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To: Thomas A. Nies, Executive Director
From: Scientific and Statistical Committee Social Sciences Subpanel
Subject: Response to Terms of Reference for SSC Social Science Subpanel Review of Groundfish and Scallops Specifications
Date: July 22, 2021

The Scientific and Statistical Committee (SSC) Social Science Subpanel for the Review of Groundfish and Scallops Specifications was convened by the Council "to seek expert opinions on whether fishery specification actions developed by the New England Council include the information needed for decision makers to understand the social and economic impact issues involved." The SSC subpanel was made up of six members: Dr. Anna Birkenbach, Dr. Kevin St. Martin, Mr. Ernest (Terry) Stockwell, Dr. Eric Thunberg, Dr. Hirotsugu Uchida, and Dr. Lindsey Williams (chair), who met April 28, 2021 via webinar with additional refinement of recommendations via correspondence review. The subpanel review was focused on the following four terms of reference (TORs) with specific sub-questions addressed below:

1. Affected Environment - Do the Affected Environment (AE) sections of the Environmental Assessments describing the fishery and fishing communities provide the relevant information for Council decision-makers to understand the potential social and economic impact issues specific to the alternatives under consideration (understanding that wherever possible, general background should be referenced in other sources and not repeated)?
2. Analyses of Social and Economic Impacts - Do the analyses of these impacts provide the relevant information for Council decision-makers to understand the social and economic impacts of the management alternatives and comply with NMFS guidance for meeting NEPA requirements?
3. Are there alternative ways to identify key fishing communities considering NMFS guidance? Is there a consistent approach that could be considered for different Council actions?
4. Are there alternative ways to present and communicate the data and analyses to Council decision-makers more effectively?

To address the four TORs, the subpanel considered the following information:
1. Groundfish Framework Adjustment 59 - Descriptive and analytical sections relevant to the social and economic impact analyses
2. Scallop Framework Adjustment 32 - Descriptive and analytical sections relevant to the social and economic impact analyses
3. Additional background information (Relevant SSC memos, NMFS and CEQ documents, and staff presentations)

Part I: Overview
Overall, the subpanel appreciates the opportunity to support the overarching goal of the review and to provide feedback on these two actions (Groundfish Framework Adjustment 59 and

Scallop Framework Adjustment 32) as a step towards further improvements to the incorporation and consideration of social and economic information in the NEFMC decision-making process. The staff working to prepare the documentation developed for these actions should be commended for doing important work with what information is available in the timeframes under which they must operate. The comments and feedback provided in this memo are not critiques of what has been completed in the past but rather ideas and opportunities for further improvements in the future in the spirit of continual improvement.

A brief summary of our review based on each TOR is provided here with more detailed comments summarized in Part II of the memo. In addition to this response memo, the subpanel is also submitting some specific comments on the documents for consideration in future work (see Appendix I).

TOR 1: Affected Environment

As currently structured, the AE sections describing the fishery and fishing communities for scallops and groundfish provide relevant important information but could benefit from improvements going forward. As methods for data collection, synthesis, and integration continue to evolve, the subpanel encourages consideration of further improvements and regular feedback from additional experts. The subpanel recommends additional focus on tracking trends in the socio-economic metrics, better integration between the AE and the impacts sections, increasing precision in language, consideration of additional metrics from other sources, streamlining of the analysis by updating metrics with less variability less frequently, and increased use of the expertise available on the SSC.

TOR 2: Analyses of Social and Economic Impacts

As currently presented, the analysis of social and economic impacts provides relevant information to decision-makers in the context of the guidance under which staff are operating. The subpanel recommends continued consideration jointly with NMFS on how to improve document readability and usefulness while still meeting NEPA requirements. Going forward, there is an opportunity to improve the linkages between the AE and impacts sections to help structure the information in a manner that supports decision-makers in their review. This could include cross-references between the two sections and/or efforts to present the materials in a more narrative flow, for example using policy analysis frameworks such as those discussed in TOR 4. In addition, the subpanel recommends a more comprehensive analysis of the full range of communities that rely on and/or are impacted by fisheries to better understand the distribution of impacts, as well as more detailed treatment of the tradeoffs between economic efficiencies and social/cultural impacts.

TOR 3: Identification of Fishing Communities

The subpanel acknowledged that even with guidance on identifying key fishing communities, this process continues to present a challenge for analysis. The subpanel recognized that there are characteristics unique to each fishery but that some framework for consistency is beneficial for decision makers and the public to interpret the information. The subpanel noted challenges associated with confidentiality rules and encourages the exploration of additional methods or approaches that might improve the information while still protecting confidentiality.

TOR 4: Presentation and Communication of Data and Analyses

The most important information that the stakeholders and Council members want to know is how different proposed alternatives compare to each other so that informed decisions on which options to pursue can be made. With this in mind, the subpanel acknowledged that one of the challenges with these documents is that there are different levels of information needed at various points along the decision process and with different audiences. In both documents and presentations, a focus on clarifying the key take-home message the writers are seeking to convey could also be beneficial. There may also be lessons from technical writing and other communications experts that could benefit the process, particularly around opportunities to create a more narrative structure that those not steeped in the analysis can better digest and interpret. The subpanel also recommended that a policy analysis framing be considered as a tool to develop structure for the documents.

Additional Overarching Feedback

In addition to the content of this memo, the subpanel recommends the Council and staff also consider further the feedback provided on the social and economic information in other venues such as the 2020 report of the SSC Subpanel for Groundfish Sector Review (specifically TOR 3 re: recommendations), the 2019 project on Consideration of Social Science by Council Members (including data from interviews with Council members on their perceptions of information and data, documents and materials, staff interactions, and general feedback), and SSC feedback on the State of the Ecosystem (SOE) Report each year (for example see response to 2019 SSC comments or response to 2020 SSC comments that include suggestions for further integration and synthesis among other comments related to the inclusion of social and economic information). Taken together, these sets of feedback and input on the further incorporation of socio-economic information provide an opportunity for NEFMC to continue to work to address several past recommendations on this topic (for example from the Program Review).

The subpanel recommends that the SOE process in particular (and the SSC input on it) should be considered more broadly as an opportunity for regular input and feedback from the SSC on the socio-economic information and its interaction with other fisheries data and analyses in support of management decisions.

The subpanel also noted the need to be mindful of the potential long-term impacts of COVID-19 on the data, analyses, trends, and interpretation going forward to the extent that they might skew trends as anomalous years and/or mask other changes, among other potential impacts.

The subpanel also recognizes that some of the recommendations and areas for consideration from this report are outside of the scope of NEFMC staff and depend on information provided by other researchers and through data collected by other parties. As such, we encourage NEFMC staff to work closely with the NEFSC Social Sciences Branch to continue to identify research priorities and needs, particularly as the NMFS Office of Science and Technology, Economics and Human Dimension Program begins to implement the new "Human Integrated Ecosystem Based Fishery Management Research Strategy 2021-2025." The subpanel also encourages academic researchers (and their funders) to consider how their work can help advance these efforts as well as any related research priorities identified by the Council.

The subpanel recognizes that many of these recommendations require additional expertise and perhaps a reconsideration of the structure of the analyses and documentation. The subpanel feels that there are changes that can be made to reduce the length and complexity of these documents while also advancing efforts to incorporate the latest advancements in understanding of the social and economic sciences and their application to fisheries management. The subpanel encourages joint efforts across NEFMC, GARFO, and NEFSC to further consider process improvements that could benefit these efforts and improve the information used to make fisheries management decisions in the New England region.

The subpanel appreciates the opportunity to participate in this new review approach as a mechanism for input and feedback and encourages the Council to continue this process like this in future years. Such a review can be incorporated in the future as part of a framework for regular and continual review and improvement of the consideration of social and economic information in the NEFMC process. The subpanel also appreciated the broad make-up of the panelists to assist in bringing a range of expertise to bear on the TOR (economics, geography, policy, sociology, academic, federal and state government, etc.) and recommends the continued use of experts from different social science disciplines in such a review, including experts from outside the SSC when appropriate.

Part II: Detailed Responses to Each TOR

The following section provides more detailed responses from the subpanel relative to each TOR. Where possible, we have specified where the comments are general in nature or specific to the documents reviewed for groundfish or scallops. While we provide comments specific to each action in some cases, the subpanel encourages the continued focus on integration and consistent approaches where appropriate to facilitate continual improvements to the information that is needed for decision makers to understand the social and economic issues involved.

TOR 1: Affected Environment	p. 5
TOR 2: Analyses of Social and Economic Impacts	p. 12
TOR 3: Identification of Fishing Communities	p. 16
TOR 4: Presentation and Communication of Data and Analyses	p. 17
Appendix I: Specific Comments for Future Consideration	p. 19
Appendix II: Relevant Excerpts from 2019 Interviews Project	p. 26

TOR 1. Affected Environment - Do the Affected Environment (AE) sections of the Environmental Assessments describing the fishery and fishing communities provide the relevant information for Council decision-makers to understand the potential social and economic impact issues specific to the alternatives under consideration (understanding that wherever possible, general background should be referenced in other sources and not repeated)?

General:
As currently structured, the AE sections describing the fishery and fishing communities for scallops and groundfish provide relevant important information but could benefit from improvements going forward. As methods for data collection, synthesis, and integration continue to evolve, the subpanel encourages consideration of further improvements and regular feedback from additional experts.

Further refinements and integration of the social and ecological information provided in the SOE might also serve to address recommendations here by improving understanding of the connections and feedback loops across different components of the system and to more holistically present the AE information. This might also address the need to streamline documents by being able to draw on or point to the SOE information for additional context.

The subpanel noted that much of the social analysis does not have historical depth, so there is little way to gauge impacts relative to what existed in the past. This historical trend information is standard when decision-makers are considering the status of stocks relative to proposed management actions, and is needed to better assess the potential social, cultural, and economic impacts. While this is challenging given limited data, there are community profiles that have some qualitative historical information. Also, more quantitatively, there are now almost 30 years of vessel trip report (VTR) data, which can give insight into the changes experienced by communities over time (numbers of vessels, labor expended, gear groups, species caught, landed quantities, etc.). Likewise, trends from the census and other long-term datasets gathered for other purposes could be compiled for these sections. The subpanel recommends presenting longer-term trends in the socio-economic metrics and continuing to explore the development of models that account for both social and ecological factors. These recommendations are relevant both to the SOE improvements and to the treatment of the AE sections going forward.

Further exploration of what elements are appropriate for automation in the long run would be beneficial. The subpanel discussed automation in the context of the use of codes/scripts to create repeatable analyses from continually updated datasets. Examples include some aspects of the SOE as well as recent offshore wind socioeconomic impact analyses or a fishery performance reporting tool. Some level of automation could serve as a way for staff to save time, improve consistency, perform updates on a deliberate schedule appropriate to each analysis, create transparency/replicability, and solve other challenges the subpanel has identified elsewhere in this report. Any efforts to pursue automation should also be undertaken with an eye to ensuring the appropriateness of each component to automation. The subpanel cautions that automation can unintentionally lock in decisions that are best revisited periodically, such as the scope of analysis, methods and datasets used, and underlying assumptions. Where possible, there should be standard and consistent information across reports, but there should also be scope for some

synthetic and interpretive analysis on issues and matters of concern in particular fisheries at particular moments in time. For example, a question of bycatch that might impact the livelihoods of specific communities may require a more targeted analysis in one fishery but may be irrelevant for another fishery. Overall, the subpanel strongly encourages further exploration of the role automation can play, perhaps first focusing on its use in the AE sections before use in impacts analyses.

See also Appendix I and II for additional relevant feedback on the documents reviewed.

a. What are the essential metrics, indicators or factors that should be included in the AE?

General:
The subpanel discussed the importance of linking the AE sections and the impacts analysis sections and considered what metrics, indicators, or other factors relevant to the AE must also be accounted for in the impact analyses. The subpanel focused most of its discussion on what improvements would benefit the AE section and did not come to a specific consensus on the essential metrics. The subpanel noted past feedback from Council members that underscored the importance of demographics, economics / financial data, information on dependence / reliance, shoreside infrastructure, community, and more as information viewed as needed by Council decision makers, as well as areas where information was lacking (from Williams et al. 2020, see also Appendix II for an excerpt from the report).

The subpanel noted that the information provided through the NMFS social indicators project provides useful context and relevant new information in this vein. Other indicators may also be useful to consider such as those developed through EPA's EJSCREEN (focused on protection of public health and the environment in the context of environmental justice), CDC's Social Vulnerability Index (identifying communities at risk before, during, and after disasters), or the Fishery Socioeconomic Outcomes Tool (Smith et al. 2019) which includes economic outcomes (employment, profit, wages, financial investments) and social outcomes such as distribution of fisheries benefits, maintaining fishing opportunities for small-scale fisheries and new entrants, reducing conflict in the fishery, safety at sea, opportunities for women, food security, and cultural importance of fishing to the community. Continued exploration of metrics and indicators that seek to track community resilience are of value to understand the AE. The subpanel underscored the importance of including information on the AE earlier in the process to the extent possible to provide additional opportunities for feedback and to build a strong base of contextual understanding across advisors and decision-makers to serve as the basis of recommendations for actions.

One area the subpanel noted is the importance of monitoring trends in consolidation. This is important for both fisheries (scallop and groundfish). Information and activity for vessel ownership groups have been tabulated annually since 2010 and provided to Council staff. While the primary use of the data is to analyze small entity impacts under the Regulatory Flexibility Act, these data were used in the five-year groundfish program review. There may be other

metrics of consolidation such as the Gini coefficient or Herfindahl–Hirschman Index (HHI) that may be considered more broadly to track trends in each fishery.

Vessel trip reports (VTR) seem underutilized in the social and economic analyses, particularly insofar as it can reveal much at the community scale. For example, while noted in one of the reports relative to vessel costs, crew days could be used more throughout the analyses. It could give insight into labor expended by fishery and changes over time. The connections between ports of landing, also reported in VTR, and home ports could give insight into fidelity to home port and how that is changing (as more vessels land in larger ports, etc.). This could be particularly important to gauge the impacts of management decisions that might make vessels travel and land well beyond their "homes" (e.g., impact on community, families, social fabric). Indeed, the migration/mobility issues seem to not be addressed at all in these reports despite our ability to track it and how sizable their impact on communities can be.

The subpanel recommends the continued exploration of what tools and metrics or indicators might be applicable in our region to improve and refine information presented in the AE. As an example, recent work on Pacific groundfish used a Theil Index, Kernel Density, and Shorrocks index to measure changes in geographic effects. These shifts are important to understanding both the AE and impacts, and further consideration of how best to incorporate this information would be valuable, particularly centered around known controversies and debates in this region.

In addition, the subpanel recommends greater focus on the intersection between the AE and the impact analyses, as ideally these should be more integrated. In this context the AE is the social and economic factors that are expected to be impacted by the planned action. The impact analysis needs to link back to those factors. Specifically, the economic impact analysis for Scallop FW32 includes metrics for trip costs, net revenue, and crew days, none of which are included in the AE. Likewise, the groundfish FW59 AE does not include the following metrics that are reported in the impact analysis; trip costs, net revenue, sector costs, quota costs, and groundfish revenue by vessel size categories.

Scallop:
See also Appendix I for additional document specific comments.

Groundfish:
Specific to groundfish, the subpanel recommended additional focus on quantifying sector costs, understanding trends in consolidation, and defining participation in groundfish fishery

See also Appendix I for additional document specific comments.

b. Are there additional groups that might be substantially affected that should be described in the AE?

General:
While the AE does a good job of describing substantially affected groups in general, this is an area where improvements to precision in language and consideration of additional groups that might be affected by management decisions needs to be considered. The subpanel discussed the challenges of precision in definitions and language when describing the various social and economic factors that make up a fishery (vessel owners, captains, crew, processing facility owners, processing employees, shoreside supporting industries, etc.). More specifically, the documents often refer to either vessels or fishermen, and in many cases, vessels and fishermen are conflated and typically actually mean vessel owner. If impacts (social and economic) are not experienced the same way by vessel owners, captains, crew, and all the various related shoreside workers, then there needs to be closer attention paid in both the analysis and the write-ups as to which actor or group is being discussed. For example, if it truly is a factor specific to the vessel owner, that should be stated clearly. If it is more broadly one of the other groups or not discernable, that should be clearly stated as well. This may require consideration of additional components of the fisheries in question (particularly when it comes to the shoreside components highlighted as important in other sections as well) and new ways of considering who is involved in various aspects of each fishery.

The AE sections might also benefit from consideration of the metrics and information presented through other projects, including but not limited to EPA's EJSCREEN and NOAA's Digital Coast. In particular, metrics in EJSCREEN relative to environmental justice and communities may be important to include in the AE to contextualize the potential impacts across a range of communities and types of participants in various aspects of the fisheries (including demographics and characteristics such as language isolation in certain communities) and to be responsive to guidance in this area. There has been significant work to understand impacts on historically excluded communities in other contexts such as climate adaptation and these efforts could be drawn on to improve the consideration and description of groups that might be substantially affected by management decisions.

Scallop:
See also Appendix I for additional document specific comments.

Groundfish:
See also Appendix I for additional document specific comments.

c. Is the AE sufficiently focused and/or do these sections provide information that is not needed?

General:
The subpanel agrees with the recommendations from both PDTs that efforts be made to streamline the process and narrow the scope of some analyses to create more time to bring in the social and economic findings earlier in the process so that the Advisory Panels, Committees, and

the SSC all have the benefit of this information during the development of their recommendations. This information is particularly important during the selection of preferred alternatives.

One recommendation for further refinement of the documents and/or streamlining of the analysis is to identify how variable certain metrics and measures are year to year. Those analyses that vary little could be updated less frequently and/or included as background with one brief reference in the main text. This recommendation was raised in the context of scallops but should be considered in groundfish and others as well.

Scallop:
The subpanel noted that the analysis of producer and consumer surplus included in Scallop Framework 32 is interesting from an economic perspective and may be valuable as background but may be more technical than is needed for the decision-making audience and general public. The subpanel encourages further review of this information for its relevance to decision making.

In addition, one metric with limited changes that could be shifted to updates every two years for scallops is the trends in limited access permits.

See also Appendix I for additional document specific comments.

Groundfish:
See also Appendix I for additional document specific comments.

d. How could the descriptive sections in the AE be improved to support Council decision-makers considering the scope of the action, the available data, short timelines, and limited resources?

General:
The AE sections could also be improved through increased use of the expertise available on the SSC. If it is possible to provide some of the AE section to the SSC earlier in the process, there could be time for further feedback from experts and opportunity for increased synthesis across the documents to support decision-makers. When possible, review of the AE and other human dimensions sections that might be ready should be included as a TOR for the SSC at the same time as the review of the acceptable biological catch (ABC). The subpanel also recognizes that some actions are on short timelines that may not be conducive to SSC review. In these cases, the subpanel recommends considering other mechanisms for additional social science expert input on these sections.

As written, the AE sections are currently focused on reporting trends. Earlier feedback and review by the SSC at the time of the ABC setting could support further synthesis and interpretation of those trends to support decision-makers throughout the process. This could improve the input and advice from the SSC which often relies on the Risk Policy as context to provide socio-economic advice but could be improved through providing input directly on the

AE drafts. Such an approach would also enhance the consideration of the feedback loops between the social and ecological components of the system and therefore better support decision-makers in understanding the trade-offs between various alternatives.

Adjusting the timeline for the draft AE may also create additional time to develop further figures (graphs, maps, sparklines, or others) to support interpretation of some data currently presented as tables (see also TOR 4). While the tables are still beneficial as background information and review during alternative development, the current reporting style of numerous tables appearing one after another makes it challenging for readers to follow a coherent narrative. Keeping only the key tables and including the others in Appendices as opposed to the main body of the text will support use of the AE as decision aids. In addition, maps can go a long way toward making much of this data more accessible and understandable to decision-makers and the public, which is one of the goals of the NEPA process and associated guidance. In addition, maps have the benefit of revealing the geographic nature of uneven distributions (rather than lists of place names). For example, maps featuring graduated circles could convey much of the information currently presented in tables.

Continued efforts by staff to further synthesize and coordinate across the various sections of the analysis and reports would be beneficial. This is particularly important as a step towards taking a more interdisciplinary lens to the analysis and presentation of information given the breadth of social science disciplines encompassed in developing the information for the AE section. For example, employment and industry consolidation were hardly mentioned in the economic section of the Scallop Framework document but were then raised in the social section without cross-referencing across the sections or any comprehensive analysis. The subpanel recommends consideration of alternative approaches where, in addition to sections of the report that are divided into valued ecosystem components (VEC), there are thematic topics of concern (e.g., employment and labor) that would synthesize information concerning each component. If the structure of the documents cannot be changed, the subpanel recommends the addition of a brief synthetic topic assessment (drawing on all components) in a summary section, rather than summarizing each component in turn.

The subpanel also recommends considering whether a more concise AE section and/or a separate document to address Stock Assessment and Fishery Evaluation (SAFE) report requirements would better serve decision-making needs. Doing so could provide Council members with a more concise summary of information concerning the most recent biological condition of stocks and the marine ecosystems in the Fishery Management Unit (FMU) and the social and economic condition of the recreational and commercial fishing interests, fishing communities, and the fish processing industries.

Scallop:
See also Appendix I for additional document specific comments.

Groundfish:
The subpanel also discussed the applicability of the recommendations from the Northeast Multispecies (Groundfish) Catch Share Review, which included the need for improvements to social sciences survey work, refinement of the costs of operations and net revenues, ACE leasing data, and shoreside infrastructure (see report in general but specifically the table on pages 185-187). As these research recommendations are developed, they may be incorporated into Framework documents as well.

See also Appendix I for additional document specific comments.

See TOR 2 for further discussion of the impacts sections, including opportunities to better link the Affected Environment and impacts sections together and create a more cohesive narrative structure to assist those reading the documents (see TOR 4 for further discussion on structure).

TOR 2. Analyses of Social and Economic Impacts - Do the analyses of these impacts provide the relevant information for Council decision-makers to understand the social and economic impacts of the management alternatives and comply with NMFS guidance for meeting NEPA requirements?

General:
As currently presented, the analysis of social and economic impacts provides relevant information to decision-makers in the context of the guidance under which staff are operating. The subpanel recommends continued consideration jointly with NMFS on how to improve document readability and usefulness while still meeting NEPA requirements. Going forward, there is an opportunity to improve the linkages between the AE and impacts sections to help structure the information in a manner that supports decision-makers in their review. This could include cross-references between the two sections and/or efforts to present the materials in a more narrative flow, for example using policy analysis frameworks such as those discussed in TOR 4.

See also TOR 1 for discussion of the importance of linking AE and impact analyses and Appendix I and II for additional relevant feedback on the documents reviewed.

a. What are the essential metrics, indicators or factors that should be included in the analysis of social and economic impacts?

General:
Further integration across the AE and impacts sections could also support further discussion of impacts on individual communities. For example, tools like those developed to model the impact of proposed wind projects could also help better understand spatial impacts if use can be expanded to evaluate spatial closures, etc. and model outputs could be used to summarize impacts on ports, states, gear types etc.. Efforts to consider various geographical entities relevant to each fishery could also be a valuable approach to better understand potential differential impacts across fisheries, home ports, landing ports, etc. The methods used for the groundfish economic impact analysis included impacts by vessel size and port. The economic impact methods for scallops are aggregated, so tracing impacts to ports or individual vessels cannot be done.

Scallop:
The subpanel recommended that the scallop economic models be updated less frequently, perhaps updating the price model in one year and the cost model the next year. Based on present performance, the annual updates may be more frequent than needed and could be explored as potentials to space out more, taking into account differential characteristics across the fishery.

Specific to the scallop fishery, a better understanding of the intersection of imports and domestic markets was raised as an area that needed additional attention. The present price model does include imports as a dependent variable; however, imports are held constant in the economic impact analysis to isolate the price effects of supply changes. As a sensitivity analysis this

assumption could be relaxed to consider the potential impacts of imports on domestic markets relative to management decisions.

See also Appendix I for additional document specific comments.

Groundfish:
The impact analyses could also better capture costs related to sectors by drawing from existing information in sector year-end reports. This is particularly relevant in the context of constraining stocks and should be better captured in future analyses.

The subpanel appreciated the use of crew days as a proxy for employment impacts and encouraged further exploration of how this metric might be used in the groundfish impacts analysis as well as in other fisheries.

See also Appendix I for additional document specific comments.

b. Are there additional groups that might be substantially impacted that should be included in the impact analyses?

General:
The subpanel discussed the importance of providing more comprehensive analysis of the full range of communities that rely on and/or are impacted by fisheries. When the reports only give information on the largest or remaining communities, a significant layer of historical trends and context is lost, leading to potential unintended consequences in the decision stages due to the narrowed scope of communities that are considered in the impacts analysis. In many of the analyses, sustainability is presumed to be achieved in the future; therefore, the future state of all communities is considered to be positive. If sustainability is achieved by removing a portion of fishing communities, then the future status is only relevant to those communities that remain, leaving questions about the impact of decisions on those communities that can no longer rely on fishing. Likewise, if sustainability is achieved by concentrating access to fisheries resources and benefits to a limited set of participants, equating community health with sustainability misses important broader impacts of decisions. This underscores the need for more detail on the analysis of communities to consider the whole range of potential impacts. The subpanel also recommends continued focus on linking AE and impacts in the context of substantially impacted groups as discussed in TOR 1b.

Scallop:
See also Appendix I for additional document specific comments.

Groundfish:
See also Appendix I for additional document specific comments.

c. How could the impact analyses of the actions be improved to support Council decision-making, considering the scope of the action, the available data, short timelines, limited resources, as well as applicable Council on Environmental Quality NEPA guidance?

General:
Within the Impacts sections, the subpanel recommends efforts to further integrate discussion and create more narrative flow to assist readers in interpreting the potential impacts. It is clear that sections of the report are written by different authors, making it hard to connect and draw conclusions in some cases.

The subpanel encourages continued efforts to provide additional clarity, refinement, and consistency to the use of terms that could be considered subjective and interpreted differently by different staff and Council members (i.e., "low positive," "low negative," etc.). While the subpanel recognizes that there are criteria and definitions for these terms, this remains an area of confusion and/or misperception among decision-makers and industry members and would benefit from some additional clarification and/or communication on the process and criteria. This challenge of potentially subjective language is also relevant to the discussion of the realization of economic efficiencies, including consolidation and redirection since these can be positive impacts in some context or negative impacts through other lenses. For example, consolidation of landing ports can be beneficial for fishers trying to increase profitability in the face of restricted harvest volume (which will benefit the stock recovery), but can negatively impact some of the smaller waterfront communities and their social fabric. More precision in discussion and acknowledgement of the potential negative social and cultural impacts of economic efficiencies would be beneficial.

The subpanel also noted the quote "measure what you can, take seriously what you can't, and manage both together" (Mintzberg, 2019) as being particularly relevant to the fisheries management context in a social-ecological system. Quantitative and qualitative data and analyses both have their places in these documents. For example, discussion of the impact of constraining stocks on the analysis is an important component that has both quantitative and qualitative elements.

As noted in the TOR1 discussion above, precision in discussion of where the potential impacts are felt across a fishery would also be beneficial. When describing the impacts to a fishery, it is important to specify what impacts (negative or positive) will be felt by which specific component of the fishery: corporate owners, owner-operators, crew, processors, local communities, etc. To the extent that analyses and discussion can be more precise about who is impacted, where, how, and to what degree, it could improve interpretation and communication of potential impacts of the alternatives under consideration (including and especially how these impacts might vary across the different alternatives). Ultimately, this will benefit the development of preferred alternatives. While the subpanel acknowledges the challenges associated with measuring impacts at different scales and the limitations of the associated tools and resources to conduct such analyses on a regular basis, we still encourage focus on this area. The interpretation of impacts over various timescales is also important given the nature of economic models.

The subpanel noted the staff comment that stakeholders tend to focus on the impacts in years one and two, so these need to be given sufficient focus on the documents and presentations while also acknowledging the longer-term impacts and caveats to the analyses. While short- and long-term impacts are discussed, further elaboration and clarified discussion of short- versus long-term impacts and the methods by which those are projected may help decision-makers weigh trade-offs in more detail.

The subpanel also encouraged consideration of what information is presented in cases where the impacts are not evenly distributed. While the means are often mentioned as the default, in the case of unevenly distributed impacts they do not tell the whole story and potentially leave out important socioeconomic impacts that need to be considered. When feasible, more emphasis should be made to present impacts in more detail (e.g., minimum and maximum values, measures of spread), not simply mean results.

The subpanel discussed automation in the context of both the AE and impacts analyses, with a recommendation to first explore its application to AE before considering automation in impacts analysis (see TOR1).

Scallop:
See also Appendix I for additional document specific comments.

Groundfish:
See also Appendix I for additional document specific comments.

See TOR 1 for further discussion of the Affected Environment sections, including opportunities to better link the Affected Environment and impacts sections and create a more narrative structure to assist those reading the documents (see TOR 4 for further discussion on structure).

TOR 3. Are there alternative ways to identify key fishing communities considering NMFS guidance? Is there a consistent approach that could be considered for different Council actions?

The subpanel acknowledged that even with guidance on identifying key fishing communities (NMFS 2007), this process continues to present a challenge for analysis. As noted earlier, the range of types of communities and the ways that individuals self-identify into various communities impacts how information is presented and interpreted by staff, decision-makers, and the public. For example, port communities, landing communities, processing communities, and industry members' home communities might all vary.

The newly released "A Practitioner's Handbook for Fisheries Social Impact Assessment" by NMFS provides some encouragement for consistency across actions. The subpanel recognized that there are characteristics unique to each fishery, but that some framework for consistency is beneficial for decision-makers and the public to interpret the information. Since decision-makers need to review information across many fisheries, consistent methods and approaches can be beneficial. The subpanel noted challenges associated with confidentiality rules and encouraged the exploration of additional methods or approaches that might improve the information while still protecting confidentiality.

The subpanel also noted the challenge of scale in the context of defining communities. Communities are defined and assessed in terms of both the number of vessels and the number of processors (there need to be three or more of both).. This essentially leaves out many communities from any analysis (as noted earlier in the Impacts discussion). This approach results in information and analysis included about the big ports and little information about the small communities which are often where the uneven impacts of management are likely to be felt most acutely (across different sizes of operations but also across geography). This can cause decision-makers to rely on their own experiences with and understanding of the various communities, as opposed to creating a shared understanding of the potential impacts through analysis available to all decision-makers. One potential way to address this is to remove the processors from the equation and instead rely upon the "hail weight" and species reported in the VTRs. While some might be concerned that the hail weight might be less accurate than dealer-reported weighout data, it is likely worth the tradeoff, as the number of communities that could then be incorporated in any analysis is greatly expanded (St. Martin and Olson, 2017). The subpanel also noted the reliance on other local infrastructure beyond just processors so consideration of a larger suite of operations when it comes to confidentiality rules might bring in more communities

See also Appendix I and II for additional relevant feedback on the documents reviewed.

TOR 4. Are there alternative ways to present and communicate the data and analyses to Council decision-makers more effectively?

Presentation of data and analyses is a key component that impacts the interpretation and perception of the information by decision-makers and the public. The most important information that the stakeholders and Council members want to know is how different proposed alternatives compare to each other so that informed decisions on which options to pursue can be made. With this in mind, the subpanel acknowledged that one of the challenges with these documents is that there are different levels of information needed at various points along the decision process (i.e., Advisory Panels, Committees, SSC, Council, NMFS) and with different audiences (decision-makers, industry, general public, etc.). As envisioned by NEPA, these are documents that should be used as a way for all impacted stakeholders to understand what is being proposed, not just those already deeply engaged with the process. The subpanel noted that communication problems can be addressed by simplifying the narrative in the presentations and reports (also raised in the Program Review and other discussions by the Council). The subpanel noted that considering how different audiences might interpret the information could also be valuable during the document development process, as these perspectives are likely to arise and warrant consideration by Council members in the decision-making process (for example, what might someone representing a potentially impacted community want to know versus what a crew member might want to know versus another audience). The subpanel also noted that while consistent economic and social analytical approaches and descriptions in the associated documents are beneficial for increasing the collective understanding of the process and the information, variation in presentations at different stages is appropriate to emphasize different levels of information for different audiences. In both documents and presentations, a focus on seeking to clarify the key take-home message the writers aim to convey could also be beneficial.

The subpanel noted that the discussion of alternatives can be hard to follow throughout the documents when the naming conventions of model runs and alternatives are inconsistent. In addition to consistent naming, the subpanel also recommends consideration of approaches like tables with rankings and color codes to compare alternatives' performance along key criteria. In addition, table titles should be simplified and clarified by moving some information to table notes. Consistent labeling is also an area where improvements can be made, perhaps with automation in some cases. For example, the same unit of measurement was sometimes expressed two or three different ways within the same table.

The subpanel also noted that economic and socio-cultural data and analyses tend to be the topics with which many Council members have the least technical experience, particularly with respect to research methods and underlying theories (Williams et al. 2020), requiring either more discussion of the concepts behind the analyses, further use of the SSC for advice, and/or additional training to increase comfort with interpreting and understanding findings and recommendations. Council members have also provided feedback on the documents that continue to be relevant to this discussion, including recommendations to streamline where possible, use visualized data, view the industry and public as the target audience for documents, create digitized interactive documents, and present social information more formally (in line with how economic and biological information is presented) (see Appendix II).

There may also be lessons from technical writing and other communications experts that could benefit the process, particularly around opportunities to create a more narrative structure that those not steeped in the analysis can better digest and interpret. In addition, there may be ways to organize the documents and/or using team writing approaches that foster greater integration among analyses, sections, and documents so that they flow more logically, read more consistently, and more effectively facilitate understanding. This is further underscored by the opportunity to consider structuring both the analysis and the writing of documents more broadly in the context of the social-ecological system or a valued ecosystem component (VEC) approach that specifically seeks to not treat each component in turn, but rather to address the interactions, relationships, and feedback loops. Moving towards more integrated team writing approaches may also further improve connections and understanding across the different disciplines that these analyses need to draw upon.

The subpanel also recommended that a policy analysis framing (e.g., Bardach's Eightfold Path: "Define the problem, Assemble the evidence, Construct the alternatives, Select the criteria, Project the outcomes, Confront the trade-offs, Decide, Tell your story") be considered as a tool to develop structure for the documents. This also aligns with the requirements outlined in the "Key Elements of the Regulatory Impact Review" sections described in the NMFS *Guidelines for Social Impact Assessment* and the *Guidelines for Economic Reviews.* The information in the provided documents is not consistently presented in this clear organizational framework. In the context of Council members needing to decide from among a set of alternatives, it would help to have the information laid out in a way that facilitates this comparison as much as possible. For example, revenue trends are useful background but by themselves do not give a way of knowing how revenues would be differentially affected by the different alternatives. In both Bardach and the "Key Elements" sections, this distinction between background info and the analytical component of scoring each alternative against various criteria is made. Some of the tables do already rank alternatives, which is helpful, but overall the subpanel recommends a focus on improving the consistency, organization, and transparency in this policy analysis step and possibly presenting a summary table that shows how each alternative ranks against each criterion, with references to specific sections, tables, or graphs for more details.

See TOR 1 and 2 for additional relevant discussion of use of maps, graphics, and other topics. See also Appendix I and II for additional relevant feedback on the documents reviewed.

Appendix I. Specific Comments for Future Consideration

The following comments are provided to serve as points of reference as staff consider future analyses and should not be construed as critiques of the work presented in the documents. These are drawn from individual comments by reviewers and should not be interpreted as consensus feedback from the subpanel.

I. Scallop Fishery Management Plan Framework Adjustment 32

(1) Figure 19 (p. 116): The formatting/legend in this graph is confusing--what do the green dots off the green line signify? One overlaps with the axis labels on the right.

(2) Table 34, 35, and 36 (p.118 and 122): I would replace these abbreviations (FT, FT-SMD, etc.). At minimum, add the definitions of these abbreviations as a note. I see that it is explained in the main text, several times actually, but there is nothing more distracting than needing to go back and forth between the main text and tables to just understand the table.

(3) Table 37 (p.123): I suggest adding a column showing the landing pounds per permit. This will show the productivity of a single permit, which I think is more informative than the total landings since this can be influenced by the total number of active permits.

(4) Table 38 (p. 124): The sideways justification of the text in some cells is distracting and unnecessary.

(5) There are a number of cases where the same information is provided as a table and a figure. It would be simpler to add a data table to the figure.

(6) Trends in effort allocation are difficult to interpret given changes in open and access area allocations over time. The same is true for used allocations and LPUE. It may be more appropriate to create and index or only base trends on open area metrics.

(7) Figure 25 reports LPUE for GC scallop IFQ – it should note that these vessels are constrained by a trip limit.

(8) Table 39 & 40: Context is needed here because the composition is jointly determined by exploitable biomass in open and access area and effort is drive by prices, particularly of U-10 scallops.

(9) Figure 42: A scatter plot of U-10 prices and quantities would bolster the case that U-10 prices are related to quantities.

(10) Table 48: How is an active vessel defined?
   a. The number of FT-NET permits is said to be declining continuously yet the table shows no change in number of permits.

(11) The presentation may be easier to follow as a progression of steps culminating with consumer producer surplus as the end product.

(12) The employment information is based on crew days. This is a measure of labor input but isn't a measure of numbers of people employed in the fishery.

II. Northeast Multispecies Fishery Management Plan Framework Adjustment 59

1. General

The following comments are derived almost exclusively from Section 5.7 (Affected Environment – Human Communities) and 6.5 & 6.6 (Impacts on Human Communities) but can be applied to other sections.

Many of these comments boil down to "clarify the key take home message" and "cut to the chase." This applies to the choice of graph type, construction of tables, and the paragraph structure.

- Ideally, graphs and tables should convey the key message by itself and visually. If it is necessary to read the main text or lengthy notes to understand the key message, then the graphs and tables are more of a distraction than being helpful. This includes the title of such graphs and tables. For example, a title such as "groundfish pounds landed," while sufficient, leaves out *what about* the landed pounds that merits readers' attention. Changing this title to "Trends in groundfish pounds landed" will help the readers what to look for, if that is the key message. Also, notice that this title is still neutral as opposed to a title such as "Decreasing trend in groundfish pounds landed."
- Section headings, including all subsections, can be both more informative and need to fit better with its content. For example, section 5.7.2 is titled "Fleet Characteristics," but it only discusses groundfish eligibilities – no mentioning of other characteristics that people typically think of such as gear type, size, age, ownership, etc.
- Some of the specific details included in the main text can be omitted for clarity. For example, again in section 5.7.2, the key message here is "Overall, there has been a decline in the number of permitted vessels in any year, from 1,389 in FY2010 to 918 in Fy2018" (about midway in this paragraph in p.113). If so, then the details about PSC and CPH are less than marginally important and can easily be pushed into a footnote or an appendix.
- Avoid the redundancy of describing what is shown in the table/graph in the main text. Rather, focus on the key message(s) and its implications when appropriate.
- The first sentence of a paragraph should set the stage for the content of that paragraph. For example, the second paragraph in section 5.7.3 (p.115) has the first sentence describing gear types, but the rest of the paragraph is about the fishing effort measured in the number of fishing trips. There are two negative consequences from this divergence. One is that it simply confuses the reader. Another is that if a reader is fast-reading the document by focusing on the topic sentences (i.e., the first sentence of paragraphs), they will miss the point.

2. Specific comments

p.109 Table 22: the average price column should maintain two decimal points (e.g., the entries "1.5" and "2" in years 2013 and 2015, respectively, should be "1.50" and "2.00").
This table contains a lot of good information but is hard for a reader to process. It might be simpler and shorter just to include labels for the heights of the bars in each individual figure.

p.110 Figures 6 and 7:

- While bar charts can be used to show trends, they are not the best choice especially when there are ups and downs (as opposed to monotonically declining or rising); line graphs are preferred in these cases. Also, it is an important message that while the landed volume and value (gross revenue) trended in parallel until 2015, suggesting overall unit value stayed constant, they diverged post-2016 (volume increased while value declined). The use of line graphs will highlight this point more clearly.
- The legend for vertical axis in both figures can be in millions, not just for cleaner look but also to save space for more important parts of the graphs.

p.113 Section 5.7.2:

- The key message is unclear in part because the paragraph contains details that are not immediately relevant, i.e., on PSC and CPH (see comment above).
- Is the key message "number of active vessels is declining" since FY2010?
- The title of this subsection and its content is a mismatch (see my comment above). This section does not really discuss the fleet characteristics.
    - In fact, the topic sentences in subsection 5.7.3 can be included in this subsection.
        - "The groundfish fishery has traditionally been made up of a diverse fleet…"
        - "Primary gear types in the groundfish fishery are…"
- What is the key message of table 23 (p.114)?
    - There is much information included in this table, but it is unclear what to look for or what is important.
    - For example, if one focuses on the Total Eligibilities column this number stayed about the same for Sector (around 840) while that for Common Pool declined steadily. However, this is very hard to see in part because the rows for Sector and Common Pool are alternating. If this is indeed one of the key messages, then this table needs to be rearranged so that the message is clearer.

p.115 Subsection 5.7.3:

- Mismatch between the topic sentence and the paragraph content for both paragraphs under this subsection (see my comment above).

- Much of the content in these two paragraphs is just describing what is shown in table 24, therefore it is redundant.
- Rather than listing numbers from that table, the main text should focus on the key take-home message(s), such as "number of active vessels are declining in all size-class."

p.116-117 Tables 24 and 25:

- Same issue with table 23 – alternating Common Pool and Sector rows makes it very difficult to understand these tables. Given the importance of the sector program in groundfish fishery, it is important to better present the data for Common Pool and Sector for easier comparison.
- Consider visualizing with graphs, along with the use of indices and changes in addition to levels. For example, if the number of active vessels is changing 160 □ 156 □ 119, then:
  - Level: 160 □ 156 □ 119
  - Change: -4 □-37
  - Index: 100 □ 97.5 □ 74.3

Which format to use will depend on the message that the authors want to convey to the readers. The point is to choose the best one accordingly.

Table 24 & 25 the metrics are based on vessels on a declared trip, which is not the same definition used for most of the other tables.

Table 24 & 25 are said to be a measure of diversity, but a diversity index may be a better indicator.

p.117 Subsection 5.7.4:

- For the second paragraph, only the first sentence is needed. The rest only describes what is shown in table 26 and is thus redundant.
- Similar for the third paragraph in this subsection (the first paragraph on p.118). "MA has the major share; ME, NH, and RI take up the rest" is all that is needed.

p.118 Tables 26 and 27:

- At least the order of states could have been in the descending order of shares in some base year (2018, 2010, etc.) so that the key message – MA dominates, ME, NH, and RI take up much of the rest – is clearer.
- Better yet would be converting it to stacked bar graph to visualize the key message.

p.119 Top paragraph:

- It is only introducing the subsequent tables. Should focus on what these tables are trying to convey.

Table 28:

- It is extremely useful to separate the utilization rates between Common Pool and Sector.
- One key message from this table is the presence of choke species, as this is one of the major interests among the stakeholders. For example, some stocks have extremely low utilization rates (e.g., haddock, pollock) – why? Could these be the consequence of choke species?

p.120 Table 29:

- Difficult to see the point of this table.
- Depending on the message being conveyed, the ordering of species can be altered, such as in descending/ascending order of landings volume or ex-vessel price.

p.123 Subsection 5.7.6:

- The main key message being "Gloucester and New Bedford have kept the top two rankings throughout" seems sufficient. The rest should be reconsidered as to whether it is worthy of keeping.
- For example, the "competition" between Gloucester and New Bedford described in the fourth paragraph on p.123 is interesting, but is it essential or important?

p. 125+ Table 32-41:

- Need to clarify what is meant by dealer location.
- It may be useful to summarize auctions from other dealers.

p.133 Subsection 5.7.6.1.1:

- There is a lot of unnecessary information that can be taken out to downsize this section as well as to enhance the clarity of its messages.
    - The first paragraph in this subsection has some explanation on how the index was generated (i.e., "using principal component factor analysis (PCFA)…" Is this necessary for the intended audience?
    - The last paragraph on this page explains somewhat in detail about how the index factor scores are labeled low, medium, etc., but is this necessary? Suggest taking it out.
    - Low, medium, etc. labels are used in tables 42 and 43. If the authors want to keep the explanation of how these categories are defined then move them closer to where they are used. Perhaps a footnote near these tables rather than in the main text. Further, consider adding color-coding to make these tables, similar to Table 119 on p.238.
        - On aside, why are category labels (i.e., low, medium, etc.) not used in Table 119?
    - The same paragraph also lists the ports with "high engagement" scores but this is apparent from Figure 12 – hence redundant.

p.134 Figure 12:

- So many bars with so many colors – and what is/are the message(s)?

- If the trends are important then this can be converted to a line graph, with horizontal axis measuring years (not ports) and each line representing a port's factor scores across years.
- Then highlight notable ones, such as Boston trending upwards and New Bedford trending downwards.

Figure 12 is useful, but with so many years it is very difficult to discern trends. If this format is preferred, consider flipping it to a horizontal bar chart so there is more page space to work with (wider bars may be easier to differentiate from each other). Lines dividing the ports might also help improve clarity.

p.138 Subsection 5.7.7

- What is the purpose of this subsection? The first paragraph defines the terms "redirection" and "consolidation." The second paragraph describes how redirection and consolidation occurred in other fisheries, citing relevant literature. But there is no mention of what happened in the Northeast groundfish fishery in terms of redirection and consolidation of fleets.

Section on consolidation and redirection is a literature review; there are no indicators provided.

p.146 Subsection 5.7.9.2:

- Its second paragraph is another example of redundantly repeating the information shown in the table by just listing the numbers. Will be much better served if the relevant numbers were converted into a diagram than being repeated in the main text.

p.147 Table 49 show groundfish and non-groundfish caught by party/charter VTR
O Commercial tables report groundfish trips but party/charter tables do not, why?

P148 Table 50 shows the number of active for hire permits. This is said to be a measure of effort, which is not.

p.215 Table 104:

- The last row: is it important to compare FY2020 predictions to FY2018 realized?
- More importantly, what is the key message that this table wants to convey?
  - Is it about how good the predictions are compared to what were realized? If so, then more emphasis in comparing the first two rows is in order.
  - Is it about how the two alternative options compare? If so, then the last row should be replaced (or a new row added) with the difference between the two options.

p.223 The most important information that the stakeholders and council members want to know is how different proposed alternatives compare to each other so that informed decisions on which options to pursue can be made.

From this perspective, the structure of this section ("*Impacts on the sector component…*") is odd since at the very top is the comparison of the predicted FY2020 values under the preferred alternative against the past. It is in the second paragraph that the comparison between the two options is discussed.

Perhaps reverse the order of the first two paragraphs. In addition, what is the benefit of comparing the FY2020 prediction to the FY2019 predictions or realized FY2018. This is because the fish prices and hence the revenues are affected by many factors other than the fishery management regulations, and thus the comparisons between FY2018 and FY2020 prediction is not very informative (unless the difference can be mostly attributed to the regulatory changes, which seems unlikely).

- The GB cod recreation catch target is the same under Alternative 1 and Alternative 2, yet Alternative 2 is said to have a more negative impact than Alternative 1.
- The GOM cod reallocation would increase GOM cod quota to the recreational fishery, yet the impact analysis says that this would have neutral to negative impacts on recreational values.

Appendix II. Relevant Excerpts "Consideration of Social Information in New England Fisheries Management: Report on 2019 Interviews with New England Fishery Management Council Members."

Excerpts from Williams, L**,** Feeney R, and M Cutler. 2020. Consideration of Social Information in New England Fisheries Management: Report on 2019 Interviews with New England Fishery Management Council Members. *Report to NEFMC.* Available from NEFMC.

A) Table 1. Information noted as needed and as lacking by Council members for federal fisheries management decision making. (see below or pages 8-10 in report)
B) Recommendations from Council members on documents (see pages 12-13 in report)

"When discussing their use of Council documents in the context of social information, members' recommendations for improvements include:

- streamlining where possible (5 seats),
- use of visualized data (5 seats),
- viewing the industry and public as the target audience for documents (4 seats),
- desire for digitized interactive documents and/or open source data (1 seat), and
- presenting social information as formally as possible (1 seat)."

Table 1. Information noted as needed and as lacking by Council members for federal fisheries management decision making.

Theme	Needed for Decisions – Details	Lacking - Details	Prevalence	Example Quote
Demographics	general, # of individuals/ participants (also at community level), age, community demographics (general and primary target species), comparison across communities, crew info (inc. earnings), demographics of impacted, gear type demographics, distribution of jobs, distribution of landings, ownership demographics (individuals, corporations, etc.), fishery participation, permit structure, recreational and commercial make-up, usage patterns / participation, vessel classes.	Lacking: distribution: # permits landing % fish, fishing activity locations, length of operation of businesses, role/position in industry, *Many items noted as needed for decisions were also noted as areas for improvement.	13 seats	"There are times with some actions that I feel I don't have a real grasp of the actual dollar numbers and how dependent people are on specific resources. Particularly when you get into small communities that have small boats that may participate in multiple fisheries. Sometimes, it does vary, and I can't give you examples now, but some documents I get a real good feel for it and others it seems like it's, they have to use, instead of quantitative information, qualitative information."
Economics/ financial	Differential financial impact of regulations, distribution of profit, distribution of revenue, distributional aspects, economics at fleet level not community, ex-vessel value, financial impact to vessel owners, general, geographic distribution of impacts, impact on businesses, input prices, overhead costs, return to owner.	Lacking: jobs linked indirectly to vessels, lost markets, percent income from fishing, percent income from leasing, see fishery economics from industry perspective, info on ability to access capital (new vs established operations), economic analysis doesn't take enough into consideration (initial permit, boat cost / payments) / solvent number is too low, incomplete economic info (i.e. health insurance costs missing, financial info missing), more needed. *Most items noted as needed for decisions were also noted as areas for improvement.	12 seats	"I understand the need for the broader analysis and I think for the most part, those are helpful and informative. But as the decision maker, it's really the economic impact. The impact to the businesses, the communities that really I think are the driving, that should be one of the driving forces." "I'm not really sure what how they come up with the numbers. They can never explain well, how they come up with those numbers. There's some kind of formula or mathematical thing that they use and maybe it's outdated?"
Quality / scientific rigor	Accuracy and reliability key	Economic numbers/info isn't right, need more up to date info, need improved quality of economic impact analysis, info doesn't seem accurate (communities, average income, etc.), MRIP data concerns, slight negative / slight positive is hard to interpret,	7 seats	"Often we look at the fishery dependent communities, but that information never seems to be that strong to me, so we tend to rely more on our personal experience and knowledge." "We're getting things on average. And so sometimes the summing up and the scale at

		concern with stretching/ extrapolations, use of assumptions in economic models impacts confidence, use of averages challenge, scale of the analysis.		which the analysis is conducted, the community level that it is conducted, it can kind of limit the reality and the complexity of the fishery that's captured. I know there's often confidentiality constraints there."
Dependence / Reliance	Community revenue from fishing, economic dependency, economic impact of fishing on community, social dependence, social reliance, general.	Most items noted as needed for decisions were also noted as areas for improvement.	6 seats	"I've been pleased to see some of the work that's come out of the social science branch in terms of the community dependence. But I don't really ever see that so explicit in the council analyses. Having that kind of work highlighted and brought forward explicitly to the council, I think would be of great benefit. "
Shoreside	General, infrastructure access, financial impact to shoreside businesses	Information on supply chain, shoreside economics, shoreside impacts, lack of hard numbers, *Items noted as needed for decisions were also noted as areas for improvement.	6 seats	"We concentrate a lot on the fleet. But we don't really pay much attention to the shoreside operations unless it becomes a contested issue. And I think that will really help us understand the distribution of the revenues and the value of these fisheries throughout the region."
Community (general)	General, context, community structure, fishery performance by community, etc.	Community health impacts / psychology, impact of catch shares on lives/families, etc.	5 seats	"if we're talking, really talking about a comprehensive social impact analysis, it should be looking at more than just the economic impact that should be looking at community health impacts, as well. Particularly [where] fishing is a significant component … of what supports that community."
Diversification	Ability to switch fisheries, diversification opportunities, impact buffering or mitigation potential, permit movement ability, where likely to move effort	Most items noted as needed for decisions were also noted as areas for improvement.	5 seats	"I would love to see some greater assessment of the diversification opportunities available in different communities. Whether that's by permits held of home ported vessels there. I guess that would be sort of a proxy that immediately comes to mind but, that really can impact how we view the impact of an action."
Recreational	General	Recognize diversity of recreational industry, recreational coverage, recreational: standardized info to compare, timing impacts (particularly on rec), understanding of recreational fishing behavior.	5 seats	"more work to understand what drives the full recreational community. It's not one broad brush of a type of person going out for an experience. There're other components to it. And that's a missing part of helping me [with] decisions, particularly with groundfish."

Confidential Data	N/A	Lack of access to data, confidentiality limitations on analysis, etc.	3 seats	"that's my biggest problem with social sciences and social information. Much of it is unavailable to fisheries managers. And we manage by guesswork with fingers crossed hoping that it all works out."
Data from industry	N/A	Socio-econ data shared from industry	3 seats	"a lot of fishermen ... don't like to participate in [social science research or council processes] so it's pretty difficult to get the right information."
Leases	Lease information	# of lease only permit holders, $ spent to lease, accessibility of leased fish, impact on individuals, lease market interaction, lease prices, leases: use of allocations, possession limit link to lease prices, profit (from leases)	3 seats	"In the last couple of years, and it'll become even more important, it's just the lease markets. And understanding those and then understanding how proposed management changes could affect the lease market."
Scenarios	Predictive analysis (for alternatives)	Scenarios of possible behavior responses/outcomes, understanding how fishermen might react to proposed regulations	3 seats	"[You could] describe a number of different scenarios and then the managers can use some of their own judgment and experience with the fishery to say, 'you know, I really think the fishermen are probably going to react [how] scenario two describes.'… So that there's not just this one assumed path and reaction by fishermen, maybe a number of different scenarios."
Consolidation	N/A	consolidation impacts on communities, consolidation risks / thresholds	2 seats	"I don't think we fully understand, if we increase possession limit, what will that do to consolidation or to the leasing market? … I don't fully understand how all those things are going to interact with each other."
General	Catch broken down by fleet, differential impacts, previous biological/social context re: past actions, previous council thinking, social impact assessments /social information generally, socio-econ impacts: individual up to port, trends over time, who/ how impacted.	Info on ability to attract new entrants / affordability of entry, differential impacts / complexity, discards, excessive shares update, historic context, network of influence, centralized data source, getting what need but would like more, general limitations.	One seat each	"It's hard to compile all that information. You know, even if you do, even if you get everybody [in] the survey you're going to have different reactions for different regulations from … different people in the same harbor. So, how do you compile all that to come up with one strong opinion on the regulation or on an impact survey?"