

**Electronic Monitoring (EM) Exempted Fishing Permit (EFP) Update  
Prepared by NMFS West Coast Regional Office  
PFMC Meeting, March 8-14, 2016**

NMFS is providing this report to support the Council's consideration of whether to extend the EM EFPs beyond December 2016. NMFS updated the Council on the at-sea and shorebased whiting EFPs at its November meeting and is now providing the Council an update on the performance of fixed gear and bottom trawl vessels. NMFS is also providing an update on the overall performance of the EFPs, and how EM data was uploaded to the Vessel Account System at the end of the year.

*Logbooks vs. EM*

In December, NMFS finalized business rules for determining when to use logbooks and EM data to debit discards from Individual Fishing Quota (IFQ) and Individual Bycatch Quota (IBQ), when the two data sources do not agree. As a reminder, Pacific States Marine Fisheries Commission (PSMFC) had been uploading logbook discards throughout the EFP to vessel accounts to debit reported discards from IFQ. In December, NMFS and PSMFC compared the EM estimates generated from the video review to the logbook estimates and determined when the logbook estimate should be replaced with the EM estimate in the Vessel Account System. In developing the business rules, NMFS reviewed the results of the EFPs and other EM programs and identified the following criteria for an appropriate standard.

- The standard should be based on a comparison of weights, rather than counts, because the IFQ fishery and cooperative allocations are managed by weight.
- The standard should allow for some difference between logbook and EM estimates. EM estimates are intended to be an independent, unbiased estimate of discards, but they are still estimates and have some inherent uncertainty. It is not reasonable to expect that logbook and EM estimates be exactly equal. In addition, a small allowable difference creates an incentive for captains to report correctly to have their own data used for management.
- The program data is being used to account for catch of IFQ species, so there is a need to minimize uncertainty in discard estimates and to consider different rules for overfished and non-overfished species.
- The standard should be rigorous enough to minimize uncertainty, but should not be so challenging as to be unattainable.

With these criteria in mind, NMFS developed the following standards for comparison of logbook and EM data. These business rules were applied to comparisons of logbook and EM discards on fixed gear, bottom trawl, and non-whiting midwater trawl trips (Table 1), and whiting trips (Table 2) to determine which data will be used for debiting allocations of IFQ species. NMFS shared the business rules with EFP sponsors and participants by email on December 18, 2015.

**Table 1. Business Rules for Fixed Gear, Bottom Trawl, and Non-whiting Midwater Trawl IFQ Trips**

<b>Species/Group</b>	<b>Rule</b>
All IFQ species/groups	If a discard is reported on EM, but not in the LB, use the EM estimate. If a discard is reported in the LB, but not by EM, use the LB estimate.
Canary rockfish, darkblotched rockfish, bocaccio rockfish South of 40°10'N, cowcod rockfish South of 40°10'N, and yelloweye rockfish, petrale sole, and pacific ocean perch North of 40°10'N (Overfished species*)	If the LB and EM estimate are not equal, use the larger of the two estimates.
All non-overfished IFQ species/groups	If the absolute difference between LB and EM is 10% or less of the EM estimate, use LB. If absolute difference is greater than 10%, use the larger of the two estimates.
All IFQ species/groups	If there is no EM estimate (e.g., due to EM system failure), use LB estimate.

LB = logbook, EM = electronic monitoring

\*Although canary rockfish and petrale sole have been declared rebuilt, they are being managed under rebuilding plans in the current specifications cycle through 2016.

**Table 2. Business Rules for Pacific Whiting IFQ Trips**

<b>Species/Group</b>	<b>Rule</b>
Total weight of discard	If a discard is reported on EM, but not in the LB, use the EM estimate. If a discard is reported in the LB, but not by EM, use the LB estimate.
Total weight of discard	If the absolute difference between LB and EM is 10% or less of the EM estimate, use LB. If absolute difference is greater than 10%, use the larger of the two estimates.
Total weight of discard	If there is no EM estimate (e.g., due to EM system failure), use LB estimate.

LB = logbook, EM = electronic monitoring

On whiting trips, the business rules were applied to the total weight of the discard, before species composition is extrapolated from the fish ticket, because whiting discards are not reported to species. The comparison is made at the trip level for shorebased trips and at the haul level for MS/CV trips. A haul level comparison for shorebased trips would also be appropriate, but would

require time-consuming matching of the hauls between the two datasets. In order to debit vessel accounts as soon as possible, NMFS applied the business rules to trip-level comparisons. Trip level is an appropriate level of comparison for shorebased trips, because video from 100 percent of the hauls are reviewed generating an EM trip total of IFQ discards by species/group to compare to the logbook trip total. Mothership catcher vessel (MS/CV) data must still be compared at the haul level because MS/CV discard data is incorporated into the mothership observer data at this level. We may revisit comparing shorebased trip data at the haul level in 2016.

As with shorebased whiting trips, data from bottom trawl, fixed gear, and non-whiting midwater trawl, were compared at the trip level. The business rules were applied to the IFQ species or group level for all non-whiting trips.

NMFS and the PSMFC updated vessel accounts with EM data according to these business rules on December 23, 2015. This timing was difficult for EFP participants and we want to thank all the participants and EFP sponsors for their patience and cooperation throughout the process. Most changes were small, but some vessels that had zeroed out their accounts at the end of the year saw account deficits. NMFS staff personally notified those vessels with large deficits or large changes to their accounts so that they could obtain quota pounds to cover the deficits before the end of the year. The West Coast Groundfish Observer Program (WCGOP) updated the mothership observer data in NORPAC using the EM estimates and completed this update on January 8, 2016.

Overall, there was close alignment between logbook and EM data. The percentage of records where the logbook was used to debit the account were 37 percent for bottom trawl, 47 percent for fixed gear, 33 percent for shorebased whiting, and 52 percent for MS/CV (Table 3).<sup>1</sup> Of those records that were changed, all but a few were small amounts and did not have a large impact on most individual vessel accounts (Table 3). A small amount of variability is to be expected, because both logbook and EM data are estimates, and can be improved over time as captains get more experience estimating discards. The majority of large differences were from nine tows on shorebased whiting trips (see PSMFC preliminary 2015 report for more detail: [http://www.pcouncil.org/wp-content/uploads/2015/11/I5a\\_Sup\\_NMFS\\_EM\\_Rpt2\\_Nov2015BB.pdf](http://www.pcouncil.org/wp-content/uploads/2015/11/I5a_Sup_NMFS_EM_Rpt2_Nov2015BB.pdf)). The majority of discard differences for the fixed gear fleet came from sablefish discards and from one vessel in particular that had been consistently underreporting discards of sablefish throughout the season (Table 4). These small differences accumulated over time and resulted in a large update to the vessel's account at the end of the year. NMFS believes this issue resulted from a lack of experience in estimating discard weights rather than non-compliance and will work with the captain to improve his estimates in 2016.

NMFS intends to continue using the same business rules described above. NMFS and PSMFC are working to update vessel accounts with EM data on a regular basis to avoid such surprises for

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<sup>1</sup> Records are defined as follows: MS/CV records are unique hauls; shorebased whiting records are unique trips; fixed gear and bottom trawl records are unique species/trip combinations.

vessels moving forward. PSMFC is also working with the staff at the Northwest Fisheries Science Center to make programming changes to the vessel account system to allow vessels to see logbook and EM data side-by-side for all trips, not just those where the logbook estimate was replaced, so that vessels can more easily QA/QC their own data.

**Table 3. Summary of changes made to vessels accounts using EM data.**

	<b>Bottom Trawl</b>	<b>Fixed Gear</b>	<b>Shorebased Whiting</b>	<b>MS/CV</b>
<b>Original discards (lb)</b>	<b>4,435</b>	<b>19,256</b>	<b>127,190</b>	<b>271,290</b>
Unchanged				
Amount (lb)	3,657	13,172	87,740	178,856
# records	23	86	112	236
% records	28%	47%	33%	52%
EM>0, LB=0				
New amount (lb)	473	127	17,777	14,881
# records	28	14	204	139
% records	34%	8%	59%	30%
EM>LB by 10%				
New amount (lb)	1,324	10,487	129,429	243,344
# records	32	83	28	83
% records	39%	45%	8%	18%
<b>New total discards (lb)</b>	<b>5,454</b>	<b>23,786</b>	<b>234,946</b>	<b>437,081</b>
Difference (lb)	1,018	4,529	107,756	165,790

Records are defined as follows: MS/CV records are unique hauls; shorebased whiting records are unique trips; fixed gear and bottom trawl records are unique species/trip combinations.

**Table 4. Summary of changes made to vessel accounts by species and species group for fixed gear and bottom trawl.**

	Bottom Trawl			Fixed Gear		
	Original Discards (lb)	New Total (lb)	Difference (lb)	Original Discards (lb)	New Total (lb)	Difference (lb)
Arrowtooth Flounder	63	145	82	60	135	75
Bocaccio Rockfish	-	8	8	-	-	-
Chilipepper Rockfish	-	27	27	-	-	-
Darkblotched Rockfish	-	-	-	2	3	2
Dover Sole	19	35	16	3	8	5
English Sole	420	813	393	-	-	-
Lingcod	4	11	7	160	290	130
Longspine Thornyhead	19	36	17	-	-	-
Minor Shelf Rockfish	3	3	-	-	-	-
Minor Slope Rockfish	49	54	5	13	24	11
Other Flatfish	1	73	72	-	-	-
Pacific Hake	162	299	138	3	12	9
Pacific Halibut	-	12	12	958	1,604	646
Petrale Sole	30	54	24	-	-	-
Sablefish	5	220	215	4,816	8,443	3,627
Shortspine Thornyhead	-	3	3	69	95	26
Splitnose Rockfish	4	4	-	-	-	-
<b>Grand Total</b>	<b>779</b>	<b>1,797</b>	<b>1,018</b>	<b>6,085</b>	<b>10,614</b>	<b>4,529</b>

In November, NMFS provided the Council a preliminary PSMFC report that summarized the discrepancies between logbook and EM estimates from shorebased whiting and MS/CV trips. PSMFC prepared the figures in Appendix 1 summarizing the differences between logbook and EM discards for fixed gear and bottom trawl vessels as of December 23, 2015. There have been a few non-whiting midwater trawl trips to date, but by fewer than three vessels, so this data was excluded from the tables to protect confidentiality. Overall, the non-whiting midwater trawl trips have been going well with no issues with catch handling.

Most bottom trawl and all fixed gear vessels are fishing under maximized retention rules, meaning all catch must be retained with a few exceptions for mutilated and depredated fish, prohibited and protected species, large fish, and invertebrates. One bottom trawl vessel fished under optimized retention rules, which allowed discarding of recognizable non-IFQ species, Dover sole, English sole, Arrowtooth flounder, and Pacific whiting. The figures in Appendix show small amounts of discards of rockfish, thornyheads, and flatfish. Most of these discards on fixed gear trips are as a result of depredation and are allowed. Some of the discards shown for both fixed gear and bottom trawl trips are not allowed under the EFP, but are not necessarily evidence of a compliance issue. EM requires changing ingrained habits, which can take time and mistakes are to be expected. PSMFC and NMFS staff followed up with vessels after such incidents to clarify and reinforce the retention rules and most vessels improved over time.

The figures show overall close alignment between logbook and EM discard estimates. 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 were some instances where discarded fish could not be identified to species, but these were small amounts relative to the total discards (Table 5). PSMFC used proportions of discards identified to species for the same haul, vessel, or fleet, to apportion these discards to species for debiting from vessel accounts. There were also some instances where fish were removed from camera view and the video reviewer could not determine whether they were retained or discarded (Table 6). PSMFC provides feedback to vessel captains after each hard drive review to adjust their catch handling to reduce the number of such incidents.

**Table 5. Summary of unidentified fish.**

	<b>Amount Unidentified (lb)</b>	<b>Total Discards (lb)</b>
Thornyhead	44	242
Rockfish	42	164
Flatfish	70	5,285
Unknown fish	49.5	
<b>Grand total</b>	<b>206</b>	

**Table 6. Summary of instances of fish removed from camera view.**

	# Trips with at least 1 Instance	Total # Instances on All Trips
Bottom trawl	0	0
Fixed gear	9	23
Shoreside whiting	0	0
MS/CV	1	1

There were 37 out of 584 total EFP trips (approximately 6 percent) that had gaps in video imagery. The majority of these were small interruptions of a few minutes caused by short power interruptions and generally did not disrupt monitoring of catch sorting. A total of 5 trips (less than 1 percent of all trips) were missing video imagery from a complete haul and 1 shorebased whiting trip had no imagery at all. These issues occurred earlier in the season and NMFS and PSMFC worked with the vessels and Archipelago to reduce the occurrence of such incidents.

**Table 7. Summary of gaps in video footage.**

	Total # Vessels	Total # Trips	# Trips with Video Gaps	# Trips with Missing Haul	# Trips with No Video
Bottom trawl	4	19	6	0	0
Fixed gear	7	57	8	0	0
Shoreside whiting	17	483	14	3	1
MS/CV	9	25	3	2	1

*Next Steps*

NMFS believes that the EFPs have been performing very well overall and **that these results support moving the whiting and fixed gear fleets to EM regulations for 2017**. NMFS has been working with the GEMPAC and GEMTAC on draft regulations for the whiting and fixed gear fleets for the Council to deem at its April meeting.

We are working with EFP sponsors on finalizing the terms of the 2016 EFPs, as well as adding new vessels to the EFPs. Vessels are currently fishing under extensions to their 2015 EFPs until the 2016 EFPs are issued. Some changes to the 2016 EFPs that are under discussion are:

- Expanding optimized retention to more bottom trawl vessels;
- Fine-tuning camera configurations to reduce unnecessary data collection to save storage space; and,
- Refining VMPs to be more vessel-specific and a tool to plan for at-sea malfunctions.

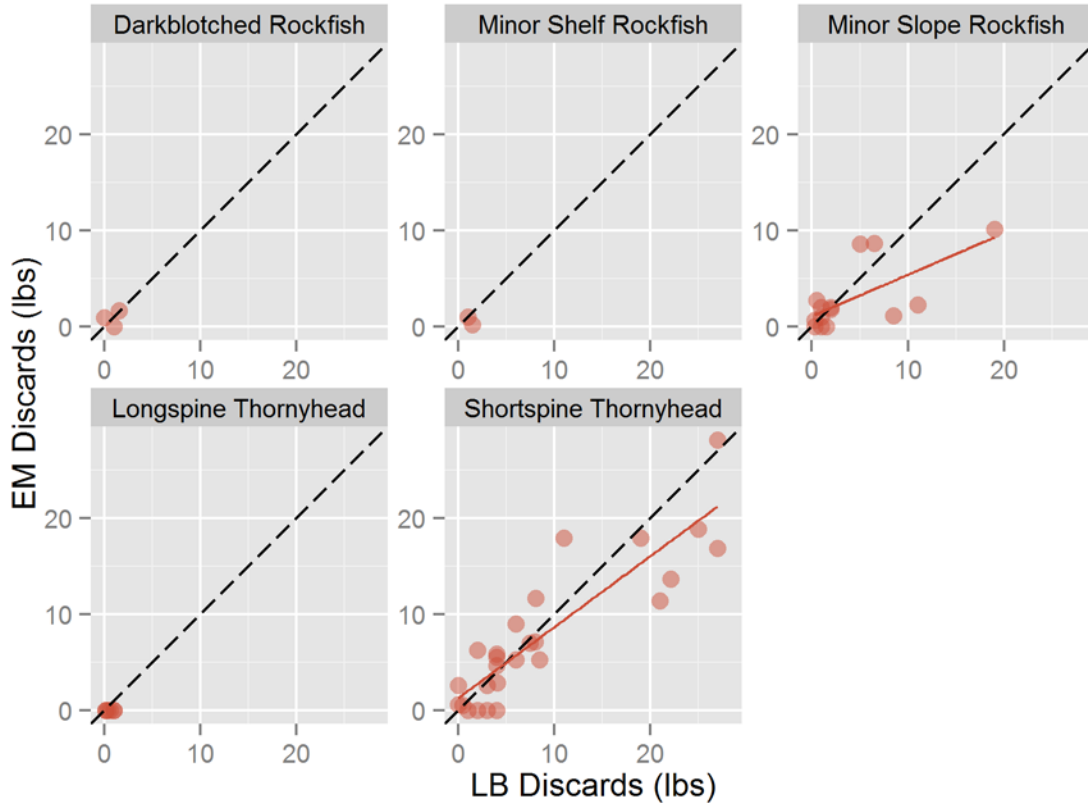
Bottom trawl gear continues to present the most challenges for EM. EFP sponsors and participants have expressed concern over the operational burden of maximized retention rules and believe this is a significant impediment to bottom trawl vessels joining the EFP and using EM under regulations. They would like to find a way to be able to discard at least recognizable non-IFQ species, as well as some IFQ species. Video reviewers currently do not track discarded non-IFQ species, except for compliance purposes, because doing so would increase review times and the data collection priority is for total accounting of IFQ species. Video reviewers could



conceivably collect data on discard non-IFQ species, but it would require careful catch handling by crew members, which could be onerous and time consuming at large volumes, and likely increase review times and costs. Without these measures, NMFS and the Council would rely on data collected from WCGOP coverage to manage non-IFQ species. Figuring out how to make EM work for bottom trawl despite these issues will be a priority focus for NMFS, PSMFC, and the EFP sponsors in the 2016 EFPs. In light of this impediment, it is likely not worth moving bottom trawl to regulations before the results of the 2016 EFPs are available. This would put implementation of bottom trawl EM regulations in mid-2017 or 2018. Given that the current EFPs expire at the end of 2016, **we recommend that the Council extend the current EFPs through at least 2017 to provide additional time to work through these issues for bottom trawl gear and gather additional data for non-whiting midwater trawl.**

**Appendix 1.**

**Fixed Gear: Rockfish and Thornyheads Discards**



**Figure 1. Relationship of EM to Logbook for Rockfish and Thornyhead Discards on Fixed Gear Trips**

### Fixed Gear: Flatfish Discards

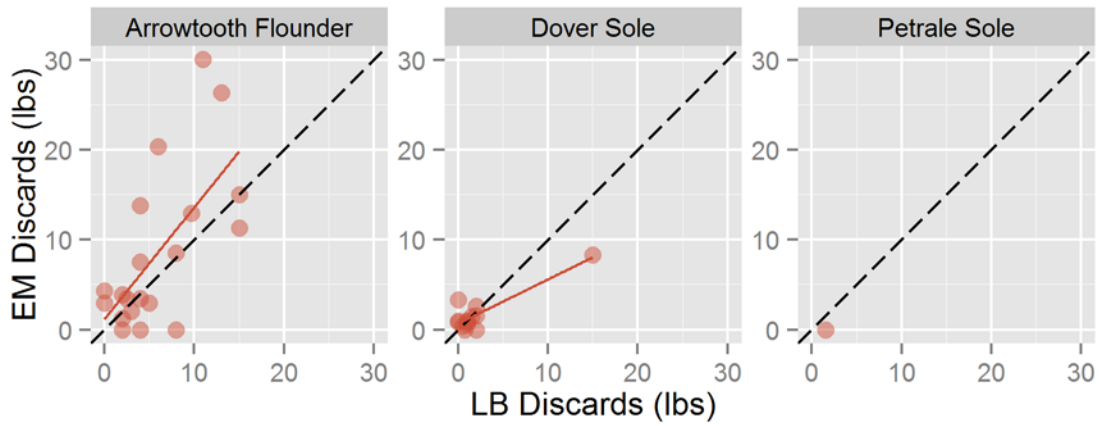


Figure 2. Relationship of EM to Logbook for Flatfish Discards on Fixed Gear Trips

### Fixed Gear: Other Discards

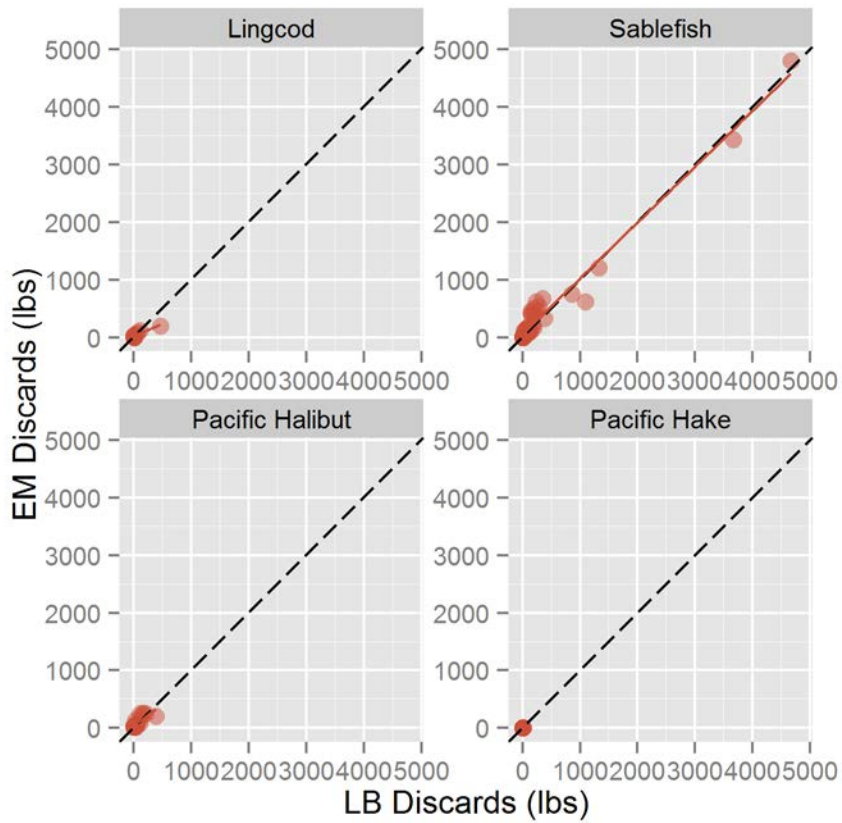
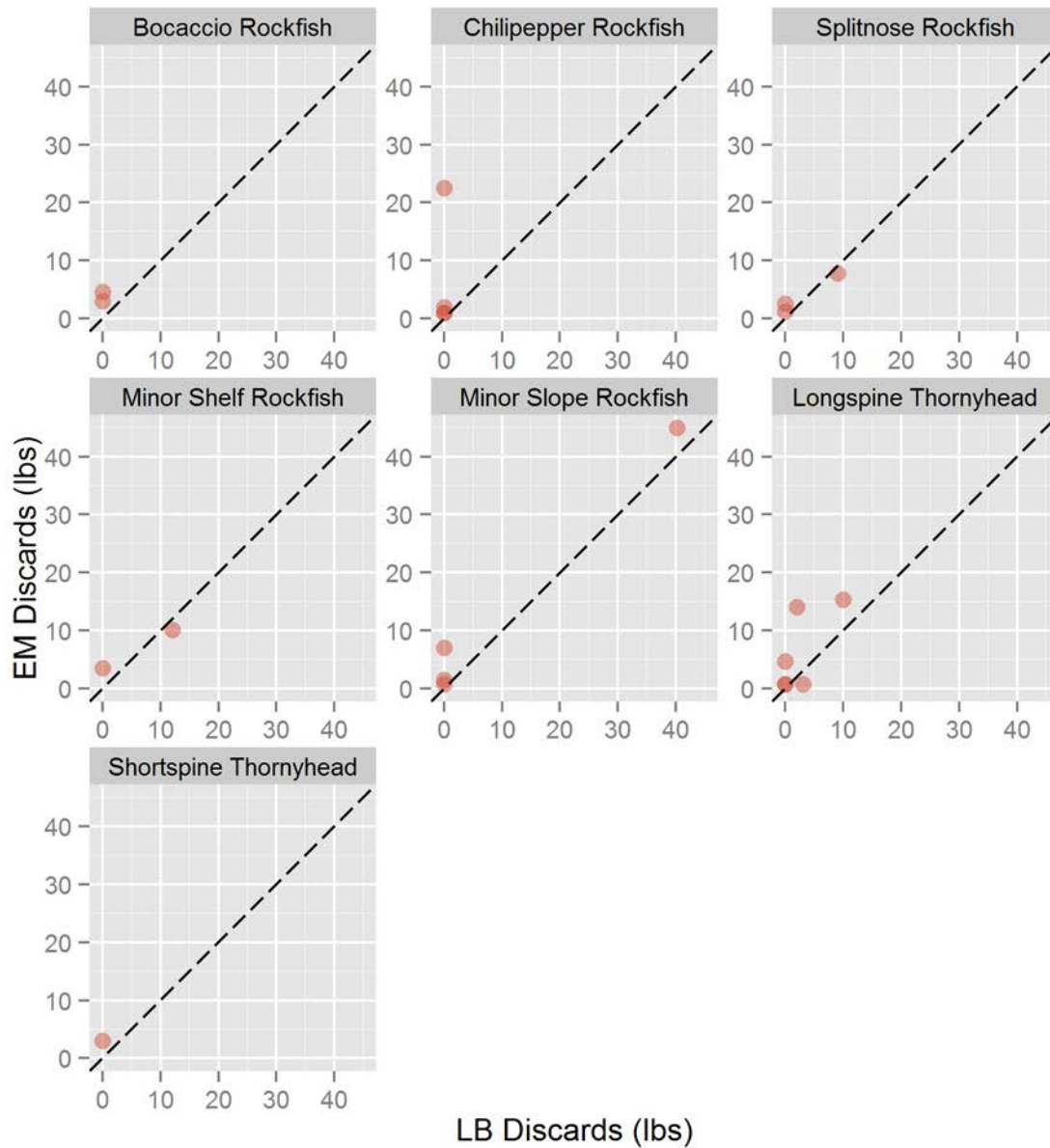


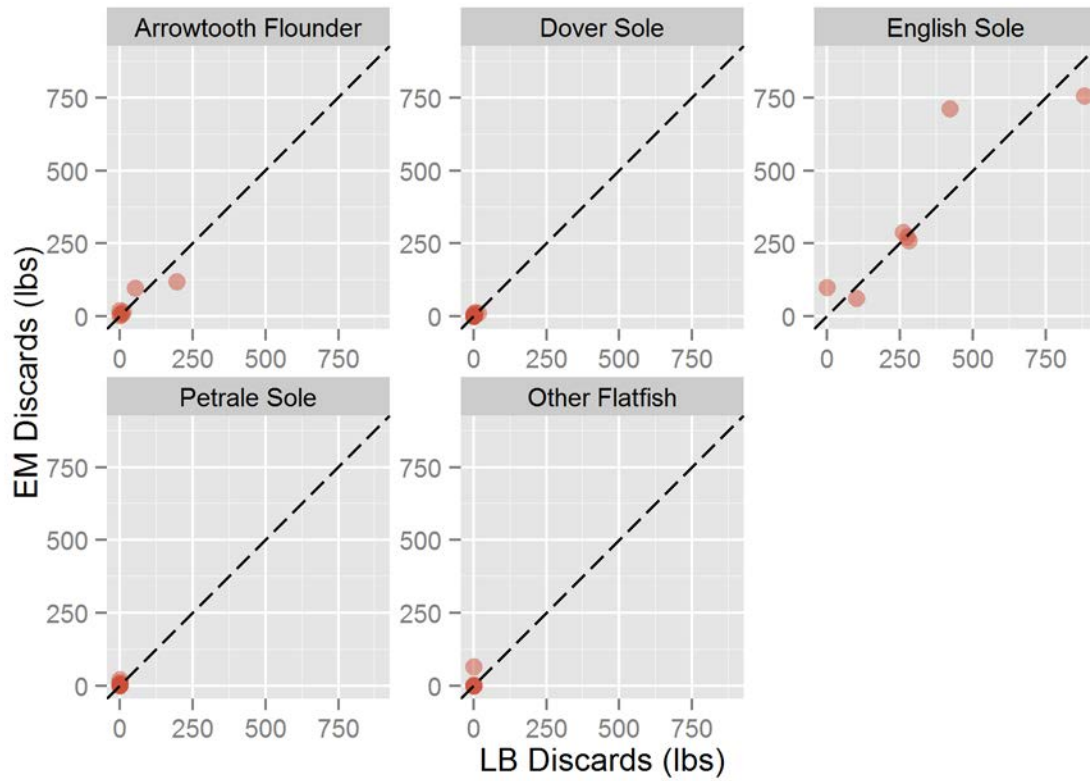
Figure 3. Relationship of EM to Logbook for Other Discards on Fixed Gear Trips

## Trawl Gear: Rockfish and Thornyheads Discards



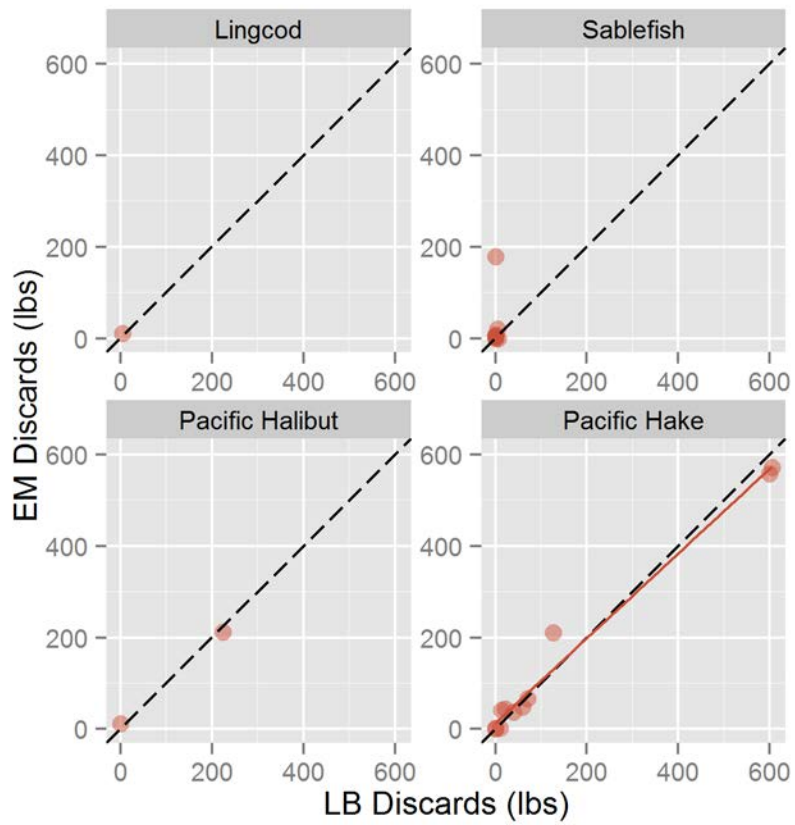
**Figure 4. Relationship of EM to Logbook for Rockfish and Thornyhead Discards on Bottom Trawl Trips**

## Trawl Gear: Flatfish Discards



**Figure 5. Relationship of EM to Logbook for Flatfish Discards on Bottom Trawl Trips**

### Trawl Gear: Other Discards



**Figure 6. Relationship of EM to Logbook for Other Discards on Bottom Trawl Trips**