Agenda Item F.2.a Supplemental NMFS Report 1 April 2017

NMFS Report 1: Electronic Monitoring (EM) Exempted Fishing Permit (EFP) Update Prepared by NMFS West Coast Regional Office PFMC Meeting, April 7-11, 2016

NMFS is providing this report to support the Council's consideration of alternatives for an EM program for groundfish vessels using bottom trawl and non-whiting midwater trawl gear. This report summarizes the performance of the EM EFP program in 2016.

General

The EM EFP program saw increased participation from bottom trawl and non-whiting midwater trawl vessels in 2016 relative to 2015. There were 109 total bottom trawl trips and 33 total non-whiting midwater trawl trips using EM in 2016 (Table 1). Overall, the EFP program performed well. EM program staff and EFP participants were more familiar with the EFP protocols, resulting in few issues that required trouble-shooting or modifications to the program. There were very few malfunctions, and the large majority of issues that arose were resolved by the captains working with Archipelago or on their own.

DeliveryYear	Fishery	Vessels	Trips
2015	BottomTrawl	5	23
2015	NonWhitingMidwater	8	26
2016	BottomTrawl	9	109
2016	NonWhitingMidwater	6	33

Table 1. Summary of EFP participation

Logbooks vs. EM

As a reminder, bottom trawl vessels fished under an "optimized retention" protocol in 2016, in which they were able to discard the majority of non-IFQ species, as well as Arrowtooth flounder, English sole, Dover sole, deep sea sole (counted as Dover sole if discarded), Pacific whiting, and lingcod. Bottom trawl vessels were still required to retain species that could not be differentiated on camera. Non-whiting midwater trawl vessels operated under a maximized retention protocol at the request of participants, who indicated that they prefer to operate similar to whiting trips putting catch directly into the hold without sorting. However, under existing regulations, only whiting vessels on a declared whiting trip (landings > 50% whiting) are permitted to retain prohibited species. Therefore, non-whiting midwater trawl vessels were still required to sort and discard prohibited species on non-whiting midwater trawl trips (landings < 50% whiting).

There was a greater volume of both landings and discards in 2016 compared to 2015, as would be expected from the increased participation and the change in retention protocol. This also resulted in a greater number of discrepancies in the estimation of discards in logbooks and EM. However, overall alignment was close between logbook and EM data (Table 2). Some discrepancies in the amount of discarded flatfish, roundfish, and rockfish, may be explained by an inability of the video reviewer to identify the discard to species and instead recording it at a higher taxonomic category. The discards in these categories are later attributed to IFQ species for debiting from vessel accounts based on the species composition of the haul, trip, or fleet.

Figures 1-4 plot the weight estimates for different species reported by EM reviewers vs. logbook estimates from bottom trawl trips. A single trip is represented by a single data point. Figures with more than 10 data points have trend lines, which in some cases appear to show large deviations from the 1:1 line (where the trend line would be if logbook and EM estimates were equal). This is misleading, however, because the small scale of the discards (0-30 lb) exaggerate the small discrepancies. There appear to be large discrepancies for Pacific halibut and lingcod weights in Figure 4, but the trend is driven by one trip in which there were consistent discrepancies between the EM and logbook weights. We have heard anecdotally from EFP participants that they tend to be conservative on their discard estimates to ensure they are not underreporting, which may explain some instances where logbook weights are greater. Figures were not produced for non-whiting midwater trawl because of the low sample size.

Fishery	Common Name	2015 (lbs)			2016 (lbs)		
		EM	Logbook	Retained Catch	EM	Logbook	Retained Catch
Bottom	Arrowtooth Flounder	269	265	13,148	2,834	2,748	71,655
Trawl	Bocaccio Rockfish	8	-	6,349	-	-	17,095
	Chilipepper Rockfish	26	-	11,332	-	-	9,181
	Dover Sole	34	25	349,165	416	150	2,012,401
	English Sole	2,533	2,317	3,491	6,480	6,749	19,176
	Minor Slope Rockfish	-	-	190	329	-	3,675
	Splitnose Rockfish	-	-	-	2	240	522
	Aurora Rockfish	-	-	18	-	8	-
	Minor Slope Rockfish	-	-	62	-	-	604
	Aurora Rockfish	45	40	10	-	-	780
	Rex Sole	23	-	4,566	23	6	32,530
	Curlfin Turbot	20	-	165	5	-	140
	Pacific Sanddab	28	-	7,674	2,460	2,008	14,284
	Pacific Halibut	395	375	-	5,087	4,465	10
	Pacific Hake	1,865	1,935	1,831	8,442	10,296	7,174
	Petrale Sole	24	-	124,735	53	10	309,692
	Sablefish	218	12	121,619	249	77	558,046
	Shortspine Thornyhead	3	-	53,833	8	99	201,154
	Starry Flounder	-	-	-	4	-	76
	Lingcod	11	4	4,821	1,580	1,846	14,448
	Flatfish Unid	65	-	-	94	-	8
	Pacific Halibut	12	-	-	1,841	2,020	-
	Sanddab Unid	-	-	-	-	-	-
	Roundfish Unid	37	-	-	12	-	-
	Rockfish Unid	1	-	-	-	-	-
	Shortspine/ Longspine Thornyhead	41	-	-	193	-	-
	Fish Unidentified	49	-	-	389	-	-
	Decomposed Fish	15	16	-	6	-	-
	Nonselective Discards (Unknown)	-	-	-	-	150	-
	Dark Rockfish	-	-	-	1	-	-
	Red Rockfish	38	-	-	277	-	-
	Mixed Fish	9	-	-	-	-	-
	Fish Unidentified(IFQ)	-	-	-	107	-	-
	Flatfish Unid(IFQ)	-	-	-	22	-	-
Non-Whiting	Pacific Hake	-	-	85,184	120	-	107,906
Midwater	Nonselective Discards (Unknown)	2,968	100	-	877	4,035	-
	Dark Rockfish	-	-	-	4	-	-

Table 2. Summary of discard estimates from logbook and EM data in 2015 and 2016



Figure 1. Relationship of EM and logbook data for flatfish discards on bottom trawl trips



Figure 2. Relationship of EM and logbook data for rockfish discards on bottom trawl trips



Bottom Trawl Gear: Rockfish Discards

Figure 3. Relationship of EM and logbook data for thornyhead discards on bottom trawl trips



Bottom Trawl Gear: Thornyhead Discards





Bottom Trawl Gear: Other Discards

The number of fish that could not be identified by species increased in each category from 2015 to 2016 for bottom trawl vessels (Table 3). However, the overall number of unidentified fish declined for bottom trawl. This is indicative of overall improvement in catch handling by EFP participants and perhaps also species identification by video reviewers. The majority of discards in non-whiting midwater trawl trips were unknown, because as with whiting midwater trawl trips most discards are non-selective as a result of fish spilling or bleeding from the net.

			Group Unid Discards	Total Discards
Fishery	Year	Species Group	(lbs)	(lbs)
Bottom	2015	Flatfish	66	2996 ^a
Trawl		Rockfish	39	118
		Roundfish	37	2131
		Thornyheads	41	44
		Unknown	3105 ^b	8801
	2016	Flatfish	116	12392*
		Rockfish	278	608
		Roundfish	12	10283
		Thornyheads	193	201
		Unknown	502	30914
Non-	2015	Unknown	2968	2968
Whiting	2016	Rockfish	4	4
Midwater		Roundfish	0	120
		Unknown	877	1001

Table 3. Total discards in mixed or unidentified groups

^a Pacific halibut are not included in the total flatfish weight because EM reviewers are able to distinguish halibut from other flatfish

^b Most of the 3,105 lb Unknown fish in 2015 were from a single net bleed event.

EM vs. Observers

As in 2015, the West Coast Groundfish Observer Program deployed observers on a subset of EM. Observers were deployed on a total of 36 bottom trawl trips in 2016. Non-whiting midwater trawl data is not shown due to low sample size. In general, there was close alignment between observer and EM data, as can be seen in Table 4 and Figures 5-7. Some discrepancies in rockfish, roundfish, and flatfish, may be explained by a video reviewer recording a discard at a higher taxonomic level where the observer recorded to species level. In one instance, 500 lb of arrowtooth flounder was incorrectly recorded by the video reviewer as discarded when it should have been marked retained. This has since been corrected.

Common Name	20	2016		
	EM	Observer		
Flatfish Unid	26	-		
Pacific Halibut	1,962	1,283		
Rock Sole	-	1		
Rex Sole	3	6		
Dover Sole	172	214		
English Sole	3,756	3,945		
Petrale Sole	26	41		
Curlfin Turbot	2	4		
Pacific Sanddab	2,460	3,002		
Arrowtooth Flounder	2,458	1,863		
Sablefish	105	364		
Pacific Hake	3,972	4,273		
Widow Rockfish	-	2		
Widow Rockfish	-	3		
Redbanded Rockfish	-	0		
Rosethorn Rockfish	-	2		
Darkblotched Rockfish	-	16		
Splitnose Rockfish	-	336		
Aurora Rockfish	-	7		
Shortspine/ Longspine Thornyhead	108	-		
Shortspine Thornyhead	-	100		
Longspine Thornyhead	-	62		
Lingcod	904	1,416		
Fish Unidentified	81	-		
Decomposed Fish	3	-		
Minor Slope Rockfish	326	-		
Dark Rockfish	1	-		
Dark Rockfish	4	-		
Red Rockfish	116	-		
Fish Unidentified(IFQ)	107	-		
Flatfish Unid(IFQ)	2	-		

Table 4. Total discards reported by EM vs. observers

^a There is an error in Table 4. EM discards include halibut discarded on trips south of 40°10'N where halibut is not an IBQ species, whereas the observer data set excludes halibut discarded on such trips, resulting in a large discrepancy.



Figure 5. Relationship of EM and observer data for flatfish discards on bottom trawl trips



Figure 6. Relationship of EM and observer data for flatfish discards on bottom trawl trips



Trawl Gear: Rockfish Discards

Figure 7. Relationship of EM and observer data for other discards on bottom trawl trips



Trawl Gear: Other Discards

Estimates of EM Program Costs

NMFS and PSMFC prepared estimated costs for bottom trawl and non-whiting midwater trawl based on 2016 EFP data, summarized in Table 5. Video review cost estimates decreased substantially for bottom trawl from 2015 to 2016. Video review costs for bottom trawl were \$163/sea day in 2015 and are estimated at \$88.06/sea day in 2016. This may be due to the fact that both captains and crew and video reviewers are more practiced at sorting and reviewing, respectively, resulting in faster review rates (review rates were 0.68 in 2015 and 0.49 in 2016). Increased effort by bottom trawl vessels in the EFP in 2016 also resulted in lower costs per sea day for equipment and field services, as these fixed costs were spread over more sea days. For bottom trawl vessels, total cost per sea day of EM is estimated at \$365.22 per sea day, down from \$500 per sea day in 2015.

Total per sea day EM costs for non-whiting midwater trawl vessels is estimated at \$806.67 in 2016. This is substantially higher than the \$500 per sea day estimated cost for an observer. This

high cost is driven by the few number of sea days by this fleet in the EFP in 2016, which resulted in fixed costs being spread over fewer days. This is seen in the \$262.47 per sea day equipment cost and \$513.52 per sea day service cost. The \$513.52 per sea day cost is based on a conservative estimate of \$300,000 total annual cost for field services divided equally among the 46 vessels in the EFP. If the \$300,000 were split equally among sea days instead, then per sea day service costs would be equal among all vessels and total field service cost for a vessel would be driven by the number of days a vessel fished. Different service providers may divide this cost among participants differently, and estimates using both methods are provided to illustrate the potential range of costs. Using the equal per sea day fee of \$150.45 for field services instead results in a total cost of \$443.60 per sea day for non-whiting midwater trawl, and a cost savings of \$6.40 per sea day with camera costs and \$268.87 without camera costs. Since non-whiting midwater trawl trips have quick review rates, even faster than whiting trips, and comparable trip characteristic to the whiting fishery, it would be expected that with more effort (more sea days to defray the fixed costs) non-whiting midwater trawl vessels would see a similar cost savings to whiting vessels. It should also be noted that there are few vessels that fish exclusively in the non-whiting midwater trawl fishery. Most vessels in the EFP fished both bottom trawl and nonwhiting midwater trawl or both whiting and non-whiting midwater trawl. Therefore, examining the fixed costs on a non-whiting midwater trawl trip by itself may not accurately reflect the actual costs for vessels in this portion of the fishery. The fixed costs would also be defrayed by a vessel's sea days in the bottom trawl and whiting fisheries.

	Bottom Trawl	Non-whiting Midwater
		Irawl
# of vessels	9	6
Avg annual sea days per	40.1	12.7
vessel		
Avg review minutes per haul	64	9
Avg review rate	0.49	0.17
Avg review hours per trip	6.30	0.40
EM Per Sea Day Costs		
Equipment cost ^a	\$83.13	\$262.47
Review cost ^b	\$88.06	\$4.98
Data storage cost ^c	\$31.39	\$25.70
Service & maintenance fees ^d		
Split equally among vessels	\$162.64	\$513.52
Split equally among days	\$150.45	\$150.45
Total Per Sea Day Costs		
EM cost per sea day ^f	\$365.22	\$806.67
Observer cost per sea day	\$500	\$500
EM Savings Per Sea Day		
With camera cost	\$134.78	(\$306.67)
Without camera cost	\$217.91	(\$44.20)

Table 5. Summary of Per Sea Day Costs for EM vs. Observer

^a Equipment cost assumes \$10,000 total cost amortized over 3 years and average annual sea days.

^b Review cost based on \$50/hr review cost.

^c Data storage cost for whiting trips used as a proxy for non-whiting midwater trawl trips, because they have similar trip characteristics.

^d Service and maintenance fees assume \$300,000 total annual cost, 46 vessels, and 1,994 sea days. ^e # vessels, etc. based on 2016 EFP fleet.

^f Total EM cost per sea day based on service fees split equally among vessels