

D4 TRAWL EM PRELIMINARY REVIEW

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OUTLINE

- Introduction
- How program works
- How data are collected
- How data quality is checked
- How data are used
- Marine mammals/seabirds



TRAWL EM TIMELINE

■ 2018 Trawl EM Committee Formed

- Focus on developing EM as a tool for meeting monitoring objectives on trawl catcher vessels in the Bering Sea (BS) and Gulf of Alaska (GOA) pelagic pollock fisheries.
- The pollock trawl fisheries were selected by the Council due to their high volume and low discards
- West Coast region successfully implemented EM and maximized retention on similar fisheries (Pacific Whiting). Many pollock vessels had EM systems installed.
- Pollock fishery accounts for over 90% of all groundfish catch delivered to shoreside processors in the Bering Sea.
- Due to high volume and lack of bycatch, sorting at-sea is difficult and not efficient allowing for a maximized retention fishery that enables collection of data shoreside
- Bering Sea pollock fishery have 100% observer coverage and observer duties during a fishing trip are limited. Most information used for quota management is collected during delivery.
- EM can be used to ensure unsorted catch is retained and delivered to a shoreside facility where shoreside observers can collect necessary biological samples (otoliths, lengths, etc.) that support stock assessment.



TRAWL EM TIMELINE

■ 2018-19: Pilot Projects

- Test if utilizing EM camera systems proves operationally effective for the BS pelagic trawl pollock CV fleet (and later GOA and tenders) for 100% compliance monitoring of catch and discards per Council and NMFS requirements.

■ 2020-now: Exempted Fishing Permit (SSC reviewed EFP proposal October 2019)

- Demonstrate maximized retention can be achieved by pelagic trawl vessels targeting pollock.
- Demonstrate that at-sea observers can be replaced with observers at shoreside processing plants such that data needs and data streams for effective fisheries management are maintained.
- Demonstrate that EM camera systems can adequately capture discard events (when they occur) and that video data can be used to verify vessel logbook discard information for compliance monitoring purposes
- Demonstrate EM cost-effectiveness (compared to at-sea observers)
- Improve salmon bycatch accounting for catcher vessels through the use of EM camera systems that will enable shoreside observers to collect salmon bycatch census data



TRAWL EM TIMELINE

- **June 2021: Council initiated analysis, approved purpose and need and alternative set**
 - 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



TRAWL EM TIMELINE

- **February 2022: Preliminary review**
- **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 OF PRELIMINARY REVIEW

- Introduce the program design and objectives, focusing on how data are collected and used in the Trawl EM program, because they are fundamentally different from existing observer or EM programs in the North Pacific
 - 1) General program design
 - 2) How data are collected and what data quality checks are used to verify self-reported information
 - 3) How data are used and how this impacts existing processes for catch accounting, stock assessment, and protected species
- Not a full EA/RIR- no cost estimation or economic analysis in this version
- No specific action or decision making associated with this preliminary review
- The purpose is to provide early communication and seek feedback from the SSC regarding concerns about data types, quality, availability and priorities.



OVERVIEW OF EM IN ALASKA

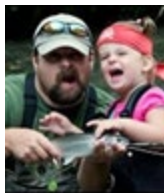
- Primary goal is to use appropriate electronic technologies to collect timely, cost-efficient data needed to manage US federal waters fisheries.
- Electronic Reporting in the Alaska Region (AKR) usually refers to Elandings and Electronic logbooks
- Electronic monitoring in the Alaska Region usually refers to the video camera systems used to verify or collect fisheries data



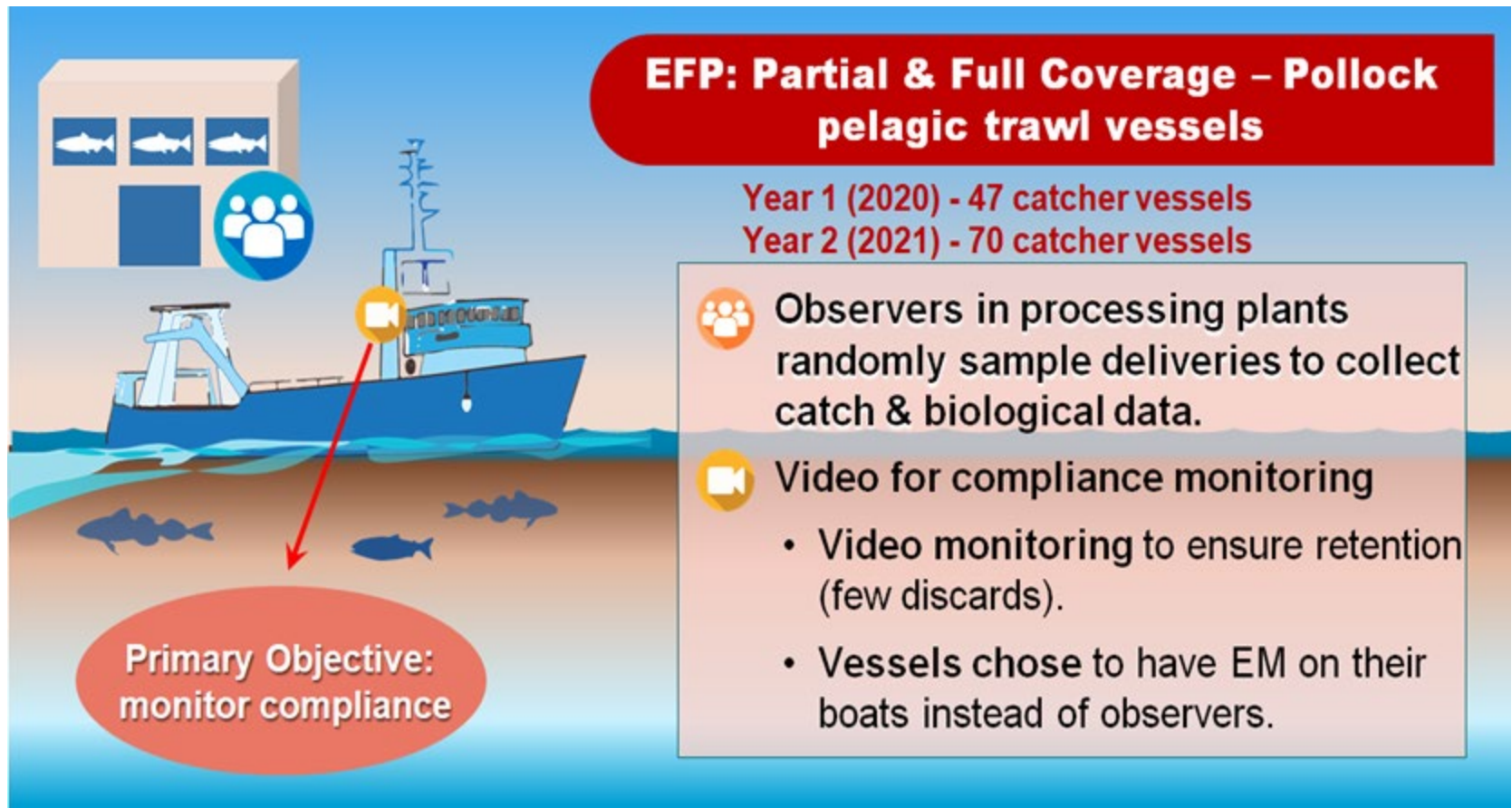
*EM for Small Fixed Gear Vessels
Primary objective: Catch estimation*



- *A80 and Rockfish Program use EM to ensure unsorted catch*
- *Chinook Salmon to ensure all salmon are sorted and stored according to regulations*



OVERVIEW OF EM IN ALASKA



The diagram illustrates the implementation of Electronic Monitoring (EM) for pollock pelagic trawl vessels. It shows a processing plant with fish icons and a group of people icon, a blue fishing vessel with a video camera icon on its deck, and a cross-section of the ocean floor with fish. A red arrow points from the video camera icon on the vessel to a red oval containing the text 'Primary Objective: monitor compliance'. A red rounded rectangle at the top right contains the title 'EFP: Partial & Full Coverage – Pollock pelagic trawl vessels'. Below this, two lines of text specify the number of vessels for Year 1 (2020) and Year 2 (2021). A light pink box on the right contains two main points: 'Observers in processing plants randomly sample deliveries to collect catch & biological data.' and 'Video for compliance monitoring', which includes two sub-points: 'Video monitoring to ensure retention (few discards).' and 'Vessels chose to have EM on their boats instead of observers.'

EFP: Partial & Full Coverage – Pollock pelagic trawl vessels

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

Primary Objective: monitor compliance

- 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.



MAXIMIZED RETENTION

- Maximized Retention rules - “Almost all” catch retained for delivery
 - Most trips have no discard events
 - Some discard events are unavoidable like a tear in the net, etc.
 - EM captures discard events that sometimes are not available to observers.
- Exceptions to retention requirements
 - Sharks (to big)
 - Jellyfish (product quality)
 - Discards for vessel stability and safety
- **ALL** discards reported in Logbook
- Discards are reported in Elandings



Sharks Discard Reporting

- Lengths collected for weight estimation
- Shark Length-weight lookup table for vessel operator to estimate weight in logbooks
- Special Project to collect biological samples



TRAWL EM ANNUAL PROCESS

- Participation in Trawl EM selection pool would be voluntary
- NMFS will establish an annual opt-in process
- NMFS would notify the CV owner of approval or denial, based on the eligibility criteria.
- Factors that may affect eligibility to participate in the Trawl EM program, include, but are not limited to:
 - Actions leading to data gaps such as repeat occurrences of dirty cameras affecting video review.
 - Non-compliance with program elements such as discarding of catch, including PSC.
 - CV configuration or fishing practices that cannot provide the necessary camera views to meet data collection goals.
- After being selected for the Trawl EM selection pool, vessel operators will work with EM service providers to install or check installed EM systems
- A VMP will be submitted to NMFS for approval and EM technicians g



VESSEL MONITORING PLAN (VMP)

- VMP (Sec 2.3.2)- A VMP is the user manual for the EM system. This document that is used by NOAA, EM vendors, etc. to communicate vessel responsibilities in support of using EM.

Revised 12/1/2020

2021 Alaska Pollock Trawl Catcher Vessel Electronic Monitoring (EM) Vessel Monitoring Plan (VMP) for Catcher Vessels

Vessel Operator Responsibilities
For each trip you must comply with the operator responsibilities listed below and in Appendix B – Guide for Vessel Operator.

Prior to Trip

- Complete Function Test:** You must turn the system on and conduct a system function test following the instructions provided in Appendix B – Guide for Vessel Operator. The vessel is advised to conduct the function test prior to leaving port. The function test must be completed at least two hours before departing port. If the function test identifies a malfunction, you must follow the guidance in the Equipment Malfunction Matrix and the troubleshooting guidelines listed in Appendix B – Guide for Vessel Operator.
- Confirm Hard Drive Storage Space:** Ensure that the system has enough storage to record the entire trip.
- OODS (GOA CVs only):** Log your trip in OODS by selecting an EFP trip and indicating whether you will deliver to a tender.
 - If you log a tender EFP trip, you must deliver all catch to a participating EFP tender; otherwise, you must deliver all catch to a participating EFP shoreside processor.
 - For assistance logging trips, OODS can be reached online at <http://odds.afc.noaa.gov/> or through the call center at 1-855-743-6377.

During Each Trip

- Power:** Maintain uninterrupted power to the EM unit while the vessel is underway.
- Maintain Equipment:** Make certain that EM system components are not tampered with, disabled, destroyed, or operated or maintained improperly unless directed to make changes by NMFS, the EM service provider, the EFP managers, or as directed in the troubleshooting guide of the VMP.

Each Day

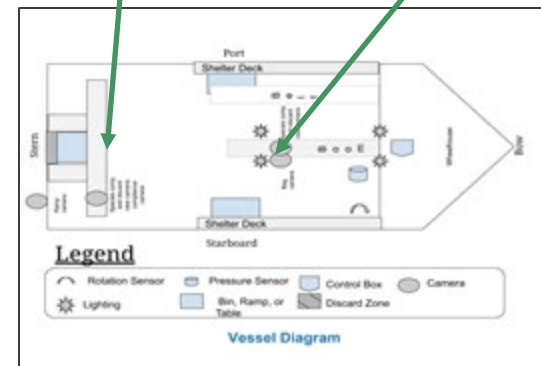
Catcher Vessels

- Logbook:**
 - You are required to complete a NMFS trawl logbook (per regulations 50CFR 679.5(c)) or complete Appendix D – Trawl EFP Logbook.
 - Record all at-sea discards by species and weight (except for jellyfish). Note whether these discards are in pounds or metric tons.
 - If discard is a large individual marine organism, record for each species, the estimated weight and number of organisms.
 - If the discard is a shark, record for each species,
 - the measured pre-caudal length,
 - weight from the length/weight table provided in Appendix E and F (or an estimate if shark species is not Pacific sleeper shark or salmon shark).



Camera Name:	Processing 2	Camera View
Location:	Forward Mast	
View:	Horizon	
Aim:	All to Forward Mast	
Hardware:	Vuelec M0005-N	
Resolution/FPS:	1080@15 fps	Camera Location
Recording Trigger:	Pressure or Rotation sensor	
Run On Time:	60 minutes	
Recording Exceptions:		
Critical Camera?	Critical	

Camera Name:	Processing 1	Camera View
Location:	Port Mast	
View:	Deck/Overcast	
Aim:	All to starboard	
Hardware:	Vuelec PD-6067-4V	
Resolution/FPS:	1080@15 fps	Camera Location
Recording Trigger:	Pressure or Rotation sensor	
Run On Time:	60 minutes	
Recording Exceptions:		
Critical Camera?	Critical	



PRE-TRIP PROCESS

- Pre-trip registration in ODDS
 - Options: GOA only (current design); All vessels
 - Opt-in on a trip basis in GOA (current design)
- CVs participating in the Trawl EM Program will be required to operate their EM systems on every Trawl EM trip.
- EM cameras would be required to be operational and recording as established in the vessel monitoring plan (VMP).
- The CV operators will ensure video recording is initiated two hours prior to deploying fishing gear on a Trawl EM trip and/or prior to transfer of catch onto a participating tender vessel.



MALFUNCTIONS

- Addressing Malfunctions are described in the VMP Malfunction tables
- Equipment malfunctions are classified as “Low” priority or “High” priority
- “Low priority” malfunctions will not affect ability of a CV to depart on a trip
- “High priority” malfunctions may prevent a vessel from leaving on a trip.
- Vessels are NOT required to return to port in the event of a High priority malfunction while at sea, if the system check passed prior to deployment of gear
- Different protocols in BSAI and GOA due to operational differences in fishery
 - “High Priority” prevent trip in Bering Sea
 - “High Priority” does not prevent next trip in GOA, but must be addressed prior to following trip



TRAWL EM CAMERA VIEWS- START



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



TRAWL EM CAMERA VIEWS; +15 MINUTES



Screenshots from EM;
+15 Minutes



TRAWL EM CAMERA VIEWS; +25 MINUTES



*Horizon and Stern
Ramp Views Clear*

Screenshots from EM;
+25 Minutes



TRAWL EM CAMERA VIEWS; END



Screenshots from EM;
End

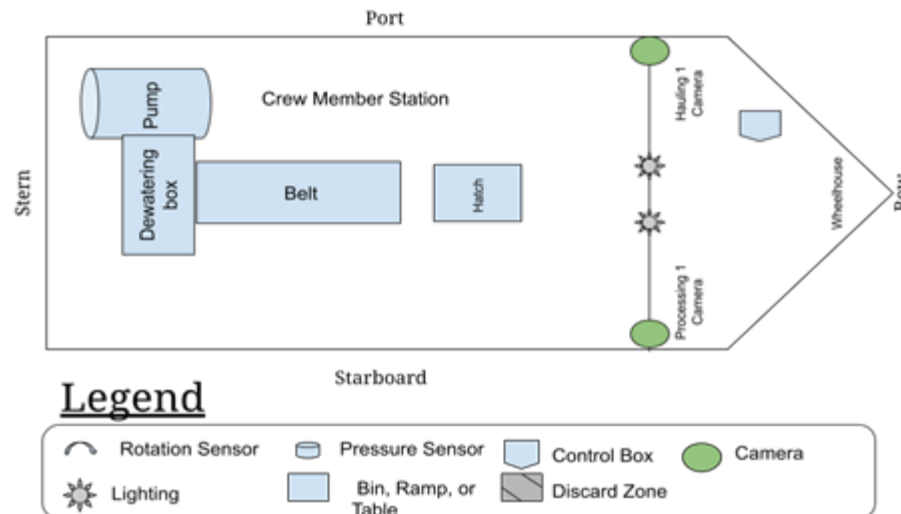
*Horizon and Stern
Ramp Views Clear*

*Last pollock to be
stored*



TENDER VESSELS

- The Western GOA pollock fishery is dependent on Tender Vessels .
- Trawl EM was developed for Tender vessels to monitor offloads
 - Little handling of fish during transfer, however sorting can and has occurred
 - Cameras on tender vessel seek to avoid blind spots, Tender VMP developed
 - EM review of tender video to ensure no fish were sorted during transfer and transit to processing plant.
 - CV cameras also used for review of transfer



POST TRIP PROCESS

- End of trip communication requirements will be established in regulations and VMP
 - (next slide)
- EM systems must continue recording through the completion of offload
 - Review of offload data will be established based on data needs
- All vessels are required to have a logbook filled out.
 - Discard information in logbooks entered into Elandings by processor
 - Logbooks submitted to EM reviewers as established in the VMP
- Hard drives mailed to EM reviewers as established in the VMP.
 - Number of trips per drive set by VMP
 - Currently 3 in the EFP, 5 on the West coast



END OF TRIP COMMUNICATIONS

- NMFS will establish a process in which vessel operators will notify observers of a pending offload to assist observer in plants meet sampling goals.
 - Similar to prior notice of landing
 - Submitted upon completion of last haul during trip
 - Identify processor for delivery, estimated time of offload, total estimated tonnage of fish on board
- Current Practice
 - GOA: Vessel operator notifies the observers, or the observer port liaison, that the vessel is ending a trip. If the liaison is contacted they will then communicate the information to the shoreside observer.
 - BSAI: Vessel operator notifies the processing plant that the vessel is ending a trip. Plant communicates delivery information to observer.

Communication between the plant and the observers are key and necessary. Direct communication between vessel and plant observer DOES NOT replace plant to observer communications!



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

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



SHORESIDE SPECIES COMPOSITION AND BIOLOGICAL SAMPLING

- BSAI- 100% of the deliveries are sampled
- 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.

Sampling Rates Goals set by FMA

Current goals (2021)

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
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



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.

	Start	A season 2020	B Season 2020	A Season 2021*
Bering Sea (Goal 100%)				
PSC Census	100%	100%	100%	100%
Pollock Biological Data (otoliths and lengths)	98%	99%	97%	97%
Species Composition	98%	80%	98%	98%
Gulf of Alaska (Goal 30%)				
PSC Census	32%	31%	33%	24%
Pollock Biological Data (otoliths and lengths)	5%	13%	32%	23%
Species Composition	1%	2%	32%	24%



BSAI VS GOA SHORESIDE PLANTS: WHAT WORKED AND WHAT CAN BE IMPROVED.

- Based on post cruise surveys with observers working in plants.
- BSAI had preexisting Catch monitoring and control plan (CMCP) that aided the observers in data collection and communications.
- GOA implemented a Catch Handling Plan similar to the CMCP in year two of the Trawl EM EFP.
- Observer sampling areas or station exist at a minimal level for the collection of Salmon Retention data at AFA processing plants, are not in place for the GOA or non-AFA plants.
- Communication methods were challenging at start of EFP. These were modified several times



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.
- Flexible tool that can help meet sampling goals



SAMPLING AND DATA COLLECTION CHALLENGES

- Communication gaps between vessels/plants. These were addressed in real near 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 and estimate tonnage prior to delivery.
- 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



CATCH ESTIMATION (GROUNDFISH)

Current regulations: Fisheries observers on Pollock CVs

Catch is estimated from landing reports and observer information

Catch Estimation

Electronic monitoring on Pollock CVs

Catch is estimated from landing reports, observer information, and logbooks

- **Data used for catch accounting on catcher vessels under current regulations:**
 - Elandings (delivered catch)
 - Observer estimates of at-sea discard of groundfish
 - CAS creates at-sea discard rate and applies to all landings
- **Data used for catch accounting on catcher vessels in Trawl EM:**
 - Elandings (delivered catch)
 - At Sea discards are reported via logbook page entered in Elandings
 - EM review verifies discards were reported.
 - Estimates from EM compared to vessel reported discard.



CATCH ESTIMATION (PROHIBITED SPECIES)

Current regulations: Fisheries observers on Pollock CVs

- Collected by **observer on the vessel**
- Data is collected **by haul and trip**
- **Chinook salmon**
 - Counts
- **Other salmon**
 - Counts
- **Halibut, Crab and Herring (rare)**
 - Observer through species composition sampling

Prohibited Species Catch (PSC)



Electronic monitoring on Pollock CVs

- Collected by **observer at the plant**
- Data is collected **by trip**
- **Chinook salmon**
 - Counts
- **Other salmon**
 - Counts
- **Halibut (rare)**
 - Weight
- **Crab and herring (rare)**
 - Sorted and reported onshore



- The EM System allows for verification that all salmon and halibut were retained during trip
- Salmon and halibut PSC is counted during offload and reported by observer
- CAS applies PSC rates to vessels using same process, more reliance on precise counts collected at delivery instead of extrapolations from at-sea samples
- Salmon and halibut PSC are donated through the Prohibited Species Donation Program
- Other PSC species are sorted and enumerated. Shoreside observers can verify these PSC species are being reported



EM VIDEO REVIEW TOOLS



EM VIDEO REVIEW

- EM review protocols established by FMA (observer program):
 - Explains data collection priorities to meet goals
 - Quality control methods established
 - Includes some logbook entry based on data needs
- EM review logs problems with video review that can include:
 - Mechanical- Camera failure
 - Video Gap – A gap in video during trip (mechanical issue)
 - Video Gap - During Offload
 - Failure to report allowable discard in logbook
 - Any discard of fish, both in vessel control and not
- All identified issues are documented and sent to NMFS, EM service provider, and vessel owner in a vessel feedback report
- Feedback reports allow for issues to be addressed
- Annotated data including logbook entry sent to NMFS



TRAWL EM REVIEW DATA

- An approximation of logbook data created using combination of annotated EM data and entry of logbook submitted
- EM system collects spatial and temporal haul data more precisely
- Some logbook fields like vessel estimate, depth, etc entered by EM Reviewers

	Trips	All Hauls
Trip start and trip end	Y	
Gear type of a haul		EM / Logbook
Haul begin retrieval date/time and position		EM
Haul end retrieval date/time and position		EM
Count/ weight of fish/organisms		Weight estimated for any discards
ID of fish/organisms		Only Discarded catch
Confirm discards reported in logbook		EM review compared with Elandings



MRA AND TRIP LIMITS

- Certain regulations require discarding at sea:
 - Maximum Retainable Amount (MRA) for species closed to directed fishing
 - Pollock Trip Limits: 300,000 pound trip limit
 - PSC of Halibut, Crab, and herring
- Trawl EM vessels will be exempt from regulations that require discard to promote maximized retention and allow for collection of data shoreside.
- Establish process for performance metrics to limit change in behavior and incentivize vessel to prevent exceeding limits
 - Suggestion: require participation in flexible, industry run plans similar to bycatch avoidance incentive plans

During the EFP, vessel operators agreed to performance metrics to maintain the “spirit” of the regulations and reduce changes in vessel behavior that could affect management.

Example: Exceeding the pollock trip limit by large amounts could result in loss of revenue of fish in excess of 300,000 lbs. Value in excess of limit donated to the North Pacific Fisheries Research Foundation to support future development.



MARINE MAMMALS

- This action would not change the management of the groundfish fisheries, the location of the fisheries, fishing effort, or the marine mammal protection measures currently in place.
- Significant incentives for compliance with marine mammal protection management measures, such as area closures, would remain in place under all of the alternatives.
- The ability to gather tissue samples would cease, because vessels do not have the appropriate authority under the MMPA to collect those samples. Only the NMFS observers have this authority.
- EM cameras would be set up to view deck activity, the stern ramp, and a horizon view to capture discards from the net during haulback, but there would be no side cameras to look for marine mammals in the area.
- Other information such as injuries, specimen length, and disposition may not be able to be accurately recorded.



SEABIRDS

- Seabird bycatch related to trawl gear (CV and C/P combined) constitutes about 11% of the overall estimated 2011 through 2020 seabird bycatch.
- The amount of seabird bycatch is not expected to change under Alternatives 2 and 3. The only difference between Alternative 1 and the action alternatives is the reporting of seabird bycatch.
- EM systems are able to accurately record seabird species with crew instructed to hold the birds up to the camera for identification.
- Information on seabirds delivered to the processing plant could be collected by observers as long as the carcasses were made available to them.
- Under all of the alternatives, if no observer is onboard, vessel owners or captains are instructed to report any ESA-listed seabird injury or mortality immediately to NMFS or to the USFWS.



Questions?

