

Center Feedback on CAMS Discards

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Introduction

The Center’s CAMS discard review team (Chuck Adams, Jason Boucher, Lei Hu, Leona Burgess, Chris Legault, Sean Lucey, Susan Wigley, Toni Chute) prepared three products for the stock assessment leads in the Population Dynamics Branch (PDB) to review. The first product was an analysis of CAMS discards by stock ([html](#) and [pdf](#)) sent on September 19, 2022. Discards by stock areas and gear, along with the definitions of stock areas, gear stratifications, and discard mortality rates, were compared between CAMS and StockEff (the PDB’s application that provides catch and survey information for use in stock assessment). The second product compared the observer length distributions between CAMS and StockEff ([html](#) and [pdf](#)) sent on September 28, 2022. The third product provided the electronic monitoring (EM) length frequency distributions by stock for the groundfish species currently covered by EM ([pdf](#)) sent on October 28, 2022. In all three cases, feedback was requested on red flags or concerns found when the stock leads examined the information for their stock. Not all stock assessment leads were able to respond to this request for feedback due to competing demands on their time, but a sufficient sample size responded to provide feedback to the CAMS programming team. It is expected that more stock-specific details will arise in the future and these will be handled through Jira tickets as necessary.

Overall, no red flags were found that prevent the Center for Independent Experts (CIE) review of CAMS from occurring in January. There were a number of common issues that arose across a number of stocks that are highlighted below. There were also some general issues that were not stock-specific. Both of these types of concerns are described in the General section below. The Summary Table provides an overview of which of the stocks were associated with the main concerns. The Stock Specific section provides detailed feedback from the stock leads. Note that the CAMS programming team continued to improve CAMS during the evaluation period and the results found below may no longer reflect the data currently available in CAMS.

General

Stock leads provided feedback on 36 stocks, 32 of which had information available in CAMS allowing examination of details. The other four stocks are included in the Summary Table to indicate the definition of managed stock is a bit gray. There are additional Atlantic States Marine

Fisheries Commission (ASMFC) stocks that require discard information but are not listed here. There were 10 stocks where the leads found no problems and could use the information available immediately. The remaining 22 stocks had at least one issue noted. These issues were

- Area: differences in the statistical areas used to define the stock between CAMS and Stockeff (12 stocks)
- Gear 0_: concern with “0_” gear groups responsible for too many discards (7 stocks)
- Gear Proportions: concern with the relative amount of discards by gear groups (8 stocks)
- Amount: concern with the magnitude of discards for one or more gear groups or overall (9 stocks)
- Length: loss of observed trips/hauls for lengths (3 stocks)
- EM length frequencies have strange odd/even length patterning (not listed by stock because it already has a Jira ticket [CAMSNR-346](#))

Of significant note, CAMS is currently configured to address the first four issues listed above through the use of lookup tables that should not require any additional programming. This approach in CAMS is well-suited for stock-specific modifications and will allow improvements to occur over time as the discard estimates are used for quota monitoring, stock assessment, and other purposes.

The Area issue is already being addressed in [CAMSNR-280](#). In most cases, it does not appear to be a major concern, but rather associated with statistical areas at the extremes of the range (e.g., near the northern or southern boundaries). However, aligning the areas in CAMS with those used in stock assessment and quota monitoring would move towards the “single set of books” goal of CAMS and reduce confusion regarding catch accounting in the region.

The Gear 0_ concern appears to be a high priority given the large number of stocks impacted and the large differences in magnitude that it created in some cases. This concern arose in some cases due to discard rates on federal trips being applied to state trips where the species does not occur (e.g., deep sea red crab). In other cases, it can be caused by low (or no) observer coverage in one type of gear with large amounts of kept fish requiring a grouping with other gears that may not be appropriate for discards of a given species (e.g., menhaden purse seine). This is a challenging issue with no obvious solution. Instead it will require some work on a stock-by-stock basis to identify which gear 0_ groups need to be modified and how to do so in a way that is biologically plausible and data-driven.

The Gear Proportions issue is also stock-specific and associated in some cases with the Gear 0_ issue noted above, but in other cases reflects differences between the previous approach to estimating discards in stock assessment and the approach used in CAMS (e.g., wolffish). Some of this may be due to the use of different sizes used for large and small mesh otter trawl or gillnet gear and may not require any changes to CAMS. Rather it may raise awareness of how these seemingly small changes can result in relatively big differences in discard estimation.

The Amount concern is also sometimes related to the Gear 0_ concern, but in some cases appears to be something else (e.g., surfclam). It may be that the estimation of discards for all fleets, instead of just a selected set of gears, is contributing to this issue for some stocks. This issue will also need to be addressed stock by stock.

The strange odd/even EM length distribution issues were not specifically mentioned by most stock leads, but are still concerning because they are used for the conversion between the amount of discards in weight (metric tons) to the number of fish caught at age. Stock assessments that use catch at age can track cohorts of fish through their life cycle and provide improved forecasts of future catches compared to stock assessments which do not have catch at age information. Since length information is not contained within CAMS, users have to determine which lengths are associated with the trips that create the discards in CAMS. Specifically, the linking of trip information within CAMS to the correct length frequency information in the observer database (OBDBS) or Northeast Electronic Monitoring Information System (NEMIS) can be challenging. This issue continues to be addressed in CAMS and we need to ensure that it remains a priority in the future as data or process changes in CAMS, OBDBS, or NEMIS could easily break the links that are currently working.

For the EM length frequency review, the table on page 7 was created based on the CAMS data at the time which only included GF=1 trips and thus shows fewer discards by sources other than DELTA or EM that occurred for GF=0 trips. This means that the EM discards for groundfish are an even smaller portion of the total discards than the table on page 7 shows. However, it is not known whether or not the discard at length patterns on the EM trips differ from trips with a human observer, therefore it would be useful to handle these as separate discards at length components until an evaluation can be conducted.

In addition to these issues identified by the stock leads, the CAMS discard review team identified a number of issues during the development of the three products noted above related to the future use and functioning of CAMS, the Standardized Bycatch Reporting Methodology (SBRM), and the National Bycatch Report (NBR).

The use of automated weekly runs of CAMS discards will ensure that all programming modifications, runtime diagnostics, and data uploads are functioning properly. The partial runs encountered during this evaluation led to some inconsistencies within the data and confusion at times. Development of a full suite of diagnostics and checks will ensure CAMS is producing the highest quality data possible and all components of CAMS are in sync. As quota monitoring and stock assessments (and other users) use CAMS discards, we expect to continue to find new issues that can be added to these diagnostics and checks as well as provide feedback to upstream data providers.

Similarly, the only constant in fisheries is change, so we see the need for a long-term plan for addressing new types of data and/or statistical analysis in the future within CAMS. We support the development of a system for change control in the future, as noted in [CAMSNR-144](#)), and hope the documentation will be updated to reflect changes as they are made. Stability in the

processes will facilitate this documentation process. We recognize the challenges associated with documenting a system as it is being developed.

While CAMS has separate Oracle data tables for landings and discards, discard data are directly linked to landings data via the use of an expansion factor based on the kept weight of all species (i.e., the landings). It will be important to consider discards when making decisions regarding changes to the processing (inclusion of and/or adjustment to) the landings data.

The CAMS discard methodology utilizes data which accumulate during a 12 month fishing year. CAMS has 6 discard modules, using 5 different 12 month fishing year intervals. While discard estimates are available throughout the interval for each species, the discard ratios and the kept weight of all species used to derive an annual discard estimate may change as more data becomes available during the 12 month interval. Discard ratios and landings may not stabilize until the 12 month interval for the given species is complete and an additional 3 months have passed to audit and finalize the observer data used in the discard ratio. Additional work is needed to evaluate the impacts of using species-specific discard estimates prior to the completion of the 15 month interval (e.g., using the previous calendar year data in a spring stock assessment).

It appears that the trips with DISCARD_SOURCE = "EM" are roughly 30% and 35% of the total EM trips in 2020 and 2021, respectively. Would this be useful feedback to the NEMIS review team to ensure that a sufficient number (or target rate) of randomly selected EM trips for review also contain the required information to match CAMS trips? This is another way that CAMS can highlight issues that otherwise could easily be overlooked in the complex world of fishery dependent data.

In addition to the Jira ticket noted above regarding strange odd/even length distributions in EM data, there are a number of other EM-related Jira tickets that when done could be used as the basis for improving the documentation of how users should best utilize EM length data (e.g., [CAMSNR-308](#), [CAMSNR-348](#), [CAMSNR-316](#), [CAMSNR-345](#), [CAMSNR-295](#)). It would also be useful to know which EM trips were not reviewed. EM trips not reviewed and EM trips with a failed review appear to be indistinguishable using the CAMS DISCARD_SOURCE. Perhaps there is information within the NEMIS database that could be brought into CAMS to allow this distinction to be made.

The SBRM estimates the number of observed trips needed to achieve a 30% coefficient of variation for all fleets, with guidelines for how to modify this estimate if funding is insufficient to meet this goal. The near-term solution for offwatch hauls in the limited access scallop dredge fleet may create problems for this approach. This is because the near-term solution treats the trips with offwatch hauls as unobserved trips, thereby reducing the sample size of observed trips considerably. Work is on-going (and additional work may be needed) to overcome the challenge to derive variances from a significantly reduced pool of observed trips in the limited access scallop dredge fleet. This issue may be resolved by the long-term solution to offwatch hauls. An

approach that addresses both discard estimation and sample size analyses is needed to meet SBRM requirements.

The CAMS stratification is similar, but not identical, to the SBRM stratification. At this time, it is not known how these differences will impact the sample size analyses of SBRM. For example, both CAMS and SBRM use region and mesh size groups as stratification variables. In SBRM region is land-based to support observer deployment, while in CAMS region is water-based. In SBRM mesh size groups use a mesh size cut point of 5.5 inches while CAMS uses 4.0 inches. The changes in stratification will require additional analyses to evaluate the impacts on existing SBRM sample size methods.

There are approximately 300+ species in the NBR analysis which are not yet included in CAMS. At this time, we do not anticipate challenges/limitations in using the CAMS estimation method and stratification for these species/species groups when these species/species groups are included in CAMS discards. We do anticipate that the inclusion of additional species/species groups would (1) require additional resources (staff time) to expand existing species support tables, and (2) would greatly increase the size of the existing discard data Oracle tables/views, which could impact the performance of the existing Oracle data tables/views and data storage. Discussions on data table structures and performance are on-going (see [CAMSNR-336](#)).

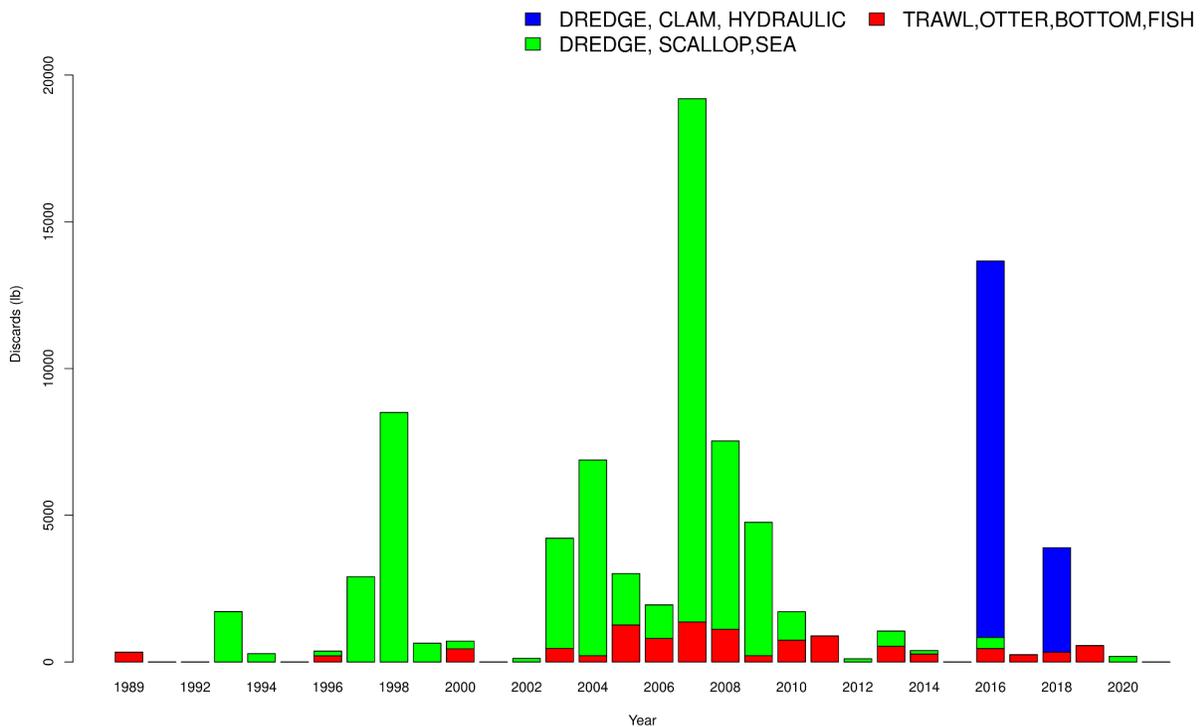
Summary table

Stock	SPECIES_ITIS	All Fine	Issue				Not in CAMS	
			Area	Gear 0_	Gear Proportions	Amount		Length
Surfdam	080944		X			X		
Ocean quahog	081343		X			X		
Shortnose sturgeon	161069							X
American shad	161702							X
Blueback herring	161703							X
Northern alewife	161706			X	X			
Southern alewife	161706			X	X			
Northern monkfish	164499		X	X		X		
Southern monkfish	164499		X	X		X		
Gulf of Maine cod	164712				X			
Pollock	164727					X		
Northern red hake	164730		X	X				
Southern red hake	164730	X						
Georges Bank haddock	164744	X						
Gulf of Maine haddock	164744	X						
Northern silver hake	164791		X					
Southern silver hake	164791		X					
Offshore hake	164793		X					
Redfish	166774	X						
Golden tilefish	168546		X					
Blueline tilefish	168559		X					
Scup	169182	X						
Wolffish	171341			X	X	X	X	
Butterfish	172567					X	X	
Fluke	172735	X						
Northern windowpane flounder	172746	X						
Southern windowpane flounder	172746	X						
Witch flounder	172873				X		X	
Georges Bank winter flounder	172905	X						
Gulf of Maine winter flounder	172905		X		X			
SNEMA winter flounder	172905				X			
Georges Bank yellowtail flounder	172909	X						
Halibut	172933					X		
Atlantic sturgeon	553269							X
Red crab	620992		X			X		
Ocean pout	630979			X	X			
Counts	36	10	12	7	8	9	3	4

Stock Specific

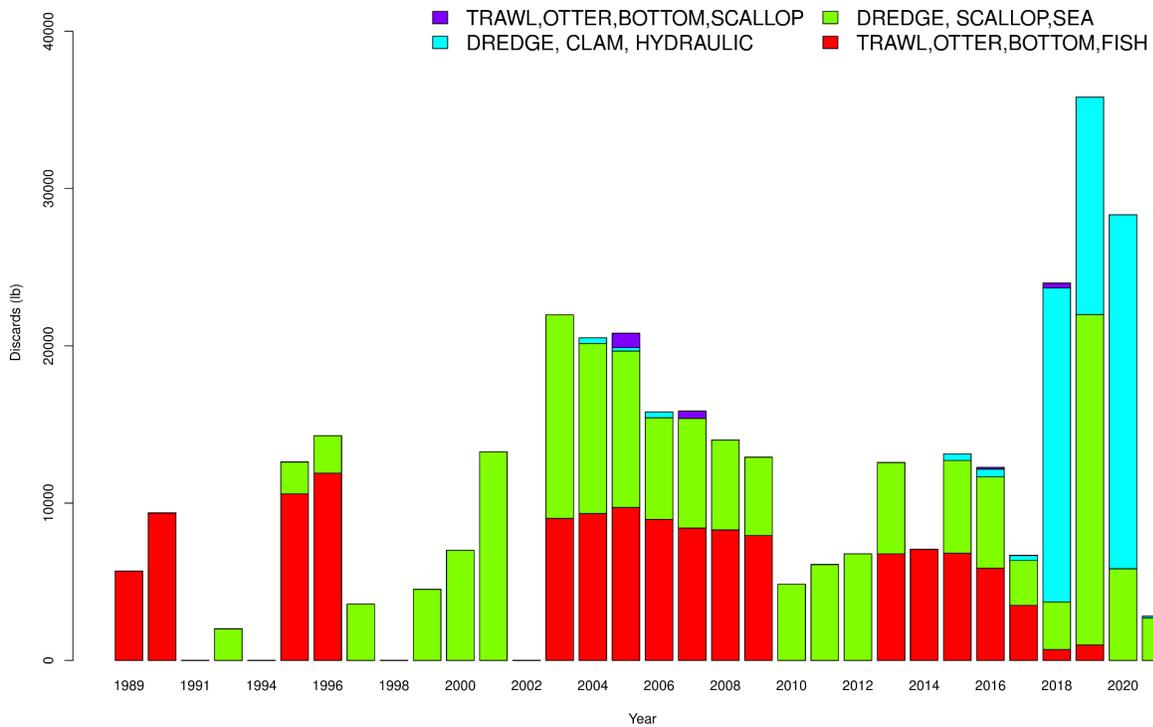
The following sections contain lightly edited responses from the PDB stock leads regarding their stock(s). Not all stock leads responded and not all stock leads who responded provided feedback on all three products.

Surfclam



- About an order of magnitude higher than I expected in CAMS (60000 lbs) vs what I expected. The gears and areas (though the areas do not match up with the assessment areas) look about right for both clam species - so that probably does not explain the difference. CAMS has very different values for all of my stocks.
- Suggested area definitions:
 - North = 522, 525, 551, 552, 561, 562
 - South = 521, 526, 533, 537, 538, 539, 611, 612, 613, 616, 614, 615, 622, 623, 621, 625, 626, 627, 628, 631, 632, 633, 634, 635, 636, 637, 638

Ocean Quahog



- Have a large amount of discards, I expected that, but not 2 M lbs! That is about 10x more than I thought there would be. The gears and areas (though the areas do not match up with the assessment areas) look about right for both clam species - so that probably does not explain the difference. CAMS has very different values for all of my stocks.
- Suggested area definitions:
 - North = 522, 525, 551, 552, 561, 562
 - South = 521, 526, 533, 537, 538, 539, 611, 612, 613, 616, 614, 615, 622, 623, 621, 625, 626, 627, 628, 631, 632, 633, 634, 635, 636, 637, 638

Shortnose sturgeon

- Not in CAMS, needed for ASMFC assessment work.

American shad

- Not in CAMS, needed for ASMFC assessment work.

Blueback herring

- Not in CAMS, needed for ASMFC assessment work.

Northern Alewife

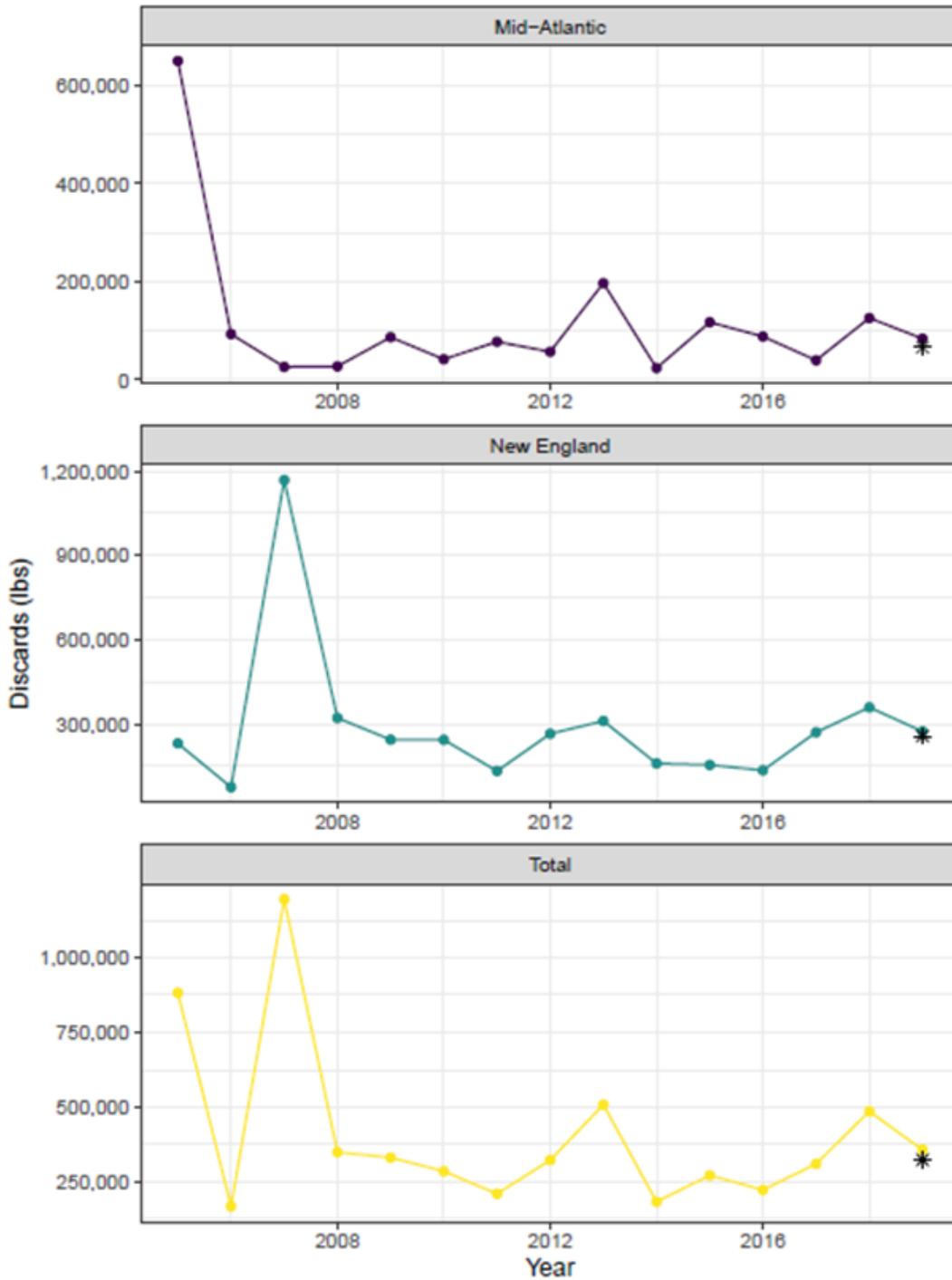


Figure 2: Alewife discards by stock from 2005 through 2019 from the modified SBRM approach of K. Curti compared to the CAMS discards estimate for 2019. CAMS estimate for 2019 represented by the star point.

- Estimation areas for alewife match with what is currently done.

- CAMS discards estimates for alewife are comparable in magnitude to those obtained through the modified SBRM approach.
- There is a substantial difference between the CAMS gear groups and the modified SBRM
 - CAMS - New England: 10 gear groups representing 47 NEGEARS
 - CAMS - Mid-Atlantic: 8 gear groups representing 23 NEGEARS
 - Modified SBRM: 13 gear groups representing 64 NEGEARS
 - 44 of the gears are not included in the either set of CAMS gear groups
- Discard Mortality Ratios are assumed to be 1.0 for all gears, in agreement with the modified SBRM approach.
- Length distributions look reasonable for alewife.

Southern Alewife

- Estimation areas for alewife match with what is currently done.
- CAMS discards estimates for alewife are comparable in magnitude to those obtained through the modified SBRM approach.
- There is a substantial difference between the CAMS gear groups and the modified SBRM
 - CAMS - New England: 10 gear groups representing 47 NEGEARS
 - CAMS - Mid-Atlantic: 8 gear groups representing 23 NEGEARS
 - Modified SBRM: 13 gear groups representing 64 NEGEARS
 - 44 of the gears are not included in the either set of CAMS gear groups
- Discard Mortality Ratios are assumed to be 1.0 for all gears, in agreement with the modified SBRM approach.
- Length distributions look reasonable for alewife.

Northern monkfish

- The 2019 discard estimates are very different for monkfish between CAMS and StockEff. In the monkfish assessment I just completed, we lowered the assumed scallop dredge mortality rate to 64% from 100%. For the purposes of the comparison to CAMS, I used the old 100% mortality rate, but the differences in total discards are still quite large (North: ~3 million pounds in my assessment versus ~4.7 in CAMS). I began pulling at some threads to see if I could explain the discrepancies. 1) There are differences in the area definitions between CAMS and StockEff, with a few areas missing from CAMS that are included in StockEff. I don't expect this inconsistency to be the main source of the difference in discard estimates between CAMS and StockEff, however. 2) The CAMS estimates are drastically different from the D2 and D4 estimates of discards (hundreds of thousands of pounds different in most cases). 3) CAMS includes gears not included in StockEff. In particular the 0_gear categories included in CAMS are often relatively large

values. In the north, 0_dredge seems to be important. 0_pottrap seems important in the North in some years. I suspect these 0_gears to be a major source of the discrepancies.

Southern monkfish

- The 2019 discard estimates are very different for monkfish between CAMS and StockEff. In the monkfish assessment I just completed, we lowered the assumed scallop dredge mortality rate to 64% from 100%. For the purposes of the comparison to CAMS, I used the old 100% mortality rate, but the differences in total discards are still quite large (South: 10.7 million in recent assessment and ~15 million in CAMS). I began pulling at some threads to see if I could explain the discrepancies. 1) There are differences in the area definitions between CAMS and StockEff, with a few areas missing from CAMS that are included in StockEff. I don't expect this inconsistency to be the main source of the difference in discard estimates between CAMS and StockEff, however. 2) The CAMS estimates are drastically different from the D2 and D4 estimates of discards (hundreds of thousands of pounds different in most cases). 3) CAMS includes gears not included in StockEff. In particular the 0_gear categories included in CAMS are often relatively large values. In the south, 0_dredge seems to be important. 0_gillnet seems important in the South. I suspect these 0_gears to be a major source of the discrepancies.

Gulf of Maine cod

- I don't see any discard estimates for 2020 and 2021. I haven't looked at those years yet, so I'm not sure why there are no estimates.
- There is also a large fraction of 200-gear discards, which I think are lobster pots, and gillnet (100). The assessment doesn't include lobster discards, so I can't say whether that is reasonable or not, but the proportion of OT compared to gillnet discards seems low. Assessment estimates for 2018 and 2019 are that OT exceed gillnet by >5x.

Pollock

- I'm concerned about pollock. 2019 CAMS estimate = 193,681 lbs and 2019 SBRM estimate (as used in the assessment) = 340,196 lbs for a difference of -43%. There were some differences in the distribution by gear and mesh and in the length frequencies but nothing that jumped out at me as the cause of the difference.

Northern red hake

- This stock has over 90% of discards coming from the pottrap_0 category in 2021 and 2022 which doesn't seem right.

- CAMS does use some stat areas in the NGOM that Stockeff doesn't (400s) where there may be more lobster pots in the mix.
- Lengths look OK.

Southern red hake

- Southern red hake looks fine over all aspects.

Georges Bank haddock

- a little strange to see the haddock stocks as "EGB", "GOM", "MA" and "WGB_SNE" (mainly the "MA" and "WGB_SNE" distinction is new to me). i've never broken out the 600 stock areas separately.
 - comparing the 4 year summaries (2018-2021), i see this:
- | Year | CAMS | SASINF | SASINF/CAMS |
|------|---------|---------|-------------|
| 2018 | 863,144 | 903,892 | 1.05 |
| 2019 | 731,233 | 675,331 | 0.92 |
| 2020 | 305,887 | 393,207 | 1.29 |
| 2021 | 97,316 | 108,921 | 1.12 |
- i would say 'close enough' but 2020 seems like a more substantial difference. i have not dug further to see where the difference is coming from in that year -- sampling was pretty poor. the 2020 discrepancies were widespread and not stock specific. i won't invest the time now to dig deeper into the 2020 estimates.

Gulf of Maine haddock

- GOM haddock- Looks good.

Northern silver hake

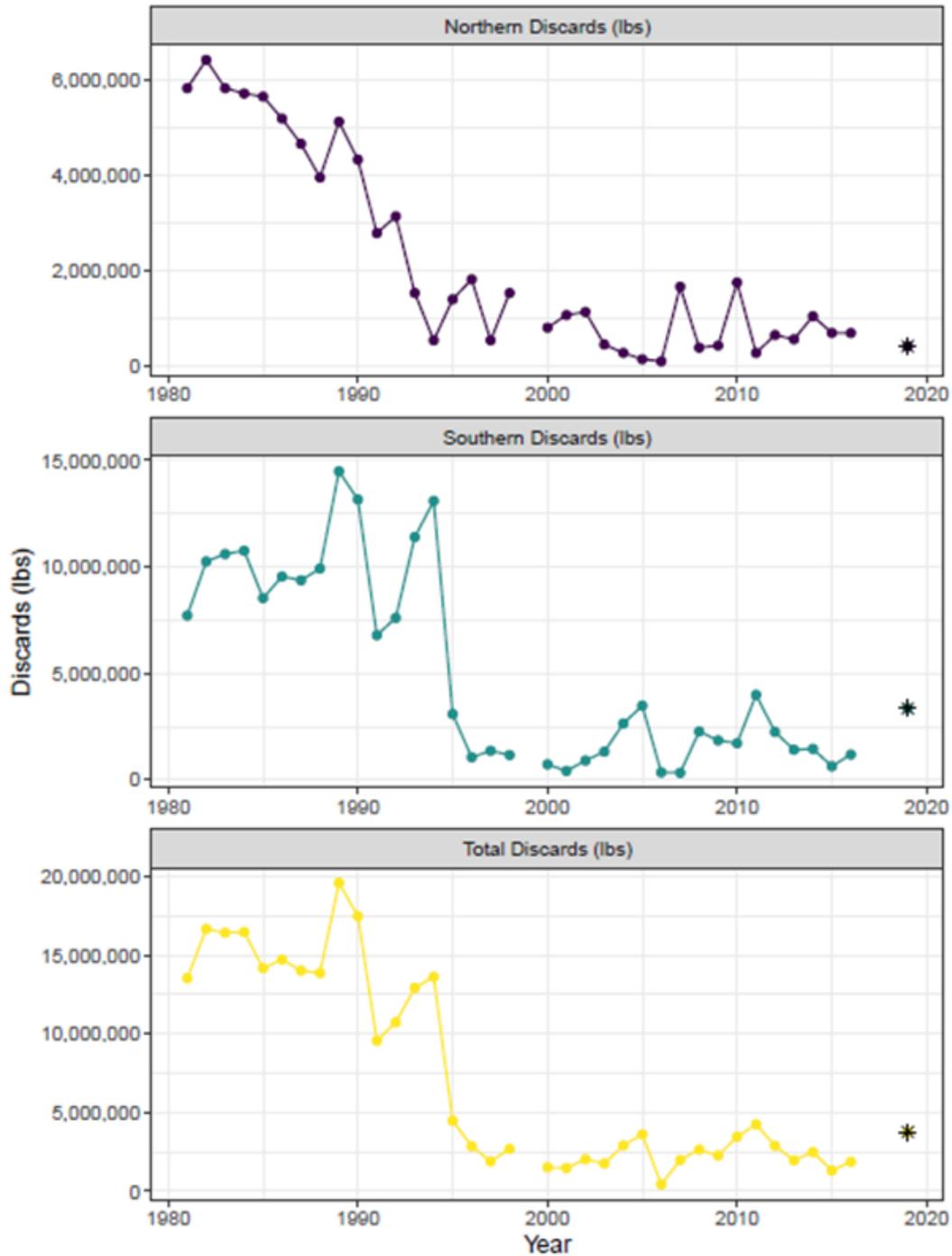


Figure 1: Silver hake discards by stock from 1981 through 2016 from the 2017 Stock Assessment Report compared to the CAMS discards estimate for 2019. CAMS estimate for 2019 represented by the star point.

- The estimation areas entered into STOCKEFF and CAMS are different.

- CAMS discards estimates for silver hake are comparable to those obtained through SBRM for 2010 through 2016.
- No issues observed at this time with gear definitions or discards by gear.
- Length distributions look reasonable for silver hake.

Southern silver hake

- The estimation areas entered into STOCKEFF and CAMS are different.
- CAMS discards estimates for silver hake are comparable to those obtained through SBRM for 2010 through 2016.
- No issues observed at this time with gear definitions or discards by gear.
- Length distributions look reasonable for silver hake.

Offshore hake

- There is no specific value for offshore hake discards in the 2017 Stock Update Report. Due to extremely low numbers and difficulty in separating silver hake from offshore hake, offshore hake discard estimates were combined with silver hake estimates.
- The estimation areas entered into STOCKEFF and CAMS are different.

Redfish

- Redfish looks reasonable to me. 2019 CAMS estimate = 128,405 lbs and 2019 SBRM estimate (as used in the assessment) = 132,723 lbs for a difference of -3%.

Golden tilefish

- I think it might be better to change the stock boundaries (MA and NE). This is a deep water species found mostly on the shelf break south of Georges Bank or on the southern flank. Maybe breaking Georges bank down the middle would be more appropriate (all the GOM strata + 521+522+561) and then the southern flank of GB strata and south to 631 + 632. Very small estimates of golden tilefish should then be estimated of the northern GOM area.
- The statistical area breakdown of CAMS golden tilefish discards is a bit strange with 521 as the highest estimate. There are likely very few tilefish in 521 and maybe doing the new stock breakdown above fixes this potential Kall issue.
- There should not be any state catch for golden tilefish since this stocks is entirely in federal waters.
- I could not find the golden tilefish CAMS discards by gear type plots?

Blueline tilefish

- I think it might be better to change the stock boundaries (MA and NE). This is a deep water species found mostly on the shelf break south of Georges Bank or on the southern flank. Maybe breaking Georges bank down the middle would be more appropriate (all the GOM strata + 521+522+561) and then the southern flank of GB strata and south to 631 + 632. Probably zero blueline tilefish in the GOM.
- There should not be any state catch for blueline tilefish since these stocks are entirely in federal waters.
- I could not find the blueline tilefish CAMS discards by gear type plots?

Scup

- In comparing the 3 THREE (!!!) sets of books (CAMS-way, STOCKEFF test-mode-way, and MY-way (SBRM/AA) for scup 2019 discards: In metric tons. Scup mortality rate = 100%.
- Scup: CAMS - 2,775
- STOCKEFF - 2614
- SBRM/AA = 2,779
- Close enuf for scup.

Wolffish

- In 1.B.3.a.i Figure, CAMS has ~ 7000 lb of discards while STOCKEFF has ~ 5000 lb, which is about a 40% increase in CAMS
- 2.C.12.a.iii 2020 UNIT has lower percentage (~10%) of 010-na than D2 (~60%) and D4 (~70%) and thus attributes way more (~70%) to 050-LM
- 2.C.12.a.iv 2021 UNIT has ~ 90% of 0_pottrap_na, which doesn't seem plausible, there are only 5 records (4.7% of the total) for pot/trap in OBHAUSPP, so I don't understand how 0_pottrap_na can account for ~ 90% of the discards by gear
- I'm surprised by the number of hauls and lengths that are dropped by the CAMS process. 15% of discard lengths for LMOT are not in CAMS 2021
- Proportions at length differ between trips in and not in CAMS

Butterfish

- 2.C.13.a.i 2018 has ~ 10% more 050-LM and ~ 10% more 058-na than D2 and D4
- 2.C.13.a.i 2019 has ~ 6% more 050-LM than D2 and D4
- I'm surprised by the number of hauls and lengths that are dropped by the CAMS process. 6% of discard lengths for SMOT are not in CAMS 2019, and 11% of discard lengths for LMOT are not in CAMS 2019

- Proportions at length differ between trips in and not in CAMS

Fluke

- In comparing the 3 THREE (!!!) sets of books (CAMS-way, STOCKEFF test-mode-way, and MY-way (SBRM/AA) for fluke 2019 discards:
- In metric tons. Fluke mortality rate = 80%, Scup mortality rate = 100%.
- Fluke: CAMS - 931
- STOCKEFF - 683
- SBRM/AA = 783
- I've been estimating trawl, scallop, and (gillnet+pots+hand+others). The 'extra' 100 mt or so is all in the '0_*' 'na' gears (dredge, pot, trawl) that's included in CAMS - whatever those are. It seems analogous to the VTR 'home use/not sold' reported landings crap that we now have to deal with in CAMS.
- So - fluke is close enuf - onward!

Northern windowpane flounder

- Northern windowpane looks fine over all aspects.
- The lengths used look good for windowpane.

Southern windowpane flounder

- Southern windowpane looks fine over all aspects.
- The lengths used look good for windowpane.

Witch Flounder

- 1.A.4.a Stock Areas
 - Witch flounder: the statistical area collections looks good for STOCKEFF and CAMS; all US EEZ stat areas are included; however the names used between CAMS and STOCKEFF are not consistent - not a show-stopper but points out that CAMS has stat area collections for discard estimation while STOCKEFF has stat areas collections at the stock level. This applies to most UNIT stocks. As Leona mentioned, the CAMS stock area support table needs to be expanded to accommodate both needs: stock area and discard estimation area.
 - CAMS stat area collections do not include "generic" (e.g. 500, 510, 520 etc) since these codes are no longer used by the VTR; however, because STOCKEFF spans a broader time range than CAMS, it is appropriate for STOCKEFF to include the "generic" areas for this UNIT stock species as well as for other UNIT stocks. Caution is needed for including "generic" areas for stocks of multi-stock species. I don't know exactly when "generic" stat areas were no longer collected

via the VTR; however, commercial port samples may still use "generic" stat areas for trips with multiple subtrips.

- 1.A.4.b. Estimation areas
 - For witch flounder, differences in CAMS and STOCKEFF involve the "generic" areas; both CAMS and STOCKEFF are appropriate for their respective time frames. Slight differences in discard estimation area names and it would be best to sync up, but not a show stopper.
 - Witch flounder is not impacted by the 700-s, but other stocks are. There are no observed trips assigned to trips departing south of 35 degrees N. In CAMS, it would be useful to know what business rules are in place to estimate discards for 700-s if there are little to no observed trips in 700-s (note: there could be a few trips that departed from 35N and go south to fish); and inventory could be done to evaluate observer coverage of 700-s and then determine the best approach for each stock with 700-s.
- 1.B. CAMS discards
 - For witch flounder, CAMS discards 95.4 MT are very close to STOCKEFF 94.3 MT.
 - While STOCKEFF does not have discards by stat area, the discards by stat area in CAMS appear general consistent with the general distributions of witch flounder for the GOM stat areas (511-515) and for 616 and 622 which encompass the Mid-Atlantic canyons (deep water). Highest discards from stat area 526 is a bit unexpected...I would have expected 515 and 521 to be higher than 526. Perhaps discarding is occurring along the southeastern edge of the Closed Area in the South Channel (the southern tip of CA is in 526).
 - Comparison discard bar plots - CAMS and STOCKEFF almost same
 - Federal vs State - do not have breakouts in the STOCKEFF run; the CAMS federal vs state appears as expected, very low state discards. This is expected because the distribution of witch flounder is primarily in deep offshore waters.
- 2. Gear
 - As expected, most witch discards in LM OT gear.
 - For witch flounder, I didn't quite follow the use of GN and mesh groups for mesh groups SM, LM, XL and na. For witch flounder discards GN "na" has the most witch flounder discards of the gillnet mesh groups. I would have thought there would not be both "na" and specific SM, LG, XL for gillnet - I must be missing something.
 - The CAMS gear support table WG_CAMS_GEARCODE_STRATA was not accessible; access to CAMS support tables continues to be a challenge.
 - Generally similar between CAMS, D2 and D4. This is consistent with my STOCKEFF runs comparing D2 and D4.
- 3. OB Length Distributions
 - No red flags...but perhaps a yellow flag that OBDBS haul and length data are being dropped via the CAMS processes.
 - The loss of length data is relatively small for witch flounder: for LMOT roughly 12% of discarded lengths were dropped in 2021 (LMOT InCAMS N=2832 LMOT

NotInCAMS N = 335. Looking at the range and modes of the proportion of lengths, 2021 LMOT distributions were similar in mode and range for InCAMS and NotInCAMS data. In 2020, the LMOT distributions revealed the mode of dropped lengths was higher than lengths in CAMS; LMOT inCAMS N = 2372 and NotInCAMS N = 118. The range of the dropped lengths was narrower and within the range of the lengths in CAMS. For 2019, LMOT distributions were similar in mode, and the range of dropped lengths was within the range of lengths in CAMS. 2019 sample sizes were LMOT inCAMS = 3716 and NotinCAMs N= 102.

- For other fleets such as scallop dredge and small mesh otter trawl trips which also had dropped lengths, the sample sizes were too small to make comparisons. That's a good sign that the dropped Ns are relatively small.
- However, the loss of OBDBS haul and length data resulting from the CAMS process is undesirable. The CAMS matching order could be reviewed/reconsidered such that OBDBS data are treated on par (equally) with VTR, rather than less than VTR, especially given the known under reporting of VTR subtrips in some fleets.
- Additionally, the loss of OBDBS haul and length data resulting from non-EEZ statistical areas in CAMS data are very small for witch flounder; however, this loss is preventable with sufficient QA/QC procedure on the VTR area. It is recommended the VTR areas be routinely screened for non-EEZ statistical areas and that US EEZ statistical areas be utilized when available.
- Follow -up on gear strata: I checked on the revised CFG_GEARCODE_STRATA for witch flounder and found that gear = OTH is grouped with gillnet. I'm not sure that OTH belongs with gillnet.
- I checked the CAMS documentation (Section 10. 0.2.2 Gear/mesh strata) to learn about gillnet "na". Based on the mesh group ranges given there, there should not be 'na' because small is less than 3.99 (that would include 0 and null values too?). In the CAMS documentation, there is a link to GEAR_STRAT_MORT, a google sheet, and I'm having difficulty understanding that because it appears VTR_GEAR_CODE = 'OTH' appears in multiple groups (see Column D), so is being used repeatedly. Do we want that?
- Perhaps we can discuss if/how this google sheet is used in CAMS -- perhaps yellow flag on the CAMS gear groups until we can understand this.
- 4. EM lengths
 - Based on the plots, there appears to be sufficient lengths to characterize the discarded witch flounder on large mesh otter trawl EM trips. The unusual length pattern does not appear in the 2020 (page 76) and 2021 (page 77) witch flounder plots for LM OT length data. The "NOT USED" and "USED" length data have generally similar patterns.

Georges Bank winter flounder

- I don't see any issues.

Gulf of Maine winter flounder

- State discards do seem somewhat lower than I would expect but maybe this is because the GB stock is in this comparison?
- A significant chunk of the GOM winter flounder discards is from scallop dredge. This is not in the assessment since it was not an issue in the past. This might be why the CAMS discard estimate for gom winter is higher than Stockeff? Wondering if this is due to recent scallop effort increases on Stellwagen which could explain this? If so, then I think this is a potential plus for the CAMS system which automatically picks up on potential increases of discards that I missed in Stockeff and in my assessment under business as usual.
- Looks like small amounts but I was wondering what the other stock is under the gear-cams discards –winter flounder (2.b.15.d other)? Are we saying these are outside of our stock catch or are these errors and not accounted for or both?
- As A23 comes into play with perhaps more EM we may need to think more on how to use ASM if that becomes less representative of a broader stratification.

Southern New England-Mid Atlantic winter flounder

- The discard results for SNEMA winter flounder look reasonable. The only thing that sticks out to me is that in 2020 CAMS seems to have shifted a significant portion (~25%) of the 132 (scallop dredge) discards to the trawl fishery.

Georges Bank yellowtail flounder

- I don't see any issues.

Halibut

- There are some differences that I would consider concerning.
- There is a -32% (~53 mt) difference in total discards between STOCKEFF and CAMS. This does not appear to be caused by the different area definitions (the CAMS areas seem fine - they leave out small inshore ones and the older group codes). The gear plots look completely different, but I realize CAMS uses different mesh cut-offs and different gear names, so perhaps this is expected? With this set of tools I can't tell exactly why CAMS discards are lower, but it looks like there may be a halibut problem. CAMS has very different values for all of my stocks.

Atlantic sturgeon

- Not in CAMS, needed for ASMFC assessment work.

Red crab

- The CAMS discards are way too high since they include 17+ million pounds discarded from state waters in the pottrap_0 category. There should not be any red crabs in state waters. I don't know if there is any way of reducing the number of stat areas involved in the estimation. The fed waters estimates are reasonable.

Ocean pout

- 2.C.21.a.iii 2020 has ~ 10% of 0_pottrap_na, which doesn't show up in D2 and D4; also, the proportions of 050-LM and 050-SM are reversed, there are no records in OBHAUSPP for pot/trap so I don't understand where ~ 10% of 0_pottrap_na is coming from
- 2.C.21.a.iv 2021 has ~ 15% of 0_pottrap_na, which doesn't show up in D2 and D4; and a much smaller proportion of 050-LM, there only 12 records (2.8% of the total) for pot/trap) in OBHAUSPP, so ~ 15% for 0_pottrap_na seems way to high
- No lengths in the not in CAMS classification

Note to CAMS Discard Review Team: A suggestion for the future would be to plot Table 9 of product 2, i.e., plots of OBDBS proportion by species, stock, fleet groups and CAMS STATUS. In other words, the totals, rather than by length.