

TRAWL EM INITIAL REVIEW

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OUTLINE



-
- Introduction/Timeline
 - Trawl EM overview
 - Program design elements
 - Shoreside communication and sampling
 - RIR/Cost elements and comparisons
 - Trawl EM Committee Report

TIMELINE OF TRAWL EM DEVELOPMENT

- 2018 Trawl EM Committee Formed
- 2018-19: Pilot Projects
- 2020-now: Exempted Fishing Permit
- June 2021: Council initiated analysis, approved purpose and need and alternative set
- February 2022: Preliminary review (SSC only)
- **June 2022: Initial review**
- October 2022: Final review
- October 2022-June 2023: Development and publication of proposed/final rule
- January 2024: Regulatory program begins



PURPOSE AND NEED

To carry out their responsibilities for conserving and managing groundfish resources, the Council and NMFS must have high quality, timely, and cost-effective data to support management and scientific information needs. In part, this information is collected through a fishery monitoring program for the groundfish fisheries off Alaska. While a large component of this monitoring program relies on the use of human observers, the Council supports integrating electronic monitoring and reporting technologies into NMFS North Pacific fisheries-dependent data collection program, where applicable, to ensure that scientists, managers, policy makers, and industry are informed with fishery-dependent information that is relevant to policy priorities, of high quality, and available when needed, and obtained in a cost-effective manner.

*The Council and NMFS have been on the path of integrating technology into the fisheries monitoring systems for many years, with electronic reporting systems in place, and operational EM in some fisheries. **An EM program for compliance purposes on pelagic pollock trawl catcher vessels and tenders both delivering to shoreside processors will obtain necessary information for quality accounting for catch including bycatch and salmon PSC in a cost-effective manner, and provide reliable data for compliance monitoring of a no discard requirement for salmon PSC. This trawl EM program has the potential to advance cost efficiency and compliance monitoring, through improved salmon accounting and reduced monitoring costs.***

Regulatory change is needed to modify the current retention and discard requirements to allow participating CVs to maximize retention of all species caught (i.e., minimize discards to the greatest extent practicable) for the use of EM as a compliance tool on trawl catcher vessels in both the full and partial coverage categories of the Observer Program and meet monitoring objectives on trawl catcher vessels in the Bering Sea (BS) and Gulf of Alaska (GOA) pelagic pollock fisheries.

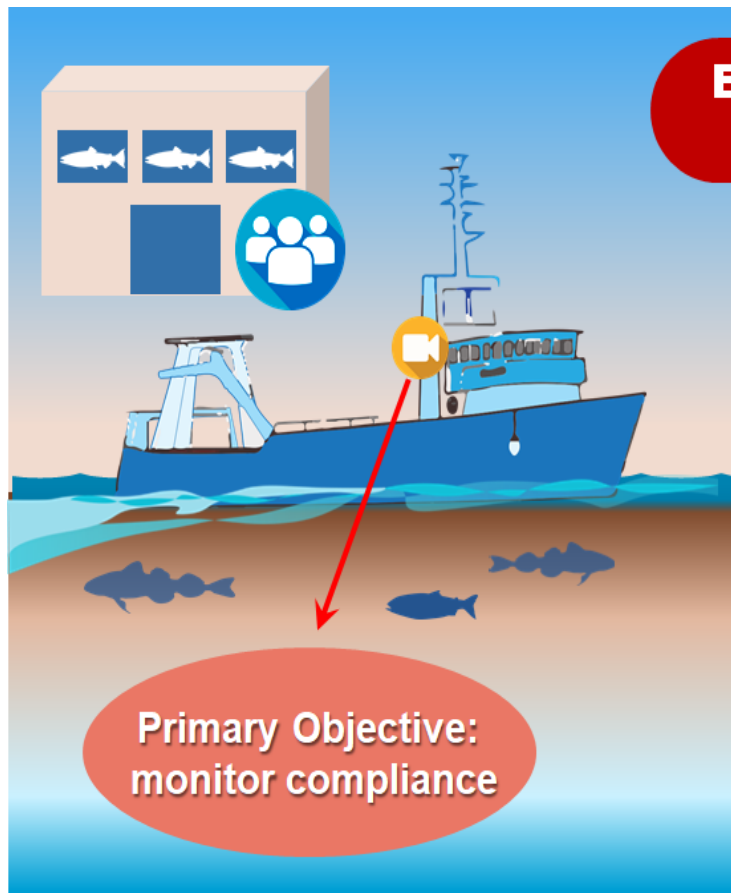


ALTERNATIVES

- Alternative 1, No Action
- Alternative 2, Electronic Monitoring implemented on vessels (both catcher vessels and tenders) in the Bering Sea and Gulf of Alaska
- Alternative 3, Electronic Monitoring implemented on catcher vessels delivering to shoreside processors (CVs only, no tenders)
 - Option 1 Bering Sea
 - Option 2 Bering Sea and Gulf of Alaska



OVERVIEW OF TRAWL EM



EFP: Partial & Full Coverage – Pollock pelagic trawl vessels

Year 1 (2020) - 47 catcher vessels
Year 2 (2021) - 70 catcher vessels

Observers in processing plants randomly sample deliveries to collect catch & biological data.

Video for compliance monitoring

- Video monitoring to ensure retention (few discards).
- Vessels chose to have EM on their boats instead of observers.

Primary Objective: monitor compliance



TRAWL EM PROGRAM

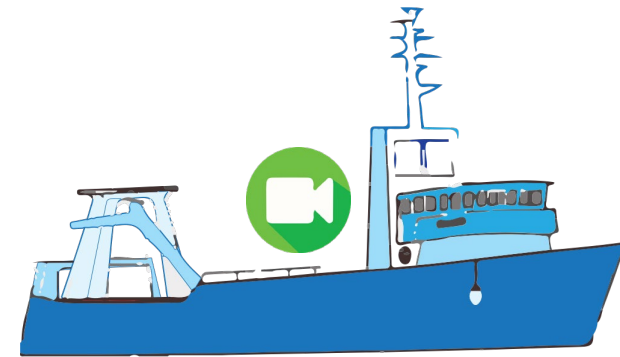
Eligible vessels can submit a request to join the Trawl EM program, annual process

Vessels who are not in the Trawl EM program remain in partial or full coverage and continue to carry an at-sea observer



EM FOR COMPLIANCE MONITORING

- Maximized Retention rules - All catch retained for delivery
- Only exceptions to retention requirements
 - Marine mammals
 - Sharks (too big)
 - Jellyfish (product quality)
 - Discards for vessel stability and safety
- Most trips have no discard events
- **ALL** discards reported in logbook and eLandings
- Cameras record **ALL** hauls
- **ALL** hauls are reviewed to verify logbook and eLandings data
- Vessel logbook data, verified through EM, is used for catch accounting

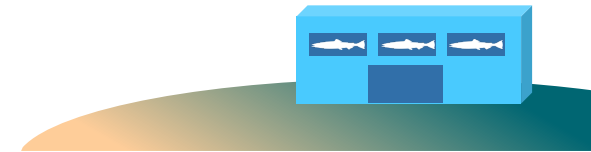


TRAWL EM PROGRAM

Status quo (vessels carry at-sea observer under partial or full coverage)



At-sea observers sample
unsorted catch on the vessel

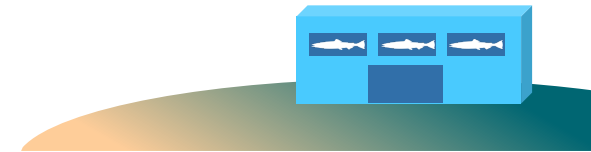


TRAWL EM PROGRAM

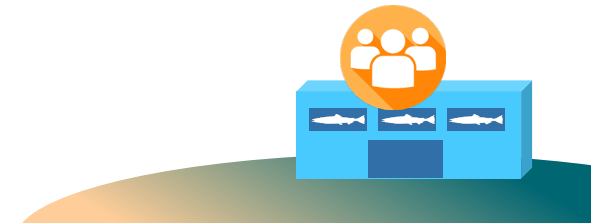
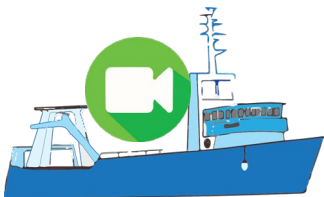
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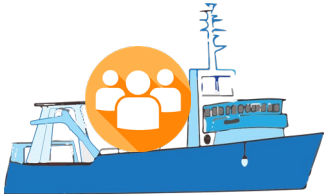


Proposed Trawl EM program (EM on the vessel, no observer on vessel)

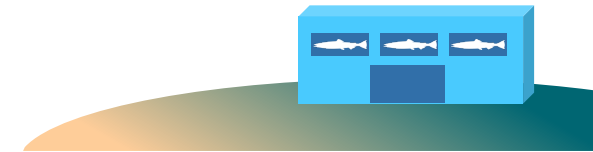


TRAWL EM PROGRAM

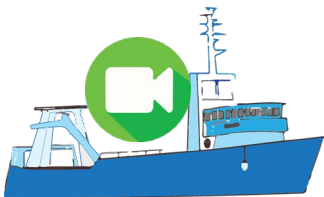
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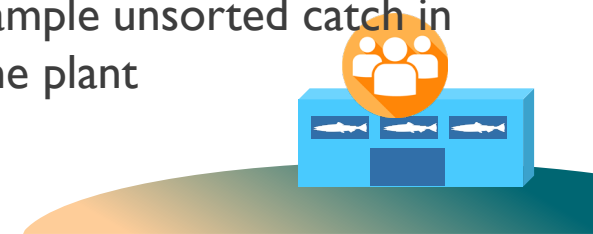
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Proposed Trawl EM program (EM on the vessel, no observer on vessel)



Shoreside observers sample unsorted catch in the plant



TRAWL EM PROGRAM

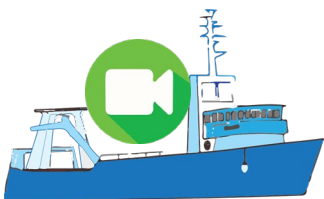
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Proposed Trawl EM program (EM on the vessel, no observer on vessel)



Shoreside observers sample unsorted catch in the plant



Cameras record all trips and for the entire trip



TRAWL EM PROGRAM

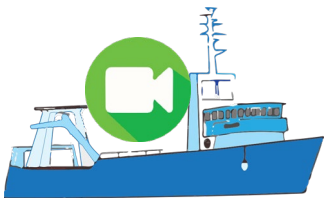
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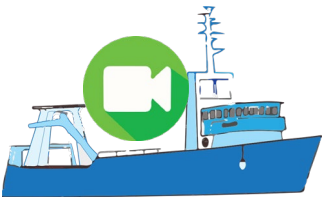
Cameras record all trips and for the entire trip
Video review of all trips



TRAWL EM PROGRAM

100% monitoring by EM
to ensure compliance with maximized retention

Proposed Trawl EM program (EM on the vessel, no observer on vessel)



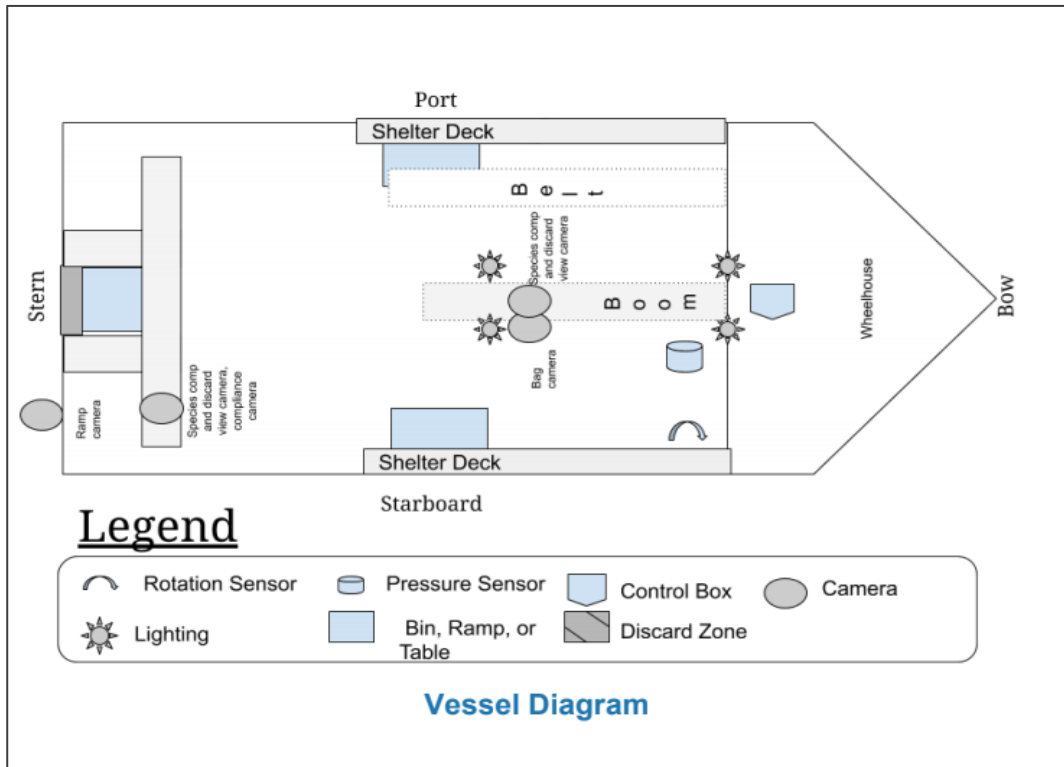
Cameras record all trips and for the entire trip
Video review of all trips

Shoreside observers
sample unsorted catch in
the plant



VESSEL MONITORING PLAN (VMP) - THE USER MANUAL

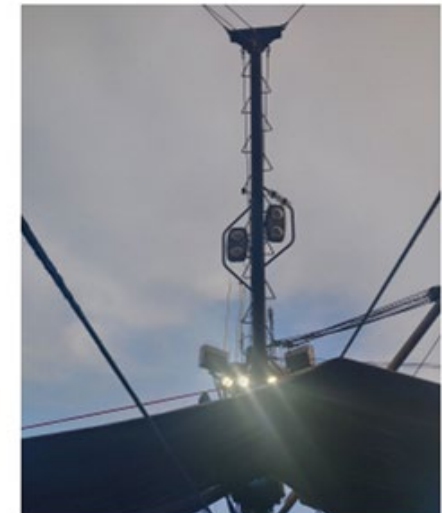
VMP is a flexible tool that outlines operator responsibilities, created specific to each vessel, annually.



Camera View



Camera Location



TRAWL EM CAMERA VIEWS- START



Start of haul retrieval; (+5 minutes after start)



TRAWL EM CAMERA VIEWS; +15 MINUTES



Screenshots from EM;
+15 Minutes



FUNDING FOR EM VIDEO REVIEW

Excerpt of Table 3-8 in Draft EA/RIR

Cost Category (per NMFS Policy 04-115-02)	Trawl EM Cost	Responsible Parties	Proposed Funding Source
Sampling Cost	Video Review	EM Review service provider	Partial Coverage Observer Fee - GOA
			New BSAI EM Review Fee
Sampling Cost	Data Storage	EM Review service provider	Partial Coverage Observer Fee - GOA
			New BSAI EM Review Fee



NEW BSAI EM REVIEW FEE

Cost of BSAI video review and data storage from previous year (Year 1)



Use pollock history to divide cost amongst BSAI Trawl EM vessels
(Year 1 costs / Year 1 BSAI Trawl EM vessels based on pollock history)



Billing occurs during fishing season (during Year 2)



If vessel fails to pay fee, could result in removal from the Trawl EM program
the following year (potential removal for Year 3)

*Received feedback from Trawl EM Committee, will be refined in next iteration
of analysis

See Section 3.3.2. in Draft EA/RIR



MAXIMUM RETAINABLE AMOUNT (MRA) AND GOA POLLOCK TRIP LIMITS

Trawl EM program require maximized retention (little or no discards) to allow the shoreside observer to sample unsorted catch, making it necessary to exempt participating CVs from regulations that require discarding:

- ❑ Maximum Retainable Amount (MRA) for species closed to directed fishing (50 CFR § 679.20(e))
- ❑ Pollock Trip Limits (GOA only): 300,000 pound trip limit (50 CFR § 679.7(b)(2))

EFP: Vessel performance standards were developed to limit changes in behavior from exemptions, including forfeiting value of overages and increasing fines until a potential removal from the EFP

- ❑ No vessels were actually removed due to MRA or GOA Pollock trip limits

Vessel performance standards were successful in limiting changes to behavior

Options proposed in analysis on how to approach this under a regulated program

*Received feedback from Trawl EM Committee, will be refined in next iteration of analysis

See Section 3.1.5 in Draft EA/RIR



OPT-IN FOR GOA

GOA only

- EFP: Vessels could opt into EM on a trip-by-trip basis during the fishing season. Vessels could indicate in ODDS if they are going on a Trawl EM trip or a partial coverage trip.
 - vessel flexibility

- Proposed program: CVs that have opted-in for the year would be required to operate their EM systems and follow all requirements when directed fishing for pollock is open.
 - increased flexibility = cost inefficient for ADP
 - budget and plan for all scenarios
 - CVs opting all trips into EM
 - CVs opting all trips for partial coverage

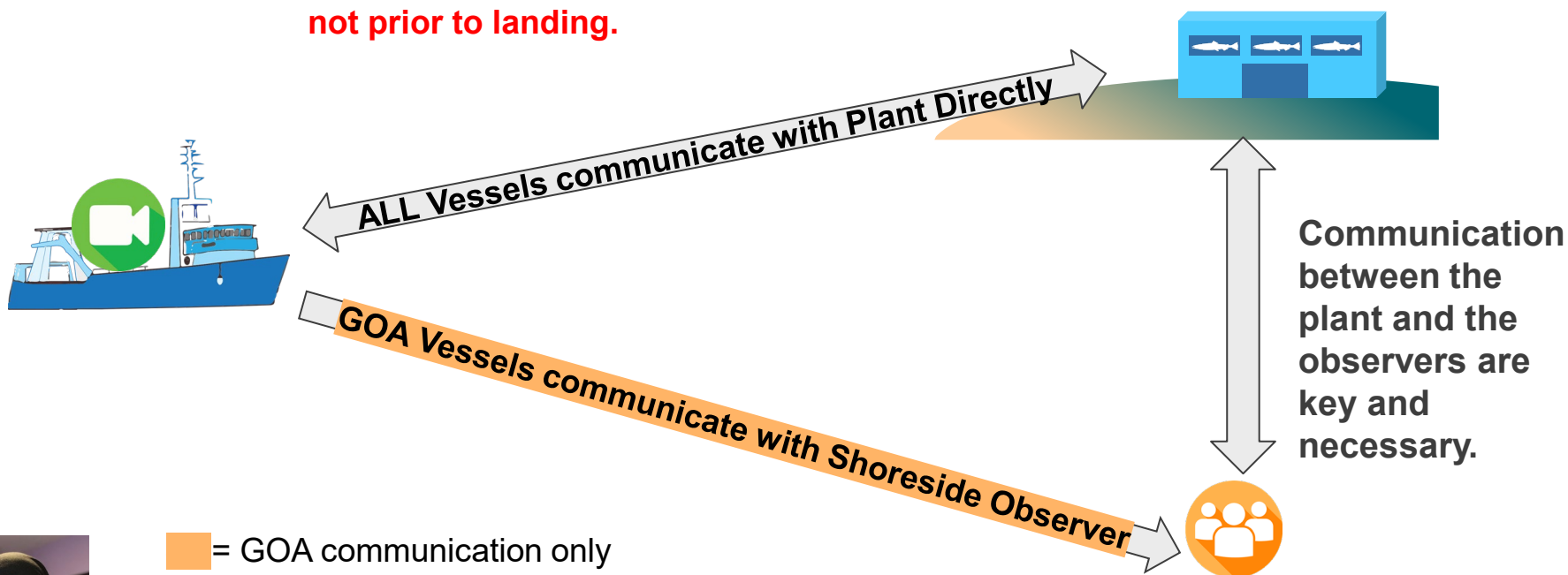
*Ongoing topic of discussion, industry has proposed additional options for analysis





COMMUNICATION IS KEY

Direct communication between vessel and shoreside observer **DOES NOT** replace plant to observer communications!

It is vital that observer know if vessels are EM or not prior to landing.



-  = GOA communication only
-  = All communications (BSAI and GOA)



CATCH SAMPLING SHORESIDE METRICS

- Early in the EFP, it was identified that shoreside observers were not able to meet sampling objectives due to many factors. The team met and discussed options to improve.

	First 3mos of EFP	A Season 2020	B season 2020	A/B Season 2021	A Season 2022
Bering Sea (Goal 100%)					
PSC Retention	100%	100%	100%	100%	100%
Pollock Biological Data (Otoliths and Length)	98%	99%	97%	96%	77%
Species Composition	98%	80%	98%	99%	77%
Gulf of Alaska (Goal 30%)					
PSC Retention	32%	31%	33%	33%	33%
Pollock Biological Data (Otoliths and Length)	5%	13%	32%	25%	27%
Species Composition	1%	2%	32%	25%	27%



CATCH MONITORING CONTROL PLAN

What is a Catch Monitoring Control Plan (CMCP)?

A plan submitted by the owner and manager of a processing plant, and approved by NMFS, detailing how the processing plant will meet the catch monitoring and control standards that are determined by federal regulations.

Why have a CMCP?

A CMCP is in place for all BSAI processing plants that take AFA pollock deliveries, but these are not currently in place for the GOA.

Proven benefits of CMCP's:

- Tracking salmon for accurate retention counts
- Detailed communication guidelines
- Description/diagrams of the observer sample collection points and observer stations
- Flexible tool that can help meet sampling goals



***May be a cost for plants, especially in the GOA**
***Outreach needed: GOA processing plants**



OBS DATA COLLECTION: VESSEL VS PLANT

Data type	Vessel Observer	Shoreside Observer
Haul specific	Y	*
Trip specific	Y	Y
Species composition	Y	Y
Biologicals	Y	Y
Halibut	Y	Y
Salmon	Y	Y**



Plant observer may have more opportunities to collect data on a safe and stable platform

* Some haul specific data can be approximated using trip data and haul data reported in logbooks

** Next slide for details

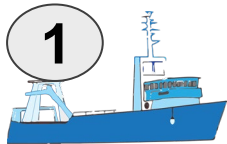
Data will now be collected from tender vessels at shoreside processing plants by observers, and transfers monitored by EM data reviewer.



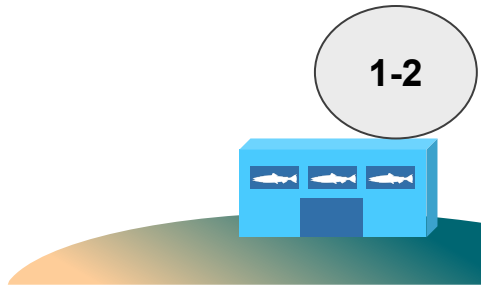
POLLOCK CV TRAWL: PRESENT AND FUTURE

Status Quo:

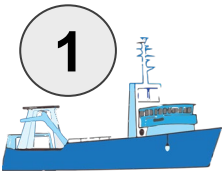
BSAI



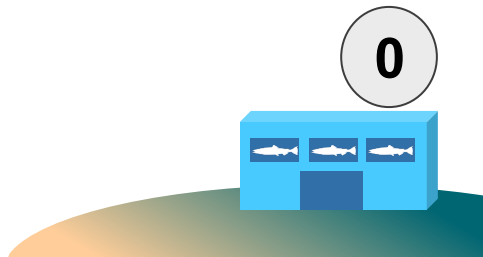
*per delivery



GOA

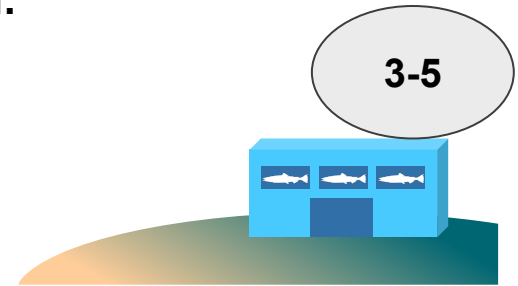


*per delivery

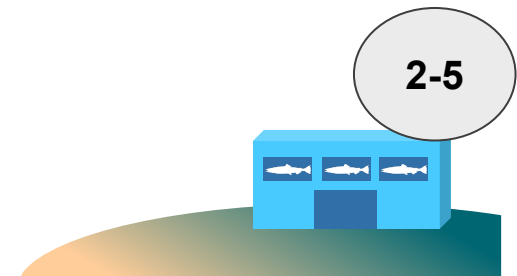


Under proposed regulatory program:

BSAI



GOA



Increased workload for shoreside observer + reduced time to collect necessary data = increased need for observer coverage shoreside.



SHORESIDE SPECIES COMPOSITION AND PSC SAMPLING

- BSAI- 100% of the deliveries are sampled (*no change)
- GOA- Goal of 30% of the deliveries are sampled

- Prohibited species data collection:
 - All Salmon are counted; Biological, and genetic samples collected from randomly selected salmon.
 - All Halibut are counted and measured
 - Crab and Herring are sorted and weighed by processor, Observer can monitor this.

*Tender vessels are included in the observer sampling scheme.



SHORESIDE BIOLOGICAL SAMPLING

Shoreside Sampling Rates:
Goals set by FMA (2022)

Predominant Species	Sex/Length Data	Biological Data (All specimen fish must have an associated s/l/w specimen)
Bering Sea Pollock	Every Sampled Offload ~100 pollock and ~100 squid (unsexed) and ~25 Rougheye and ~25 Sablefish	Every Sampled Offload 2 pollock otolith pairs with maturity scan for all female otolith fish and ~ 8 pollock sex/length/weight specimens (must not be from an otolith fish)
		Every Sampled Offload 25 Rougheye otolith pairs
		Every Sampled Offload 25 Pollock otolith pairs with maturity scan for all female otolith fish and 5 Pacific Cod otoliths
Gulf of Alaska Pollock	Every Sampled Offload ~ 150 Pollock and ~ 30 Pacific Cod	Every Sampled Offload 25 Pollock otolith pairs with maturity scan for all female otolith fish and 5 Pacific Cod otoliths

Vessel Observer Sampling Rates (2022)

Predominant Species	Sex/Length Data	Biological Data (All specimen fish must have an associated s/l/w specimen)
Gulf of Alaska Pollock	Every Sampled Haul ~ 50 Pollock and ~ 10 Pacific Cod	Every Sampled Haul 8 Pollock otolith pairs with maturity scan for all female otolith fish and 1 Pacific Cod otolith pair with maturity scan for all female otolith fish

*The Agency retains the right to deploy observers on vessels.



SALMON RETENTION DATA IS UNCHANGED

Salmon retention remained the priority for observers at the plant (and the EM reviewers).



Observer duties:

- ☐ Collect and report **salmon retention** data
- ☐ **Identify species, count, sex and weigh** all the salmon
- ☐ Collect **salmon genetics** data on all sampled deliveries according to protocols in FMA observer manual.
- ☐ **FMA ID scales** for salmon according to protocols in FMA observer manual.
- ☐ Collect **tagged salmon data** according to protocols in FMA observer manual.

If observers are unable to collect all requested shoreside biological samples, then they are instructed to continue monitoring for salmon. ALL salmon retention and biological data are #1 priority.



CMCP's are critical to salmon retention data!



STOCK ASSESSMENT DATA STREAM UPDATES

Feb 2022: SSC requested that stock assessment scientists specifically address the impacts.

- Status quo: At-sea observers collect data at the individual tow level.
- Proposed regulatory Trawl EM program: Shoreside observers collect data at the trip level. Vessels record tow specific information in logbooks.
 - Some loss of spatial and temporal resolution. Some data impacts can be mitigated with haul information from logbooks. **AKRO will link haul specific information from logbooks with trip level data collected by shoreside observers.**
 - **Pollock: trip level information does not negatively impact stock assessments**, but may affect development of future approaches to the assessments and/or other uses for spatially resolved fishery data.
 - Pacific cod and Pacific ocean perch: trip level information will likely have little impact on stock assessments.
 - **Sharks:** trip level information will likely have little impact on stock assessments. Trawl EM may provide additional or new information for scientists.



SEABIRDS

	Observer	EM Reviewer
Monitoring Seabird Avoidance	Yes	Yes*
Species Identification	Yes	Some
Interaction Type	Yes	Some
Photograph	Yes	Some
Biological Specimens	Yes	No**
Rehabilitation (very rare)	Yes	No

* EM can only review what is in camera frame

**Physical specimens include whole carcass (observer-salvage permits)

- USFWS has protocols for vessel operators to collect whole bird carcasses. Without observers onboard vessels these specimens may be able to be recovered.



MAMMALS: OBSERVER DATA VS EM REVIEWER DATA

	Observer	EM Reviewer
Identify to species	Yes	Yes*
Mammal Condition	Yes	Some
Interaction Type	Yes	Some
Photograph	Yes	Some
Biological specimens	Yes	No

***physical specimens include Sex/Length/Tissue**

- **Most common specimen type collected by observers is photographs.** These can be collected by EM reviewers, but they may not capture details (e.g., froth around nose/mouth; free flowing blood).
- **EM cannot collect any physical specimen data** such as sex, snouts, deep tissue samples. *These are important for stock ID, contaminant testing, and stable isotope profiles etc.
- EM cannot capture any physical sample data and **views may or may not capture information on brands, tags, and marking** as it is dependent on animal size, camera resolution, and camera placement.



SAMPLING AND DATA COLLECTION CHALLENGES

- ❑ Communication gaps between vessels/plants. These were addressed in near real time, and CMCP's or Catch Handling Plans helped improve communications.
- ❑ Observers must have adequate prior notice to delivery in order for them to be available to sample and **collect unbiased data**.
- ❑ Observers must have specific information on **delivery date/time, estimate tonnage, and if vessels are operating with EM or not**.
- ❑ Work Load: Observers prioritized salmon retention data, which in some cases prevented them from collecting biological data resulting in need for multiple observers
 - ❑ CMCPs can introduce EM options like bin monitoring to assist observer provide precise salmon PSC data.
 - ❑ EM Options are currently used in some CMCPs to meet goals
 - ❑ By allowing observers to leave sorting line to sample during a haul we can better utilize their time and skills for other data collections.



SAFETY AND CATCH ACCOUNTING IMPROVEMENTS



- **Safe stable** sampling platforms!
- More precise **PSC** accounting
 - Salmon (full enumeration)
 - Crab (full enumeration)*
 - Halibut (full enumeration*)
- Halibut measurements*
- Improved **bycatch verifications**.
- **No at -sea discard rates**



REGULATORY IMPACT REVIEW (RIR)

COST ELEMENTS
AND
COMPARISONS

APPROACH TO COST ANALYSIS

- Many uncertainties and challenges associated with estimating costs
 - Differing levels of participation, effort, scope and program design specifics will entail very different cost structures, impacting both the range of individual costs and average costs per unit.
 - Vessels participate in multiple programs- some in west coast, some in BS and GOA so costs are spread across different areas, while some vessels participate in one area
 - Multitude of different fishery operations- rationalized program, race to fish, shoreside, tenders
 - Unknown future effort levels based on TACs and changes in management.
 - Proprietary information (less than 3 providers) requires rolling up to large categories and overall costs (for both EM and observer costs)
 - Different companies have different structures and cost models
 - Despite the cost reporting subgroup's discussions there may still be nuances/differences to how each company defines each category.
 - Providers do not track costs in ways that allow parsing by alternative or option (i.e., BS v. GOA, CVs v tenders)
 - Technology changes- some costs will decrease as technology improves- i.e., data drives; some costs will go up- i.e., control centers that can do more may cost more
 - COVID- impact on costs



APPROACH TO COST ANALYSIS

- Estimate range of costs of at sea observers (Alt 1) for fishing effort from 2021 EM EFP
 - Based on costs reported in Observer Program 2020 Annual Report
- Estimate range of costs of 2021 EM EFP (Alt 2)
 - EM costs reported by providers in cost categories identified by subgroup
 - Shoreside observer costs estimated based on discussions with providers
- Qualitatively describe comparisons and how costs may change with potential regulated program



AT SEA OBSERVER COSTS

- Multiplied the sea days of all EM trips by the fully loaded sea day cost of an at sea observer as reported in the 2020 annual report.
- Sea days are calculated using two separate methods:
 - 1) estimated days fished, which assumes one of the days the vessel is gone is a day that the vessel did not harvest and retain catch (for example a trip that left on the 20th of the month and returned on the 22nd would be two days)
 - 2) estimated days +1 which assumes the vessel harvested and retained catch every day the vessel was gone (for example a trip that left on the 20th of the month and returned on the 22nd would be three days).
- Recent clarification on data that this is underestimate and trip start is when gear goes in the water. Current estimate of days +1 is better estimate for days fished. Future version of document will include new days +1 and days +2 for better proxy of at-sea days.



AT SEA OBSERVER COSTS-FULL COVERAGE

- Industry-funded through a pay-as-you-go system whereby fishing vessels procure observer services through NMFS-permitted observer service providers
- The average “fully-loaded” cost per day of observer coverage in the full coverage category in 2020 was \$375
- The 2020 Annual report also provides a daily rate that includes incidentals, for the pelagic trawl CVs of \$415

Table 5-26 estimates of 2021 BS costs for at-sea monitoring on EM trips

	EM days	fully loaded day		Total at-sea cost estimate for EM days	
		low	high	low	high
days fished	3,041	\$375	\$415	\$1,140,375	\$1,262,015
days +1	4,217	\$375	\$415	\$1,581,375	\$1,750,055

Sources: Sea days from AKFIN summary of CAS data (Trawl_EM_Trips 3-23-22). Cost per day from NPOP annual reports see <https://repository.library.noaa.gov/gsearch?terms=North%20Pacific%20Observer%20Program%202019%20Annual%20Report&collaction=>



AT SEA OBSERVER COSTS- PARTIAL COVERAGE

- Since 2018, the target deployment rates for the trawl partial coverage strata have ranged from 16% to 30%
- The average “fully-loaded” cost per day of observer coverage in the partial coverage category was \$1309 in 2019 and \$1,381 in 2020 (As reported in the North Pacific Observer Program Annual Report)

Table 5-28 estimates of costs for at-sea monitoring on GOA EM trips in 2021

	EM days			fully loaded cost per day		Total at-sea cost estimate for EM days	
	16%	30%	low	high	low	high	
days fished	823	132	247	\$1,309	\$1,381	\$172,369	\$340,969
days +1	1,264	202	379	\$1,309	\$1,381	\$264,732	\$523,675

Sources: Sea days from AKFIN summary of CAS data (Trawl_EM_Trips 3-23-22). Cost per day from NPOP annual reports see <https://repository.library.noaa.gov/gsearch?terms=North%20Pacific%20Observer%20Program%202019%20Annual%20Report&collection=>



FULL COVERAGE SHORESIDE PLANTS

- AFA plants are in the full coverage category (pay-as-you-go) whether they are physically located in the BSAI or GOA. See p. 179 of RIR.
- AFA shoreside plants located in Dutch Harbor/Unalaska or Akutan will realize an increase in the number of observer plant days.
 - Under the Status Quo an AFA inshore processor must provide an observer for each 12 consecutive-hour period of each calendar day during which the processor takes delivery of, or processes, groundfish harvested by a vessel engaged in a directed pollock fishery in the BS. This means 2 observers plus the at-sea observer.
 - Under EM it is anticipated that three to five shoreplant observers will be required at each BS plant. Two observers working when plant is taking pollock deliveries.
- AFA plants that are located in the GOA will also have additional plant observers, though likely not as many as AFA plants in Dutch Harbor/Unalaska or Akutan (2 to 3 plant observers).
- A specific number of observers for each plant will not be defined in regulation to allow NMFS to adjust coverage to meet sampling needs as they may change.
- Increasing the number of plant observers needed is expected to increase costs plant operators must pay for coverage relative to the No Action alternative. The analysis does not address how increased plant observer costs and vessel observer cost savings will be negotiated between the parties involved.



FULL COVERAGE SHORESIDE PLANTS

- Full coverage plant operators contract directly with an approved observer provider.
- Compensation for observer coverage is negotiated between the vessels/plants and the observer provider.
- The average “fully-loaded” full coverage cost per day for an observer in 2020 was reported to be \$375 in the North Pacific Observer Program annual report.



FULL COVERAGE SHORESIDE PLANTS

- Based on discussions with observer providers and the average cost per day in 2020, a low (\$380/day), medium (\$410/day), and high (\$430/day) is assumed for full coverage plant observers.
- The values attempt to account for increasing observer travel costs, tight labor markets, overhead costs and general inflation.
- These values should be considered estimates and no specific value is given a higher probability of occurring when the program may be implemented in 2024.
- Based on 1,588 plant observer days in 2021 under the EM EFP, the assumed rates result in full coverage plant observer costs of \$608k to \$688k.



PARTIAL COVERAGE SHORESIDE PLANTS

- Shoreside plants in the partial coverage category do not have plant observers under the No Action Alternative. The observer assigned to the vessel monitors the offload, enumerates PSC, and takes required biological samples.
- At-sea coverage rates are determined in the ADP and for pelagic trawl was set at 16% in 2021. Note the rate ranged from 16% to 30% from 2018-2022.
- Plants are currently required to pay half of the 1.65% observer fee assessed on the ex-vessel value of deliveries.
- The 1.65% fee funds the at-sea observer coverage and the ADP determines sampling rates that can be funded with the available funds.
- One observer provider has the contract with NMFS for the partial coverage fleets. That contract expires in August 2024.
- Estimating future daily costs for shoreplant observers challenging. Information we do have is that in 2020 the average partial coverage at-sea day cost was reported be \$1,381/day in the 2020 North Pacific Observer Program's annual report.



PARTIAL COVERAGE SHORESIDE PLANTS

- Actual cost data cannot be reported because of confidentiality restrictions.
- Confidentiality restrictions, uncertainty regarding actual costs, future contracts to provide partial coverage, and whether shoreplant observers will be compensated the same as at-sea observers results in a broad range of cost estimates for the shoreside partial coverage observers.
- Partial coverage shoreside plant observer costs were estimated to fall within a range that included a low (\$500/day), mid (\$1,050/day), and high (\$1,600/day) rate. These rates were based on the reported at-sea partial coverage rate and discussions with the observer provider.
- During 2021, there were 548 observer days at plants located in the GOA under the EFP. The analysts did not attempt to project the number of days that would be needed under the regulated program, but will depend on participation in the voluntary program, available funding, actual future daily rates, and coverage rates for plants determined in the ADP.
- Using the 2021 EFP shoreplant days and range of assumed daily costs, a total annual cost for shoreplant partial coverage was estimated to range from \$274k to \$877k.



EM COSTS

Table 5-31 Total costs and average per unit costs for the 2021 Trawl EM EFP. Numbers in parenthesis correspond to the level of participation and effort in the 2021 EFP. *Day represents estimated fishing days, for example a trip that leaves on the 20th and returns on the 22nd is considered two days.

	Total costs	Average per unit cost for 2021 EFP			
		CV (68)	Trip (1503)	Haul (4272)	Day* (3864)
Ongoing costs					
1. Service Provider Fees and Overhead	\$188,559	\$2,773	\$125	\$44	\$49
2. EM Equipment Maintenance and Upkeep	\$86,832	\$1,277	\$58	\$20	\$22
3. Data Transmittal	\$5,720	\$84	\$4	\$1	\$1
5. Data Review	\$101,488	\$1,492	\$68	\$24	\$26
6. Data Processing and Storage	\$9,403	\$138	\$6	\$2	\$2
Total ongoing costs	\$392,002	\$5,765	\$261	\$92	\$101
One-time costs					
	Total costs	CV (15)	Tender (2)		
4. Equipment Purchases and Installation	\$276,653	\$17,496	\$7,106		

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Source: Discussions with EFP EM service providers and data reviewers.



Cost categories developed by subgroup described p. 152-154



EM COSTS

Table 5-34 participation and effort by program component in 2021 EM EFP. *Metrics reported are for CVs that delivered to tenders. 4 tenders accepted EM deliveries in 2021. **Given overlapping participation totals may differ from sum of each element

Area	CVs		Trips		Hauls		Days	
	number	%	number	%	number	%	number	%
BS	34	59%	1,055	70%	3,321	78%	3,041	79%
BS and GOA	12	18%	na	na	na	na	na	na
GOA	22	41%	448	30%	951	22%	823	21%
using tenders in GOA*	3	4%	20	1%	24	1%	22	1%
Total**	68		1,503		4,272		3,864	



EM COSTS

Table 5-34 participation and effort by program component in 2021 EM EFP. *Metrics reported are for CVs that delivered to tenders. 4 tenders accepted EM deliveries in 2021. **Given overlapping participation totals may differ from sum of each element

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using tenders in GOA*	3	4%	20	1%	24	1%	22	1%
Total**	68		1,503		4,272		3,864	

Cost category	Variables
1. Service Provider Fees and Overhead (Ongoing)	Related to a combination of vessels and effort- some costs are based on the amount of data generated and tracked, some based on the number of vessels participating- the variability in costs per vessel is quite large.
2. EM Equipment Maintenance and Upkeep (Ongoing)	More driven by the number of vessels
3. Data Transmittal (Ongoing)	More likely related to effort
4. Vessels Original Equipment Purchases and Installations (One time)	Dependent upon the new vessels participating and more driven by specifics such as the location and availability of the vessel.
5. Data Review (Ongoing)	More likely related to effort
6. Data Storage (Ongoing)	More likely related to effort

COST UNCERTAINTIES

- **fishery characteristics**
- number of participants
- types of participants
- geographic location/distribution of participants
- overlapping participation in other programs
- timing and notice of scale ups
- trips per drive
- future TACs
- boat schedules
- vessel infrastructure- complexity of cable runs, camera mounts
- use of electronic vs paper logbooks
- number of tows
- number of vessels
- number of trips
- number of logbook pages
- number and quantity of discards
- length of time to complete haul-back & store catch
- amount of data transmitted
- amount of data stored
- how long data is stored
- number of drives
- length of trip
- amount of movement recorded during trip
- **program design**
- program requirements
- maturity of program
- treatment of systems
- data review protocols
- how much data access is required
- technological, software innovations
- age of systems
- **external costs**
- costs of broadband
- travel costs
- shipping costs
- hardware costs

Table 5-32 p. 163-4 provides a summary of EM cost categories and factors that influence costs



SUMMARY OF ESTIMATED COSTS

Estimated costs of Alternative 1 (for effort associated with 2021 trawl EM EFP)

Description	Area	Low Estimate	High Estimate
Partial coverage at-sea Observer Cost	GOA	\$172,000	\$524,000
Full coverage at-sea observer cost	BS	\$1,140,000	\$1,750,000
Full coverage shoreside monitoring cost	BS	\$304,000	\$344,000
Total	BS and GOA	\$1,616,000	\$2,618,000

Estimated costs of 2021 trawl EM EFP (Alternative 2 at 2021 EFP level of effort, scope, scale)

Description	Area	Low Estimate	High Estimate
Ongoing EM costs (does not include one-time equipment costs)	BS and GOA	\$392,000	\$392,000
Partial coverage shoreside monitoring cost	GOA	\$274,000	\$877,000
Full coverage shoreside monitoring cost	BS	\$608,000	\$688,000
Total	BS and GOA	\$1,274,000	\$1,957,000

Table 5-40 p. 182



CONCLUSIONS OF COST ESTIMATES

- Expected overall cost savings with EM
 - Exact difference uncertain, likely larger than in document due to estimated fishing days (at sea observers)
 - Difficult to parse out by sector
- Potential changes in distribution of costs
 - Differs by sector (pay-as-you-go vs. observer fee)
- Uncertainty of future costs
 - Program design, scope, scale, flexibilities, contracts



SALMON PSC ACCOUNTING

- It is anticipated that salmon bycatch accounting will improve under the action alternatives.
- The sampling and enumeration methods for salmon PSC will not change under this action.
- Under Alternative 1, observers in the partial coverage category are deployed using established random sampling methods to collect data on a statistically reliable sample of fishing vessels. The vessel observer monitors the offload and conducts a full enumeration of salmon at the shoreside processing plant. Only deliveries with an at-sea observer are monitored.



SALMON PSC ACCOUNTING

- EM (under Alternative 2 or Alternative 3 option 2) is expected to improve salmon accounting on shoreside delivery partial coverage trips by:
 - reduced extrapolation of salmon bycatch estimates from sampled tender vessel deliveries across that strata,
 - ensuring at-sea discards do not occur and by having greater coverage of the CVs deck than one observer can provide,
 - increasing the percentage of partial coverage trips that are monitored for discard/retention compliance at-sea (it is assumed that vessels with EM will account for a larger percentage of trips than currently covered by at-sea observers),
 - all EM trips will have 100 percent EM review for discards at-sea, and
 - full enumeration of salmon bycatch at the plant on larger percentage of partial coverage shoreside deliveries than are currently monitored by at-sea observers in the plant (note that under the EFP plants had 30 percent coverage and trawl CV's target coverage was 16 percent in the 2021 ADP), which results in less extrapolation of salmon bycatch rates to unobserved trips.



SAFETY

- The safety of members of the fishing industry and the observers that monitor those fisheries is of utmost importance.
- The pollock fishery is a relatively safe fishery by Alaskan fishery standards, but it is still a challenging working environment.
- A beneficial aspect of the trawl EM EFP was that observers were collecting data on a stable and safe platform. By moving observer sampling duties to shoreside processors they were able to sample without the safety concerns associated with sampling at-sea.
- NIOSH developed the Commercial Fishing Incident Database to track incidents/fatalities in the U.S. commercial fishing industry. Since 2003, NIOSH's CFID contained nine reported incidents in the North Pacific pollock fisheries. The most recent incident occurred in 2018.
- Two of the fatalities were at-sea observers, but the fatalities occurred while the vessel was moored at the dock.



OUTSTANDING POLICY DECISIONS

- Opt-in timing for GOA vessels
 - Annual ↔ trip-by-trip: tradeoff between flexibility and cost-efficiency
- Responsibility for cost of food and lodging for shoreside observers
 - Use of partial coverage fee would be consistent with fixed gear EM program
- Cost burden for EM Service Provider Fees and Overhead, Equipment Maintenance and upkeep
 - Use of partial coverage fee would be consistent with fixed gear EM program
- Structure of performance standards for GOA trip limits and MRAs
- Preliminary preferred alternative
 - Nothing identified in analysis suggests excluding any sector



THANK YOU

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TRAWL EM COMMITTEE REPORT

MAY 31, 2022 HYBRID/ANCHORAGE, AK

The Trawl EM Committee met to review the Trawl EM EA/RIR Initial Review analysis and provide comments and recommendations for the Council.

OPT-IN TIMING FOR EM FOR GOA POLLOCK PARTICIPANTS

- The Committee spent significant time discussing provisions for opt-in requirements, noting that **this is a challenging issue and supports the ongoing work to identify acceptable strategies.**
- **The Committee noted that the specific requirement for opt-in timing is a policy call with tradeoffs in terms of flexibility, efficiency and costs**
 - The most flexible provision for participants is a trip-by-trip opt-in
 - The least flexible provision would be an annual opt-in. This would be more predictable and less costly for the observer program, however it would reduce operational flexibility for vessels and may result in low participation in the EM program from vessels in the CGOA.



OPT-IN TIMING FOR EM FOR GOA POLLOCK PARTICIPANTS

- AGDB presented data on trends of vessel participation in EM in the CGOA
 - changing dynamics in the fishery have led to decreased participation in EM and the potential that annual opt-in requirements will lead to reduced participation from vessels in the CGOA.
- The Committee discussed the differences in participation of EM among the various sectors and **recommended more discussion be added to the analysis regarding the different incentives for vessels to participate in EM** based on operational specifics and regulatory structures in the BS, CGOA, WGOA.



OPT-IN TIMING FOR EM FOR GOA POLLOCK PARTICIPANTS

- A potential opt-in requirement for a threshold of trips was proposed that represents a compromise between an annual opt-in and a trip-by-trip opt-in.
 - This would allow vessels to opt-in to EM on less than an annual basis, but require a commitment that a percentage of trips above a specified threshold (i.e. 50%) must be EM trips.
- **The Committee recommended that industry specify in writing potential options for opt-in requirements that present a middle ground on flexibility such as a range of thresholds (% of trips that must be EM) and that these are analyzed in the next draft of the analysis including potential impacts on which vessels choose to participate in program.**



TENDER EM VESSEL PROVISIONS

- The Committee discussed specific provisions of the EM program that apply to tender vessels, focusing specifically on provisions for tenders that are offloading split trips.
- The Committee discussed a provision that plants taking split tender trips would require 100% observer coverage and would therefore need to “opt-in” or somehow indicate the intention to receive split trips as part of their Catch Monitoring Control Plan (CMCP) in October of the prior year.
- **The Committee recommended adding to the analysis a discussion of the cost implications of the 100% observer requirement for offloads at plants receiving split tender trips including the impacts on other partial coverage sectors.**
- **The Committee stressed that the EM program should not impact patterns of deliveries, recognizing that there should be minimal disruption to processor dependent communities.**



VESSEL PERFORMANCE STANDARDS FOR GOA POLLOCK TRIP LIMITS AND MRAS

- Two options for vessel performance standards for GOA pollock trip limits and maximum retainable amounts (MRAs) were proposed for the regulatory trawl EM program.
- **The Committee does not recommend option one that would exempt participating trawl EM vessels from MRAs and trip limit regulations with the Council conducting a reevaluation of these exemptions every three years.**
- The Committee discussion focused on option two which would exempt participating trawl EM vessels from MRAs and trip limit regulations and require participation in flexible, industry run plans that would function similar to the vessel performance standards that have been utilized in the EFP.
- **The Committee recommended that the document clarify that in the Bering Sea this would be a separate incentive plan and would not be an added element to the existing salmon Incentive Plan Agreements to avoid any potential disruption of salmon performance standards. Any vessel performance standard should be implemented in the intercoop agreement so that all vessels are managed consistently and should give the coops the flexibility to design the most effective plans.**
- The Committee discussed that in the GOA, there is support for the way performance standards are functioning under the EFP and **recommended that the next version of the analysis describe the structure more specifically, with the goal that the regulations require the development of a singular incentive plan to avoid exceeding trip limits and that vessels would be required to agree to the incentive plans in order to participate in EM.**



MONITORING REQUIREMENTS FOR PROCESSORS

- **The Committee agreed that Catch Monitoring and Control Plans (CMCP) are necessary to ensure shoreside sampling goals are met.**
- **The Committee recommended that NMFS staff do outreach in plants without existing CMCPs to discuss expectations including requirements for observer sampling areas to ensure that observers have adequate platform and tools to perform sampling duties.**
- **The Committee suggested more discussion be added to the analysis of the potential costs associated with CMCPs, particularly the costs of slowing down the sorting line, in the context of a race for fish, recognizing that each individual plant is unique and some may incur higher costs than others.**
- **The Committee requested the Council indicate a policy position regarding the responsibility for the costs of food and lodging for shoreside observers**
 - processing plants have borne these costs under the EFP
 - may be covered by the observer fee under a regulated program to maintain consistency with existing regulations.
- **The Committee also requested clarification in the analysis on the expectations for the timing of the final fish ticket as well as sorting landings to species and whether subsamples will be adequate.**



BIOLOGICAL SAMPLING

- **The Committee emphasized that the trawl EM program is not expected to impact the stock assessments or harvest policy and management advice coming out of the stock assessments.**
- The Committee discussed the specifics of the agency's authority to deploy observers on vessels that are using EM systems
 - If this was a regular deployment the Council would approve it in the Annual Deployment Plan.
 - If it were a special project outside of the ADP the agency would cover the cost because it would be collecting information other than catch and bycatch.



SALMON ACCOUNTING IMPROVEMENTS

- The Committee emphasized that salmon retention remains the priority for observers at the plant and the EM reviewers and highlighted that **the EM program improves salmon accounting in two important ways:**
- **Including tenders in the program allows for full enumeration of salmon at the plants rather than relying on extrapolation of at-sea samples.**
- **EM systems and EM video review on 100% of the trips combined with post trip selection for shoreside monitoring in the GOA removes the potential for observer effects.**



COLLECTING DATA ON SPECIES EM DOESN'T CAPTURE (SEABIRDS, MAMMALS)

- The Committee discussed some of the limitations of data collection by EM systems,
 - EM can only review what is inside the camera frame and physical specimens cannot be collected.
 - **The Committee recommended continued collaboration with USFWS and NMFS protected resources program regarding what data crew may be able to collect, recognizing there will be different requirements for seabirds and marine mammals and to ensure that crew has clear instructions, expectations and proper training.**



STOCK ASSESSMENT DATA STREAM UPDATES

- Under the EM program, data that was previously collected at the individual tow level by at-sea observers is now collected at the trip level by shoreside observers.
- The Committee emphasized that the analysis shows this will not negatively impact stock assessments.
- NMFS is in the process of building an automated program to compare discard estimates between logbooks and EM review.
- **The Committee supports this to encourage efficient data comparisons to allow for timely accounting of discards**, recognizing that the EM program allows for each discard event to be accounted to the specific trip and coop, creating a new level of urgency to the timeliness of data reporting.



FUNDING FOR EM VIDEO REVIEW

- The Committee explored options of calculating the BS EM review fee based on either a percentage of the vessel's initial AFA pollock allocation or the actual catch in the year prior.
- More discussions with stakeholders are necessary to determine which approach is supported, understanding that while actual catch may be preferred, this may delay the process, making it more difficult meet a deadline of the first quarter of the following year.



APPROACHES FOR EM CONTRACT WITH SERVICE PROVIDER FOR VIDEO REVIEW

- NMFS provided an informational discussion of potential vehicles for contracts for EM video review as outlined in the analysis
- Discussion that participants would like to maintain flexibility to select providers and reviewers competitively, while also acknowledging that there may be a tradeoff between flexibility and cost efficiency.
- **The Committee approves how this process has functioned under the EFP and encourages continuing that approach.**
- The Committee also discussed differences in cost models between the fixed gear and trawl EM programs specifically as they relate to cost categories 1. Service Provider Fees and Overhead and 2. EM Equipment Maintenance and Upkeep.
- **The Committee recommended more discussion in the analysis of how cost burdens between fixed gear and trawl EM are related.**



COST ELEMENTS AND COMPARISONS

Committee had the following recommendations:

- Review the turnaround time between trips for observers in the BS to determine whether the cost estimates for at sea observers using fishing days+1 may be underestimating costs.
- Provide more discussion of the incentives for each sector to participate in the trawl EM program.
- Include additional specifics regarding new shoreside costs and the potential redistribution of costs.
- Discuss discrepancies between cost burdens and incentives in fixed gear and trawl EM and specify what annual costs are borne by vessels that participate in both programs.



OTHER COMMENTS

The Committee also provided the following comments and recommendations:

- Clarify in the analysis that any vessel can use a NMFS approved electronic logbook, including those already approved or any that are approved in the future.
- Additional discussion in the analysis of how vessels may be able to re-enter the program after being removed.
- Emphasized the importance of communication in successful implementation of the program, including feedback with vessels and providers on what they need to communicate as well as with processors.
- Recommended the creation of a subgroup to discuss improvements in feedback mechanisms in the EM service provider portal.
- Appreciates the quality of the initial review draft, reflecting all the work the Trawl EM Committee has done and the extensive collaboration and involvement of the PIs (Julie Bonney, Ruth Christiansen and Charlotte Levy).
- Appreciates the extent to which the initial review relies on non-regulatory tools to achieve Council objectives.



UPDATE FOR NFWF GRANT APPLICATIONS FOR FINAL YEAR OF THE PROJECT

- UCB and AGDB will be submitting a proposal to cover the final year of the EFP in the BS and CGOA. This request will include funding for only half of the shoreside observer costs in the BS as AFA will be covering the other half. There is no plan to expand the footprint of vessels beyond that of 2022 participation.
- AEB will be submitting a proposal for the final year of funding for the EFP vessels and tenders in the WGOA. This will include a subproject to test EM in plants, to potentially replace the need for a human observer to stand and watch the sorting line.
- AGDB will be submitting a proposal to develop a proof of concept and a pilot program for EM for pelagic and non-pelagic trawl CVs in the Gulf rockfish program.
- **The Committee recommends supporting all three of these proposals**, to sustain the final year of the EFP as it moves towards a regulated program and to advance new EM work that is the logical next step in the development of trawl EM in Alaska.
- The Committee noted that the timeline of the NFWF RFP process is earlier than usual this year and proposals are due June 7, 2022 (prior to the beginning of the Council meeting).



SCHEDULING AND OTHER ISSUES

- **The Committee emphasized the importance of maintaining a timeline of final review at the October 2022 meeting to meet the goal of implementation of a regulated program in January 2024.**
 - Requires consistent work after final action including additional steps that must be met by October 2023 (such as vessel opt-in and CMCP approval).
 - If during the completion of the analysis, additional issues arise that require a Committee meeting, the Committee has tentatively identified September 20, 2022 as a potential meeting date to review the analytical draft and provide comments prior to the Council's final review.
 - If this meeting is not needed, the next Committee meeting would occur after the October Council meeting to discuss future work and the role of the Committee moving forward.
 - Future version of the Committee may cover EM issues more broadly than “trawl” EM.
 - Consistent recognition that the collaborative approach has been key to the effectiveness of this Committee and that that model should be maintained.

