pot - Rigid	String Pot - Slinky
Haul Count	130	82	18	23	6,901	8	12	13	43
Average Sort Min/Haul	94	138	106	103	4	205	100	94	122
Average Review Min/Haul	64	77	56	101	3	143	52	51	83
Average Review Min/Sort Min	0.73	0.59	0.53	0.97	0.96	0.67	0.53	0.55	0.70

Seabird Deterrents

Streamer lines are used as seabird deterrents during longline gear deployment. In 2025, 63% of longline trips were confirmed to have used a streamer line (Appendix Table D-5). No streamer line was used for 24.5% of longline trips, and streamers were partially deployed for 3.5% of longline trips. The presence or absence of a streamer line could not be determined for 5% of longline trips.

Appendix Table D-5. -- Presence of streamer lines on EM monitored longline trips.

	Halibut Target		Pacific Cod Target		Sablefish Target		
Streamer Line Status	Fixed Hook Longline	Snap Longline	Fixed Hook Longline	Snap Longline	Fixed Hook Longline	Snap Longline	**Total**
Streamer Line Present	14	16	1	2	1	2	**36**
No Streamer Line	5	5	1	2	1	-	**14**
Partial	-	1	-	1	-	-	**2**
Unknown	-	1	-	1	1	-	**3**
NA	1	-	-	-	1	-	**2**
Percent Trips with Streamer Line	***70%***	***70%***	***50%***	***33%***	***25%***	***100%***	***63%***

Catch summary

Since total catch accounting is the goal for EM in the SE AK fixed gear sectors, all species of retained or discarded marine organisms were reported and summarized to the target fishery level (Appendix D2). Video reviewers identified a high proportion of retained and discarded catch to species. Exceptions were primarily those species that reviewers have been instructed to identify to a group level because they are too similar to reliably differentiate (e.g., shortraker/rougheye rockfishes, and arrowtooth/Kamchatka flounders). There were also a small proportion of rockfish that were recorded as "Rockfish – unidentified".

For most discarded species, the majority were discarded after interaction with the vessel or a crew member (Appendix D2). Interactions included the crew member throwing the fish overboard after the

fish came onboard; a crew member shaking the line or manipulating the hook to release the fish before the fish came onboard; or the fish hitting the vessel and falling back into the water while no crew was attending the line.

Pacific halibut

Reviewers recorded the method of release (longline only) and the condition of each individual halibut at the time of release. These release methods and condition ratings were identical to those used by the observer program with the addition of three new release methods after consulting with the observer program: "Hand release", "Other careful release" and "Other non-careful release". The majority (93%) of Pacific halibut were released carefully using the "Hook twisting and shaking" method (Appendix Table D-6 and Appendix D3).

Appendix Table D-6. Pacific halibut counts for each release method by target fishery.

	Halibut Target				Pacific Cod Target				Sablefish Target				All Fisheries	
	Fixed Hook		Snap Longline		Fixed Hook		Snap Longline		Fixed Hook		Snap Longline			
Release Method	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Total	% of total
Crucifying	5	>1%	-	>1%	1	>1%	-	>1%	1	1%	-	>1%	7	>1%
Cut the gangion	1	>1%	1	>1%	-	>1%	1	>1%	-	>1%	-	>1%	10	>1%
Gaff	38	1%	4	>1%	-	>1%	1	>1%	1	1%	-	>1%	44	>1%
Hand release	4	>1%	21	>1%	-	>1%	-	>1%	-	>1%	1	>1%	26	>1%
Hit the roller	103	4%	17	>1%	-	>1%	16	2%	1	1%	2	1%	139	2%
Hook straightening	1	>1%	-	>1%	-		1	>1%	-	>1%	-	>1%	2	>1%
Hook twisting and shaking	2,266	84%	3,879	98%	112	96%	937	97%	63	89%	145	97%	7,402	93%
No Selection	26	>1%	12	>1%	-	>1%	2	>1%	4	6%	-	>1%	44	>1%
Other careful release	39	1%	4	>1%	-	>1%	-	>1%	1	1%	-	>1%	44	>1%
Other non-careful release	98	4%	13	>1%	1	>1%	4	>1%	-	>1%	1	>1%	117	1%
Unknown	132	5%	8	>1%	3	3%	7	>1%	-	>1%	-	>1%	150	2%
Grand Total	2,713		3,959		117		969		71		149		7,985	

Appendix Table D-7. -- Pacific halibut counts for each release condition by target fishery.

	Halibut Target				Pacific Cod Target						Sablefish Target						All Fisheries	
	Fixed Hook		Snap Longline		Fixed Hook		Snap Longline		Single Pot -		Fixed Hook		Snap Longline		String Pot - Slinky			
Release Condition	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%	Total	% of total
Dead/Sand Fleas/Bleeding	59	2%	219	6%	-	>1%	29	3%	6	5%	2	3%	1	>1%	1	>1%	317	4%
Minor	653	24%	2,559	65%	2	2%	199	21%	26	20%	21	30%	20	13%	3	3%	3,483	42%
Moderate	19	>1%	5	>1%	1	>1%	-	>1%	-	>1%	2	>1%	-	>1%	-	>1%	27	>1%
Severe	13	>1%	-	>1%	-	>1%	1	>1%	-	>1%	-	>1%	-	>1%	-	>1%	14	>1%
Unknown	1,949	72%	1,171	30%	114	97%	739	76%	96	75%	42	59%	128	86%	100	96%	4,339	53%
NA	20	>1%	5	>1%	-		1	>1%	-	>1%	4	6%	-	>1%	-	>1%	30	>1%
Grand Total	2,713		3,959		117		969		128		71		149		104		8,210	

Most halibut were judged to have minor damage at the time of release, of those that could be assessed (89.9% of those assessed; Appendix Table D-7). Without corresponding release condition data from onboard the vessel, it is not possible to test how well a video reviewer can assess halibut release condition from EM data. A halibut was given a release condition of "unknown" if the video reviewer could not observe both sides of the fish and the injuries could not be observed clearly at point of release. A release condition was not possible to capture for 53% of the discarded halibut across all fisheries.

References

EM Workgroup (2017) Final 2017 Electronic Monitoring Pre-Implementation Plan. https://meetings.npfmc.org/CommentReview/DownloadFile?p=4f61e41d-8a9c-46ba-a2c5-338f642523a2.pdf&fileName=HANDOUT%20EM%20Pre-implementation%20plan.pdf

Appendix D1. Longline and Pot effort logs given to skippers to fill out on each trip.

Appendix Table D1-1. -- Longline EM Effort Logbook

Vessel Name:		Start Port:
ADF&G Number:	Trip Start Date (mm/dd):	Offload Port:
Operator Name:	Offload Date (mm/dd):	ODDS Trip Number:

Did you haul at night? Y N **Did the EM system function normally the entire trip?** Y N If no, please describe any problems:	**Gear ID**	**Gear Type**	**Length of Skate (Feet)**	**Hook Size**	**Hook Spacing (ft)**	**No. Hooks Per Skate**
	A					
	B					
	C					
	D					

Set		**Haulback**		**Marine Mammals Feeding on Catch?**	**Seabirds Caught?**	**Did you discard legal-sized halibut?**	**Gear ID**	**No. Skates Set**	**No. Skates Lost**
Date (mm/dd)	**Start Time**	**Date (mm/dd)**	**Start Time**						
				Y N	Y N	Y N			
				Y N	Y N	Y N			
				Y N	Y N	Y N			
				Y N	Y N	Y N			
				Y N	Y N	Y N			
				Y N	Y N	Y N			
				Y N	Y N	Y N			
				Y N	Y N	Y N			
				Y N	Y N	Y N			

Appendix Table D1-2. -- Pot EM Effort Logbook

Vessel Name:	Did you use string pots/slinky pots? y N	Start Port:
ADF&G Number:	Trip Start Date (mm/dd):	Offload Port:
Operator Name:	Offload Date (mm/dd):	ODDS Trip Number:
Did you set pots at night? y N	Did you retrieve pots at night? y N	How much gear did you fish? (e.g., 60 pots)

Did the EM system function normally the entire trip? Y N If no, please describe any problems:	**Other Trip Comments:**

Set		**Retrieval**		**# of Pots Set**	**# of Pots Retrieved**
Date (mm/dd)	**StartTime**	**Date (mm/dd)**	**Start lime**		

Appendix D2. Counts of video recorded retained and discarded catch

Appendix Table D2-1. -- Counts of video recorded retained and discarded catch within the Pacific halibut target.

Species		Pacific Halibut Target									
		Fixed Hook Longline					Snap Longline				
		Retained	Discarded			Unknown	Retained	Discarded			Unknown
			Interacted w/ Vessel or Crew	*Drop-off*	*Utilized Onboard*			*Interacted w/ Vessel or Crew*	*Drop-off*	*Utilized Onboard*	
Rockfish and Thornyheads	Rockfish - unidentified	3	11	-	-	-	-	8	-	-	-
	Rockfish, Black	66	7		4	-	11	2		2	-
	Rockfish, Canary	-	-		-	-	1	1		-	-
	Rockfish, China	1	3		-	-	-	-		-	-
	Rockfish, Copper	2	-		-	-	1	-		-	-
	Rockfish, Dark (was Dark Dusky)	2	-		-	-	-	-		-	-
	Rockfish, Darkblotched	2	-		-	-	-	-		-	-
	Rockfish, Dusky (was Light Dusky)	10	4		-	-	6	2		-	1
	Rockfish, Northern	2	1		2	-	4	1		-	-
	Rockfish, Quillback	25	16		-	2	131	17		-	-
	Rockfish, Red Banded	14	1		-	-	148	7	1	-	-
	Rockfish, Shortraker/Rougheye unidentified	115	30	3	1	3	36	10		-	-
	Rockfish, Silvergray	-	-		-	-	38	-		-	-
	Rockfish, Thornyhead unidentified	217	30	1	-	9	23	2		-	-
	Rockfish, Tiger	-	1		-	-	4	3		-	1
	Rockfish, Vermilion	1	-		-	-	-	-		-	-
	Rockfish, Yelloweye	581	113	3	4	6	499	16	2	1	16
	Rockfish, Yellowtail	7	17		-	-	-	-		-	-
Sablefish	Sablefish (Black Cod)	1,474	1,569	12	-	-	366	147		10	46
Halibut	Halibut, Pacific	2,651	2,687	26	-	-	2,126	3,946	13	-	5
Cod	Cod, Pacific	646	598	14	856	143	384	197	8	713	18
Lingcod	Lingcod	23	215	4	-	-	47	49	1	-	-
Flatfish	Flatfish - unidentified	-	2		-	-	-	3		-	-
	Flounder, Kamchatka/Arrowtooth - unidentified	2	111		5	-	1	232		126	2
	Sole, Dover	-	1		-	-	-	1		1	-
	Sole, Flathead	-	-		-	-	-	12		-	-
	Sole, Rex	-	1		-	-	-	-		-	-
	Sole, Rock Sole unidentified	-	-		-	-	-	1		-	-
	Turbot, Greenland	-	1		-	-	-	-		-	-
Other Fish	Fish - unidentified	-	3		-	-	-	3		-	-
	Fish head /lips or parts	-	2		-	-	-	1		-	-
	Greenling - unidentified	1	-		3	-	-	-		-	-
	Grenadier, (Rattail) - unidentified	-	1		-	-	-	1		-	-
	Pollock (Walleye Pollock)	1	4		1	1	-	4		7	-
	Ratfish, Spotted	-	9		-	-	-	1		-	-
	Ronquil/Searcher - unidentified	-	-		1	-	-	-		-	-
	Roundfish - unidentified	-	1		-	-	-	8		-	-
	Sculpin - Myoxocephalus unidentified	3	114	1	3	-	-	22		1	-
	Sculpin - unidentified	-	2		-	-	-	-		-	-
	Sculpin, Irish Lord - unidentified	7	986	3	96	1	1	448	1	84	12
	Wolf-eel	-	3		-	-	-	1		-	-
	Wolffish, Bering	-	4		-	-	-	-		-	-

Wrymouth Unidentified	1	2	-	-	-	6	-	-

Species		Pacific Halibut Target								
		Fixed Hook Longline					Snap Longline			
		Retained	Discarded			Unknown	Retained	Discarded			Unknown
			Interacted w/ Vessel or Crew	*Drop-off*	*Utilized Onboard*			*Interacted w/ Vessel or Crew*	*Drop-off*	*Utilized Onboard*	
Shark	Shark, Pacific Sleeper (Mud)	-	5	1	-	-	-	-		-	-
	Shark, Spiny Dogfish	-	1,307	4	12	-	21	935	4	52	-
Skate	Skate - Soft Snout unidentified	-	250	1	-	-	-	107	1	-	-
	Skate - Stiff Snout unidentified	-	1		-	-	-	-		-	-
	Skate, Big	-	153	2	-	-	-	140	1	-	-
	Skate, Longnose	-	129		-	-	-	390	2	1	-
Crab	Crab, Box	-	-		-	-	-	1		-	-
	Crab, King - unidentified	-	-		-	-	-	2		1	-
Coral	Bryozoans/Coral Unid	3	24		-	-	6	50		-	-
Invertebrate	Barnacles	-	1		-	-	-	-		-	-
	Invertebrate - unidentified	-	-		-	-	-	2		-	-
	Jellyfish - unidentified	-	3		-	-	-	-		-	-
	Octopus - unidentified	3	39	10	16	-	1	2	1	7	-
	Oysters, Clams, Mussels, Scallops	-	2		-	-	-	-		-	-
	Sand Dollars, Sea Urchins	-	3		-	-	-	7		-	-
	Sea Anemone - unidentified	-	49		-	-	-	10		-	-
	Sea Whip, Sea Pen - unidentified	-	43		-	-	-	1		-	-
	Snail - unidentified	-	1		-	-	-	19		-	-
	Sponge - unidentified	-	11		-	-	-	12		-	-
	Starfish - unidentified	-	129		-	-	1	58	1	-	-
	Starfish, Basket	-	4		-	-	-	13		-	-
	Starfish, Brittle	-	-		-	-	-	4		-	-
	Starfish, Sunstar	-	667	7	-	-	1	222	7	1	-
Bird	Gull - unidentified	-	1		-	-	-	-		-	-
Misc.	Miscellaneous - unidentified (rocks, mud, garbage, etc)	-	115		-	-	4	26		-	-
Unknown	Unknown	-	4	3	-	-	-	2	1	-	-

Appendix Table D2-2. -- Counts of video recorded retained and discarded catch within the Pacific cod target.

		Pacific Cod Target											
		Fixed Hook Longline				Single Pot				Snap Longline			
	Species	Retained	Discarded			Retained	Discarded			Retained	Discarded		
			Interacted w/ Vessel or Crew	*Drop-off*	*Utilized Onboard*		*Interacted w/ Vessel or Crew*	*Drop-off*	*Utilized Onboard*		*Interacted w/ Vessel or Crew*	*Drop-off*	*Utilized Onboard*
Rockfish and Thornyheads	Rockfish - unidentified	41	7			-	3	-	-	1	2		
	Rockfish, Black	34	6	-	-	-	11	-	1	1	-	-	-
	Rockfish, Dusky (was Light Dusky)	4	1	-	-	-	24	-	3	3	1	-	-
	Rockfish, Northern	-	-	-	-	-	7	-	-	-	-	-	-
	Rockfish, Pacific Ocean Perch (POP)	-	-	-	-	-	-	-	-	2	-	-	-
	Rockfish, Quillback	25	8	-	-	-	-	-	-	4	16	-	-
	Rockfish, Shortraker/Rougheye unidentified	1	1	-	-	8	1	-	-	64	6	2	-
	Rockfish, Thornyhead unidentified	-	-	-	-	-	-	-	-	1	-	-	-
	Rockfish, Widow	-	-	-	-	-	-	-	-	1	-	-	-
	Rockfish, Yelloweye	2	-	-	-	-	-	-	-	24	4	-	-
Sablefish	Sablefish (Black Cod)	-	-	-	-	-	3	-	-	1	155	2	-
Halibut	Halibut, Pacific	216	117	-	-	-	128	-	-	14	967	2	-
Pacific Cod	Cod, Pacific	581	253	6	419	159,082	2,229	82	82	5,856	181	29	-
Lingcod	Lingcod	-	3	-	-	7	68	-	-	-	5	-	-
Flatfish	unidentified	-	46	-	-	-	56	-	-	1	664	-	-
	Sole, Dover	-	-	-	-	-	4	-	-	-	-	-	-
	Sole, Flathead	-	-	-	-	-	3	-	-	-	2	-	-
	Sole, Rock Sole unidentified	-	-	-	-	-	71	-	2	-	3	-	-
	Sole, Yellowfin	-	-	-	-	12	1,874	-	-	-	-	-	-
Other Fish	Fish - unidentified	-	-	-	-	-	7	-	-	-	-	-	-
	Fish head /lips or parts	-	-	-	-	-	-	-	-	-	2	-	-
	Gadid - unidentified	-	1	-	-	-	1	-	-	-	-	-	-
	Greenling - unidentified	-	3	-	-	-	313	-	2	-	-	-	-
	Mackerel, Atka	1	1	-	-	130	208	-	-	143	39	-	-
	Pollock (Walleye Pollock)	-	1	-	-	-	25	-	-	-	-	-	-
	Prowfish	-	-	-	-	-	5	-	-	-	5	-	-
	Roundfish - unidentified	-	22	-	-	-	99	-	-	-	25	-	-
	Sculpin - Myoxocephalus unidentified	-	-	-	-	-	3	-	-	-	-	-	-
	Sculpin - unidentified	-	-	-	-	-	2	-	-	-	-	-	-
	Sculpin, Bigmouth	2	688	-	-	2	6,108	1	40	-	48	-	-
	Sculpin, Irish Lord - unidentified	-	-	-	-	-	6	-	-	-	-	-	-
	Wolffish, Bering	-	-	-	-	-	3	-	-	-	1	-	-
	Wrymouth Unidentified	-	-	-	-	-	4	-	-	-	-	-	-
Shark	Shark, Spiny Dogfish	1	56	-	-	-	-	-	-	-	194	-	3
Skate	Egg Case, Skate	-	-	-	-	-	1	-	-	-	-	-	-
	Skate - Soft Snout unidentified	1	103	3	-	-	1	-	-	-	95	-	-
	Skate - Stiff Snout unidentified	-	1	-	-	-	-	-	-	-	-	1	-
	Skate, Big	5	60	1	-	-	-	-	-	18	111	2	-
	Skate, Longnose	6	30	-	-	-	-	-	-	41	129	-	-
Crab	Crab - unidentified (Family Unknown)	-	-	-	-	5	119	-	33	-	-	-	-
	Crab, Hermit - unidentified	-	-	-	-	1	1	-	-	-	-	-	-
	Crab, King - unidentified	-	-	-	-	2	10,895	-	1	-	-	-	-
	Crab, Lyre - unidentified	-	-	-	-	-	33	-	-	-	-	-	-
	Crab, Paralomis verrilli	-	-	-	-	-	1	-	-	-	-	-	-
	Crab, Tanner - Unidentified	-	-	-	-	7	1,109	-	12	-	-	-	-
Coral	Bryozoans/Coral Unid	-	7	1	-	-	3	-	-	-	5	-	-
Invertebrate	Barnacles	-	-	-	-	-	1	-	-	-	4	-	-

	Species	Pacific Cod Target											
		Fixed Hook Longline				Single Pot				Snap Longline			
		Retained	**Discarded**			**Retained**	**Discarded**			**Retained**	**Discarded**		
			Interacted w/ Vessel or Crew	*Drop-off*	*Utilized Onboard*		*Interacted w/ Vessel or Crew*	*Drop-off*	*Utilized Onboard*		*Interacted w/ Vessel or Crew*	*Drop-off*	*Utilized Onboard*
	Crinoids - unidentified	-	-	-	-	-	-	-	-	-	4	-	-
	Invertebrate - unidentified	-	-	-	-	-	15	-	-	-	1	-	-
	Jellyfish - unidentified	-	-	-	-	-	50	-	1	-	-	-	-
	Octopus - unidentified	-	8	2	-	40	344	212	7	-	-	2	-
	Oysters, Clams, Mussels, Scallops	-	-	-	-	-	38	-	1	-	-	-	-
	Sand Dollars, Sea Urchins	-	33	-	-	1	290	-	-	-	-	-	-
	Sea Anemone - unidentified	-	6	-	-	-	17	-	-	1	2	-	-
	Sea Cucumber - unidentified	-	-	-	-	-	8	-	-	-	-	-	-
	Sea Whip, Sea Pen - unidentified	-	-	-	-	-	-	-	-	-	11	-	-
	Snail - unidentified	-	1	-	-	1	655	-	4	-	-	-	-
	Snail, Empty Shell	-	-	-	-	-	1	-	-	-	-	-	-
	Sponge - unidentified	-	2	-	-	-	12	-	1	-	2	-	-
	Starfish - unidentified	-	9	-	-	1	373	-	2	-	18	-	-
	Starfish, Basket	-	-	-	-	-	-	-	-	-	1	-	-
	Starfish, Sunstar	-	66	-	-	-	94	-	-	1	383	-	-
Bird	Shearwater, Dark - unidentified	-	-	-	-	-	37	-	1	-	-	-	-
Misc.	Miscellaneous - unidentified (rocks, mud, garbage, etc)	-	3	-	-	3	208	-	-	-	5	-	-
Unknown	Unknown	-	-	-	-	-	20	-	-	-	1	-	-

Appendix Table D2-3. -- Counts of video recorded retained and discarded catch within the sablefish target.

		Sablefish Target														
		Fixed Hook Longline			Snap Longline					String Pot			String Pot Slinky			
	Species	Retained	Discarded		Retained	Discarded			Unknown	Retained	Discarded		Retained	Discarded		
			Interacted w/ Vessel or Crew	*Drop-off*		*Interacted w/ Vessel or Crew*	*Drop-off*	*Utilized Onboard*	*Unknown*		*Interacted w/ Vessel or Crew*	*Utilized Onboard*		*Interacted w/ Vessel or Crew*	*Drop-off*	*Utilized Onboard*
Rockfish and Thornyheads	Rockfish - unidentified	-	1	-	-	-	-	-	-	8	1	-	-	-	-	-
	Rockfish, Black	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
	Rockfish, Dusky (was Light Dusky)	-	-	-	-	5	1	-	-	-	-	-	-	-	-	-
	Rockfish, Pacific Ocean Perch (POP)	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
	Rockfish, Quillback	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Rockfish, Redbanded	1	-	-	2	-	-	-	-	-	-	-	2	-	-	-
	Rockfish, Shortraker/Rougheye unidentified	29	1	1	12	3	-	-	47	-	-	-	84	1	-	-
	Rockfish, Thornyhead unidentified	209	21	1	41	34	1	-	-	3	-	-	13	2	-	-
	Rockfish, Yelloweye	6	1	-	8	-	-	-	5	-	-	-	-	-	-	-
Sablefish	Sablefish (Black Cod)	2,827	384	40	570	13	-	1	-	4,922	-	5	28,352	1,008	-	-
Halibut	Halibut, Pacific	135	67	4	205	149	-	-	-	-	-	-	58	104	-	-
Cod	Cod, Pacific	1	-	-	-	2	1	45	16	-	-	-	3	88	1	-
Lingcod	Lingcod	-	2	-	2	1	-	-	-	-	-	-	-	5	-	-
Flatfish	Flatfish - unidentified	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
	Flounder, Kamchatka/Arrowtooth - unidentifie	-	11	-	-	9	-	9	-	-	1	-	-	156	-	-
	Sole, Dover	1	4	1	-	-	-	-	-	2	1	-	-	17	-	-
	Sole, Flathead	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-
	Sole, Rex	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
	Turbot, Greenland	-	4	-	-	9	-	-	-	-	-	-	-	-	-	-
Other Fish	Fish - unidentified	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
	Grenadier (Rattail), Giant	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-
	Grenadier, (Rattail) - unidentified	-	12	-	-	1	-	-	-	-	6	-	-	108	-	25
	Lamprey - unidentified	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
	Pollock (Walleye Pollock)	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2
	Sculpin - Myoxocephalus unidentified	-	-	-	-	-	-	-	-	-	-	-	-	4	-	-
	Sculpin, Irish Lord - unidentified	-	-	-	-	-	-	-	-	-	-	-	-	64	2	-
Shark	Shark, Pacific Sleeper (Mud)	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-
	Shark, Spiny Dogfish	-	5	-	-	-	-	-	-	-	-	-	-	2	-	-
Skate	Skate - Soft Snout unidentified	1	19	-	-	79	1	-	-	-	-	-	-	-	-	-
	Skate, Big	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
	Skate, Longnose	-	8	-	-	61	2	-	-	-	-	-	-	9	-	-
Crab	Crab, King - unidentified	-	-	-	-	-	-	-	-	-	3	-	-	-	-	-
	Crab, Tanner - Unidentified	-	-	-	-	-	-	-	-	-	-	-	-	13	-	-
Coral	Bryozoans/Coral Unid	-	10	-	-	16	-	-	-	-	-	-	-	1	-	-
Invertebrate	Jellyfish - unidentified	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-
	Octopus - unidentified	-	-	-	-	-	-	-	-	-	3	-	4	8	-	-
	Sand Dollars, Sea Urchins	-	-	-	-	2	-	-	-	-	-	-	-	1	-	-
	Sea Anemone - unidentified	-	22	-	-	-	-	-	-	-	-	-	-	1	-	-
	Snail - unidentified	-	-	-	-	-	-	-	-	-	8	-	-	340	-	-
	Sponge - unidentified	-	-	-	-	6	-	-	-	-	-	-	-	-	-	-
	Starfish - unidentified	-	1	-	-	-	-	-	-	-	3	-	-	9	-	-
	Starfish, Basket	-	-	-	-	3	-	-	-	-	-	-	-	8	-	-
	Starfish, Sunstar	-	2	-	-	11	1	-	-	-	-	-	-	14	1	-
Misc.	garbage, etc)	1	12	-	-	20	-	-	-	-	-	-	-	9	-	-
Unknown	Unknown	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-

Appendix D3. Pacific halibut counts for each type of discard

Appendix Table D3-1. -- Pacific halibut counts for each type of discard.

			Halibut Target		Pacific Cod Target			Sablefish Target		
Discard Type	**Release Method**	**Release Condition**	Fixed Hook Longline	Snap Longline	Fixed Hook Longline	Snap Longline	Single Pot Rigid	Fixed Hook Longline	Snap Longline	String Pot Slinky
DepredatedDiscarded	Crucifying	Dead/Sand Fleas/Bleeding	1	0	0	0	0	0	0	0
	Gaff	Dead/Sand Fleas/Bleeding	5	0	0	0	0	0	0	0
	Hit the roller	Dead/Sand Fleas/Bleeding	3	0	0	0	0	0	0	0
	Hook twisting and shaking	Dead/Sand Fleas/Bleeding	25	25	0	3	0	1	1	0
		Unknown	3	0	0	0	0	0	0	1
	No Selection	Dead/Sand Fleas/Bleeding	0	0	0	0	0	0	0	1
	Unknown	Unknown	1	0	0	0	0	0	0	0
DiscardedDamaged	Gaff	Moderate	1	0	0	0	0	0	0	0
		Severe	10	0	0	1	0	0	0	0
	Hand Release	Dead/Sand Fleas/Bleeding	0	1	0	0	0	0	0	0
	Hit the roller	Severe	1	0	0	0	0	0	0	0
	Hook twisting and shaking	Dead/Sand Fleas/Bleeding	0	2	0	0	0	0	0	0
		Moderate	0	3	0	0	0	0	0	0
	Other non-careful release	Dead/Sand Fleas/Bleeding	3	3	0	0	0	0	0	0
DiscardedGeneral	Crucifying	Moderate	1	0	1	0	0	1	0	0
		Severe	1	0	0	0	0	0	0	0
		Unknown	2	0	0	0	0	0	0	0
	Cut the gangion	Minor	1	1	0	0	0	0	0	0
		Unknown	0	0	0	1	0	0	0	1
	Gaff	Dead/Sand Fleas/Bleeding	2	0	0	0	0	0	0	0
		Moderate	15	0	0	0	0	1	0	0
		Severe	1	0	0	0	0	0	0	0
		Unknown	2	3	0	0	0	0	0	0
	Hand release	Minor	2	8	0	0	0	0	1	0
		Unknown	2	11	0	0	0	0	0	0
	Hit the roller	Dead/Sand Fleas/Bleeding	0	0	0	1	0	0	0	0
		Minor	5	6	0	1	0	0	0	0
		Unknown	93	8	0	14	0	1	2	0
		NA	0	1	0	0	0	0	0	0
	Hook straightening	Minor	0	0	0	1	0	0	0	0
		Unknown	1	0	0	0	0	0	0	0
	Hook twisting and shaking	Dead/Sand Fleas/Bleeding	2	1	0	3	0	1	0	0
		Minor	645	2537	2	197	0	21	19	0
		Moderate	2	2	0	0	0	0	0	0
		Severe	1577	1126	110	713	0	40	125	50
		Unknown	0	0	0	0	1	0	0	0
	No Selection	Dead/Sand Fleas/Bleeding	0	0	0	0	26	0	0	3
		Minor	0	0	0	0	94	0	0	46
		Unknown	0	1	0	0	0	0	0	0
	Other careful release	Minor	39	3	0	0	0	1	0	0
		Unknown	1	0	0	0	0	0	0	0
	Other non-careful release	Dead/Sand Fleas/Bleeding	94	10	1	4	2	0	1	0
		Unknown	1	0	0	0	0	0	0	0
	Unknown	Dead/Sand Fleas/Bleeding	129	6	3	6	0	0	0	0
		Unknown	0	5	0	0	0	0	0	0
DropOffAboveWater	No Selection	Minor	4	3	0	0	0	0	0	0
		Unknown	15	3	0	1	0	4	0	0
		NA	0	1	0	0	0	0	0	0
	Unknown	Unknown	2	0	0	1	0	0	0	0
DropOffBelowWater	No Selection	Unknown	5	1	0	0	0	0	0	0
		NA	2	1	0	0	0	0	0	0
SandFleasPredatedDiscarded	Gaff	Dead/Sand Fleas/Bleeding	0	1	0	0	0	0	0	0
	Hand release	Dead/Sand Fleas/Bleeding	1	2	0	0	0	0	0	0
	Hit the roller	Dead/Sand Fleas/Bleeding	12	182	0	21	0	0	0	0
	Hook twisting and shaking	Dead/Sand Fleas/Bleeding	0	1	0	0	0	0	0	0
		Minor	0	0	0	0	5	0	0	1
	No Selection	Dead/Sand Fleas/Bleeding	0	0	0	0	0	0	0	1
		Unknown	1	1	0	1	0	0	0	0
	Unknown	Dead/Sand Fleas/Bleeding	3	0	0	1	0	0	0	0
TOTAL			**2,716**	**3,959**	**117**	**970**	**128**	**71**	**149**	**104**

Appendix E. Alaska Trawl Electronic Monitoring Report for the 2025 Season

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Introduction

In collaboration with the North Pacific Fishery Management Council and NOAA Fisheries, participants in the Bering Sea and Gulf of Alaska pollock fishery operated under an Exempted Fishing Permit from 2020 through 2024 to evaluate the use of electronic monitoring as a cost-effective and operationally efficient alternative to at-sea human observers for monitoring compliance with salmon PSC retention requirements. The program implemented a maximized retention approach and shifted observer coverage from vessels to shoreside processing plants to reduce variance in salmon PSC estimates by replacing at-sea samples with more accurate shoreside census counts. To verify compliance with maximized retention requirements, staff reviewed EM video to identify any at-sea discards, supplementing shoreside observer data of catch and biological sampling.

This program transitioned to a regulatory program in 2025, and this report summarizes the EM data collected during its first year.

The Pacific States Marine Fisheries Commission (PSMFC) began developing the Electronic Monitoring program in 2012 to evaluate the efficacy of using EM in the West Coast Trawl Rationalization Program. This effort ultimately led to the implementation of the current West Coast EM regulatory program in 2024. PSMFC has participated in the NPFMC working group and has conducted EM data review for the pollock trawl EM program since 2018.

The vessels in this program include those participating in the Gulf of Alaska (GOA) partial coverage category and those participating in the Bering Sea/Aleutian Islands (BSAI) full coverage category. Archipelago Marine Research (AMR) and Saltwater Inc. (SWI) provided and installed the EM systems, and PSMFC conducted the EM data review. This report outlines the EM data collected throughout 2025.

Vessel Participation

Pollock trawl vessels operating in the Gulf of Alaska in the partial coverage category have the option to use EM instead of carrying an onboard observer. Vessel operators must register each fishing trip in ODDS before departure and will receive notification via ODDS if the trip is selected for EM trip coverage and review.

Pollock trawl vessels operating in the Bering Sea/Aleutian Islands in the full coverage category have the option to use EM instead of carrying an onboard observer, and opt-in to the EM program on a yearly basis.

Electronic Monitoring Systems

AMR and SWI were contracted to provide and install EM systems, and to provide technical and logistical support. The on-board systems included a sensor to capture hydraulic pressure activity; a GPS to capture locations from which the speed of the vessel was calculated; and 3-7 cameras.

Sensor data (GPS and hydraulics) were collected at 10-second intervals when the EM system was fully powered on. Video began recording when the hydraulic pressure exceeded a trigger threshold set by the EM technician and specific to each vessel. In order to capture all catch handling, video recording continued for two hours past the last point when pressure was above the trigger threshold.

Video feed and system information were displayed on the user interface (typically installed in the wheelhouse) providing vessel operators with a live update of system performance, and continuous video feeds (even when not recording).

Electronic Monitoring Video Review

PSMFC reviewers used FishVue Interpret™ software from AMR. The software integrates the hydraulic sensor and GPS data with the synced video output. GPS data, dates and times are automatically recorded and reviewers added annotations to identify trips, hauls, and catch data. A configuration of this software allows review of both the AMR and SWI EM data.

The start and end locations, dates, and times of all trips and hauls were annotated. Other metadata such as the vessel information, ports, and fishery were either recorded by the hardware or annotated by the reviewer.

Reviewers recorded whether sensor and video data were complete for each haul based on the quantitative data from the sensor readings. Reviewers also assessed data quality and image quality for each haul. "Data Quality" was defined as the overall ability of the reviewer to effectively quantify and accurately identify catch data. Data quality could be impacted by a diversity of factors such as the image quality, catch handling, and camera angles or operation. Reviewers also gave specific ratings of the image quality and reasons for decreases in image quality (e.g. water spots on the camera, night lighting, etc.).

Reviewers reported estimated weight for discarded catch, including catch kept for personal use. Retained catch was not reported in the EM review data. Unsorted discarded catch was reported as 'non-selective discard'. Discard events that occurred when the catch was on the vessel (including the stern ramp, deck, or factory) were reported as general discards. Discard events that occurred before reaching the vessel (including net bleeds and net blowouts) were reported as unintentional discards.

Video reviewers recorded the number of minutes it took to review each haul. On-deck sort time was calculated from the start and end times of catch handling in the video. Review rate was calculated as review minutes divided by sort minutes.

Results

In 2025, there were 96 pollock trawl vessels that participated in the EM program, completing 2,072 reviewed EM trips. By FMP area, there were 1,489 BSAI reviewed trips and 583 GOA reviewed trips (Appendix Table E-1). The data spanned 5,765 BSAI sea days and 1,544 GOA sea days for a total of 7,309 sea days, with trips averaging 3 days across both FMP areas. There were 6,098 total hauls that comprised the reviewed trips.

Appendix Table E-1 -- Summary of EM monitored fishing activity for 2025.

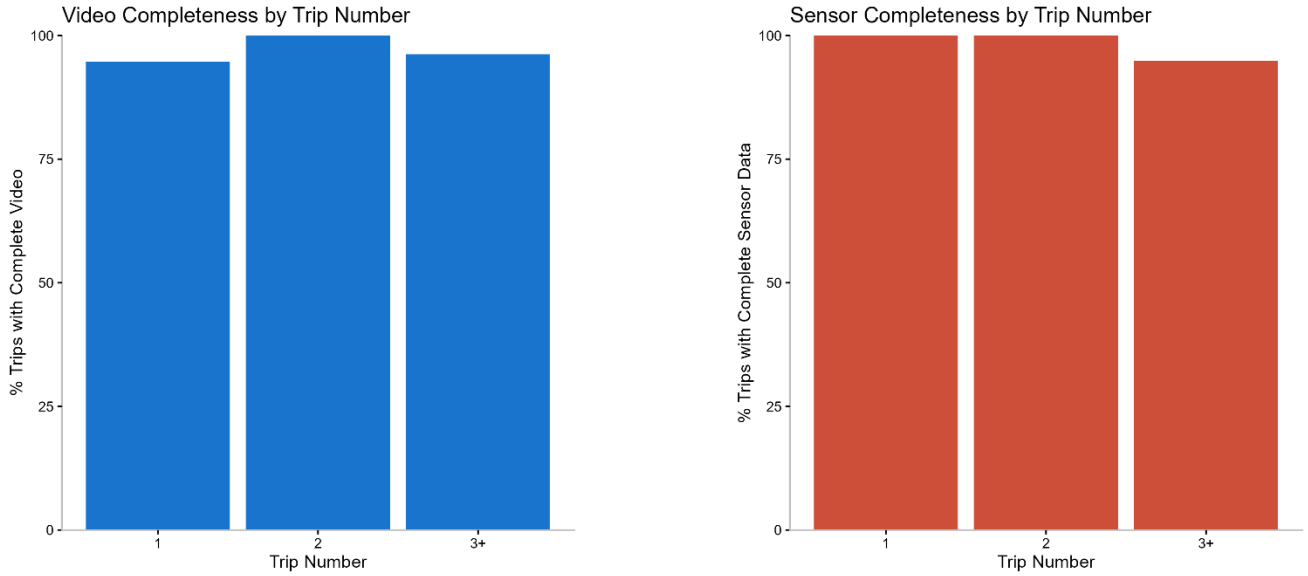
		Pollock Trawl		All FMP Areas
		BSAI	GOA	
Reviewed EM	Vessels	63	43	**96**
	Trips	1,489	583	**2,072**
	Hauls	4,944	1,160	**6,104**
	Reviewed Hauls	4,938	1,160	**6,098**
	Sea Days	5,765	1,544	**7,309**
	Average Trip Length (Days)	3.9	2.6	**3.3**
Non-Reviewed EM	Trips	357	368	**725**

Data Quality

Aspects of data quality including video and sensor completeness, overall data quality, and image quality were noted by reviewers for every reviewed haul (Appendix Table E-2).

Video gaps were present in 4% of pollock trawl trips, and 2.4% of hauls had video gaps that occurred during fishing activity; most often these gaps resulted from no video recorded on 1 or more cameras, or intermittent gaps in video coverage. These issues suggest technical problems relating to EM system functionality.

Data quality was rated as high or medium for 99% of the 6,098 reviewed hauls. The most common reason for low data quality was video completeness.



Appendix Figure E-1 -- Video and sensor completeness in relation to the number of trips the electronic monitoring system had been on a specific vessel.

Appendix Table E-2 -- Data quality including video and sensor completeness, data quality, and image quality.

Trip Level Data Quality

	Pollock Target		
Video Complete	BSAI	GOA	**Total**
Number of trips	1428	566	**1994**
Percent of trips	*96%*	*97%*	***96%***

Sensor Data Complete			
Number of trips	1397	571	**1968**
Percent of trips	*94%*	*98%*	***95%***

Haul Level Data Quality

	Pollock Target		
Haul Video Completeness (number of hauls)	BSAI	GOA	**Total**
Video complete - Entire haul recorded	4,821	1,132	**5,953**
Intermittent gaps in video	30	9	**39**
Video ends before catch handling ends	2	-	**2**
Video ends before fish stowed (handling complete)	1	-	**1**
Video starts after haul start	3	1	**4**
No data recorded on 1 or more cameras	81	18	**99**

Catch Video Completeness (number of hauls)			
Complete - All catch recorded	4,931	1,159	**6,090**
Incomplete	7	1	**8**

Data Quality from Video
(Number of Hauls)

High	4,663	1,107	**5,770**
Medium	255	51	**306**
Low	17	1	**18**
Unusable	3	1	**4**

Image Quality
(Number of Hauls)

High	3,426	871	**4,297**
Medium	1,477	288	**1,765**
Low	32	1	**33**
Unusable	3	-	**3**

Primary Reason for
Medium Image Quality
(Number of Hauls)

Banding/Scrambling/Color	21	-	**21**
Condensation	102	10	**112**
Dirty Cameras	133	52	**185**
Glare	50	31	**81**
Night Lighting	65	4	**69**
Obstruction	2	-	**2**
Out of Focus	503	92	**595**
Poor Camera Angles	55	10	**65**
Video completeness	61	21	**82**
Water Spots	485	68	**553**

Primary Reason for
Low Image Quality
(Number of Hauls)

Dirty Cameras	6	-	**6**
Out of Focus	1	-	**1**
Poor Camera Angles	4	-	**4**
Video Completeness	17	1	**18**
Water Spots	4	-	**4**

Review Rate

The review rate for pollock trawl ranged from 0.23 to 0.24 minutes of review per minute of video (Appendix Table E-3), slightly faster than one-quarter real time.

Appendix Table E-3 – Review rate by FMP Area.

	Pollock Target	
	BSAI	GOA
Haul Count	4,938	1,160
Average Sort Min/Haul	72	80
Average Review Min/Haul	16	15
Average Review Min/Sort Min	0.24	0.23