NOAA Fisheries Response to NRCC Tasking to Develop

A New Process for Assessment of Managed Fishery Resources off the Northeastern United States

Task 2: Develop prioritization and scheduling system for operational assessments - with consideration of the intrinsic biological properties of stock, ripeness of or availability of new fishery-related data and/or research results, changes in stock status (i.e., Overfished; rebuilding program required), rebuilding program status, and miscellaneous external factors. Also considered should be the NRCC role in process, and the management process itself. Finally, develop a strawman schedule of operational assessments.

a. Develop criteria including considerations of the following:

i. Overview of Optimal Timing Concept - The issue of optimal timing of assessments has been addressed in various reports by teams charged with organizing stock assessments at the regional and national level. This report attempts to build on those previous studies. The conceptual framework for a biological rationale is described but there does not appear to be an unequivocal metric for assessment frequency. Ultimately, the assignment of an assessment frequency to each stock is at some point a subjective, but essential step.

If there is any advancement in this essay it is the concept of identifying the relative assessment workload for each stock. The workload is expressed in terms of effort by the lead analyst as well as the indirect effort of colleagues. The indirect efforts include not only technical assistance on logistics but also attending intermediate meetings and so forth. Effort is expressed in units of person months. The total person month effort for each assessment, divided by the assessment frequency provides a measure of annualized person months. The sum of all annualized person months provides a measure of overall staffing needs for the Branch to conduct assessments.

The implications of any particular assessment schedule can be quantified as the sum of the person-months of effort. A scheduling matrix is introduced as a useful tool for evaluating the relative costs of alternative schedules. The scheduling matrix consists of a tableau of species (rows) and years (columns) with zero entries indicating no assessment and ones identifying assessment years. The sum product of the total person-month vector and the schedule vector is the total "cost" of a particular schedule.

This report is a strawman document designed to define the scope of the assessment process conducted by the NEFSC, to identify relevant factors for identifying assessment frequency, and to introduce a structured approach for matching assessment schedules with available staffing.

ii. Biological and Fishery Factors Influencing Assessment Frequency

Life History - A common feature of most previous white papers and planning documents is that the optimal timing of assessments must first begin with the basic biology of the resource and the primary sources of mortality. Factors influencing stock assessment frequency include :

- Underlying life history attributes, e.g.
- Natural mortality (M), Longevity
- Growth (K, max size)
- Reproductive strategy
- Derived quantities such as net reproductive rate or maximum spawning potential.
- Evidence of gradual trends in biological characteristics such as average size or maturity,
- Evidence of abrupt changes such as large-scale recruitment events, i.e., temporal and (occasionally) spatial variation in recruitment.
- A major change in the fishery selectivity (such as an increase in discarding due to a management regulation or development of a new fishery)

There may be some advantages of conducting assessments on groups of stocks that share similar life-history traits, are harvested by similar fisheries, or represent regional differences. For example the "round" groundfish (cod, haddock, white hake, pollock) and "flat" groundfish (e.g. yellowtail flounder, winter flounder, plaice, witch flounder, halibut) would constitute similar life history traits and often support different fleets.

Stock Status - The status of a population with respect to biological reference points for biomass and fishing mortality is another primary determinant of assessment frequency. Current population status can be expressed a fraction of the desired population biomass and the desired fishing mortality rate. For species in a rebuilding program the number of years remaining in the rebuilding schedule is important, especially if management measures need to be adjusted. In general terms the need for stock assessments would increase as the rebuilding deadline approached and as the disparity between rebuilding waypoints and actual abundance increases. The frequency of assessments should increase as the ratio of F/Fmsy increases, especially when the ratio exceeds one. Conversely, assessment frequency should diminish when B/Bmsy is above one.

Use of Indicators - The ability to identify conditions that necessitate increased or allow decreased frequency of assessments often depends on the availability of reliable indicators. Although conceptually simple, there does not appear to be any formal framework for decisions. Conflicting trends in underlying information can be addressed in an assessment models, but formal decision-theoretic approaches do not appear to have been used in actual management. Instead managers and scientists often rely on a convergence of evidence approach, gathering information from several different sources to affirm underlying trends. For example a strong year class might be indicated by high abundance in one or more surveys, high rates of discarding, and various reports from fishermen.

For assessments that depend entirely on the use of surveys, it would be advantageous to monitor stock status more frequently, say every two years. Staffing costs for such assessments are relatively low and checking model assumptions is important. Changes in fishery selectivity or pulses of recruitment could invalidate the simple assumptions underlying such models.

Data, Model and Staffing Constraints - The ability to conduct an assessment in a given year depends on a number of factors including the:

- Availability of critical data, especially age data, state surveys, etc.
- Complexity of model (e.g., index assessments can be more frequent).
- Availability of key scientific personnel, especially the lead scientist who may have more than more than one species responsibility.
- Stability of model performance in recent years. Example—models with strong retrospective patterns often require greater allocation of staff resources.
- Need for team efforts to accomplish modeling tasks, especially when technical challenges arise.
- Calibration coefficients for Bigelow to Albatross
- Discard issues
- Hindcasting
- Reformulation of model in response to retrospective patterns.
- The degree of external peer review required. Formal meetings with external reviewers require longer planning horizons.
- Conflicts with other major assessment initiatives.

It is particularly important to identify instances where data or modeling issues are limiting factors for assessments. An assessment that fails due to lack of information on migration patterns, or violations of existing stock boundary assumptions will not improve without new information on these processes.

Forecasting Models - For stocks with reliable forecasting models, assessment frequency can be decreased but all forecasts are ultimately constrained by the need to validate assumptions related to incoming recruitment. As the length of the forecast period increases, predicted population size gradually becomes more dependent on the magnitude of incoming recruitment because the initial population is replaced with assumed levels of recruitment. The degradation of forecast quality is a function of the difference between average predicted recruitment and the realized recruitment in the forecast period. An unobserved sequence of weaker than expected year classes could make catch projections too high, leading to overfishing or delays in rebuilding. The importance of incoming recruitment for defining ACLs depends on when the recruits enter the fishery. A fishery with an average age at entry of say 5 years would be able to could have longer periods between assessments than a species with average age at entry of 2 years.

For a population subjected to an overall mortality annual of Z, the expected average age is 1/Z. As a rule of thumb, most groundfish stocks would tend to have F~M~0.2 so that 1/Z ~2.5 years.

iii. Additional Considerations - A suite of other biological, economic, social and political factors can also affect the timing of stock assessments. These are not easily categorized but include such as:

- Interactions among fleets, ports, states for access
- Interactions among fishery management plans, e.g.,
- Haddock in the herring fisheries
- Butterfish in the loligo fishery
- Yellowtail flounder in the scallop fishery
- River herring
- Ecological conditions such as direct evidence of changes in natural mortality
- Spatial variations in populations or fisheries, especially sessile stocks where localized declines may warrant consideration of alternatives (e.g. recruitment events in scallop fishery, or regional declines in commercial LPUE in clam fisheries).
- Concerns about previous assessments particularly if low ACLs impinge on other fisheries.
- National criteria for reporting requirements (e.g. 5 year staleness factor)
- Direct political intervention

Ultimately the purely biological or fishery related considerations will contribute to but not necessarily determine the assessment schedule or optimal frequency.

b. Develop a strawman schedule of operational assessments

i. NEFSC Assessment Responsibilities - The Population Dynamics Branch contributes to the assessments of 62 stocks in the Northeast. The Branch provides assessment information to the New England and Mid –Atlantic Councils and the Atlantic States Marine Fisheries Commission. Of these stocks, Atlantic salmon is assessed in collaboration with US Fish and Wildlife Service and states as part of the US Atlantic Salmon Assessment Committee. Hagfish has not been assessed but data on this resource is now being collected prior to the possible creation of an FMP. ASMFC has lead responsibility for American eel, Atlantic sturgeon, shortnose sturgeon, river herring, American shad, and 3 stocks of American lobster. For the purpose of this planning exercise we will consider 60 stocks (Table 1) with the three management units for American lobster will be considered as one group. Assessment responsibilities for these stocks are summarized in Appendix 1.

Even though several of these species have not been assessed, it is important to remember that any quantitative analyses of these stocks will reduce the amount of staff time available for other stocks. Recent examples include river herring, Atlantic sturgeon , and cusk. Moreover, any stock that presently does not have an approved assessment will require a substantial investment to improve the assessment methodology.

ii. Key Determinants of Assessment Frequency - Table 2 is intended to be a start towards identifying a reduced set of parameters to determine stock assessment frequency. I have selected the primary factors that govern the shelf life of an assessment product and its projections. In general terms stock assessments are needed when status depends primarily on assumptions about the stock recruitment process. Reliance on such assumptions increases as fishing mortality increases, as the mean age of recruitment to the fishery decreases, and as recruitment variability increases. Stocks that are above Bmsy have some buffering, so schedules could be relaxed for such species. The ratio of average age of entry to the fishery and age at maturity is important also. Values below one would be undesirable since unintentional increases in F could rapidly deplete future SSB. The data elements in Table 2 could be changed but it should be recognized that there is unlikely to be a non-arbitrary metric of assessment frequency. Ultimately the assessment frequency will need to be adjusted based on non-biological factors.

iii. Assessment Workload - Table 3 provides a rough idea of the workload associated with each assessment. It attempts to incorporate a broad range of factors but factors in the need for age samples and recent model performance. Assessments that have been or are likely to be controversial have increased workloads. Results suggest that annual assessments of all species would require approximately 76 staff years of which 55 years would be for lead analysts. The sum of the annualized estimates, using the candidate assessment frequencies is approximately 24 staff years. The staffing workload estimates will be refined by further discussions with staff.

iv. Strawman Schedule - The implications of a candidate assessment schedule are explored in Table 4. Table 4 is not intended to be a proposal. Instead it demonstrates several salient features of the assessment process and allows planners to gauge the impacts of various scenarios with respect to total workload. For example the proposed schedule requires about 27 and 29 person years in 2012 and 2013, but drops to 15.8 years in 2014. Alternative schedules could be devised to reduce the effects of bottlenecks and spread workloads out more uniformly. It should be emphasized that any scheduling system that requires nearly full utilization of available staff will greatly diminish scientific research productivity that would otherwise be possible. Moreover, a fully saturated schedule will also be less flexible because the input data, particularly age samples, must be closely matched with the schedule.

Task 3: Define system for delivering operational assessments - Establish general framework for how system will function, outlining:

a. Roles and responsibilities of participant groups: NEFSC; Council and Commission PDTs, working groups, and technical committees; SSCs ; external scientific expertise; public participation - The NRCC will remain responsible for final scheduling of assessments, and for oversight on the general a Terms of Reference for assessments. Operational assessments themselves will be prepared by NEFSC or Council/Commission staff. A senior NEFSC assessment scientist, and the chairs of the Mid-Atlantic and New England SSCs will constitute the Assessment Oversight Panel and will be advised by staff of the NERO, NEFMC, MAFMC, and ASMFC. The public may participate in the deliberations of the AOP. Finally, peer review of operational assessments will be conducted by an Integrated Peer Review team including at least the lead assessor(s), the SSC member responsible for the stock, and an assessment scientist either from outside of NMFS or if from within NMFS, from outside of the lead assessor's working group. Results from the peer review will then be forwarded to the PDT/TC/SSC for the Councils' use in the ABC setting process.

b. Terms of reference - The baseline model, developed as part of a previous benchmark assessment or through the research track, will be used to produce operational assessments. Typically, this will be the model used at the last operational assessment and the process for application of the model will follow Figure 1:

i. Step 1 - In the year prior to an operational assessment year, the NRCC will meet to determine the final operational assessment schedule for the next year. This schedule will build off of the 2-5 year assessment intervals for stocks that reflect the NEFMC /MAFMC/ASMFC specification setting cycles and stock biology.

ii. Step 2 - After the NRCC has set the schedule but prior to initiating the operational assessments, each lead assessor will determine how the baseline model will be applied in his/her upcoming operational assessment. Little, if any, change is expected or encouraged in the application of the baseline model in the operational assessments. However, it is incumbent upon the lead assessor to consider all relevant results from the research track, and to explore applying them in the operational track. Each assessment will be guided by the following generic Terms of Reference prepared to guide all operational assessments, with some tailoring to meet the characteristics of individual stocks:

1. Update all fishery-dependent data (landings, discards, catch-at-age, etc.) and all fishery-independent data (research survey information) used as inputs in the baseline model or in the last operational assessment.
2. Estimate fishing mortality and stock size for the current year, and update estimates of these parameters in previous years, if these have been revised.
3. Identify and quantify data and model uncertainty that can be considered for setting Acceptable Biological Catch limits.
4. If appropriate, update the values of biological reference points (BRPs).
5. Evaluate stock status with respect to updated status determination criteria.
6. Perform short-term projections; compare results to rebuilding scedules.

7. Comment on whether assessment diagnostics—or the availability of new types of assessment input data—indicate that a new assessment approach is warranted (i.e., referral to the research track).
8. Should the baseline model fail when applied in the operational assessment, provide guidance on how stock status might be evaluated. Should an alternative assessment approach not be readily available, provide guidance on the type of scientific and management advice that can be.

iii. Step 3 - The Assessment Oversight Panel (AOP) will meet with all of the lead stock assessors to review each stock's proposed operational assessment. All stocks proposed for the assessment year will be reviewed by the Assessment Oversight Panel at this meeting(s).

1. The Assessment Oversight Panel will be composed, at a minimum, of a senior NEFSC assessment scientist, and the chairs of the Mid-Atlantic and New England SSCs, and will be advised by staff of the NERO, NEFMC, MAFMC, and ASMFC. Should an SSC Chair be a NEFSC scientist or not have the appropriate skills to technically review assessments, the SSC will appoint an alternative member scientist to the Assessment Oversight Panel.
2. The Assessment Oversight Panel meeting will be open to the public.
3. The purpose of the AOC's review is to finalize the Terms of Reference for each assessment and review the assessor's proposed approach for every assessment.
4. Each assessor is also expected to provide an alternative approach to the assessment should the baseline model fail.
5. The Assessment Oversight Panel review will focus on any proposed changes in the baseline model proposed by the lead assessor, recognizing that the proposed modeling approach should follow the baseline model as closely as possible (Terms of Reference need development for this review). Other possible approaches to the assessment can be discussed, and proposals from other potential assessors can also be tabled. However, any approaches significantly different from the baseline model will be referred to be research track for study, development, and peer review.
6. The Assessment Oversight Panel may determine that, based on advice from the lead assessor, that the baseline model will not work; if so, the alternative approach will be implemented in the operational assessment, and the stock will be referred to the research track.

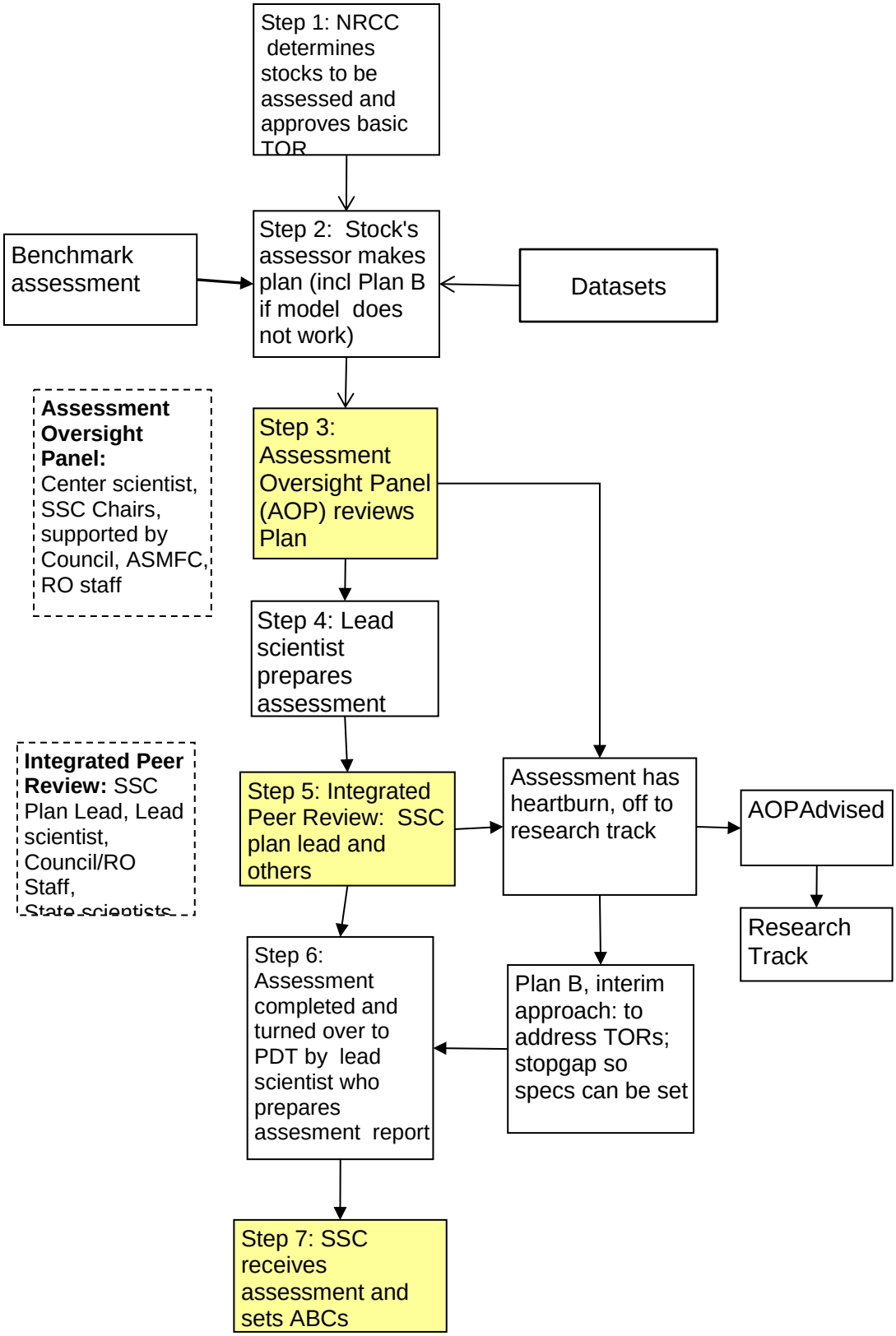

Figure 1. New Stock Assessment Framework

iv. Step 4 - The operational assessment will then be developed by the lead assessment scientist.

v. Step 5 – The operational assessment will be subjected to an Integrated Peer.

vi. Step 6 – PDT/TC review of assessment with conclusions forwarded to SSC.

vii. Step 7 – SSC review of assessment with ABC recommendations forwarded to Council.

c. Operational assessment development completion process and finalization - Following the Integrated Peer Review of an operational assessment, two reports will be provided to the appropriate PDT/TC. One report will summarize the results of the Integrated Peer Review (and authored by the Chair of the Integrated Peer Review). The second report will be the assessment document, which will be an NEFSC Reference Document, and will serve as the basis for the stock status determination (and will be authored by the stock's assessment scientist). A standardized template will be used in preparing this report (see attached Appendix Figure 1). The SSC will then review the two reports, and the PDT/TC recommendations. The SSC will also review situations where the Integrated Peer Review determined the baseline model was inappropriate and where the Integrated Peer Review subsequently provided scientific and management guidance based on an alternative approach.

d. Process for identifying interim year stock evaluation metrics through operational assessment - In years between operational assessments, the PDT/TC will provide assessment data and information to the SSC. Such information could include: a) Recent survey indices, and recent landings and discard estimates, b) projections based on the last operational assessment, and c) resource status and/or fishery performance metrics. The PDT/TC (as supported by the NEFSC) will be responsible for obtaining the above data, updating projections, and providing the relevant information to the SSC.

e. Peer review of operational assessment outputs (uncertainties, interim year stock evaluation metrics, etc.), Process to be applied (integrated/internal, handoff/external) - The operational assessment will be subjected to an Integrated Peer Review by a team including at least the lead assessor(s), the SSC member responsible for the stock, and an assessment scientist either from outside of NMFS or if from within NMFS, from outside of the lead assessor's working group. Terms of Reference remain to be developed for the Integrated Peer Review. The Integrated Peer Review will make the determination whether the completed operational assessment is technically sufficient to (a) evaluate stock status and (b) provide scientific advice; (c) successfully address the Terms of Reference. The Integrated Peer Review may determine that application of the baseline model in the operational assessment has not worked; if so, the alternative approach to the assessment will be implemented, and the stock will be referred to the research track.

f. Define amount of latitude/modification of methods is permissible from established assessment baseline - A stock assessment will be a candidate for development of a new (or substantially revised) assessment approach via the research track if one or more of the following criteria apply, as determined during the peer review of the operational assessment:

i. A change in stock definition is contemplated.

ii. Diagnostics from the operational assessment indicate the assessment model is inadequate to continue to serve as a scientific basis for management.

iii. New types of input data are available which, if incorporated into the assessment, might significantly change the assessment results. A significant change is one in which the

estimates of stock size and OFL might differ by a stock specific amount (e.g., 20-30% for groundfish) from the assessment estimates without incorporating such new types of data.

iv. A significant retrospective pattern has become evident in the assessment estimates of stock size, fishing mortality, or recruitment.

v. A significantly different value of natural mortality (e.g., derived from analysis of trophic interactions) is considered appropriate in characterizing non-fishing stock dynamics.

vi. Significant changes in management practices have occurred that have markedly reduced the accuracy and utility of the existing assessment data inputs, or significantly diminished the reliability or validity of the assessment model itself.

vii. If any of the above criteria are met, the issue will be referred (through the Center Director/appropriate SSC Chair) to the research track for development of a new baseline model. However, until the issue is resolved for use in an operational assessment, either the existing baseline model or the alternative assessment approach will be followed. Note that not all topics referred to the research track will indicate that the baseline model is an inappropriate analytic tool.

viii. If the assessment is considered acceptable by the Integrated Peer Review but involves significant deviations from the approach outlined from in the Assessment Oversight Panel review, then the assessment <u>may</u> be referred back to the Assessment Oversight Panel with a brief description of changes that were made from what was agreed to during the Assessment Oversight Panel review. The Assessment Oversight Panel can then review as necessary (and likely by correspondence) the assessment, and determine the course of action for the assessment.

a. <u>Protocols for incorporation of results into fishery management plans (as needed, i.e., regulatory changes or specifications process)</u> – See Task 5, but an example of how the process would work (compared to the prior years) is shown in the Figure 2.

Task 4: Define system for research track - Establish general framework for how system will function, outlining:

a. Roles and responsibilities of participant groups: NEFSC; Council and Commission PDTs, working groups, and technical committees; SSCs; external scientific expertise, and public participation - SSC Chairs, and the NEFSC Science and Research Director will refer stocks to the NEFSC for development of new approaches to the assessment through the research track. The NRCC will be responsible, as appropriate, with prioritizing the research projects. External experts will participate in the development and peer review of the research, and the public will be invited to sit in on the peer review.

b. Protocols for remand, re-examination, addressing errors or new information (as needed) - The research track will be used to develop improved stock assessment models and approaches, and will not provide stock status determinations. Three general types of research projects will be referred to the research track: (1) stocks where the analytic method works but some biological issue requires investigation (e.g., stock structure), (2) stocks where application of the baseline model has not worked, or where a competing model has been suggested as a better analytic approach, and (3) stocks where an acceptable assessment has not yet been developed. The research track is not, however, meant as the repository for a host of research items. A stock assessment will be a candidate for development of a new (or substantially revised) assessment approach via the research track if one or more of the following criteria apply, as determined during the peer review of the operational assessment:

    i. A change in stock definition is contemplated.
    ii. Diagnostics from the operational assessment indicate the assessment model is inadequate to continue to serve as a scientific basis for management.
    iii. New types of input data are available which, if incorporated into the assessment, might significantly change the assessment results. A significant change is one in which the estimates of stock size and OFL might differ by a stock specific amount (e.g., 20-30% for groundfish) from the assessment estimates without incorporating such new types of data.
    iv. A significant retrospective pattern has become evident in the assessment estimates of stock size, fishing mortality, or recruitment.
    v. A significantly different value of natural mortality (e.g., derived from analysis of trophic interactions) is considered appropriate in characterizing non-fishing stock dynamics.
    vi. Significant changes in management practices have occurred that have markedly reduced the accuracy and utility of the existing assessment data inputs, or significantly diminished the reliability or validity of the assessment model itself.

c. Terms of Reference – TORs for research track activities will vary depending on the reason for forwarding a project to the research track. Research track TORs for new baseline assessment models would include:

    i. Develop scientifically valid methodologies and models to serve as the baseline model in future operational assessments. All new assessment models/approaches will be tested on datasets from the last operational assessment.

ii. Identify a framework /protocol for using available data to monitor the fishery and stock, and for setting specifications during the interval between operational assessments.
iii. Identify the metrics most useful to monitor in evaluating whether a management change may be needed
iv. Develop BRPs that are consistent with any newly-developed assessment model or methodologies
v. Suggest alternative approaches to assessing the stock should the baseline model fail when applied in a future operational assessment

d. Peer review of transitional assessment results - Work products developed in the research track will undergo an independent peer review process, which may be similar to that used in the Stock Assessment Review Committee/SARC (e.g., a sequential peer review involving the Center for Independent Experts and chaired by an SSC member).

e. Process for transitioning a research assessment to an operational assessment baseline - The timing of research within the research track should be such that all work is completed and peer reviewed before the next scheduled operational assessment. At end of research track:
i. A decision will be made by the peer reviewers as to whether (a) the work products are adequate to replace the existing baseline model; (b) the new model or methods can be run either from the assessment model toolbox or through other available software; and (c) the revised/new BRPs are technically appropriate.
ii. Once accepted by the peer review panel, the new assessment model/approach will become the new baseline model.
iii. To facilitate timely incorporation of new, peer-reviewed baseline research into the operational track, the NRCC will review the operational assessment schedule in response to research track output and may amend the operational assessment schedule, subject to the availability of resources.

Task 5: Develop transition plan - Establish general framework for how system will function, outlining:

a. Identify FMPs that would require regulatory changes to be more responsive to scientific advice. To better match available resources to management needs, because the current assessment process cannot meet the increased management needs of an annual catch limit (ACL)-based management program for every fishery. If the current practices are significantly changed, FMPs and implementing regulations will need to be amended accordingly.

There are currently 50 managed stocks in the Northeast Region, in 13 Fishery Management Plans (FMPs), managed under Magnuson-Stevens Act (MSA) authority. Each FMP and its implementing regulations describe a process for setting specifications or making framework adjustments to the fishery on a periodic basis.

Although the MSA requires ACLs to be set for each stock in a fishery, ACLs can be set for more than 1 year at a time (e.g., a 3-year specification action could set ACLs for each of the 3 years; the ACLs could be the same for each year in the cycle, or different). With the exception of Atlantic salmon, for which there is no fishery, the authority currently exists, or will likely soon exist through the MAFMC's Omnibus ACL/AM Amendment, in every FMP, for setting multi-year specifications (see Table 5). The currently authorized specification periods are from 2 to 5 years, but generally are 2 or 3 years. In the Mid-Atlantic, the ACLs and related specifications are established through specification actions, which are implemented through proposed and final rulemaking. In New England, fishery specifications are established through Framework Adjustments, which are also implemented through proposed and final rulemaking.

While the authority for multi-year specification setting has existed in most fisheries for several years, it has been used only to a limited extent. In the Mid-Atlantic, only the surfclam and ocean quahog fisheries have routinely been managed through multi-year specifications, though tilefish has been operating under a constant-catch scenario, pending the next stock assessment. Two-year specifications were set for the summer flounder fishery once, but the specifications were subsequently changed in the second year in response to new information; multi-year specifications in this fishery have not been used again. In New England, the scallop, groundfish, skate, and monkfish fisheries are managed through biennial Framework Adjustments; the herring fishery is currently under a 3-year specification cycle, and it is anticipated that the small-mesh groundfish species will be managed through 3-year specifications, beginning in FY 2012. In some cases (e.g., groundfish and scallops), "biennial" adjustments in New England have established specifications for 3 years, as a default in case the next biennial adjustment specifications are delayed.

If use of multi-year specifications is to be expanded, the ACL Working Group has recommended that there be objective criteria identified that would be used to determine a rational schedule for operational assessments; biologically-based criteria are being developed by the Task 2 Working Group ("Develop prioritization and scheduling system for operational assessments"). These criteria are based on the properties of each stock, including such factors as life history, stock condition,

recruitment patterns, stock resilience, etc. It is envisioned that these criteria would be used, at least in part, to determine the optimal frequency of operational assessments for each stock or group of stocks, and that the operational assessments would be coupled with specification/adjustment processes to convert the results of the assessments into management action. In addition to the biological criteria, there are other aspects of management that should be considered by the NRCC in determining the frequency of assessments and specification setting; these other factors are discussed under item 5.b. below.

If, based on the criteria developed by the Task 2 Working Group and consideration of the information described under item b. below, the NRCC concludes that the optimal frequency of assessment and specification setting for a stock is not consistent with the authority in the FMP (e.g., if the NRCC determines that assessments and specifications for surfclams be done every 7 years, but the Surfclam Ocean Quahog FMP only allows specifications to be set for up to 3 years), then that FMP will need to be amended to provide that authority. This could be done through either an FMP amendment or framework action, as appropriate, either as part of another action (i.e., combined with changes to other management measures in the FMP), or as a stand-alone action. Such a change should be relatively straightforward, from a technical standpoint. If the optimal frequency of assessment and specification setting is within the existing authority in an FMP, no change to the FMP or implementing regulations would be required.

Each FMP and its implementing regulations define the fishing year for each stock or groups of stocks (see Table 6). Fishing years can be changed, if doing so would spread workloads or make it easier to use the most recent scientific and/or fishery information for the operational assessment and associated specification setting. The issues associated with changing fishing years are discussed in item c. below. If the NRCC determines that the timing of assessments and/or the resultant specifications is such that it is desirable and/or necessary to change the starting date of any fishing year, this could be accomplished through either an FMP amendment or framework action, as appropriate to the FMP, with an associated proposed and final rule to change the implementing regulations. This would require analysis of the environmental, economic, and social impacts of such a change.

Each FMP and its implementing regulations also describe a process for specification setting or framework adjustments, including the parties involved (e.g., Plan Development Teams (PDTs), Fishery Management Action Teams (FMATs), Technical Committees, Monitoring Committees, Councils, Scientific and Statistical Committees (SSCs), etc.) and their respective roles; the timing of the process; and the range of specifications and/or adjustments that can be made through that process. If the new assessment/specification process approved by the NRCC requires changes to the existing process in a given FMP, there would need to be a change to that FMP and to its implementing regulations to define the new process for setting specifications and/or adjustments.

If multi-year specifications are used more extensively, which is recommended by the ACL Working Group, it is likely that the Councils will want some way to ensure that the specifications for out-years

(e.g., years 2 and 3 in a 3-year specification cycle) are still appropriate. The approaches to doing this are discussed in item d. below. If the Councils choose to provide for out-year adjustments or responses to new information, establishing the process and criteria to be used to do that may require changes to the FMP and its implementing regulations. This could be done through an FMP amendment or framework, as appropriate to the FMP, and implemented through proposed and final rulemaking, which would likely be relatively straightforward. If the existing process in an FMP is sufficient to accommodate the adjustment approach (e.g., if the Council chooses to use the current specification process to make the out-year adjustment), no changes to the FMP or regulations would be necessary.

Summary/Recommendations: Changes in multi-year authorities, fishing years, specification processes, and/or out-year adjustment procedures that result from the NRCC's decisions on the new assessment process will need to be made through FMP amendments or frameworks, as appropriate to the FMP, with accompanying changes to the implementing regulations, and the expected impacts of those changes will need to be analyzed as part of that process. If multiple FMPs need to be amended, an omnibus amendment could be an efficient way to accomplish this. The regulatory sections of 50 CFR that would potentially need to be amended are listed in Tables 6 and 7 (these could be different if/when the MAFMC's Omnibus ACL/AM amendment is implemented). The administrative/regulatory changes would take several months for the Councils to develop, and 5 -7 months for NMFS to review, approve, and implement.

b. Define optimal duration of specifications by stock (connected to Task 2) - To match assessment advice to the management cycle, provide greater stability and predictability to the process and for the industry, and streamline the process to better balance workloads of Council and NMFS staff. Staggering the assessment and specification processes for different fisheries and/or stocks would spread out the assessment and specification setting workloads.

As discussed above under item 5.a., authority already exists to use multi-year specifications, and any additional authorities could be obtained through FMP amendments and/or frameworks, if necessary. To rationalize the frequency of operational assessments and the setting of multi-year specifications, the ACL Working Group has recommended that criteria should be established to determine the most appropriate duration of specifications for each stock and/or fishery. The Task 2 Working Group is developing biologically-based criteria for this purpose, to consider such things as life histories, generation times, stock status, stock resiliency, etc. However, there are other issues that are also relevant to these decisions, such as the importance of the fishery (value, number of participants, etc.), the stability of the fishery and the resources, whether the stock is overfished or experiencing overfishing, where the stock is relative to the end of a rebuilding plan, past performance of the management program, etc. Table 8 summarizes information for each managed stock that could be relevant for determining optimal assessment and specification cycles, but does not include the results of the Task 2 workgroup, which are not yet available. A first cut at estimating what appropriate assessment and specification frequencies might look like is also provided, as a strawman for further discussion. The frequencies vary from 3 to 7 years. The largest

challenge will be the 20 multispecies stocks; it would be very difficult to assess all 20 stocks in the same year. It is possible, however, that the multispecies stocks could be grouped in such a way that the most important stocks (e.g., cod, haddock, yellowtail flounder, etc.) are assessed more often than the minor stocks (e.g., ocean pout, wolffish, cusk, halibut, etc.), and/or that groups of stocks could be assessed at staggered times (e.g., the roundfish in the same year, and the flatfish in a different year.

Summary/Recommendations: For the proposed process of operational assessments to make meaningful and necessary changes to better match assessment resources to management needs, the use of multi-year specifications will need to be expanded. To rationalize the decision process, it is recommended that there be science-based criteria developed (by Task 2 Working Group), and that other factors such as those in Table 8 also be considered by the NRCC, such that the assessment/specification process can be optimized consistent with available assessment resources. The implications of doing this are explored further under item c. below. One hurdle to be overcome is the timing of the start-up of a new process, because the benefits of a staggered assessment/specification process will not be realized immediately.

c. Examine modifications to fishing years, specifications cycles to optimize available resources (i.e., offset FMPs by years, change seasons to better synchronize with survey data and analytical availability) - Establish a schedule that ensures that operational assessment results are available at the right times to feed into the Councils' specification/adjustment processes; stagger the process such that the assessment workloads are manageable with existing resources.; and make best use of scientific and fishery-dependent data in the operational assessment and specification setting process.

Table 6 shows the current fishing years for Northeast MSA-managed stocks. Most fishing years are based on calendar years, and begin on January 1. Four fishing years (groundfish, spiny dogfish, skates, and monkfish) start May 1. Two fishing years (scallops and red crab) begin on March 1. Only one fishing year (tilefish) begins November 1. The current staggered fishing years provide some administrative benefits, in that they spread out the specification processes such that not all specifications are being developed, submitted, reviewed, published, and implemented at the same time. On the other hand, having different fishing years for different fisheries could be more confusing to the public and the industry than a standard fishing year across all fisheries. Also, having fishing years not aligned with calendar years causes some complications in data reporting and use in assessments (assessments are generally based on calendar year data, and specifications for some fisheries are not). A downside of having all fishing years begin January 1 is that the specification packages and implementing rules must be processed late in the year, when holidays and weather can cause delays, and when many Federal agencies, including other regions of NMFS, are trying to get year-end actions in place and published in the Federal Register.

Making changes to fishing years to facilitate availability of assessment and/or data (surveys, landings data, recreational data, etc.) is administratively straightforward, but may be complicated by

resistance from the fishing industry, since there are practical aspects of the timing of the fishing year such as fish availability (inshore/offshore, north/south, among different states or regions, etc.), fish prices, fish quality, weather, etc. For example, recent attempts to change the Atlantic sea scallop fishing year were vigorously opposed by industry. Nevertheless, this remains an available mechanism to better align scientific advice and the management process, as well as to stagger assessments and specification setting within the same year.

The ability to change fishing years is not explicitly frameworked in any FMP, though the frameworkable measure descriptions for many fisheries are broad (see Table 7). FMP amendments would likely be needed to change the fishing years in most, if not all, FMPs, given recent litigation that found that frameworking options may be narrower than previously assumed. The impacts of any changes to a fishing year would need to be analyzed along with the amendment.

Changes to the specification/adjustment processes are listed as frameworkable measures in several FMPs (Atlantic Mackerel, Squid, Butterfish; NE Multispecies; Summer Flounder, Scup, and Black Seabass; Tilefish), and may be possible under the broad interpretation of frameworkable measures in others (Table 7). Depending on the FMP and the magnitude and impacts of such changes, they could be accomplished through FMP amendments or frameworks.

The staggering of specification/adjustment cycles will be necessary to accomplish meaningful resource-smoothing, i.e., to ensure that assessment resources are deployed to provide the necessary scientific advice on a schedule that is appropriate to each fishery. The frequency of assessments and specifications will depend on the results of the Working Group for Task 2 regarding biological criteria for assessment frequency, and on the other factors discussed above in item b., and in Table 8. Regardless of the final decisions on assessment/specification frequency made by the NRCC, it will be necessary to schedule assessments such that they meet the timelines of the Council and ASMFC processes (i.e., that the final operational assessment results feed into the management process in a way to allow them to be used quickly), and that they are sufficiently spaced to allow the assessment process to be completed with existing resources. In addition, to allow flexibility in making out-year changes to multi-year specifications, changes to the analyses accompanying the specification/adjustment actions will be necessary (see item 5.e. below).

The current status of specification and adjustment schedules is shown in Table 9, and the frequency and timing of specifications and adjustments based on the strawman assumptions in Table 8 are shown in Table 10. There would be a significant start-up workload, because the new process would necessitate a large number of specifications/adjustments to be performed in the first year as the new processes and schedules are phased in. The information in Table 10 is for illustrative purposes, and is subject to change based on decisions by the NRCC. Table 11 illustrates an example comparing the status quo process with the proposed operational/research track process.

Summary/Recommendations: Changing fishing years is possible, but may be opposed by the industry, if there are significant practical implications of the changes. Nevertheless, it is a tool

available to stagger the starts of fishing years and/or to align assessments and specification setting with the availability of input data. It will be necessary to stagger the operational assessments and specification setting for different fisheries, consistent with biological and management factors discussed under item b. above. The start-up of the new process will require a large investment of resources to transition to the new process, since most fisheries will need initial specifications set in the first year or two, before the staggered schedules are effective at spreading out the assessments and specification setting.

d. Discuss issues/policy for interim year modifications to established multiple year specifications. - If multi-year specifications are used more extensively, and there are limited resources available to provide assessment advice to the Councils and/or ASMFC outside of the operational assessment process, there needs to be a way to ensure that the specifications remain appropriate throughout the specification cycle, through an out-year examination process, with at least some ability to make changes, if deemed necessary (not through MSA emergency or interim rules.

Under multi-year specifications, there needs to be some assurance that the original specifications remain adequate to protect the stocks from overfishing, to rebuild overfished stocks in the specified time frame, and to prevent ACLs from being exceeded. There also will be industry/public interest in determining whether the stock status has improved more than anticipated, such that the catch levels could be increased in the out-years. However, there will be no operational assessment possible while the multi-year specifications are in place. This will require a disciplined approach to avoid reacting to "noise" in the information; without this, the process will revert to the existing process whereby specifications are set or adjusted every year or two. It also would undermine the objective of a more stable and predictable assessment and management program.

At a minimum, there needs to be an annual examination of the performance of the fishery relative to the ACL(s), including the discard mortality associated with each stock. If an ACL is exceeded, associated accountability measures will be triggered, as specified in each FMP. Regardless of the number of years that specifications are set for, ACLs need to be established for each year in the time series (through the initial specification setting), and the performance of the fishery will need to be examined every year, relative to the ACL. This process is to ensure that ACLs are not exceeded, and to take appropriate measures to correct the overages and to prevent them from occurring again, but it does not examine whether the ACLs are still appropriate for the out years. This is a requirement of the MSA, and is not reflective of the new proposed process.

To address the issue of whether the ACLs as set for the out-years are still appropriate, the Councils have at least two alternatives. One approach is to set the multi-year specifications and to agree to leave them in place, without change, unless something unexpected and significant were to occur, and to not undertake any formal examination in the out-years. A second approach is, in years between operational assessments and the associated specification/adjustment process, to have the Council's PDT and/or Technical Committee (TC) provide assessment data and information to the Council's SSC (but note there would be no new assessment). Such information could include:

Recent survey indices, and recent landings and discard estimates; projections based on the last operational assessment; and resource status and/or fishery performance metrics. The PDT/TC (as supported by the NEFSC) would be responsible for obtaining these data, updating projections, and providing the relevant information to the Council's SSC. This could include a staff recommendation from the Council, or not. Based on the SSC's review of the out-year information, the SSC would recommend to the Council whether there should be a change to the out-year specifications, and what that change should be. If the SSC recommends, and the Council agrees, that a change should be made, a regulatory response would be required.

The regulatory response to the SSC's recommendation and Council's determination to make an out-year change could take at least two forms. In the first, the Council could recommend a new set of specifications that would be sent to NMFS for consideration, and proposed and final rules would be used to implement the changes, much the way the existing processes work. This would take 5-7 months to implement any change. Alternatively, it may be possible/advantageous to identify very specific criteria that the SSC and the Council would use to determine whether any adjustments are necessary, and to specify what the regulatory response to a triggering of the criteria would be. For example, the Council could pre-determine that, if Criterion X is exceeded by Amount Y, the ACL for the stock would be increased/decreased by Amount Z. The better defined the linkages (i.e., the less discretionary the decision), the faster the response could likely be. It is possible that, if the response is sufficiently non-discretionary, and the impacts of the change have been anticipated and analyzed in advance (see also the discussion under item e. below), the change could be made directly through a final rule.

Whichever out-year process is chosen (and a Council could choose to apply one process to some FMPs, and the other to other FMPs), to achieve stability in the fishery and the management process, it is recommended that any out-year changes should be made only in response to significant deviations from the established specifications; it would not be productive to require changes to the specifications in out-years if only small deviations have occurred. Further, any such changes should be triggered whether the stock condition is improving or worsening (i.e., whether the news is good or bad).

Another consideration of out-year adjustments is timing of the availability of the information needed, when the decision can be made as to whether a criterion is triggered, and whether an adjustment can be made part way through the fishing year. Because data on the performance of a fishery is typically not available until a few months after the fishing year ends, determinations on ACLs typically cannot be made until the next fishing year has begun. The same would be true for adjustment criteria that are based on fishery-dependent information. It would likely be necessary to wait to make any adjustment until the beginning of the following fishing year (e.g., if information from fishing year 2012, examined in fishing year 2013, indicated an adjustment to the specifications would be necessary, that adjustment would be made in fishing year 2014. Fishery-independent data, such as survey results, could potentially be obtained and examined prior to the start of, or very

early in a fishing year. In this case, it is possible that an out-year adjustment could be made in that same fishing year.

Summary/Recommendations: To be effective and consistent with the overall goals of the ACL Working Group recommendations, the out-year examination process needs to be simple, structured, have well-defined criteria, and strive for stability. Non-discretionary adjustments could likely be accomplished most quickly. Adjustments should be responsive to either improving or declining stock conditions. MSA emergency rules and interim rules should be avoided.

e. Discuss ways to streamline and improve required analyses (e.g., NEPA, RIR) in multiple year specification packages; provide recommendations for NERO and Council consideration. - To facilitate the use of multi-year specifications, including out-year adjustments, by anticipating and satisfying analytical requirements at the beginning of the process.

It appears that it would be relatively easy to address analytical issues associated with multi-year specifications, including any necessary out-year adjustments. The key to making this work is to appropriately determine the range of possible outcomes that could reasonably be expected, including the out-year adjustments. For example, assume the preferred alternative for the ACLs for the fishery over a 3-year specification cycle is 10,000 mt in year 1; 12,000 mt in year 2; and 14,000 mt in year 3, and that there is an adjustment criterion that could change the ACLs by up to 2,000 mt, up or down. The analyses of the initial specification package would then include, at a minimum, the no action alternative, the preferred alternative, and alternatives that would include a year-2 ACL of between 10,000 and 14,000 mt (if an adjustment can be made in year 2), and a year-3 ACL of between 12,000 and 16,000 mt. So long as any adjustments stay within the range of those alternatives, the analyses under the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA section 7), the Regulatory Flexibility Act (RFA), E.O. 12866, and essential fish habitat (EFH) should be adequate to cover any out-year adjustment(s). This would make adjustments easier and faster.

Summary/Recommendations: In most circumstances, analytical requirements should not be an impediment to using multi-year specifications, or to making out-year adjustments. Planning for a reasonable range of anticipated outcomes will be necessary, but should make any out-year adjustments easier and quicker to do.

f. Recommend consolidation of species/stocks into FMPs; discuss logical species/stocks groupings. - To determine whether combining stocks into fewer FMPs would make the assessment/specification process more efficient.

It is possible that some efficiencies in assessments and specification setting could be obtained from changing the way species are grouped into FMPs. Any such changes in stocks in the fisheries would need to be done through FMP amendments. However, it is not clear that any such changes would necessarily result in changes to how often the stocks would be assessed.

Several of the fisheries appear unique enough that they would likely not be easily combined with others. These are:

- Atlantic Salmon (no fishery),
- Tilefish,
- Surfclams/Ocean Quahogs,
- Sea Scallops,
- Deep-sea Red Crab, and
- Spiny Dogfish.

Other fisheries have at least some characteristics sufficiently in common that it might be possible to combine them into a single FMP. These are:

- Northeast Multispecies; Monkfish; Skates
- Atlantic Herring; Atlantic Mackerel, Squid, and Butterfish
- Summer Flounder, Scup, Black Sea Bass; Atlantic Bluefish

The first group of species (multispecies, monkfish, skates) are caught by many of the same fishermen, using similar gear (bottom trawls, gillnets, hook gear). The fisheries for multispecies and monkfish are already somewhat linked though days-at-sea provisions in both FMPs. One potential complication of this grouping is that the Monkfish FMP is a joint FMP, with the NEFMC the lead; the other FMPs are solely the responsibility of the NEFMC. Another consideration is the Limited Access Privilege (LAPP) referendum requirements for NEFMC-managed fisheries. If these FMPs were combined into one, it is unclear how the referendum requirements would apply. For example, to approve a monkfish IFQ program, would it require a referendum approval by everyone with a multispecies, skates, and/or monkfish permit? Or only those with monkfish permits?

The second potential grouping (Atlantic herring; Atlantic mackerel, squid, and butterfish) consists of species caught with much the same gear (trawls and/or purse seines), in large volumes (with the exception of butterfish in recent years), with relatively short life spans, and with similar roles in the ecosystem (e.g., as important prey species for other fish, marine mammals, and seabirds, as well as being predators themselves). Many of the industry participants in these fisheries are the same. A complication in this grouping, however, is that herring are currently managed by the NEFMC and the ASMFC; whereas mackerel, squid, and butterfish are managed by the MAFMC.

The third grouping (summer flounder, scup, black sea bass; Atlantic bluefish) contains fisheries with significant recreational components, as well as commercial components. The management processes for these two FMPs are already similar, and all of these species are managed by the MAFMC and the ASMFC.

Summary/Recommendations: Combining species/stocks into fewer FMPs is possible, and would be done through FMP amendments. However, there are potentially significant jurisdictional and

statutory (i.e., LAPP referendum) issues that would need to be addressed. This is likely not something that could be accomplished quickly or easily, and it is not clear that making such changes would result in meaningful improvements to stock assessment or management workloads or efficiencies.

Table 1. Summary of stock status in the Northeast Region

FMP	Species	Stock	Assessment Type	Project. Method	Overfishing?	Overfished?	Rebuild Date	Fishing Year
Northeast Multispecies	Cod	GB	VPA	AGEPRO	Yes	Yes	2026	1-May
	Cod	GOM	VPA	AGEPRO	Yes	No	2014	1-May
	Haddock	GB	VPA	AGEPRO	No	No	rebuilt	1-May
	Haddock	GOM	VPA	AGEPRO	No	No	rebuilt	1-May
	Yellowtail Flounder	GB	VPA	AGEPRO	Yes	Yes	2014	1-May
	Yellowtail Flounder	SNE/ MA	VPA	AGEPRO	Yes	Yes	2014	1-May
	Yellowtail Flounder	CC/G OM	VPA	AGEPRO	Yes	Yes	2023	1-May
	American Plaice	GB/G OM	VPA	AGEPRO	No	No	2014	1-May
	Witch Flounder		VPA	AGEPRO	Yes	Yes	2017	1-May
	Winter Flounder	GB	VPA	AGEPRO	Yes	Yes	2017	1-May
	Winter Flounder	GOM	none	none	Unknown	Unknown	N/A	1-May
	Winter Flounder	SNE/ MA	VPA	AGEPRO	Yes	Yes	2014	1-May
	Redfish		ASAP	AGEPRO	No	No	2051	1-May
	White Hake	GB/G OM	SCAA	AGEPRO	Yes	Yes	2014	1-May
	Pollock	GB/G OM	ASAP	AGEPRO	No	No	rebuilt	1-May
	Windowpane Flounder	GB/G OM	AIM	none	Yes	Yes	2017	1-May
	Windowpane Flounder	SNE/ MA	AIM	none	Yes	No	2014	1-May
	Ocean Pout		Index	none	No	Yes	2014	1-May
	Atlantic Halibut		Repl. Yield	none	No	Yes	2055	1-May
	Atlantic Wolffish		SCALE	none	Unknown	Yes	N/A	1-May
Northeast Multispecies (small mesh)	Silver Hake	North	Survey Index	none	No	No	N/A	1-May
	Silver Hake	South	Survey Index	none	No	No	N/A	1-May
	Red Hake	North	Survey Index	none	Unknown	No	N/A	1-May
	Red Hake	South	Survey Index	none	Undefined	No	N/A	1-May
	Offshore Hake		Survey Index	none	Undefined	No	N/A	1-May

FMP	Species	Stock	Assessment Type	Project. Method	Overfishing?	Overfished?	Rebuild Date	Fishing Year
NEFMC (potential)	Cusk		SCALE	none	Unknown	Unknown	Not defined	N/A
Northeast Skate Complex	Little Skate		Survey Index	none	No	No	rebuilt	1-May
	Winter Skate		Survey Index	none	No	No	rebuilt	1-May
	Barndoor Skate		Survey Index	none	No	No	N/A	1-May
	Thorny Skate		Survey Index	none	No	Yes	Not defined	1-May
	Clearnose Skate		Survey Index	none	No	No	rebuilt	1-May
	Rosette Skate		Survey Index	none	No	No	N/A	1-May
	Smooth Skate		Survey Index	none	No	No	N/A	1-May
Atlantic Herring	Atlantic Herring		ASAP	AGEPRO	No	No	N/A	1-Jan
Deep-Sea Red Crab	Deep-Sea Red Crab		Survey	none	Unknown	Unknown	N/A	1-Jan
Atlantic Sea Scallop	Atlantic Sea Scallop		CASA	SAMS	No	No	rebuilt	1-Mar
Monkfish	Monkfish	North	SCALE	none	No	No	rebuilt	1-May
	Monkfish	South	SCALE	none	No	No	rebuilt	1-May
Spiny Dogfish	Spiny Dogfish		Catch at Length	length-based	No	No	rebuilt	1-May
Summer flounder, scup and black sea bass	Summer Flounder		ASAP	AGEPRO	No	No	N/A	1-Jan
	Scup		ASAP	AGEPRO	No	No	rebuilt	1-Jan
	Black Sea Bass		SCALE	none	Yes	No	rebuilt	1-Jan
Squid, Mackerel, Butterfish	Atlantic Mackerel		ASAP	AGEPRO	Unknown	Unknown	N/A	1-Jan
	Loligo Squid		Survey Index	N/A	No	No	N/A	1-Jan
	Illex Squid		Survey Index	N/A	No	Unknown	N/A	1-Jan
	Atlantic Butterfish		KLAMZ	KLAMZ	No	Yes	Not defined	1-Jan

FMP	Species	Stock	Assessment Type	Project. Method	Overfishing?	Overfished?	Rebuild Date	Fishing Year
Atlantic surfclam and ocean quahog	Atlantic surfclam		KLAMZ	KLAMZ	No	No	rebuilt	1-Jan ??
	Ocean Quahog		KLAMZ/VPA	KLAMZ	No	No	rebuilt	1-Jan ??
Bluefish	Bluefish		ASAP	AGEPRO	No	No	rebuilt	1-Jan
Tilefish	Golden Tilefish		ASPIC	ASPIC	No	No	N/A	1-Nov
American Lobster	American Lobster	GB	CKWM	N/A	No	No	N/A	1-Jan ??
	American Lobster	GOM	CKWM	N/A	No	No	N/A	1-Jan ??
	American Lobster	SNE	CKWM	N/A	No	Yes	Not defined	1-Jan ??
Northern Shrimp	Northern Shrimp		CSA/ASPIC	N/A	No	No	N/A	1-Dec
Striped Bass	Striped Bass		SCA/MARK	N/A	No	No	rebuilt	1-Jan
NEFMC (potential)	Atlantic Hagfish		none	none	N/A	N/A	N/A	N/A
Atlantic Salmon	Atlantic Salmon		Run reconstruction	none	N/A	N/A	N/A	N/A
American Eel	American Eel		none	none	N/A	N/A	N/A	N/A
Atlantic Sturgeon	Atlantic Sturgeon		none	none	N/A	N/A	N/A	N/A
ASMFC	Shortnose Sturgeon		none	none	N/A	N/A	N/A	N/A
Shad and River Herring	River Herring		none	none	N/A	N/A	N/A	N/A
	American Shad		none	none	N/A	N/A	N/A	N/A

Table 2. Summary of key biological and fishery determinants of assessment frequency

--additional detail to be provided

Species Common Name	Ages Required ?	Rebuild Program ?	Max Age (yr)	M (yr^{-1})	Approx Age at Maturity (yr)	Ave Age in Catch (yr)	Mean Generation Time (yr)	Recruitment Variability (H,M,L,U)	F/Fmsy	B/Bmsy	Potential Freq (/yr)
Atlantic Cod GB	Yes			0.2							3
Atlantic Cod GM	Yes			0.2							3
Haddock - GB	Yes			0.2							3
Haddock - GOM	Yes			0.2							3
Yellowtail Flounder - GB	Yes			0.2							3
Yellowtail Flounder - SNE/MA	Yes			0.2							3
Yellowtail Flounder - CC	Yes			0.2							3
American Plaice	Yes			0.2							3
Witch Flounder	Yes			0.2							3
Winter Flounder - GB	Yes			0.2							3
Winter Flounder - GM	Yes			0.2							3
Winter Flounder - SNE MA	Yes			0.2							3
Acadian Redfish	Yes		50	.1??							6
White Hake	Yes			0.2							3
Pollock	Yes			0.2							3
Windowpane - N	No			NA							2
Windowpane - S	No			NA							2
Ocean Pout	No			NA							2
Atlantic Halibut	No			0.06							6
Atlantic Wolffish	No			.2??							6
Silverhake - N	Yes										2
Silverhake - S	Yes										2
Red Hake - N	No										2
Red Hake - S	No										2
Offshore Hake	No										2
Cusk	No										9
Skates--Little	No			NA							2
Skates--Winter	No			NA							2
Skates--Barndoor	No			NA							2
Skates--Thorny	No			NA							2
Skates--Clearnose	No			NA							2
Skates--Rosette	No			NA							2
Skates--Smooth	No			NA							2
Atlantic Herring	Yes										3
Deep Sea Red Crab	No										5
Sea Scallops	Yes			0.1							3
Goosefish - N	Yes										3
Goosefish - S	Yes										3
Spiny Dogfish	No		40								2
Summer Flounder	Yes										3
Scup	Yes										3
Black Sea Bass	Yes										3
Atlantic Mackerel	Yes										3
Longfin Squid	No			>1							5
Northern Shortfin Squid	No			>1							5
Butterfish	Yes			0.8							2
Atlantic Surfclam	Yes			.15??							3
Ocean Quahog	Yes			.02??							3
Bluefish	Yes			0.2							2
Tilefish	No			NA							4
American Lobster	No			0.15							5
Northern Shrimp	No			0.15							1
Striped Bass	No			0.15							3
Atlantic Hagfish	No			.8??							9
Atlantic Salmon	Yes			0.15							9
American Eel	No										9
Atlantic Sturgeon	No										9
Shortnose Sturgeon	No										9
River Herring	No										9
American Shad	No										9

i.

Table 3. Estimated staff time necessary for stock assessments. Annual person months are total person months/assessment frequency.

Counter	Orig index	Species Common Name	Potential frequency (yr)	Last assessment	Per Assessment Workload: Direct Person Months	Per Assessment Workload: Indirect Person Months	Per Assessment Workload: Total Person Months	Anualized workload: Anualized person months =(total PM/freq)
1	27	Northern Shrimp	1	2011	4	2	6	6.0
2	17	Bluefish	2	2010	6	1	7	3.5
3	18	Butterfish	2	2009	6	3	9	4.5
4	28	Ocean Pout	2	2008	3	1	4	2.0
5	30	Offshore Hake	2	2010	2	1	3	1.5
6	32	Red Hake - N	2	2010	4	1	5	2.5
7	33	Red Hake - S	2	2010	4	1	5	2.5
8	38	Silverhake - N	2	2010	4	1	5	2.5
9	39	Silverhake - S	2	2010	4	1	5	2.5
10	40	Skates--Winter	2	2011	2	1	3	1.5
11	41	Skates--Little	2	2011	2	1	3	1.5
12	42	Skates--Barndoor	2	2011	2	1	3	1.5
13	43	Skates--Thorny	2	2011	2	1	3	1.5
14	44	Skates--Clearnose	2	2011	2	1	3	1.5
15	45	Skates--Rosette	2	2011	2	1	3	1.5
16	46	Skates--Smooth	2	2011	2	1	3	1.5
17	47	Spiny Dogfish	2	2010	4	2	6	3.0
18	52	Windowpane - N	2	2008	3	1	4	2.0
19	53	Windowpane - S	2	2008	3	1	4	2.0
20	4	American Plaice	3	2008	12	4	16	5.3
21	6	Atlantic Cod GB	3	2008	24	8	32	10.7
22	7	Atlantic Cod GM	3	2008	24	8	32	10.7
23	10	Atlantic Herring	3	2009	36	12	48	16.0
24	11	Atlantic Mackerel	3	2010	36	12	48	16.0
25	16	Black Sea Bass	3	2010	12	3	15	5.0
26	21	Goosefish - N	3	2010	12	12	24	8.0
27	22	Goosefish - S	3	2010	12	12	24	8.0
28	23	Haddock - GB	3	2008	24	8	32	10.7
29	24	Haddock - GOM	3	2008	24	8	32	10.7
30	29	Ocean Quahog	3	2009	12	12	24	8.0
31	31	Pollock	3	2010	24	8	32	10.7
32	35	Scup	3	2008	12	4	16	5.3
33	36	Sea Scallops	3	2010	24	12	36	12.0
34	48	Striped Bass	3	2008	6	2	8	2.7
35	49	Summer Flounder	3	2010	12	4	16	5.3
36	51	White Hake	3	2008	24		24	8.0
37	54	Winter Flounder - GB	3	2011	12	4	16	5.3
38	55	Winter Flounder - GM	3	2011	12	4	16	5.3
39	56	Winter Flounder - SNE MA	3	2011	12	4	16	5.3
40	57	Witch Flounder	3	2008	24	8	32	10.7
41	58	Yellowtail Flounder - CC	3	2008	12	4	16	5.3
42	59	Yellowtail Flounder - GB	3	2010	12	8	20	6.7
43	60	Yellowtail Flounder - SNE/M	3	2010	12	4	16	5.3
44	14	Atlantic Surfclam	3	2009	12	12	24	8.0
45	50	Tilefish	4	2009	6	2	8	2.0
46	20	Deep Sea Red Crab	5	2008	12	4	16	3.2
47	25	Longfin Squid	5	2010	12	8	20	4.0
48	26	Northern Shortfin Squid	5	2005	12	8	20	4.0
49	1	Acadian Redfish	6	2008	24	8	32	5.3
50	9	Atlantic Halibut	6	2008	3	1	4	0.7
51	15	Atlantic Wolffish	6	2008	6	3	9	1.5
52	2	American Eel	9	xx	4	0	4	0.4
53	3	American Lobster	5	2008	24	8	32	6.4
54	5	American Shad	9	xx	4	0	4	0.4
55	8	Atlantic Hagfish	9	2003	4	1	5	0.6
56	12	Atlantic Salmon	9	2011	12	0	12	1.3
57	13	Atlantic Sturgeon	9	xx	12	4	16	1.8
58	19	Cusk	9	2010	6	2	8	0.9
59	34	River Herring	9	xx	12	4	16	1.8
60	37	Shortnose Sturgeon	9	xx	12	2	14	1.6
		person months			664	255	919	285.9
		person years			55.3	21.3	76.6	23.8

ii.

Table 4. Example application of assessment frequency and work load factors for an example assessment schedule.

			Example Assessment Schedule							
Assessment Frequency (yr)	Species Common Name	Last assessment	2012	2013	2014	2015	2016	2017	2018	Total Events
1	Northern Shrimp	2011	1	1	1	1	1	1	1	7
2	Bluefish	2010	1		1		1		1	4
2	Butterfish	2009	1		1		1		1	4
2	Ocean Pout	2008		1		1		1		3
2	Offshore Hake	2010		1		1		1		3
2	Red Hake - N	2010		1		1		1		3
2	Red Hake - S	2010		1		1		1		3
2	Silverhake - N	2010		1		1		1		3
2	Silverhake - S	2010		1		1		1		3
2	Skates--Winter	2011	1		1		1		1	4
2	Skates--Little	2011	1		1		1		1	4
2	Skates--Barndoor	2011	1		1		1		1	4
2	Skates--Thorny	2011	1		1		1		1	4
2	Skates--Clearnose	2011	1		1		1		1	4
2	Skates--Rosette	2011	1		1		1		1	4
2	Skates--Smooth	2011	1		1		1		1	4
2	Spiny Dogfish	2010	1		1		1		1	4
2	Windowpane - N	2008		1		1		1		3
2	Windowpane - S	2008		1		1		1		3
3	American Plaice	2008	1			1			1	3
3	Atlantic Cod GB	2008	1			1			1	3
3	Atlantic Cod GM	2008			1			1		2
3	Atlantic Herring	2009	1			1			1	3
3	Atlantic Mackerel	2010		1			1			2
3	Black Sea Bass	2010			1			1		2
3	Goosefish - N	2010		1						1
3	Goosefish - S	2010		1						1
3	Haddock - GB	2008	1			1				2
3	Haddock - GOM	2008	1			1				2
3	Ocean Quahog	2009	1			1			1	3
3	Pollock	2010		1			1			2
3	Scup	2008	1			1			1	3
3	Sea Scallops	2010		1			1			2
3	Striped Bass	2008	1			1			1	3
3	Summer Flounder	2010	1			1			1	3
3	White Hake	2008		1			1			2
3	Winter Flounder - GB	2011			1					1
3	Winter Flounder - GM	2011			1					1
3	Winter Flounder - SNE MA	2011			1					1
3	Witch Flounder	2008		1						1
3	Yellowtail Flounder - CC	2008		1			1			2
3	Yellowtail Flounder - GB	2010	1	1	1	1	1	1	1	7
3	Yellowtail Flounder - SNE/MA	2010		1			1			2
3	Atlantic Surfclam	2009	1			1			1	3
4	Tilefish	2009		1				1		2
5	Deep Sea Red Crab	2008			1					1
5	Longfin Squid	2010				1				1
5	Northern Shortfin Squid	2005				1				1
6	Acadian Redfish	2008		1						1
6	Atlantic Halibut	2008						1		1
6	Atlantic Wolffish	2008			1					1
9	American Eel	xx								0
5	American Lobster	2008								0
9	American Shad	xx								0
9	Atlantic Hagfish	2003								0
9	Atlantic Salmon	2011								0
9	Atlantic Sturgeon	xx								0
9	Cusk	2010	1							1
9	River Herring	xx								0
9	Shortnose Sturgeon	xx								0
	Number of assessments		23	21	19	22	18	14	20	
	Estimated Annual Workload	(pers mon)	325	353	189	349	241	120	253	
	Estimated Annual Workload	(pers yrs)	27.1	29.4	15.8	29.1	20.1	10.0	21.1	

Table 5. Specification duration authority (assumes approval of Mid-Atlantic Omnibus).

Stock	Council	Specification Authority
Atlantic salmon	NEFMC	No specifications
Atlantic herring	NEFMC	Up to 3 years
Monkfish	NEFMC/MAFMC	Up to 3 years
NE multispecies	NEFMC	Biennial adjustments
Small-mesh groundfish	NEFMC	Expected to be 3-yr adjustment cycle
Atlantic sea scallop	NEFMC	Biennial review, DAS allocations for 2 years
Deep-sea red crab	NEFMC	Up to 3 years
Skates	NEFMC	Biennial, with PDT review, baseline reviews
Summer flounder	MAFMC	Up to 3 years
Scup	MAFMC	Up to 3 years
Black seabass	MAFMC	Up to 3 years
Loligo squid	MAFMC	Up to 3 years, annual review
Illex squid	MAFMC	Up to 3 years, annual review
Atlantic mackerel	MAFMC	Up to 3 years, annual review
Butterfish	MAFMC	Up to 3 years, annual review
Atlantic bluefish	MAFMC	Up to 3 years proposed in Omnibus Amendment
Surf clams/ocean quahogs	MAFMC	Up to 3 years, annual review
Spiny dogfish	MAFMC/NEFMC	Up to 5 years
Golden tilefish	MAFMC	Following new stock assessment or establishment of RSA

Table 6. Current Fishing Years

Stock	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Atlantic salmon																								
Atlantic herring																								
Monkfish																								
NE Multispecies																								
Small-mesh groundfish																								
Atlantic Sea Scallops																								
Deep-sea red crab																								
Skates																								
Summer flounder																								
Scup																								
Black seabass																								
Loligo squid																								
Illex squid																								
Atlantic mackerel																								
Butterfish																								
Atlantic bluefish																								
Surfclams/ocean quhogs																								
Spiny dogfish																								

Table 7. Frameworkable provisions for fishing year and specification/adjustment process.

Fishery	50 CFR Framework Regs	Fishing Year Frameworkable?	Specifications Process Frameworkable?
Mackerel, squid, butterfish	§ 648.24	Maybe (not explicit)	Yes
Atlantic salmon	§ 648.41	NA	NA
Atlantic sea scallops	§ 648.55	Maybe	Maybe
Surfclams, ocean quahogs	§ 648.77	No	No
NE multispecies	§ 648. 90	Maybe	Yes
Monkfish	§ 648.96	Maybe	Maybe
Summer flounder	§ 648.108	Maybe	Yes
Scup	§ 648.127	Maybe	Yes
Black sea bass	§ 648.147	Maybe	Yes
Atlantic bluefish	§ 648.165	Maybe	Maybe
Atlantic herring	§ 648.206	Maybe	Maybe
Spiny dogfish	§ 648.237	Maybe	Maybe
Deepsea red crab	§ 648.261	Maybe	Maybe
Tilefish	§ 648.294	No	Yes
Skates	§ 648.321	No	No

Table 8. Regulations for procedures and frequency of specifications/adjustments.

Fishery	50 CFR Regs for Specification and Adjustment Procedures	50 CFR Regs for Specification and Adjustment Frequency
Mackerel, squid, butterfish	§ 648.21	§ 648.21
Atlantic salmon	NA	NA
Atlantic sea scallops	§ 648.55	§ 648.55
Surfclams, ocean quahogs	§ 648.71	§ 648.71
NE multispecies	§ 648.90	§ 648.90
Monkfish	§ 648.96	§ 648.96
Summer flounder	§ 648.100	§ 648.100
Scup	§ 648.120	§ 648.120
Black sea bass	§ 648.140	§ 648.140
Atlantic bluefish	§ 648.160	§ 648.160
Atlantic herring	§ 648.200	§ 648.200
Spiny dogfish	§ 648.230	§ 648.230
Deepsea red crab	§ 648.260	§ 648.260
Tilefish	§ 648.290	§ 648.290
Skates	§ 648.320	§ 648.320

Table 9. Current status of specification/adjustment schedules for Northeast Fisheries.

FMP	2011	2012	2013	2014	2015
Atlantic Bluefish	1 yr; specs; set for 1-3 yr; specs (2012-?)	Undetermined	Undetermined	Undetermined	Undetermined
Mackerel, Squid, Butterfish	1 yr; specs; set for 1-3 yr; specs (2012-?)	Undetermined	Undetermined	Undetermined	Undetermined
Summer Flounder, Scup, Black Sea Bass	1 yr; specs; set for 1-3 yr; specs (2012-?)	Undetermined	Undetermined	Undetermined	Undetermined
Tilefish	Roll over	Following new assessment or RSA	Following new assessment or RSA	Following new assessment or RSA	Following new assessment or RSA
Spiny Dogfish	1 yr; specs; set for 1-5 yr; specs (2012-?)	Undetermined	Undetermined	Undetermined	Undetermined
Surfclams, Ocean Quahogs	3 yr; specs	3 yrs; specs	3 yrs; specs; need to be set for 1-3 yr; specs	Undetermined	Undetermined
Atlantic Salmon	NA	NA	NA	NA	NA
Monkfish	3 yr; Amend. 5	3 yr; Amend. 5	3 yr; Amend. 5; need to be set for 3 yr (2014-2016); FW or Amend.	Set through FW or Amend.	Set through FW or Amend.
Deep-sea Red Crab	3 yr; Amend. 3	3 yr; Amend. 3	3 yr; Amend. 3; need to be set for 1-3 yr (2014-2016); FW or Amend.	Set through FW or Amend.	Set through FW or Amend.
Skates	2 yr; Amend. 3	2 yr; Amend. 3; set for 2 yr (2013-2014); FW or Amend.	Set through FW or Amend.	Need to be set for 2 yr (2015-2016); FW or Amend.	Set through FW or Amend.
Atlantic Herring	3 yr; Amend. 4	3 yr; Amend. 4	3 yr; Amend. 4; need to be set for 1-3 yr (2014-?); FW or Amend.	Undetermined	Undetermined

FMP	2011	2012	2013	2014	2015
NE Multispecies (U.S./Canada stocks currently assessed and adjusted annually)	2 yr; FW 44; set for 2 yr (2012-2013, default 2014); FW 45	2 yr; FW 45	2 yr; FW 45; set for 2 yr (2014-2015, w default 2016?); FW or Amend.	Default specs in place under FW 45; new specs in place under FW or Amend.	2 yr; FW or Amend.
Small-mesh Groundfish	set for 3 yr (2012-2014); Amend. 19	3 yr; Amend. 19	3 yr; Amend. 19	set for 3 yr (2015-2017); FW or Amend.	3 yr; FW or Amend.
Sea Scallops	2 yr (2011-2012, w 2013 default); FW 22	2 yr, (w. 2013 default); FW 22; set for 2 yr (2013-2014, w 2015 default ?)	Default 2013 specs in place under FW 22; new specs under FW or Amend.	2 yr, (w. 2015 default?); FW or Amend.; set for 2 yr (2015-2016, w 2017 default ?); FW or Amend.	Default 2015 specs in place?; new specs under FW or Amend.

Table 10. Example of specification/adjustment schedules for Northeast Fisheries, if multiyear specifications/adjustments are used in all fisheries, and assuming the frequency of assessments in Table 5. Numbers in parentheses after each FMP are the number of stocks for which specifications would be set. The notation "set" means the year in which the Council must develop the specifications for the next fishing year(s) (e.g., the MAFMC would "set" summer flounder specs in 2012 for the fishing year(s) starting 2013). Numbers in parentheses next to "Set" are the numbers of years that the specifications are to be set for. The results of the operational assessment for each stock would need to be available at least 1-2 months prior to the Council taking action, to allow for recommendations from the technical committees and SSCs to be developed. Assumes that new process starts with next specification/adjustment cycle in or after 2013 (the Council development of specs in 2013 for FY(s) 2014 and beyond).

FMP	2011	2012	2013	2014	2015	2016	2017	2018	2019
Atlantic Bluefish (1)	X Set 1 (2012)	X Set 1 (2013)	Set 3 (2014-2016)	X	X	Set 3 (2017-2019)	X	X	Set 3 (2020-2022)
Mackerel, Squid, Butterfish (4)	X Set 1 (2012)	X Set 1 (2013)	Set 3 (2014-2016)	X	X	Set 3 (2017-2019)	X	X	Set 3 (2020-2022)
Summer Flounder, Scup, Black Sea Bass (3)	X Set 1 (2012)	X Set 1 (2013)	Set 3 (2014-2016)	X	X	Set 3 (2017-2019)	X	X	Set 3 (2020-2022)
Tilefish (1)	X	X	X Set 5 (2014-2018)	X	X	X	X	Set 5 (2019-2023)	X
Spiny Dogfish (1)	X Set 1 (2012)	X Set 1 (2013)	Set 5 (2014-2018)	X	X	X	X	Set 5 (2019-2023)	X
Surfclams, Ocean Quahogs (2)	X	X	X Set 7 (2014-2020)	X	X	X	X	X	X
Atlantic Salmon	NA	NA	NA	NA	NA	NA	NA	NA	NA
Monkfish (2)	X	X	X Set 4 (2014-2017)	X	X	X	X Set 4 (2018-2021)	X	X

FMP	2011	2012	2013	2014	2015	2016	2017	2018	2019
Deep-sea Red Crab (1)	X	X	X Set 5 (2014-2018)	X	X	X	X	X Set 5 (2019-2023)	X
Skates (7)	X	X Set 2 (2013-2014)	X	X Set 3 (2015-2017)	X	X	X Set 3 (2018-2020)	X	X
Atlantic Herring (1)	X	X	X Set 3 (2014-2016)	X	X	X Set 3 (2017-2019)	X	X	X Set 3 (2020-2022)
Major Groundfish [1] (13)	X Set 2 (2012-2013)	X	X Set 3 (2014-2016)	X	X	X Set 3 (2017-2019)	X	X	X Set 3 (2020-2022)
U.S./Canada Groundfish[2] (3)	X Set 1 (2012)	X Set 1 (2013)	X Set 2 (2014-2015)	X	X Set 2 (2016-2017)	X	X Set 2 (2018-2019)	X	X Set 2 (2020-2021))
Other Groundfish[3] (6)	X Set 2 (2012-2013)	X	X Set 5 (2014-2018)	X	X	X	X	X Set 5 (2019-2023)	X
Atlantic Halibut (1)	X Set 2 (2012-2013)	X	X Set 7 (2014-2020)	X	X	X	X	X	X Set 7 (2021-2027)
Small-mesh Groundfish (5)	X Set 3 (2012-2014)	X	X	X Set 5 (2015-2019)	X	X	X	X	X Set 5 (2020-2024)
Sea Scallops (1)	X	X Set 2 (2013-	X	X Set 3 (2015-	X	X	X Set 3 (2019-	X	X

FMP	2011	2012	2013	2014	2015	2016	2017	2018	2019
		2014)		2017)			2021)		
No. of Stocks Set	37	20	39	13	3	22	13	9	31

X = Specifications already established or under development

X = Specifications would be in place

[1] For purposes of this strawman, "major groundfish" are GB cod, GOM cod, GB haddock, GOM haddock, pollock, white hake, CC/GOM yellowtail flounder, GB yellowtail flounder, SNE/MA yellowtail flounder, American plaice, GB winter flounder, GOM winter flounder, SNE/MA winter flounder, witch flounder.

[2] For purposes of this strawman, "U.S./Canada groundfish" are Eastern GB cod, Eastern GB haddock, GB yellowtail flounder. There are discussions of changing this to a 2-year assessment/adjustment cycle.

[3] For purposes of this strawman, "other groundfish" are Acadian redfish, northern windowpane flounder, southern windowpane flounder, wolfish, ocean pout, cusk.

Table 11. Example of proposed process for assessments/specifications versus status quo process. Summer flounder is used as the example.

	Status Quo Assessment Processes		*Proposed Framework for NE Assessments*		
	SAW/SARC track	**annual stock assessment update track**	**Operational Assessment Year**	**No Operational Assessment Conducted (interim years)**	**Research Track to Operational Assessment (new baseline available)**
Periodicity	dependent on NRCC agreed schedule (2-5 yrs).	annual	every 2-5 years (T.B.D.)	Intervening years between 2-5 year operational schedule	Dependent on 1) need of research track development, 2) completion of accepted baseline model
			Action(s) by group		
Prior year	SDWG: TORs for SAW developed and finalized				Prior year (or years); Development of new baseline model, methods, etc.; TORS for SAW developed
Jan	SDWG: data and model meetings, NEFSC: Data collection and analyses		NRCC schedules Operational Assessment cycle (Oct. prior year), adopts ToRs; Assessment Oversight Panel to review Operational Assessment Plan developed by lead stock assessment scientist; assessment plan, including interim approach, approved for use **or** assessment deferred to research track and interim approach implemented		SDWG: data and model meetings, NEFSC: Data collection and analyses
Feb					
March	SDWG: Finalization of data and model meetings, NEFSC: Data collection and analyses				SDWG: Finalization of data and model meetings, NEFSC: Data collection and analyses
April	SDWG: data and model meetings, NEFSC: Final model runs, report work	NEFSC/SDWG: Data assembly (Survey and Age data); stock assessment update analyses	NEFSC lead scientist consult with PDT/TC/SSC (integrated peer review); develop, prepare, and finalize operational assessment using current baseline model **or** interim approach finalized	PDT/TC data collection and assembly (with support by NEFSC, as needed)	SDWG: data and model meetings, NEFSC: Final model runs, report work
May					
June	SARC meeting; Peer review report and recommendation finalization; NEFSC summary report; information conveyed to MAFMC staff	NEFSC/SDWG: Stock assmnt. update review mtg.	Integrated peer review, Initiation of research track decision point --Research Track started, as needed; NEFSC reports made final; PDT/TC provides operational information to SSC **or** interim approach forwarded for management use	PDT/TC update interim year operational assessment-related performance metrics; provide information to SSC	SARC (or SARC-type) meeting; Peer review report and recommendation finalization; NEFSC summary report; information conveyed to MAFMC staff
July	Peer review report and recommendation finalization; NEFSC summary report; information conveyed to MAFMC staff; SSC/MC: Meetings (pre-decisional, ABC, and TAC/TAL recommendation)	SSC/MC: Meetings (pre-decisional, ABC, and TAC/TAL recommendation)	SSC/MC: Meetings (pre-decisional, ABC, and TAC/TAL recommendation)	SSC/MC: Meetings (pre-decisional, ABC, and TAC/TAL recommendation)	Peer review report and recommendation finalization; NEFSC summary report; NEW operational model FINAL using prior year or outdated data
Aug	MAFMC: Meeting; receives and reviews SSC ABC and MC TAC/TAL recommendations; action on specifications	MAFMC: Meeting; receives and reviews SSC ABC and MC TAC/TAL recommendations; action on specifications	MAFMC: Meeting; receives and reviews SSC ABC and MC TAC/TAL recommendations; action on specifications	MAFMC: Meeting; receives and reviews SSC ABC and MC TAC/TAL recommendations; action on specifications	Process continues as outlined in either the operational year or interim year descriptions
Sept	MAFMC: Submits EA/RIR/IRFA, specs Recommendation to NMFS	MAFMC: Submits EA/RIR/IRFA, specs Recommendation to NMFS	MAFMC: Submits EA/RIR/IRFA, specs Recommendation to NMFS	MAFMC: Submits EA/RIR/IRFA, specs Recommendation to NMFS	
Oct	NMFS: Proposed Rule on specifications	NMFS: Proposed Rule on specifications	NMFS: Proposed Rule on specifications	NMFS: Proposed Rule on specifications	
Nov	NMFS: Public comment; development of final specifications rule	NMFS: Public comment; development of final specifications rule	NMFS: Public comment; development of final specifications rule	NMFS: Public comment; development of final specifications rule	
Dec	NMFS: Final Rule; Specifications	NMFS: Final Rule; Specifications	NMFS: Final Rule; Specifications; restart track with next year's Assessment Oversight Panel	NMFS: Final Rule; Specifications	

(Prepared by Jessica Coakley and Michael Ruccio)

Appendix Figure 1. Draft Template

Assessment of Stock XXXXX

NEFSC Author

Date

I. Executive Summary

A. Summary of Assessment Changes
   1. Changes in input data
   2. Changes in assessment methodology

B. Summary of Results

	Last year		This year	
Quantity/Status	2010	2011	2011	2012
Fishing Mortality				
Stock Size				
Fishing Mortality Threshold				
Stock Size Threshold				
Is the stock overfished or being subjected to overfishing?				

State the current stock status based on the previous peer reviewed assessment (i.e., is the stock in a rebuilding program, is it overfished, overfishing?

II. Introduction

III. Fishery/Catch Statistics

IV. Data

A. Fishery Catch Statistics
B. Survey Data
C. Other Data

V. Analytic Approach

VI. Overfishing Definition and Biological Reference Points

A. State the current official overfishing definition (for overfished and overfishing).
B. State the current BRPs (F_{MSY}, B_{MSY}, MSY, or their proxies)
C. Give the updated estimates of the BRPs (FMSY, BMSY, MSY, or their proxies)

VII. Results

A. Provide estimates of B, SSB, F, recruitment, and catch (landings, discards) for the entire time series.

B. Make a stock status determination based on the latest results.
C. OFL recommendations (if possible, provide the pdf of OFL)

VIII. Discussion

A. Ecosystem considerations
B. Analytic issues and key sources of uncertainty in the assessment
C. Research priorities and data gaps

IX. Literature Cited