



New England Fishery Management Council

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MEMORANDUM

DATE: May 13, 2014
TO: Scallop Oversight Committee
FROM: Scallop Plan Development Team (PDT)
SUBJECT: **Input from Scallop PDT Meeting, April 8/9, 2014**

The Scallop PDT met on April 8 and 9, 2014 in New Bedford, MA. Day 1 of the meeting focused on the LAGC IFQ Performance Report, as well as recommendations for RSA research priorities. Day 2 included presentations from about a dozen researchers on preliminary results from recent Scallop RSA awards. The PDT had a follow-up conference call on May 12, 2014 to review final PDT findings for the LAGC IFQ Report and review this memo. This memo summarizes the major findings and input from the PDT on these subjects.

1. Review of updated LAGC IFQ Performance Report

Council staff summarized updated analyses prepared for the LAGC IFQ Report. The report includes four overall variables to evaluate the performance of the program to date: biological, economic, safety and enforcement, and governance. Below is a brief summary of the conclusions for the variables that the PDT decided to draft "findings" for at the meeting.

- Biological Variable 1 – Catch

In summary, from a biological perspective this IFQ and sub-ACL management program has been effective at controlling mortality and preventing overfishing. Furthermore, during the first three years under IFQ management, a relatively small percentage of the total available catch has been left unharvested, about 10% of the sub-ACL the first year and under 5% in 2011 and 2012.

PDT Finding – *The 15% carryover provision added to this IFQ program in Amendment 15 potentially adds management uncertainty in terms of final catch staying below the sub-ACL. Total carryover has been about 5% of the sub-ACL. Even if all vessels utilized the 15% carryover provision, the risk of that measure causing the entire ACL to be exceeded is diminimus since 15% of the 5.5% allocation for LAGC vessels is a relatively small proportion of the total fishery. Since this is a relatively low risk and had not been an issue to date no action is needed at this time, but the issue should be monitored and a small buffer could be considered in the future if needed. For example, a sub-ACL could be set 1% lower than the sub-ACL to account for the 15% carryover provision allowed in this fishery.*

- Safety Variable 1 – Vessel casualties

Since 2007, the total number of incidents has declined in the LAGC IFQ fishery, potentially suggesting that as a fishery overall there are fewer vessel safety issues. However, there are too many variables involved to conclude that vessel safety is any different now compared to before IFQs were implemented based on these data.

Table 1 – Summary of “vessel casualties” that US Coast Guard has responded to in Northeast fisheries (2007-2012)

	2007	2007	2008	2008	2009	2009	2010	2010	2011	2011	2012	2012
	LAGC	Total	LAGC	Total	LAGC	Total	LAGC	Total	LAGC	Total	LAGC	Total
Groundings	2	11	0	14	1	7	0	15	1	14	1	4
Disabled	11	49	11	69	13	51	12	63	8	48	1	11
Medico	2	9	2	11	2	14	2	11	1	10	3	15
Medevac	5	18	7	19	0	7	2	10	0	16	0	7
Sunk	1	11	5	21	0	3	0	7	0	2	0	2
Collision	0	3	3	10	1	6	3	18	2	10	0	4
Allision	0	1	1	2	0	0	0	1	0	2	1	2
Flooding	3	22	1	10	0	11	0	7	1	10	0	11
Fire	0	7	0	2	0	10	0	10	0	5	0	4
Terminations	1	27	1	29	1	24	0	19	2	14	0	2
Total	25	158	31	187	18	133	19	161	15	131	6	62
<i>LAGC % of Total</i>		15.8%		16.6%		13.5%		11.8%		11.5%		9.7%
<i>LAGC % for vessel maintenance</i>		16.9%		16.7%		17.3%		13.8%		13.8%		3.6%
Fishing Related Deaths	4	9	0	3	0	3	0	5	0	2	2	4

Note: LAGC % for vessel maintenance: Includes disabled, sunk, flooding, and fire combined

- Safety Variable 2 – Vessel age

The average year built for active LAGC IFQ vessels has been stable between 2010 and 2012. There is not much of a difference in vessel age for vessels that lease in and lease out. However, the average age of vessels that permanently transferred quota in is lower than vessels that have permanently transferred or sold quota.

- Compliance and Enforcement Variable 1 – Violations

There has been a very limited number of violations for LAGC IFQ vessels since 2010. About 30 incidents overall and only 5 resulted in violations. Less than a handful of this incidents related to the IFQ program specifically, most had to do with observer program requirements. There has been a small decline in the overall number of incidents, but that may be related to the level of enforcement presence and not necessarily improved compliance.

- Compliance and Enforcement Variable 2 – VMS prelanding reports

VMS staff went back and summarized VMS prelanding reports since the program started, 2010-2013. Each year about 6,000 LAGC IFQ trips are taken. The total number of trips varies based on the total quota available for the year, and the possession limit increased from 400 pounds to 600 pounds in 2011.

Based on these data, a segment of the LAGC IFQ fishery is not complying with the VMS prelanding requirement (about 30 vessels each year are not sending in prelanding notifications at all). While most vessels are in compliance, since a subset are not reporting at all this reduces the overall capability for NMFS to effectively monitor and enforce this IFQ program.

PDT Finding – PDT is concerned about the level of compliance with the prelandings requirement since being able to enforce the possession limit and IFQ per vessel is critical for an IFQ program. NMFS should ensure that all LAGC IFQ vessels are aware of this requirement and specifically reach out to the 25 or so vessels that are chronically not in compliance with this regulation. The AP may be able to add insight on the level of awareness and compliance with this requirement.

- Compliance and Enforcement Variable 3 – Monitored offloads

There was very limited onsite monitoring and enforcement of the LAGC IFQ program in the first year of adoption (2010). In 2011 and 2012 there were about 140 LAGC IFQ offloads monitored by Enforcement agents. The majority of these monitored offloads occurred in 2011 in NJ ports. The offload checks did not result in any violations.

NMFS staff provided the total number of trips for the LAGC IFQ fishery per year to help with this variable.

Fishing Year	LAGC IFQ	LA with LAGC IFQ	Total
2010	6,178	564	6,742
2011	6,573	531	7,104
2012	5,784	531	6,315

- Compliance and Enforcement Variable 4 – IFQ Overages

NMFS staff provided the IFQ overages per vessel from FY2011 and FY2012. Overall the level of overage in terms of # of vessels and amount of overage is relatively low and does not seem to be an issue currently.

- Economic variables

Demet Haksever reviewed updated analyses related to over a dozen topics. *The PDT provided some input and agreed to include an overall finding about how data for this IFQ fishery should be tracked and summarized for future years.* In summary, the staff resources needed to get these data in the format needed was very time consuming. Since a more formal LAPP Performance Report is required in the near future it would be advantageous to develop standard ways to combine these data.

- Governance Variable 3 – LAGC representation and participation

Frequency and location of meetings – To the extent it is possible, scallop meetings are in convenient locations for some LAGC IFQ participants and are frequent enough so the public can feasibly participate.

PDT Finding – The PDT suggests that the AP provide input on this variable in terms of meeting locations and timing with PDT and/or Committee meetings.

2. PDT recommendations for 2014/2015 Scallop RSA priorities

The Scallop PDT reviewed the list of research priorities used in the RSA announcement last year. The PDT focused on additions made by the Council based on AP and Committee input from meetings after the PDT initially provided input. Specifically, the two additions recommended by the Scallop AP and ultimately endorsed by the full Council were:

4. Broad, resource wide industry-based survey of entire scallop resource area.

8. Research examining whether chemicals, water quality, and other environmental stressors effect reproduction and growth of scallops (i.e., jet fuel, pesticides, ocean acidification, etc.).

The PDT had several questions about the first item: broad, resource wide industry-based survey of entire scallop resource. It was not clear to the PDT if this priority was meant to cover the entire resource including the GOM, Canada, and inshore areas. The PDT suggests that the priority be modified to be more specific in terms of defining the “resource area”; potentially limiting it to GB and MA; the primary resource areas. The PDT also recommends that the justification or rationale for the research priority be included to clarify the intent of the priority. For example, is the primary purpose of this priority to provide an additional indicie for the CASA model to improve the overall precision of the scallop biomass estimate, or is it something else? Finally, the PDT agrees this priority is an important topic that should be on the list, but the PDT does not agree that it have the same priority level as intensive surveys of access areas. The PDT went further to recommend the Committee elevate intensive industry-based surveys of relevant access areas as the highest priority overall. Intensive surveys of access areas are essential for setting TACs; therefore the management relevance is very high for that priority.

Following an initial discussion of the priority item Dr. Dvora Hart gave a presentation from the last benchmark assessment (SAW50) that evaluated biomass estimates of the same area (Nantucket Lightship) from five different survey methods. Three intensive surveys were conducted in the same area in 2009: VIMS dredge survey, SMAST small drop camera, and Habcam towed camera, as well as two broadscale surveys: NEFSC dredge and SMAST large drop camera.

Several additional slides were added to the end of the SAW50 presentation that assessed the overall impact of removing one year of data from the SMAST broadscale large camera drop camera survey. These analyses were completed to inform the PDT discussion about the potential benefit of including an additional year of broadscale data as it relates to the overall biomass estimate for GB and MA. SMAST has completed a broadscale survey of GB and the MA for about ten years, 2003-2012. The SMAST broadscale large camera data series is included in the overall CASA model that is used to estimate scallop biomass. But in terms of the RSA priorities, the question is what is the impact of an additional data point in the time series, as the previous years would still be used in the model.

Therefore, the PDT removed the 2012 data point only, but kept in data from the previous years to evaluate the impacts of an additional year of broadscale data on the overall estimate of scallop biomass. In general, the overall biomass estimate is slightly higher when one year of SMAST broadscale data is removed. For the MA, there was essentially no difference in the estimate of biomass with the 2012 SMAST broadscale data point included, or without it. For GB, the overall biomass estimate was 8% higher with 2012 SMAST data point removed. It was noted that the overall error associated with CASA estimate is about 10%.

Therefore, the PDT recommends that future RSA research priorities should include an additional broadscale survey of GB and MA because it is useful for improving the overall estimate of scallop biomass in the CASA model, but it should have a lower priority than intensive surveys of access areas, which more directly impact fishery allocations the following year. The PDT also recommends the item be more specific for GB and MA resource areas only, and overall rationale for the priority should be added so the intent is clear. These recommendations have been added to the draft priorities attached.

The PDT also discussed the other item added by the Council last year: research examining whether chemicals, water quality, and other environmental stressors effect reproduction and growth of scallops. While the PDT recognizes that these issues are important some comments were made that these are big picture issues and RSA funding may not be the most appropriate source of funding as RSA is very linked to management and the Council does not regulate industries impacting water quality and ocean acidification. The PDT supports that it remain on the list as medium priority and recommends it be combined with other more long-term studies like predation (#9) and scallop biology projects (#11). These recommendations have been added to the draft priorities attached.

Finally, the PDT reviewed the other priorities from last year. Several recommendations were made to shift priorities around and delete several that are more appropriate for the assessment process and not RSA. The additional recommendations are listed below along with the recommendations described above for broadscale surveys and impacts of environmental stressors:

- 1) Take the first three items and put them in priority order: 1) intensive industry-based survey of relevant scallop access areas; 2) intensive industry-based survey areas that may be candidate access areas in the future; and 3) identify and evaluate methods to reduce the impacts on bycatch
- 2) Clarify the bycatch priority to specifically include mention on windowpane flounder and gear modifications
- 3) Move #4: broadscale survey under medium priority and clarify the text
- 4) Combine several of the priorities that are more long-term in nature as medium priority (#8, #9, and elevate #11 from other to medium priority)
- 5) Remove several priorities that are more appropriate for the assessment process (10a, 10d, 10f, and 10g)

The PDT also discussed that the benchmark assessment that is currently underway (SAW59) will also identify research priorities. Those priorities will not be final before the Council is scheduled to approve RSA research priorities in June, but a draft list of research priorities from the assessment working groups should be available for the full Council to consider in June. The PDT recommends the Council consider those items as well when making final recommendations at the June Council meeting.

The final research recommendations from the PDT for the 2015 and 2016 RSA announcement are attached (Appendix 1). A track changes version is included to show what modifications are suggested, followed by a “clean” version, which includes all the PDT recommendations.

3. Summary of recent Scallop RSA projects

On Day 2 of the Scallop PDT meeting about a dozen researchers presented preliminary results from recent RSA funded projects. Staff began the meeting with an overview of RSA projects awarded in the last few years by subject and research organization. The vast majority of projects have provided data used directly by the PDT in the management process. Many of these include survey work using several different methods (dredge and optical) as well as several gear, turtle, bycatch, and habitat related projects that have been used by the Scallop, GF, and Habitat PDTs in recent Council actions. Therefore, the presentations at this meeting focused on projects that have *not* yet been used directly in the management process, or are still under development.

Five presentations were given in the morning related to bycatch and conservation engineering. Two projects focused on potential gear modifications designed to reduce flatfish bycatch. A third presentation summarized the evolution of the SMAST voluntary bycatch avoidance program. Another summarized efforts to use electronic reporting systems on scallop vessels that would send data to a third party. Finally, preliminary results were presented about bycatch from SNE LAGC IFQ scallop fishery.

After lunch the PDT heard five presentations focused on scallop biology and other issues like enhancement and grey meats. Many of these projects are still under development and this meeting was a useful opportunity to get input from the PDT about how best to summarize future results etc. The last session of the day included three presentations on the effects of gear on habitat. Discard mortality of skates, and satellite and video data of loggerhead turtles. Overall, all the presentations were very impressive and a lot of data is being produced from the RSA program. The PDT discussed that it may be useful to have a meeting of this nature once a year to help integrate results into the management process and identify future research priorities.

Appendix 1: Scallop Research Priorities

The research priorities listed below are the ones used in the Scallop RSA federal funding announcement for fishing years 2014 and 2015. The modifications suggested by the Scallop PDT have been noted.

Action Item for the Scallop AP and Committee:

Review the current list of research priorities and suggest recommendations for the full Council to consider in June 2014 for the 2015-2016 Scallop RSA announcement.

The PDT met on April 8, 2013 and recommended a handful of changes listed below. The major changes from last year have been summarized below as well for background.

After the priorities are approved, the Council will send a letter to NMFS and an announcement for available funds would likely be published in the summer of 2014. Final awards will not be granted until the start of the 2015 fishing year.

Major modifications to 2014/2015 announcement included:

1. [Clarify that some access areas have a higher priority than others based on schedule for opening.](#)
2. [Add mortality from predation as a MEDUIM priority and include specific examples \(starfish and dogfish\).](#)
3. [Add a new priority about scallop product quality and marketability as medium.](#)
4. [Add a new bullet under HIGH that would include a broad, resource wide survey of the entire scallop resource.](#)
5. [Add a new bulled under MEDIUM that would identify and evaluate the potential impacts of environmental stressors on scallops.](#)

Scallop PDT recommendations for 2015/2016 priorities:

1. [Take the first three items and put them in priority order: 1\) intensive industry-based survey of relevant scallop access areas; 2\) intensive industry-based survey areas that may be candidate access areas in the future; and 3\) identify and evaluate methods to reduce the impacts on bycatch.](#)
2. [Clarify the bycatch priority to specifically include mention on windowpane flounder and gear modifications.](#)
3. [Move #4: broadscale survey under medium priority and clarify the text.](#)
4. [Combine several of the priorities that are more long-term in nature as medium priority \(#8, #9, and elevate #11 from other to medium priority\).](#)
5. [Remove several priorities that are more appropriate for the assessment process \(10a, 10d, 10f, and 10g\).](#)

2014/2015 Atlantic Sea Scallop Research Priorities

HIGHEST (IN PRIORITY ORDER)~~not listed in order of importance~~):

1. An intensive industry-based survey of each of the relevant scallop access areas (Closed Area I, Closed Area II, Nantucket Lightship, Delmarva, Elephant Trunk and Hudson Canyon). The primary objective of these surveys would be to estimate total allowable catches (TACs) under the rotational area management program if the data from these surveys are available by August of the prior fishing year. Areas scheduled to be open in the following fishing year generally have a higher priority than other areas. For 2015 the three priority areas are: Delmarva, Elephant Trunk, and Hudson Canyon. For 2016 the priority areas may be: any areas in and around GB scallop access areas that may be open based on the EFH Omnibus Amendment (Northern edge area in and around Closed Area II, northern part of Closed Area I, and east and west of Nantucket Lightship access area).

~~2. Identification and evaluation of methods to reduce the impact of the scallop fishery with respect to bycatch. This would include projects that determine seasonal bycatch rates, characterize spatial and temporal distribution patterns as well as, the associated discard mortality rates of yellowtail flounder, and other key bycatch species.~~

~~2.~~ 3.—An intensive industry-based survey of areas that may be candidate access areas in the future (i.e., open areas with high scallop recruitment or closed areas that may open to fishing in the future, such as groundfish mortality closed areas or current habitat closed areas). For example, Northern edge area in and around Closed Area II, the northern part of Closed Area I that is currently part of an EFH closed area, and east and west of the Nantucket Lightship access area where small scallops have been observed.

3. Identification and evaluation of methods to reduce the impact of the scallop fishery with respect to bycatch. This would include projects that determine seasonal bycatch rates, characterize spatial and temporal distribution patterns, gear modifications to reduce bycatch, as well as, the associated discard mortality rates of yellowtail flounder, windowpane flounder, and other key bycatch species. Research efforts should be targeted to avoid pending or potential implementation of accountability measures.

~~4.—Broad, resource wide industry based survey of entire scallop resource area.~~

MEDIUM (not listed in order of importance):

~~4. Broad, resource wide industry-based survey of entire scallops resource within Georges Bank and/or Mid-Atlantic resource areas.~~ area. The primary objective of these surveys would be to provide an additional broadscale biomass indicie to improve the overall precision of the scallop biomass estimate produced from the model used by the Scallop Plan Development Team. If the data from these surveys are available by August of the prior fishing year these results can be used in the overall scallop biomass estimate to evaluate the current status of the stock.

5. Other resource surveys to expand and/or enhance survey coverage in areas that have the potential to be important resource areas, but which currently have a lack of comprehensive survey coverage.

6. Research to support the investigation of loggerhead turtle behavior in the Mid-Atlantic (via satellite tagging or other means) to understand their seasonal movements, vertical habitat utilization, and how and where interactions with dredge gear are occurring. This priority topic also includes monitoring of scallop dredge and trawl operations, and the development of further gear modifications if monitoring should indicate current designs are not eliminating the threat or harm to sea turtles or are resulting in unacceptable scallop catch loss.

7. Research aimed at describing the occurrence as well as understanding the mechanisms of processes that affect scallop product quality and marketability (i.e., scallops with grey meats or evidence of disease). Research should also include evaluation of the potential magnitude of impacts on scallop mortality from scallops due to quality issues.

~~8.—8. Longer term research projects designed to: 1) Research examining whether chemicals, water quality, and other environmental stressors effect reproduction and growth of scallops (i.e., jet fuel, pesticides, ocean acidification, etc.); 2) Studies aimed at evaluation of the mortality of sea scallops from predation (i.e. starfish, dogfish, etc.); or 3) Other scallop biology projects, including studies aimed at understanding recruitment processes (reproduction, larval and early post-settlement stages), growth, and natural mortality (including predation and disease).~~

10. Studies aimed at addressing relevant issues that were identified as research priorities in the 2010 50th Stock Assessment Workshop including:

10a. ~~incidental gear mortality, d~~Discard mortality of scallops. The current assumption used in the assessment is very uncertain. Projects that could improve the understanding and rate of discard mortality would be useful.

10b. ~~, and s~~Seasonal growth of scallops. The model used to estimate biomass currently assumes even growth during the year, but there is some evidence available to suggest that scallops do not grow evenly during the year. Projects that could improve the understanding of seasonal cycles of scallop growth would be useful.

10a.—Development of a procedure to fit discarded scallops, which have a different length frequency from the rest of the population, into the assessment model.

10b. Incidental mortality of scallops. The current assumption used in the assessment is very uncertain. Studies could ~~e~~Evaluate~~tion of~~ the effect of the four-inch rings on incidental mortality. Now that a larger fraction of small scallops are traveling through the mesh, examine whether incidental mortality has increased or are the scallops relatively unaffected. This could be done by running HabCam or an Autonomous Underwater Vehicle (AUV) along dredge tracks.

10c.—Exploration and evaluation of various methods to express the variation in the Habitat Camera (HabCam) abundance data.

~~10d. Examination of historical patterns of the “whole stock,” including the manner in which the spatial patterns of scallops and the fishery have changed over time.~~

~~10e. Estimate incidental mortality by running HabCam or an Autonomous Underwater Vehicle (AUV) along dredge tracks~~

~~10f. Calculation of stock-recruit relationships for various sub-sections of the stock, smaller areas than just Mid-Atlantic Bight (MAB) and George’s Bank (GBK) to look for possible patterns or relationships.~~

~~10g. Further refinement of the estimate of the extent of scallop habitat relative to that of the survey.~~

10h. Continue analysis of scallop annual growth data. NEFSC has Age-archived scallop shells from the 1980s and 1990s and additional age analyses would support information about scallop growth. :

10i. Continue to investigate~~look at~~ patterns of seasonality in weight of the meats and gonads, and timing of scallop spawning.:

OTHER PRIORITIES (not listed in order of importance):

~~11. Other scallop biology projects, including studies aimed at understanding recruitment processes (reproduction, larval and early post-settlement stages), growth, and natural mortality (including predation and disease).~~

12. Investigation of variability in dredging efficiency across habitats, times, areas, and gear designs to allow for more accurate quantitative estimates of scallop dredge impacts on the seabed and development of practicable methods to minimize or mitigate those impacts.

13. Habitat characterization research including (but not limited to): video and/or photo transects of the bottom within scallop access areas, closed scallop areas, and in comparable fished areas that are both subject and not subject to scallop fishing before and after scallop fishing commences (BACI or before after control impact dredge impact studies); identification of nursery and over-wintering habitats of species that are vulnerable to habitat alteration by scallop fishing; and other research that relates to habitats affected by scallop fishing, including, but not limited to, long-term or chronic effects of scallop fishing on marine resource productivity, other ecosystem effects, habitat recovery potential, and fine scale fishing effort in relation to fine scale habitat distribution. In particular, projects that directly support evaluation of present and candidate EFH closures to assess whether these areas are accomplishing their stated purposes and to assist better definition of the complex ecosystem processes that occur in these areas.

14. Scallop and area management research, including but not limited to: evaluation of ways to control predation on scallops; research to actively manage spat collection and seeding of sea scallops; social and economic impacts and consequences of closing areas to enhance productivity

and improve yield of sea scallops and other species; and estimation of factors affecting fishing power for each limited access vessel.

15. Develop methodologies or alternative ways for the scallop fleet to collect and analyze catch and bycatch data on a near real-time basis (i.e., collection of scallop meat weight and quality data, specific bycatch information, etc. Potential ideas include but are not limited to: concepts like a “Study Fleet”, electronic monitoring, dockside monitors, bag tags, etc.).

Track Changes Accepted Version – all PDT recommendations included

2014/2015 Atlantic Sea Scallop Research Priorities

HIGHEST (IN PRIORITY ORDER)

1. An intensive industry-based survey of each of the relevant scallop access areas (Closed Area I, Closed Area II, Nantucket Lightship, Delmarva, Elephant Trunk and Hudson Canyon). The primary objective of these surveys would be to estimate total allowable catches (TACs) under the rotational area management program if the data from these surveys are available by August of the prior fishing year. Areas scheduled to be open in the following fishing year generally have a higher priority than other areas. For 2015 the three priority areas are: Delmarva, Elephant Trunk, and Hudson Canyon. For 2016 the priority areas may be: any areas in and around GB scallop access areas that may be open based on the EFH Omnibus Amendment (Northern edge area in and around Closed Area II, northern part of Closed Area I, and east and west of Nantucket Lightship access area).

2. An intensive industry-based survey of areas that may be candidate access areas in the future (i.e., open areas with high scallop recruitment or closed areas that may open to fishing in the future, such as groundfish mortality closed areas or current habitat closed areas). For example, Northern edge area in and around Closed Area II, the northern part of Closed Area I that is currently part of an EFH closed area, and east and west of the Nantucket Lightship access area where small scallops have been observed.

3. Identification and evaluation of methods to reduce the impact of the scallop fishery with respect to bycatch. This would include projects that determine seasonal bycatch rates, characterize spatial and temporal distribution patterns, gear modifications to reduce bycatch, as well as the associated discard mortality rates of yellowtail flounder, windowpane flounder, and other key bycatch species. Research efforts should be targeted to avoid pending or potential implementation of accountability measures.

MEDIUM (not listed in order of importance):

4. Broad, resource wide industry-based survey of scallops within Georges Bank and/or Mid-Atlantic resource areas. The primary objective of these surveys would be to provide an additional broadscale biomass indicie to improve the overall precision of the scallop biomass estimate produced from the model used by the Scallop Plan Development Team. If the data from

these surveys are available by August of the prior fishing year these results can be used in the overall scallop biomass estimate to evaluate the current status of the stock.

5. Other resource surveys to expand and/or enhance survey coverage in areas that have the potential to be important resource areas, but which currently have a lack of comprehensive survey coverage.

6. Research to support the investigation of loggerhead turtle behavior in the Mid-Atlantic (via satellite tagging or other means) to understand their seasonal movements, vertical habitat utilization, and how and where interactions with dredge gear are occurring. This priority topic also includes monitoring of scallop dredge and trawl operations, and the development of further gear modifications if monitoring should indicate current designs are not eliminating the threat or harm to sea turtles or are resulting in unacceptable scallop catch loss.

7. Research aimed at describing the occurrence as well as understanding the mechanisms of processes that affect scallop product quality and marketability (i.e., scallops with grey meats or evidence of disease). Research should also include evaluation of the potential magnitude of impacts on scallop mortality from scallops due to quality issues.

8. Longer term research projects designed to either: 1) examine whether chemicals, water quality, and other environmental stressors effect reproduction and growth of scallops (i.e., jet fuel, pesticides, ocean acidification, etc.); 2) evaluate the mortality of sea scallops from predation (i.e. starfish, dogfish, etc.); or 3) research other scallop biology projects, including studies aimed at understanding recruitment processes (reproduction, larval and early post-settlement stages), growth, and natural mortality (including predation and disease).

9. Studies aimed at addressing relevant issues that were identified as research priorities in the 2010 50th Stock Assessment Workshop including (*may want to update with research priorities under development in SAW59 – available in June 2014*):

9a. Discard mortality of scallops. The current assumption used in the assessment is very uncertain. Projects that could improve the understanding and rate of discard mortality would be useful.

9b. Seasonal growth of scallops. The model used to estimate biomass currently assumes even growth during the year, but there is some evidence available to suggest that scallops do not grow evenly during the year. Projects that could improve the understanding of seasonal cycles of scallop growth would be useful.

9c. Incidental mortality of scallops. The current assumption used in the assessment is very uncertain. Studies could evaluate the effect of the four-inch rings on incidental mortality. Now that a larger fraction of small scallops are traveling through the mesh, examine whether incidental mortality has increased or are the scallops relatively unaffected. This could be done by running HabCam or an Autonomous Underwater Vehicle (AUV) along dredge tracks.

9d. Continue analysis of scallop annual growth data. NEFSC has archived scallop shells from the 1980s and 1990s and additional age analyses would support information about scallop growth.

9e. Continue to investigate patterns of seasonality in weight of the meats and gonads, and timing of scallop spawning.

OTHER PRIORITIES (not listed in order of importance):

10. Investigation of variability in dredging efficiency across habitats, times, areas, and gear designs to allow for more accurate quantitative estimates of scallop dredge impacts on the seabed and development of practicable methods to minimize or mitigate those impacts.

11. Habitat characterization research including (but not limited to): video and/or photo transects of the bottom within scallop access areas, closed scallop areas, and in comparable fished areas that are both subject and not subject to scallop fishing before and after scallop fishing commences (BACI or before after control impact dredge impact studies); identification of nursery and over-wintering habitats of species that are vulnerable to habitat alteration by scallop fishing; and other research that relates to habitats affected by scallop fishing, including, but not limited to, long-term or chronic effects of scallop fishing on marine resource productivity, other ecosystem effects, habitat recovery potential, and fine scale fishing effort in relation to fine scale habitat distribution. In particular, projects that directly support evaluation of present and candidate EFH closures to assess whether these areas are accomplishing their stated purposes and to assist better definition of the complex ecosystem processes that occur in these areas.

12. Scallop and area management research, including but not limited to: evaluation of ways to control predation on scallops; research to actively manage spat collection and seeding of sea scallops; social and economic impacts and consequences of closing areas to enhance productivity and improve yield of sea scallops and other species; and estimation of factors affecting fishing power for each limited access vessel.

13. Develop methodologies or alternative ways for the scallop fleet to collect and analyze catch and bycatch data on a near real-time basis (i.e., collection of scallop meat weight and quality data, specific bycatch information, etc. Potential ideas include but are not limited to: concepts like a “Study Fleet”, electronic monitoring, dockside monitors, bag tags, etc.).