DRAFT 6/16/2017 Generic Terms of Reference for Operational Assessments[a]

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. Make a recommendation about current stock status (overfishing and overfished) with respect to updated status determination criteria[b].

6. Perform short- term projections; compare results to rebuilding schedules.

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. In that guidance,include qualitative written statements about the condition of the stock that will help to inform NOAA Fisheries about stock status[b]. Should an alternative assessment approach not be readily available, provide guidance on the type of scientific and management advice that can be.

aSource: **NRCC. 2011. A new process for assessment of managed fishery resources off the Northeastern United States. Internal Report.** With edits made by NEFSC on 6/16/2017.

bThe Peer Review panel is asked to recommend what the stock status appears to be. NOAA Fisheries still has final responsibility for making the stock status determination based on best available scientific information.

Term of Reference[a]	*Response*
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.	Completed. See Table 1 and 2. See Figure 1,2,3, and 3.5. Appendices 1 and 4.
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.	Not available. This is a Plan B assessment. An attempt was made to apply the Depletion Corrected Average Catch model but the results were judged not credible because they relied on unverifiable assumptions. See Table 13. Figures 12-14.
3. Identify and quantify data and model uncertainty that can be considered for setting Acceptable Biological Catch limits.	A parametric bootstrapping method was developed to estimate the uncertainty of the Catch forecast. Inputs include the precision of the NEFSC bottom trawl survey biomass estimates and precision of the discard to kept all ratio derived from trips observed by NEFSC observers and at-sea monitors. See Appendix 1. Figure 21-22. Effects of alternative estimators of discards, accounting for potential survival of captured fish, is addressed. See Figures 28-29. Table 1.5
4. If appropriate, update the values of biological reference points (BRPs).	Not available. The BRPs for RYM have been rejected. An attempt was made to use the DCAC model for this purpose but the results were judged not credible because they relied on unverifiable assumptions.
5. Make a recommendation about current stock status (overfishing and overfished) with respect to updated status determination criteria[b].	Available data, previous judgements of peer review panels and recent literature on Atlantic halibut all suggest that abundance is low compared to historical values. Abundance may have peaked as early as the 1820's, nearly two centuries ago. Fishing mortality could not be estimated. However, several lines of evidence suggest that the stock has increased about 3 fold in the last decade. (See Tables 8-10, and 12). See comments in TOR 8.
6. Perform short- term projections; compare results to rebuilding schedules.	The method can be used to project catches for one year in advance. Longer term projections are possible but rely on progressively less information about population trend and therefore have increasing uncertainty. See Figure 21, 22

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).	The previous assessment model (RYM) was rejected at the 2015 Operational Assessment. This assessment proposes a new approach that relies on rates of change in one or more abundance indices to adjust catches annually. The proposed approach could be expanded to consider alternative measures of rates of change in relative abundance. Prospects for a full-scale analytical assessment in the near term are considered slim given the low landings, paucity of age data, uncertainty about stock structure, and lack of a dedicated survey to monitor a species with apparent low catchability in trawls.
8. Should the baseline model fail when applied in the operational assessment, provide guidance on how stock status[b] might be evaluated. In that guidance, include qualitative written statements about the condition of the stock that will help to inform NOAA Fisheries about stock status. Should an alternative assessment approach not be readily available, provide guidance on the type of scientific and management advice that can be.	The previous assessment approach was rejected at the 2015 Operational Assessment. This assessment utilizes the guidelines for a Plan B assessment described in NRCC 2011. Without a measure of scale, it is impossible to quantitatively define biomass status or fishing mortality. Available data, previous judgements of peer review panels and recent literature on Atlantic halibut all suggest that abundance is low compared to historical values. Abundance may have peaked as early as the 1820's, nearly two centuries ago. Despite apparent increases in relative abundance in recent years, there are no compelling data to refute previous conclusions that the stock is overfished. Increases in relative abundance over the past decade for US stock area are consistent with trends in the much larger Canadian stock. The DFO assessment utilizes an analytical model which suggests that fishing mortality rates have been low during this period of increase. Such considerations support the notion that fishing mortality rates in the US have been sufficiently low to allow population growth. Canada does not utilize the same definitions as the US for overfishing, but the similarities between their respective trends would lead to a tentative conclusion that overfishing is not occurring.

[a]Source: **NRCC. 2011. A new process for assessment of managed fishery resources off the Northeastern United States. Internal Report.** With edits made by NEFSC on 6/16/2017.

[b]The Peer Review panel is asked to recommend what the stock status appears to be. NOAA Fisheries still has final responsibility for making the stock statusdetermination based on best available scientific information.