



New England Fishery Management Council

50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116

John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

MEETING SUMMARY

Fishery Data for Stock Assessment Working Group

School for Marine Science and Technology, New Bedford, MA

April 26, 2018

The Fishery Data for Stock Assessment Working Group (Working Group) met on April 26, 2018 in New Bedford, MA to begin discussions on how the Working Group can meet the objective of discussing how fishery dependent data can be used to inform stock abundance. The Working Group also identified work to address the four main deliverables, as tasked by the Executive Committee.

MEETING ATTENDANCE:

Working Group Members: Rich Bell, Chris Brown, Steve Cadrin, Chad Demarest, Robin Frede, Vito Giacalone, Emily Keiley, Brian Linton, JJ Maguire, and Paul Rago

Audience: Greg DeCelles, Alex Hansell, Alison Lorenc, Cate O'Keefe, Qi Pu, Jeff Taylor, and Brooke Wright

SUPPORTING DOCUMENTATION: 1) Meeting notice; and 2) meeting agenda.

The meeting began at approximately 10:00 a.m.

REVIEW WORKING GROUP OBJECTIVES AND TIMELINE, MS. FREDE

Staff gave an overview of the formation and tasking of objectives of the working group by the Council's Executive Committee and reviewed the working group timeline. Originally the final report was to be due for the June Council meeting, but this has been revised to be a preliminary report in June, with the final report at the September Council meeting. There was a question of whether the group would be tasked with doing analysis as opposed to review, as the expectation is not unless there are additional resources. It was clarified that the group has been tasked with review of previous and current efforts, and is not expected to conduct its own analyses.

Staff explained that the Council's intent in forming the working group is to tie the group in with development of Amendment 23 (A23), so that if the working group has any recommendations for use of fishery data that would require changes to monitoring, these could be considered. It was also explained that GARFO is offering support for any recommendations the working group may have for changes to the use of fishery data that could be considered under A23.

BEGIN DISCUSSIONS ON HOW THE WORKING GROUP CAN MEET THE OBJECTIVE OF DISCUSSING HOW FISHERY DEPENDENT DATA CAN BE USED TO INFORM STOCK ABUNDANCE FOR NORTHEAST MULTISPECIES STOCKS, DR. CADRIN

Discussions began by addressing a series of questions that had been asked by the Executive Committee to the Council during development of the working group.

- What data would be most valuable for improving the assessments?

One working group member said the most accurate data is the most valuable and that inaccurate data doesn't help.

The group then went through different fishery data types and described benefits and issues with each.

- Dealer:

The group noted that some mis-reporting occurs, but feels that Carlos Rafael is a good portion of this, and that dealer mis-reporting would have to be intentional. Some members said that 100% dockside monitoring would improve dealer reporting and noted that in the previous groundfish dockside monitoring program, the coverage requirement was initially 50% for sector monitoring plans, but that 100% is what is needed to meet the needs of landings monitoring. Others mentioned that a Canadian audit of the dockside monitoring programs there has in general found problems with dockside monitoring [correction: the audit was concerned with conflict of interest issues for dockside monitoring companies, rather than with dockside monitoring itself.] Some cautioned that while dealer data might be fairly accurate, area fished may not be captured here and that is an issue because the assessments need to know where the fish came from, and also does not account for discards. The group talked about rounding that they have seen in dealer reports, and noted that this is seen in the data but is not perceived as being a frequent occurrence from fishermen. Other members talked about market analysis that ICCAT has done for bluefin tuna traded internationally in which the models assume dealer data as a census of the population.

- Logbook (VTR):

The group talked about paper logbook data and noted issues with statistical area (stat area) reporting and concerns that generally fishermen report fewer stat areas than actually fished. One member said that they are seeing more stat areas reported post sector implementation with an increase in reporting of stat areas with VMS polling (VMS shows 95% accuracy in the sector era for fishing locations versus less than 80% before 2010), but said there are issues with catch not apportioned to the correct area and that these are cases of strategic misreporting, noting that this is more on a granular level (individual vessels, captains). One member noted that fishermen haul weights are not accurate, and that electronic monitoring (EM) should be considered the gold standard.

The group talked about eVTR and the value of having tow by tow locations. One member clarified that for location, study fleet reports tow by tow data using GPS to record tow begin and end, while those fishermen who report via eVTR report by subarea. A major area of concern that was raised is that of multi-stock area trips, which cannot be sampled by port samplers because the catch cannot be attributed to stock area. The group discussed that if this poses a bias, perhaps observer kept catch samples could be valuable and given greater emphasis for sampling. This is not an issue for single US stocks, like redfish, pollock, American plaice, witch flounder, wolffish, and halibut. A few members

raised the point that stock identity is uncertain for some species, but the group acknowledged that revising stock boundaries is beyond both A23 or the working group and that stock assessments assume management units are unit stocks which rely on accurate removals.

- Observer:

The group discussed observer data and noted that the focus of observer data is information on discards to get discard rates, as well as kept catch information which is used to determine K_{all} . Observer effect/observer bias was mentioned as the biggest issue surrounding observer data, but the magnitude of this problem isn't known. The group agreed that this is a problem if it is resulting in non-representative coverage because vessels are avoiding observers. Chad gave a brief summary of the analysis he is working on to examine observer effect. He explained his work is based off analysis by Canadian scientists (Benoit and Allard) who used a method that isolates vessel effect (deployment effects) from fisherman changes in behavior with observers by comparing observed and unobserved trips. He listed some of the potential reasons he has thought of to explain observer bias, including the possibility that fishermen worry about having another person on the boat when they take an observer or worry about affecting others in the sector with their discards. Chad explained that since 1992, the magnitude of observer-effect bias hasn't been large, but that after 2013-2014 large reductions in quotas presented new incentives for observer effect with illegal discarding of sublegal sized fish. He also noted the issue of allowing discards of legal-sized unmarketable fish, and said that the other part of observer bias is illegal discarding of legal-sized fish, which may occur on unobserved trips. Chad also explained analysis he and colleague Anna Henry are working on to examine discard incentives, and noted that this work as well as observer bias will be presented to the Groundfish Advisory Panel and Groundfish Committee.

One member talked about a problem with the current paradigm of the fishery where the feeling from industry is that the more they tell the truth the more they are punished, and thinks a voluntary program like study fleet produces the best data because fishermen do not feel there are negative consequences in reporting, as they may with observers. Others felt that a feedback loop would occur if CPUE were included more in the assessment process, as this should provide an incentive to report more accurately. Some noted changing perspectives of fishermen over the last 30 years, as fishermen are realizing the importance of better scientific data for determining catch limits. The group discussed uses for observer data in developing CPUE, including information on average landings, trip durations, and area fished. Paul noted recent work (Wigley & Rago 2014, 2016) that has looked at observer data use for CPUE and found a good correlation for some species to VTR data. The group discussed that while study fleet data could be used for CPUE it doesn't represent the entire fleet, and so observer data is a more reliable source of CPUE data.

- Port Sampling:

The group discussed port sampling and said that coverage has been at a good level now compared to in the past. Members also noted that the structure in the northeast is different from other regions, and that the program here is designed to feed into VPA analysis and is stratified by port, quarter, and gear, whereas most other areas sample by fleet. The group discussed whether this is something they should consider recommending – a wholesale change in the port sampling structure. It was noted that since the late 1990s sampling has improved, although there are still some gaps for rare situations (e.g. yellowtail flounder last quarter had no samples, because there were few trips and they were multi-stock area trips and so were unable to be used for sampling). The group also said talked about how electronic data collection systems (measuring boards, scales) should improve efficiency.

- Study Fleet:

The group recognized that study fleet data is not used in the assessments, and asked what potential there is for it to be used more. Some members felt study fleet data is more accurate and honest because of the voluntary nature of it. Rich, who works with study fleet projects, explained that study fleet data has been used for discard mortality studies including for summer flounder, as well as ancillary studies on length conversion factors and maturity. He also explained that the study fleet program was started in 2003 and increased in 2007 and is geographically focused to Southern New England. Others said some of the potential limitations to use of the data are due to the program having a smaller number of vessels so there is more variation, and that this is not a long timeline for the data series. Some attributed the lack of application of the data to an institutional reluctance to use new data and that this comes from both fishermen and scientists. The group recognized that they have an opportunity to recommend a change in how study fleet data could be used in assessments, and pointed to past work with witch flounder that confirmed fishermen observations of seasonal and geographical patterns by comparing to study fleet data. Rich said that study fleet could be used for discard information and noted cases where it has been compared to observer data, potentially resulting in better sampling of portions of the small mesh fleet in providing more representation of some species. The group noted that the study fleet program does not collect biological samples, and so there are no age structures or length data. There were questions about the status on the study fleet database in terms of QA/QC and access, and it was agreed that it is much more accessible now.

The group then talked about the importance of effort data, as more effort data is needed to consider use of CPUE, and talked about how logbooks may provide better information on effort than observer data, and that perhaps this is because logbooks are a census collection. The group discussed how they may want to consider all three (logbook/VTR, observer, and study fleet data) as recommendations for developing CPUE. Members discussed how study fleet has the potential to capture targeting information, as identifying targeting is important for developing CPUE, and said this could help in other data like observer data, where target species is recorded but not always filled out to the most detailed level by stock. Related to targeting information, one member talked about work to identify footprints of cod targeting (by area and season) and discussed how footprints are a way to get stock specific CPUEs.

- Electronic Monitoring (EM):

The group talked about some of the uses for EM, including information on discards, size composition, location, and effort. The group noted that EM records highly accurate data that is verifiable (can go back and check the video) and has a higher percentage of actual measurements (very little subsampling). One limitation identified with the EM data collected by exempted fishing permits is that they do not assess capacity, which the group agreed is important to relating EM to the larger fleet, and said there is a need to be able to relate bycatch of these select study vessels to the larger fleet.

- What are the reasons for the disconnect between the assessments and fishermen's perceptions of stock status?

Working group members representing industry said there are large differences between availability and allocations, particularly with cod and haddock, and that these differences go in both directions (both decreases and increases). They also noted that availability is relative as there has been a shifting baseline.

Others noted the importance of understanding changes in unit of effort for CPUE. There was discussion about distribution change and whether the surveys account for changes in distribution. Greg DeCelles (MADMF) raised the issue of potential changes in fish distribution and whether survey strata should be re-evaluated to ensure the strata surveyed match current fish distributions.

- What data could be used to form an index of abundance that can be used in the assessments? How can CPUE be designed so it can be used in an assessment?

The group identified that the cleanest effort is observed tows or study-fleet tows and that species-specific CPUE should be the target. The group discussed posterior standardization of tows, recognizing that standardizing is difficult, given technological increases or regulatory changes, which all too often leads to CPUE being rejected as an index of abundance. Some suggested identifying where these effects of gear or regulatory changes apply and where they have not, in order to determine whether CPUE can be used for certain stocks. Others felt that the groundfish fishery has been relatively unchanged since the 2010 sector program. The group discussed whether there are criteria for accepting CPUE use in assessments, and members noted that ICES and ICCAT have a process for including information on CPUE in assessments, and the Southeast Fisheries Science Center, which incorporates CPUE indices in assessments, has guidance on this as well. Some mentioned data-limited stocks such as southern windowpane flounder and halibut, and whether there is a place for CPUE for increasing information available on these stocks. Working group members raised the idea of industry monitoring to document missing biomass in the assessments and noted the difficulty of coming up with a time series of CPUE since the regulations have been designed to decrease effort. But others noted the industry perspective that effort is still high in the footprint for cod activity, and this could be explored by filtering out targeted fishing behavior versus avoidance behavior. The group noted a generality that here in the northeast CPUE isn't used in assessments which is likely because there is a lot of data in surveys, but felt it is important to look at catch and effort data to help with credibility of the survey data.

IDENTIFY WORK TO ADDRESS THE FOUR MAIN DELIVERABLES, DR. CADRIN

1. Explain how fishery dependent and fishery independent data is used in stock assessments. This should include an explanation of how different data elements are used and interact in an age-based analytic assessment.

JJ Maguire agreed to lead this deliverable, given his extensive experience with stock assessments (ICES, ICCAT, DFO). The group plans to discuss the O'Keefe et al. 2015 review paper more thoroughly as this has information on recent efforts with CPUE use. The group felt that examining the potential use of CPUE for data-limited stocks may be beyond the deliverables but is still relevant. Other ideas for examining fishery dependent data use in assessments include Management Strategy Evaluations (MSEs), the 2013 Northeast Fisheries Science Center data review, and the NMFS Fishery Dependent Data Visioning (FDDV) project. Working group members plan to explore and document these recent efforts.

2. Summarize the theoretical utility and limitations of using CPUE/LPUE as an index of abundance for Northeast Multispecies stocks. List recent (GARM III or later) efforts to create a CPUE for any of these stocks and the results of those efforts (i.e. successful/unsuccessful, used in analytic assessment, etc.).

Paul Rago agreed to lead this deliverable with his experience as an assessment scientist, and Brian Linton was also assigned to the deliverable with his experience as a current stock assessment scientist for several groundfish stocks and past experience with Southeast Fisheries Science Center assessments. The group also thought examining the O'Keefe et al. 2015 review paper would be relevant here. Brian offered to share a compilation of CPUE work put together from the Northeast Fisheries Science Center. Two recent graduate student projects on witch flounder CPUE and halibut CPUE will be presented to the group and included as a part of this deliverable. Additionally, Paul suggested that noting any year to year changes in CPUE for any stocks may be more informative.

3. Without regard to existing fishing practices, regulations, or monitoring systems, identify the fishery factors and fishery dependent data needed to create a CPUE that would be a reliable index of abundance for Northeast Multispecies stocks.

Vito Giacalone agreed to lead this deliverable with his industry perspective, and Chris Brown agreed to work on this as well with his experience as a commercial fisherman. Vito presented the idea for a stock-specific footprint as something that could be pursued for development of CPUE, and suggested starting with cod. The group talked about gear improvements and changes and how this may affect CPUE, and Vito said he plans to speak with representatives from Reidar gear manufacturing to find out what changes in gear have occurred, and think about what data would indicate this. Brian talked about how at SEDAR data meetings, there are sessions with fishermen to talk about changes in gear and fishing behavior, and offered to provide more information on this. JJ said that as a part of ICES assessments there are surveys for fishermen to give perceptions of availability. Others noted work that describes how fishermen's information can be used more in ecosystem-based assessments in helping to interpret trends (e.g., climate).

4. Compare the desired factors identified with existing conditions and data for the fishery. This should be a gap analysis of factors and data needed, as well as the analytical approaches necessary, to create a CPUE that would be a reliable index of abundance for Northeast Multispecies stocks.

Emily Keiley agreed to lead this deliverable with her experience both at GARFO and at SMAST with monitoring data. Chad Demarest and Rich Bell also agreed to work on this deliverable given their experience with various aspects of monitoring. The group discussed how this exercise can be a comparison of what types of fishery data the current system has as well as what an ideal system could look like, and how this can tie into A23 with the potential for changes to the groundfish monitoring program. The group discussed the importance of cost-benefits of different data streams and the frustration of investments in programs that produce data that is never used.

The working group discussed a few other topics before adjourning. Chris spoke on electronic monitoring and wondered what the critical mass would be to getting EM implemented in the fishery widespread, and the group agreed that it would have to be enough to be representative of the fleet. Paul said that the Science Center has historic maps of fishing areas/footprints for stocks like pollock, which could be of interest. Cate O'Keefe (MADMF) suggested the group think about cost-benefit analysis of fishery dependent data pieces that aren't used and whether those resources could be better utilized with different data pieces. The working group also discussed economic applications of CPUE, and Chad talked about several ways the Social Sciences Branch uses it, including as a use of predicting catch and quota utilization, detecting covariance among stocks, and exploring spatial distribution.

The working group agreed on the following presentations for its next meeting:

- Groundfish Plan Development Team (PDT) update on observer effect – Chad
- Effort metrics (tow, trip)
- O’Keefe, et al. 2015 review - Cate
- Cod footprint - Vito
- Witch flounder and halibut CPUE applications – Brooke and Alex
- Study fleet applications (scup, fluke) - Rich and Chris
- FDDV project – Emily (and Cate)
- Criteria/best practices – JJ and Brian

The Working Group meeting adjourned at approximately 2:00 p.m.