DRAFT 2021 Sample Design Worksheet

Project Title: EM in the pollock trawl CV fishery
Prepared By: Jen Cahalan, Glenn Campbell, Matt Kemp, Brian Mason, Sarah Neumeyer
Date Completed: Working Document – to be updated as appropriate
Revision Date: 14 January 2021

This is a working document that will be updated as appropriate. As outlined in the EM EFP Permit, the Alaska Fishery Science Center, Fisheries Monitoring and Analysis (AFSC FMA) will establish the observer sampling goals and protocols (EFP Permit Section H, Part 6, a, i). This document is the AFSC EM EFP Sampling Plan.

Direction

Project Goal: Design a shoreside sampling program to monitor 30% of deliveries from trawl CVs fishing in the GOA, 30% of GOA tender deliveries, and 100% of deliveries from trawl CVs fishing in the BS for vessels participating in the EM EFP. Primary goals of this shoreside monitoring will be to determine the total number of salmon present in the delivery, total number and weight of halibut present in the delivery, and to obtain a sample of fish from which biological data will be collected (per EFP Application https://docs.google.com/document/d/1yrLaRDcFULesVQmxwilzocnp7L4W8-4V2ZPHjGDBIBo/edit).

Objectives and Measurable Outcomes:

- Data collections from shoreside monitoring, replacing at-sea data collections, which maintain data quality and are consistent with standard Observer Program methods.
- Data sufficient to evaluate whether collected data meet Observer Program standards.
- Written sample design that all parties agree is feasible to implement, inclusive of specified data collections, summary of associated assumptions, summary of data elements that will not be captured. Sampling design will have sufficient detail to allow development of training materials, instructions to observers, and preparation of any necessary data forms.

Data Need / Benefit

In the pollock CV fisheries there is a need for increased accuracy of bycatch estimates for limiting species (PSC) and decreased monitoring costs for participants without loss of data needed for management of fisheries.

Current Knowledge

This project will apply to participating trawl catcher vessels (CVs; Appendix A), processing plants receiving EFP deliveries (Appendix B), and the tender vessels accepting catch from participating vessels (Appendix C). Observers on participating vessels will be replaced by EM systems consisting of several cameras and gear sensors.

Currently all observer data collections for non-salmon species occur at-sea on a haul-specific basis. Collected data includes haul locations (latitude, longitude to the nearest second), haul duration and retrieval times, catch and biological data, and other fishing and catch related data elements. Data

collections follow a multi-stage cluster design and observers are tasked with determining the best methods to use at each stage of sampling.

Salmon data collections follow a separate sample design where all salmon are sorted from the catch by industry (vessel crew and plant employees) and set aside until the observer team can verify the species-specific count. These salmon are set aside in a lockbox until the observer team is available to verify the species and count. Tissues are collected for genetic analysis and subsequent river-of-origin determination. Tissue samples are collected from every 30th chum salmon and every 10th Chinook salmon systematically throughout the catch.

Additional biological data are collected depending on the dominant species in the haul and the fishing location (see Observer Sampling Manual Chapter 12, Chapter 13). Specifically, when pollock is the dominant species in the catch, the observer team collects sex and length data for pollock, squid, and rougheye rockfish; pollock and rougheye rockfish otoliths, pollock maturity data, and halibut post-capture condition data. The frequency of data collections varies (see tables below).

Length and Specimen Priority List for Predominant Species in the Bering Sea/Aleutian Islands for at-sea data collections (Observer Sampling Manual pg. 13-23)

Predominant Species	Sex/Length Data	Biological Data (All specimen fish must have an associated s/l/w specimen)	Halibut Condition
Aleutian Islands (Fed Areas 541, 542, 543) **Pollock**	**Every Sampled Haul** ~ 75 pollock	**Every Sampled Haul** 10 pollock otolith pairs with maturity scan for all female otolith fish	**CV: Every Sampled Haul** **CP: Every 2nd Sampled Haul** ~10 Viability Assessments
Bering Sea Pollock	**Every Sampled Haul** ~ 20 pollock **and** ~ 20 squid (unsexed) **and** ~ 5 Rougheye **and** ~ 5 Sablefish	**Every 5th Sampled Haul** 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 Haul** 5 Rougheye otolith pairs	**CV: Every Sampled Haul** **CP: Every 2nd Sampled Haul** ~10 Viability Assessments

Length and Specimen Priority List for Predominant Species in the Gulf of Alaska for at-sea data collections (Observer Sampling Manual pg. 13-26)

Predominant Species	Sex/Length Data	Biological Data (All specimen fish must have an associated s/l/w specimen)	Halibut Condition
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	**CV: Every Sampled Haul** **CP: Every 2nd Sampled Haul** ~10 Viability Assessments

Length and age data for pollock feed into three stock assessments: Bering Sea (BS), Aleutian Islands (AI), and Gulf of Alaska (GOA). In addition, the BS squid stock assessment uses length data collected by observers and the BS rougheye rockfish assessment uses both length and age data from observers.

Note that in 2020, the GOA Pacific cod stock assessor requested biological collections from P. cod caught as bycatch in the directed pollock fishery. This collection will be incorporated into the sampling methods.

Monitoring in the plant

Observer sampling priorities have been reprioritized for this EFP to ensure collection of biological data and to meet other EFP sampling objectives while maintaining standard data collections. Note there are no vessel observers available to conduct shoreside sampling in the GOA or under COVID-19 protocols, hence salmon retention other standard observer duties from all EM EFP deliveries will be conducted by the plant observer team (all assigned observers).

Proposed Study and Data Collection:

Under the EFP, we are adding to the plant observer's sampling duties the collection of biological data and verification of fish tickets (species composition), hence additional staffing are needed to meet the EFP objectives. The expectation is that the observer team will have eyes-on-catch for the duration of the offload in order to meet salmon monitoring objectives (complete enumeration of salmon). As a result, a second observer is needed per delivery, at a minimum, to collect additional data elements (e.g., biological data).

The observer team monitoring priorities for selected deliveries are below; salmon data collections and PSC monitoring are the highest priority while verification of fish tickets is the lowest. Although verification of fish tickets is an objective of this EFP, in some situations these data may not be collected, for example in deliveries where only a single observer is available to monitor the offload or where the species diversity is higher than anticipated.

Monitoring Priorities (selected deliveries)

1. Record delivery information on the Plant/Vessel Offload Form
2. Salmon counts; complete enumeration (census)
3. Tissue collections for salmon stock of origin analysis (genetics); wand all salmon for the presence of CWTs and collect snouts of tagged salmon (consistent with current protocols)
4. Halibut, complete enumeration (census) plus length measurements and viability assessments of all halibut in delivery
5. Collect sample(s) of (unsorted) catch (most efficient method to obtain biological data) including enumeration of all species in the sample. Herring and crab composition will only originate from the species composition sample.
    a. obtain biological data (lengths and otoliths as specified; see pgs. 13-23 through 13-26 of the 2021 Observer Sampling Manual)
    b. determination of species composition/fish ticket verification
    c. PSC crab and herring will be recorded as part of the composition sample
6. Transmit data to NMFS daily.
7. Verify delivery weight.

Proposed Methods:

Throughout this study, there will be extensive collaboration and coordination between the project (EFP) PIs, the NMFS Observer Program staff, and the Observer Providers. While many of these data collections have been conducted by at-sea observers using methods detailed in the Observer Manual, many aspects are novel and may need special accommodation. For example, access to catch and accommodations at the processing plant are critical to successful completion of data collections. Similarly, project field coordinators, FMA staff, processing plant staff, and observers will need to consistently coordinate in order to ensure all EFP deliveries are monitored or a randomized selection of EFP deliveries are monitored.

Deployment / Randomization of offloads to monitor

There are four groups of deliveries of interest: EM EFP CV deliveries, Non-EFP CV deliveries, EFP Tender deliveries, and non-EFP tender deliveries. In some plants, deliveries may be taken from all four groups, however only EFP deliveries will be sampled under these sample methods. For non-EFP deliveries, standard Observer Program methods apply.

Tracking EM EFP offloads and the selection of EM offloads for monitoring will differ between BSAI catch and catch from the Gulf of Alaska. Where randomization is applied (GOA and tender deliveries), randomizing directly on deliveries within each processing plant will be the most efficient method (lowest variance per effort). This will necessitate constant communication between observers and plant staff, potentially working from a maintained list of expected deliveries that includes the time of the delivery, expected total offload weight, and number of hauls fished.

Bering Sea AFA Deliveries

In the Bering Sea, all EFP deliveries will be monitored by the observer team and it is expected that all data collection goals will be accomplished. There are 29 BSAI CVs and an additional 13 CVs that fish in both the BS and GOA participating in the project (Appendix A). For a specific processing plant , the list of expected deliveries will need to identify EFP and non-EFP deliveries, including expected time the offload will begin and anticipated duration (or weight).

Gulf of Alaska Catch

There are 28 GOA pollock CVs in addition to the 13 CVs that fish in both the BS and GOA that are participating in the EFP (see Appendix A). A 30% random selection of EFP deliveries will be monitored by two observers. If EFP deliveries are expected to occur only during certain portions of the day, the observers will adjust their schedules accordingly. Since only a portion of the fleet is participating, and of those only 30% of deliveries need to be monitored, it is expected that this will meet the project needs.

From the expected delivery schedule for EFP deliveries, the observer team will coordinate among themselves and implement a systematic random selection of 33% (1 in 3 deliveries monitored). This randomization will depend on the observers being fully updated on the delivery schedule and that the schedule is as accurate as possible. Since vessels will be hailing their deliveries in advance, this should be reasonable. Two observers will monitor selected deliveries, however, there will be occasions where only a single observer will be available. Sampling considerations under both these scenarios are outlined below in the next section.

Note that any GOA catch from EFP vessels that is delivered to Akutan (or other Bering Sea plants) will be monitored at 30%.

Tender Deliveries (CVs delivering to tenders)

Similar to the methods described above for monitoring of GOA EFP catch, a 30% random selection of deliveries from tender vessels participating in the EFP (Appendix C) will be monitored by the observer team.

Although this is the second year that tender deliveries will be monitored under the EFP, for this study they will be monitored using the sampling methods identical to those used to monitor CV deliveries. These deliveries are expected to be larger however, hence the duration of the offload and time required to monitor will be longer.

Additional Considerations

These are relating to these deployment and randomization methods as outlined below.

Sample unit – individual deliveries

- Vessels will hail their deliveries in advance since adequate notification is key to maintaining sample frames (lists) and having observers in the right place to monitor EFP deliveries.
- For deliveries of GOA catch, observers will coordinate to best achieve proposed randomization
    - Note that data collection duties will be shared by all observers (the observer team) will coordinate both data entry/accountability and sampling activities.

- There will be no split deliveries (per the EFP) - however, vessels are allowed to come off the dock for a time, then return to deliver the remainder. Coordination with observers to ensure complete monitoring of the delivery will be essential.
- Vessels delivering deck-loads of catch will be monitored using the current methods; again coordination will be essential and in this situation there may need to be pre-delivery meetings with the observer team.
- If a vessel delivers EFP catch to a non-EFP plant, the delivery will not be sampled (see Appendix B for list of participating processing plants). This may result in a loss of salmon retention and other EFP data collections outlined in the EFP permit. Since the plant is not part of the EFP, EFP plant protocols would not be in place and data collection resources would not be available. However, these deliveries will be tracked and included in in-season reporting on data collections by NMFS FMA staff.

Sample Frames

- Sample frames based on coordination with plants -
    - Frames will be developed and maintained for each participating processing plant
    - Frames need to include anticipated offload (observer sampling) weight and offload duration, in addition to the time the offload is expected to begin
    - Vessels will notify plant in advance of landing; plant will need to notify observer and/or coordinator
- Note: The sampling frame will not always be known in advance, but list of anticipated deliveries will be maintained in-real-time by processing plant personnel (see EFP Permit, Section H, 6, b, ii) so that observers are able to randomize deliveries and coordinate such that observers are available to monitor and the selection of appropriate (randomized) deliveries can be determined in advance.

Sample Unit Selection

- Randomizing directly on deliveries will be the most efficient method (lowest variance per effort).
- Observer is responsible for randomization
- Coordination will be tricky since within each processing plant, the observer team will maintain a single sample frame (EFP CVs and EFP tenders, combined)
    - Aim for monitoring one in three, systematic samples.
    - Allows for missed deliveries – no observer available or offload cannot be sampled for other reasons: sample next offload and then revert to previous sample schedule
    - Will tend to over sample (33% not 30%)

<u>Monitoring Selected Deliveries</u>

Once a delivery is selected to be monitored, observer responsibilities will follow the monitoring priorities (above): salmon enumeration, salmon tissue collections, halibut enumeration, halibut length and viability assessments (all halibut), sample collections for biological data, and fish ticket verification (species composition samples, including herring and PSC crab). Note that salmon data will be recorded by the observer team, through ATLAS, in the NORPAC salmon tables while for halibut, individual

length measurements will be entered for each halibut and totaled for the haul. In both cases, the total number and weight of each species for the delivery will be presented in ObsInt.

The observer team will monitor the offloaded catch as it comes into the processing plant from the vessel, referring to the processing plant's Catch Handling Plan for information about the plant layout and flow of fish through the plant. All salmon will be removed from the catch by either the observer team or by plant personnel under the supervision of the observer team and set aside. At the completion of the delivery, the observer team will enumerate the salmon by species and will collect salmon tissue samples per usual observer sampling methods. Halibut will also be removed from the offloaded catch by the observer team, enumerated, and biological data will be collected (weight, length, viability, etc.). See Appendix D for additional processing plant information.

Offloaded catch will be sampled and the number and weight of all species within the sample will be recorded (similar to species composition samples collected using standard observer sampling methods). From these samples, individual fish of specified species will be randomly selected for collection of other biological data (e.g., length, weight, etc.) and specimens (otoliths).

If insufficient numbers of observers are available, their highest priority will be to monitor the offload for salmon and halibut bycatch (complete enumeration of salmon (by species) and halibut, and crab, and collection of tissues and specimen data) using standard observer methods. If possible given constraints (storage space, plant operations), the observer team will collect a single sample of fish from which they will obtain biological specimens and species composition of the catch. Collection of the sample of catch will follow standard observer methods (randomize, collect multiple samples (if reasonable), collect large samples) within the constraints imposed by the specific sampling situation (e.g., number of observers, speed and depth of the flow of fish, storage space, availability of plant staff assistance, and/or other factors). The observer team member monitoring the delivery cannot stop monitoring the catch for salmon and halibut bycatch to collect these samples but may be able to divert a sample to fish to be processed once monitoring bycatch has been completed. If a single observer is available and storage space is limited, collection of species composition and biological specimens may not be logistically possible.

In all cases, the observer team will monitor delivered catch between vessel and tank or between vessel and start of processing to minimize the potential to lose track of fish. The specific location will depend on the flow of fish and processing plant layout; as needed NMFS will work with the EFP PIs to ensure the observer team has adequate space and tools to achieve monitoring objectives.

The collection of species composition samples will be similar to standard sample collections on trawl vessels. The observer team will use time-as-proxy methods to systematically collect samples throughout the offload. The individual samples will (likely) be small samples (one or two baskets of fish). All species in the selected sample will be recorded and these data will be used for fish ticket verification.

From within one or more of the species composition samples, individual fish will be randomly selected and biological data collected. Biological data collections will be from a subset of species as outlined in the Observer Manual and will aim for collecting the same approximate number that would be expected based on at-sea sampling (i.e. numbers of otoliths or fish lengths). In the BSAI, biological data are collected for salmon, pollock, halibut (lengths), squid, rougheye rockfish, and Sablefish while in the GOA data are only collected for salmon, pollock, halibut, and P. cod.

The length and specimen priority list for this EFP is based on feedback from stock assessors, understanding of observer workflow, and an intent to maintain current specimen collection rates. This table is similar to the one used by observers during standard deployments, pages 13-23 through 13-28 in the 2021 Observer Sampling Manual.

2021 Pollock EM EFP Length Specimen Priority List

Predominant Species	Sex/Length Data	Biological Data (All specimen fish must have an associated s/l/w specimen)	Halibut Condition
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** Measure and Assess the Viability of **ALL** Halibut
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	**Every Sampled Offload** Measure and Assess the Viability of **ALL** Halibut

Data elements that will no longer be available

Haul specific data, including

- location,
- gear retrieval time,
- fishing depth,
- haul durations,
- haul size (t),
- predominant species in the haul,
- between haul variability in species composition

Workload Considerations

Sampling Area and Equipment Considerations:

Processing plant personnel will need to work with NMFS field office staff and the EFP PIs to ensure that adequate sampling conditions are provided, including,

- Access to the flow of fish
- Ability to monitor sorting of catch
    - pace and depth of fish on belts must allow for data collections
- Adequate space to store samples (totes or baskets of fish)!
- Ability to remove fish from belt; this will be specific to the plant
- Location for Observer Scale and sampling tools (totes/baskets/containers, smaller scales, forms)
- Will need an estimate of offload time, size, and if possible duration in addition to the tender log (if applicable)

Prior to the start of monitoring, the observer teams will meet with plant staff to determine best practices for monitoring; FMA staff and PIs will participate as available.

Observer Workload Considerations:

Under current staffing (observers), additional data collection duties have been assigned. This EFP may incur an addition to the workload for observers that may need to be adjusted in future years.

As in past years, during this EFP NMFS and the PIs will need to be able to evaluate the feasibility and effectiveness of sampling and identify areas that need to be fixed/improved. In 2020 we were able to

- Evaluate sampling against sample frame - did we randomize? Did we meet sample goal?
- Shift randomization methods if these are not practicable
- Document where and how many additional observers are needed.
    - If observers often exceed 12hrs or exceed 12hrs by a lot, adjustments to sampling will be evaluated or additional observers will be brought into the project
    - There is an exemption from the 12-hour rule for this EFP
    - Similar to last year, one of the primary goals for this year is to learn enough that future years will be adequately staffed

During the 2021 EFP, we will continue to evaluate these same areas for potential improvements and to assess whether the project goals are being met.

Training Considerations:

For this EFP to be successful, observers will need to be trained before deploying into processing plants participating in the EFP. This briefing will focus on randomization of deliveries to be monitored in the GOA and from tender vessels, prioritization of monitoring duties, and communication between observers, plants, and EFP coordinators. A short briefing will be included in all training sessions (annual and 3 week initial).

Specific tasks include:

- Development of observer packet
    - Monitoring instructions
    - EFP background information to give observers sufficient context to understand EFP goals and objectives
- Development of training curricula and materials
- Development of additional forms that may be needed
    - Offload tracking forms - both anticipated (sampling frame) and actual offloads

- Provision of gear and additional forms

Data Quality/Observer Debriefing Considerations:

Several aspects of this EFP will result in increased workload for debriefing and QA/QC staff including:

- Exit surveys and potentially exit interviews for observers moving out of the EFP (see Appendix E)
- In-season advising will be provided for deployed observers
- Updating/adding/relaxing error scripts in NORPAC, if needed during the 2021 season (this was completed in 2020)

Appendix A: List of participating EFP vessels. Vessels that are new to the EFP in 2021 are designated with a *. The Alaska Beauty (2046), Perseverance (2837), and Chellissa (6222) participated for all or part of 2020 and are not participating in 2021. EM systems are provided by Saltwater Inc. and Archipelago Marine Research (AMR).

Fed. Permit	Vessel Name*
901	Aldebaran*
1688	American Beauty*
434	American Eagle*
3388	Arctic Explorer
2889	Auriga*
2888	Aurora*
516	Bering Rose*
3007	Bristol Explorer
2657	Commodore*
3988	Destination*
1292	Golden Dawn*
3679	Miss Berdie*
428	Nordic Star
2769	Northern Patriot
422	Pacific Viking*
1164	Patricia L
1265	Pegasus
1275	Predator*
512	Progress*
1236	Raven
543	Royal American*
1652	Sea Wolf*
2059	Seadawn

2849	Seeker
2770	Sovereignty*
1167	Starfish*
1998	Starlite*
1641	Storm Petrel*
134	Western Dawn*
523	Arctic Ram
5137	Arctic Wind*
1235	Cape Kiwanda
2791	Collier Brothers
410	Excalibur II
1868	Gold Rush
249	Half Moon Bay*
993	Hickory Wind
1234	Leslie Lee
4506	Lisa Melinda
4305	Pacific Ram
251	Sunset Bay
825	Walter N
6097	Alaska Dawn
2010	Alaskan
1889	Alaskan Lady
1193	Bay Islander
10562	Cape St Elias
3402	Caravelle
3474	Celtic
4579	Courtney Noral
4614	Decision

4208	Equinox
34939	Evie Grace*
4141	Heather Margene
4212	Just in Case
3713	Karen Evich
4657	Lady Joanne*
3734	Lady Lee Dawn
1191	Marathon
4521	Marauder
4131	Michelle Renee*
25218	Miss Courtney Kim
4989	Miss Sarah*
5000	Ocean Storm*
2781	Pacific Star*
4226	Primus
1043	Sea Mac
4144	Shawna Rae
4187	Temptation
1846	Tern

Appendix B: Bering Sea and Gulf of Alaska shoreside processors.

Fed. Permit	Shoreside Plant	Plant Liaison
5306	Trident (Akutan)	
5358	Peter Pan (King Cove)	
4078	Icicle (Dutch - Northern Victor)	
5310	UniSea (Dutch)	
5320	Alyeska (Dutch)	
27990	Trident (Kodiak)	
5342	APS (Kodiak)	
35011	Silver Bay (False Pass)	
30883	OBSI (Kodiak)	
5305	Trident (Sand Point)	
5392	ISA/Silver Bay (Kodiak)	

Appendix C: List of Participating Tender Vessels

Vessel Name	Delivery Processing Plant
Cape Denbigh	Peter Pan
Gayla Maureen	Peter Pan
Bering Hunter	Peter Pan
Polestar	Peter Pan
Perseverance	Trident
Entrance Point	Trident
Four Daughters	Trident
Last Frontier	Trident
Tuxedni	Trident
Bulldog	Trident
Dolphin	Trident
Royal Viking	Trident
Billikin	Trident
Southern Wind	Trident
Barbara J	Trident
Farwest Leader	Trident
Arcturus	Trident
Aldebaran	Trident
Columbia	Trident
Dominator	Trident
Golden Dawn	Trident
Gladiator	Trident
Northern Patriot	Trident
Pacific Viking	Trident
Sovereignty	Trident
Viking Explorer	Trident
Constellation	Trident

Karin Lynn	Trident
Time Bandit	Trident
Katie Lynn	Trident
SBS Provider	Silver Bay
Westward Wind	Silver Bay
Pacific Star	Silver Bay
Rondy's	Silver Bay
Titan Explorer	Silver Bay
Handler	Silver Bay
American Lady	Silver Bay
Debbie Sue	Silver Bay
Sea Venture	Silver Bay
Kona Kai	Silver Bay
Polar Sea	Silver Bay
Incentive	Silver Bay
Kodiak	Silver Bay
Eleinor J	Silver Bay
Tugidak	Silver Bay
Valiant	Silver Bay
Sea Warrior	Silver Bay
Seabrooke	Silver Bay
Diligence	Silver Bay
Pacific Sounder	Silver Bay
Ocean Invictus	Silver Bay
Nordic Lady	Silver Bay
Camai	Silver Bay
Oracle	Silver Bay
Denali	Silver Bay
Nushagak Spirit	Silver Bay
Pacific Star	Silver Bay

Lady Helen	Silver Bay
Mako	Silver Bay
Sea Pride	Silver Bay
Rogue	Silver Bay
Stormbird	Silver Bay
Kaia	Silver Bay
Sea Diamond	Silver Bay
Lady Alaska	Silver Bay
Melanie	Silver Bay
Icy Bay	Silver Bay

Appendix D: Shoreside Processing Plant Layout and Flow of Fish

This Appendix contains descriptions of the processing plant layouts and flow of fish based on FMA knowledge and observations. Actual conditions may differ from what is presented here. These descriptions are provided as a guide to observers and to set initial expectations. These descriptions are not intended to replace processors' Catch Handling Plans.

Bering Sea Plants

Akutan

- Observers monitor sorting from the point at which fish enters the plant
- Fish exits hopper and divides into two sorting lines
- Each conveyor's flow is sorted onto one of two belts nested directly below primary sorting belts
- Bycatch is sorted onto first lower belt and sent to fish meal following being sorted, counted and weighed
- Cod and jellyfish are sorted onto second lower belt and sent to outside totes to be counted and weighed
- Salmon is sorted off primary sorting belts and placed directly into lockable bins
- Hopper scale directly following converging sorting belts. Primary duty is to sort Pollock.
- Observer has sampling station directly adjacent to sorting area equipped with MCP scale and table
- Observer conducts salmon retention count near sample station, collecting sample at sampling station

Unisea (Dutch Harbor)

- Observers monitor sorting from the point at which fish enters the plant
- Fish exits hopper and divides into two sorting lines. Belt nearest observer sampling station is primary sorting belt, furthest belt used infrequently
- Sorters remove misc. bycatch into chutes that lead to totes and salmon bins directly below sorting level
- Salmon is placed in salmon bin and bycatch is sorted into totes to be counted and weighed
- Cod is sorted into individual tote, Skates and other misc. species are sorted into another
- Observer has sampling station directly adjacent to sorting area equipped with MCP scale and table
- Observer conducts salmon retention count on the level below the point where sorting occurs

Icicle – Northern Victor (Dutch Harbor)

- Flow of fish: Fish exits the delivering vessels and enters mid-ship of the Northern Victor where if travels via conveyor belt to an initial incline. From this point fish travels onto the flowscale where it is weighed before landing on the main sorting conveyor belt.
- This belt serves as the main point of sorting where plant crew are stationed along the belt and either allow Pollock to pass through the point of sorting to the next point of processing/sorting OR sort all other species into either the Salmon storage bin, or onto a lower belt which transfer fish to a secondary belt outside to sorting totes. At this point fish

species or species groups are sorted into bins to be accounted for individually and are compiled on the fish ticket.

- Pollock passing the point of sorting travel up an incline and drop onto a size-sorting device that grades the fish by size and directs particular sizes towards different areas for further processing.
- Salmon is accounted for via observer retention count following the running of the offload. Sample fish are worked up at the observer team's designated sample station that is directly adjacent to the sorting belt, near the salmon bin.

Peter Pan Seafoods – King Cove (Place holder, additional information will be provided as it becomes available)

Alyeska Seafoods - Dutch Harbor **(**Place holder, additional information will be provided as it becomes available**)**

Gulf of Alaska

Trident Star of Kodiak (SOK) Plant (North Dock)

- Flow of fish: The fish are pumped out of the vessel's RSW tank/s onto an upper sorting area and then up an incline belt into a dual hopper for weighing (they typically do not use this weight to generate the fish ticket but it is a legal certified scale and can be used), and into one of the 10 RSW holding tanks.
- The fish may be stored in the RSWs for anywhere from 1-36 hours, average is around 5 hours. After storage, the fish are pumped out of the RSW tanks and into the ALKOD factory (where pollock is processed). The fish are weighed again through a set of hopper scales in that factory then run over a size sorter before feeding the factory. Occasionally there are a few salmon and halibut that are missed on the initial sort from the belts feeding the RSW tanks. Those salmon and halibut are pulled out at the size sorter or by the machine operators in the ALKOD plant then sent to the sorting line in the SOK factory to be weighed and recorded with the other waste and bycatch from the offload.
- The EFP observer can monitor the entire offload for salmon and halibut bycatch on the upper sorting belts prior to the fish entering the RSW tanks. Species composition sampling and collection of biological data can also be accomplished at this station. If the fish are run too fast and deep, there is some likelihood that an observer could miss a salmon or halibut, particularly if they have no monitoring assistance by another observer or plant personnel. Per the observer's request, if a delivery has more bycatch than we typically see, the plant could place personnel at the upper sorting area to assist observers in sorting salmon/halibut before the catch goes into the hoppers and then into the RSW tanks.
- On occasion, Trident will pump the fish from the vessel directly to the factory, and bypass the RSW system. When this happens, a member of the observer team will need to be in the factory. The best place for them to stand is adjacent on the main dewatering belt prior to the set of hopper scales in the ALKOD factory. This is not ideal as they will likely miss fish and

need to reconcile with the production manager after the vessel is processed to get the accurate salmon/halibut census information.

- On rare occasions, there will be a delivery with a very high percentage of bycatch mixed with pollock. If this situation were to occur, the fish would be pumped out of the vessel's RSW tank/s onto an upper sorting area and then up an incline belt into a dual hopper for weighing and into RSW tanks 9 & 10. Salmon and halibut would still be pulled off on the upper sorting belt before going in to the RSW tanks, and this would still be the ideal position for an EFP observer. After being offloaded to the plant RSW tanks, the fish are pumped out of the RSW tanks and into a sorting area on the second level of the facility. The sorting area is upstairs in the southwest corner with an adjacent platform scale. This is where the remainder of the sorting will take place. If there are any salmon or halibut that are missed on the initial sort on the dock, they will be pulled out here and recorded with the other waste and bycatch from the offload.

Trident Kodiak Near Island (KNI) Plant (South Dock)

- Flow of fish: The fish are pumped out of the vessel's RSW tank/s to a dewatering box from which they exit onto one of two sorting belts which are staffed with 2-10 sorters depending on the diversity of the delivery. Bycatch is sorted by species and size into one of 12 batch hoppers with the predominant species moving over the flow scales into the plant for processing. Weights from the flow scales are submitted electronically to the office.
- The batch hoppers containing non-predominant species (i.e. non-pollock) are emptied into species-specific totes and weighed.
- The EFP observer would have to monitor the entire offload for salmon and other PSC from the Observer work station adjacent to the sorting area.

Ocean Beauty Kodiak

- Flow of fish: Fish are pumped out of the vessel's RSW tank(s) to a dewatering box from which they exit onto a dewatering belt then onto a sorting belt which is staffed with sorters who separate out bycatch into totes. This sorting area has an observer station for monitoring of the offload and sampling. The predominant species (pollock) flows from this sorting area into any of 9 outdoor RSW holding tanks. The pollock may be held in the tanks from 2-24 hours depending on scheduling or other variables. From the RSW tanks, the fish empty from the RSW tanks onto another dewatering belt into hopper scales for weighing before moving into the plant for processing.
- Salmon, halibut and other incidental species are sorted prior to entering the plant's RSW tanks. As always, there is a chance that a salmon or halibut could pass through the sorting process and into the production area undetected. If this occurs, it would be returned to the appropriated plant personnel for accounting.

North Pacific Seafoods (NPS) Kodiak

- Flow of fish: Fish are pumped from the vessel RSW upstairs to a dewatering tank, onto a sorting belt where all but the main species are sorted off of the belt, and the main species flows onto a dual hopper system (that keeps a weight tally on a computer) and into one or

more of 8 Refrigerated Saltwater (RSW) tanks. This computer is adjacent to the sorting belt area.

- The fish that are sorted before the dual hopper system are then dumped into a hopper below, that weighs those bycatch fish and then dumps them into totes on the ground level. Fish too large to weigh in these hoppers are dumped down chutes into totes at ground level, and are weighed on a platform scale there.
- Salmon are sorted from the main catch from the sorting belt and set aside at the weigh table for an observer to process. After the tanks are emptied into the factory for processing, some small additional sorting or grading may occur in the production room, which contains two platform scales, and those weights are then subtracted from the hopper weight. The fish in the RSW tanks may sit from approximately one to approximately 20 hours before processing, with an average of 4-8 hours. It is possible that salmon or halibut could make it past the initial sort and into these tanks. If that happens, they are separated out in the production room, weighed, and then brought to a plant manager where they are subtracted from the ticker weight of the predominant catch and ascribed to that vessel's delivery.

Trident Sand Point (Place holder, additional information will be provided as it becomes available)

Appendix E: EFP Observer Exit Survey

EM EFP Shoreside Observer Survey

1. Did the pre-deployment NMFS briefing adequately prepare you for your specific EM-EFP shoreside observer duties and sampling protocols?
   Yes No
   What should be added to better prepare future observers?

   Comments:

2. Was there an on-site pre-fishery meeting with Observer program staff and/or EFP Observer port coordinator and plant personnel? Yes No
   If so, did it adequately address your concerns/questions? If not, why not? Yes No

   Comments:

3. Were you given EFP background information prior to deployment to adequately inform you of the project?
   Yes No

   Comments:

4. Was there adequate coordination and communication with your AFA (Bering Sea) observer, if applicable, to facilitate your specific duties?
   Yes No N/A

   Comments:

5. Was there adequate coordination and communication with other EFP observers, if applicable, to facilitate your specific duties?
   Yes No N/A

   Comments:

6. Was there adequate coordination and communication with plant staff to facilitate successful completion of your observer sampling/monitoring duties?
   Yes No

   Comments:

7. Was there adequate coordination and communication with the EFP port observer coordinator, if applicable, to facilitate your specific duties?
   Yes No N/A

Comments:

8. Was there adequate communication with your in-season advisor to facilitate successful completion of your observer sampling/monitoring duties?

   Yes No N/A

   Comments:

9. Communications with plants is vital to the success of the project.
   a. Were you informed of your plant liaison name, position, phone number? Yes No

   b. Were you informed of the offload start at least one hour before an offload began for those EM deliveries selected for sampling? Yes No

   c. Were you informed of offload size estimates and estimated time to complete offload?
      Yes No

   d. Were you ever unable to organize and maintain/update the delivery list due to communication issues? If not, what tools could be provided to help with maintaining the delivery list?
      Yes No
      Comments:

   e. If so, were you able to resolve the issue?
      Yes No
      Comments:

10. Is there any information you think would be useful to add and/or change to the catch handling plan/layout and description? Yes No
    Comments:

11. In selecting EM deliveries for sampling, did you have any issues with the delivery list being accurate and/or up-to-date (in order to randomly select deliveries for monitoring)?
    - Never/rarely
    - Sometimes
    - Frequently

    Comments:

12. Did you have any issues organizing and/or maintaining separate sample frames?
    Yes No

13. Were you able to get the fish ticket information from office staff in a timely manner?
    Yes No

14. Was your sampling station adequate to effectively facilitate your specific duties? Yes No

If not, please provide details in Q15.

15. Was there adequate space/convenient location for your scales, sampling gear? Yes No

16. Did you have adequate space to store samples? Yes No

17. Are there any improvements you would recommend for modifying your station?

18. Were you able to monitor the belt and sort out all the salmon and halibut?
    Yes No
    If not, did plant staff work with you to adjust the belt speed and/or depth or provide other assistance as needed? Yes No
    Comments:

19. Were you able to account for after-scale salmon and halibut (fish that were missed during main offload)?
    Yes No
    Comments:

20. If after-scale fish were encountered, how often did this occur?
    a. Never
    b. Occasionally
    c. Most offloads
    d. Every offload

21. Were you able to complete your length and biological data collections for pollock?
    Yes No

22. Were you able to complete biological data collections for other BS/GOA species?
    Yes No

23. Were you able to conduct species composition sampling?
    Yes No

24. What were the main challenges encountered in conducting your sorting and sampling duties?

25. Was your observer workload:
    a. Manageable?
    b. About normal?
    c. Heavier than usual?
    d. Lighter than usual?

    Comments:

26. How often did you work more than 12 hours in a day?
    a. Never
    b. Rarely
    c. Often

27. Would you request or accept this EFP assignment again? Yes No

28. Other Comments/recommendations?

For observers who worked with tenders:

1. Roughly how long did it take you to complete your tasks for a selected tender delivery?
    a. 0-2 hours
    b. 2-4 hours
    c. 4+ hours
    d. All of the above

2. Did you ever experience logistical constraints that impacted your ability to complete your tasks due to larger and/or fewer offloads?
    a. Not enough storage space
    b. Depth and flow of fish
    c. Availability of plant staff assistance
    d. Back to back offloads/staffing issues
    e. Other (explain)

3. If you were able to do biological and composition sampling, did you have the resources (time, space, support, etc.) you needed to randomize and maximize the number/size of samples?