**Canada/United States (U.S.) Transboundary Resources Steering Committee Meeting**

**September 14, 2022**

**Meeting Summary**

**Canadian Participants:**

Tara McIntyre, DFO, TRAC Co-Chair

Irene Andrushchenko, DFO, TRAC

Kathryn Cooper-MacDonald, DFO, TMGC

Heidi Schaefer, DFO

Alain d’Entremont, TMGC Industry Co-Chair

Paul Gillis, DFO, Steering Committee A/Co-Chair

Reide Thomas, DFO, Integration Committee

Ray Belliveau, Industry, GOMAC Co-Chair

Ian McIsaac, Industry, GOMAC Co-Chair

**U.S. Participants:**

Pete Christopher, National Marine Fisheries Service (NMFS) Greater Atlantic Regional Fisheries Office (GARFO), Supervisory Fishery Policy Analyst (Groundfish)

Jamie Cournane, NEFMC

Elizabeth (Libby) Etrie, NEFMC, TMGC Industry Co-Chair

Marianne Ferguson, NMFS GARFO, Integration Committee Co-Chair

Jean Higgins, NMFS GARFO, SAR WG Co-Chair

Tom Nies, NEFMC, Executive Director

John Pappalardo, NEFMC, TMGC

Michael Pentony, NMFS GARFO, Steering Committee Co-Chair

Eric Reid, NEFMC Ecosystem-Based Fishery Management Committee, TMGC

Michael Simpkins, NMFS Northeast Fisheries Science Center (NEFSC), TRAC

Spencer Talmage, NMFS GARFO, Integration Committee

Talya tenBrink, NMFS, TRAC Co-Chair

**Opening Remarks**

Mr. Pentony (attending virtually) welcomed the participants back to Boston. He shared that his staff returned to the office in June, while continuing to embrace flexible scheduling and the hybrid work environment. He also shared that NMFS continues to work on measures that will reduce risks to North Atlantic right whales (NARW) from vessel strikes and entanglement in fishing gear in order to support recovery of the declining population. NMFS recently proposed modifications to the NARW vessel speed rule and continues to work toward modifications of the Atlantic Large Whale Take Reduction Plan (ALWTRP). NMFS approved Amendment 23 to the Northeast Multispecies Fishery Management Plan to revise the groundfish monitoring plan in its entirety on April 12, 2022. Proposed implementing regulations were published on February 28, 2022 to solicit public comment. Publication of the final rule implementing regulations is anticipated in the fall with an effective date prior to the end of the calendar year. He then provided an update on offshore wind on the east coast. It is a significant issue that requires a lot of staff time and resources to manage. NMFS works with the Bureau of Ocean Energy Management to ensure National Oceanic and Atmospheric Administration (NOAA) trust resources (fisheries, protected species, and habitat) as well as the fishing industry and communities are considered in the development of offshore wind projects.

Mr. Paul Gillis welcomed participants and shared that unfortunately, Mr. Doug Wentzell was not able to make the trip so he would be serving as the acting co-chair of this Committee alongside Mr. Pentony. He noted that DFO is very happy to be reengaging in a face to face capacity and thanked the U.S. delegation for hosting in Boston. Mr. Gillis thanked the members of TRAC and TMGC for their efforts to develop the fisheries management advice for this Committee’s consideration.

He shared that from June 27 to July 1, 2022, Minister Murray led Canada’s delegation to the UN Ocean Conference in Lisbon, Portugal. At the conference, Canada announced new voluntary commitments and emphasized existing priorities. Mr. Gillis noted that developing the Blue Economy Strategy is a priority for the Government of Canada and this work is currently underway. All input received during the engagement process is summarized in the Department’s *What We Heard Report* and is being used to inform the Strategy’s ongoing development.

He also shared that on July 19, 2022, the Prime Minister of Canada announced the next phase of Canada’s Oceans Protection Plan which includes a new investment of $2 billion over nine years. This new funding brings the total invested in support of the plan to $3.5 billion. Mr. Gillis mentioned that the Fish Stock provisions under the *Fisheries Act* came into force on April 28th. The provisions place binding obligations on DFO to manage certain fish stocks sustainably, and to put rebuilding plans in place when stocks become depleted. Requirements are also now in place to ensure that rebuilding plans are developed in a timely and consistent manner. He spoke on the status of DFO’s comparative surveys noting that several factors have affected the Department’s ability to conduct surveys over the past few years, such as the pandemic, aging ships, new ships with new requirements to be completed in order to implement use, etc. Despite these difficulties there has been two weeks of successful Comparative Fishing a few weeks ago in the 4X area and the Canadian portion of 5Z. He also mentioned that DFO is about to complete the full Comparative Fishing coverage for Quebec region and that the Department is roughly on track to accomplish their Comparative Fishing goals for the Gulf Region. He also shared that the Maritimes Region is on track with the joint DFO/NOAA survey which covers the three groundfish stocks. Mr. Gillis briefly reported on both Atlantic herring and Atlantic mackerel stocks reporting that Atlantic herring stock remains in the critical zone and in June the DFO announced a 33 percent decrease in the TAC for the 2022 season.

**Species at Risk Working Group Updates**

Ms. Jean Higgins provided an overview of the June meeting of the SAR Working Group. Presenters from NMFS and DFO reviewed department and office structures, roles, and functions. They went over their primary mandates and how they are implemented, including the Endangered Species Act (ESA), Species at Risk Act (SARA), Marine Mammal Protection Act (MMPA), and the Fisheries Act. They also discussed the role of science in supporting management and provided a poll to participants to gain information about future coordination topics. Themes that emerged included managing SAR in a changing climate, engaging in species or threat-specific discussions to enhance transborder cooperation, assessment and monitoring of the cumulative effects on SAR, and the examination of specific listing or recovery process elements to enhance transborder collaboration/cooperation.

Other themes included the challenges, opportunities, and approaches surrounding listing or not listing certain commercial fish stocks and identifying, promoting, and supporting the undertaking of specific recovery activities for transboundary species, including addressing gaps in science. Ms. Higgins added that the fall core team meetings would help decide which topics to cover in upcoming winter and spring meetings. She then transitioned into the U.S. updates for SAR.

Ms. Higgins reviewed the proposed amendments to the Right Whale Vessel Speed Rule. This included proposed changes to: spatial and temporal boundaries of the Seasonal Management Areas (renamed to Seasonal Speed Zones); the inclusion of most vessels between 35 feet and less than 65 feet in speed restrictions; a mandatory Dynamic Speed Zone framework (i.e., temporary speed restrictions in areas where right whales are detected outside Seasonal Speed Zones); and updates to the safety deviation provisions. The proposed rule was open to public comment through September 30, 2022. Next, she gave an overview of the MMPA Take Reduction Program and the recommendations that the Atlantic Large Whale Take Reduction Team (ALWTRT) is focusing on that will help reduce mortality and serious injury to NARW below the stock’s potential biological removal (PBR). It is estimated that a 90 percent minimum reduction in risk is necessary. The next step in these reductions are reducing risk from commercial trap/pot and gillnet fisheries. A Notice of Intent (NOI) to prepare an environmental impact statement (EIS) and a request for public comment was published on September 9, 2022 and a webinar was held on September 27, 2022. Comments were also accepted through the *regulations.gov* portal through October 11, 2022 and team meetings were planned through the fall to develop recommendations. Lastly, she provided an update on the Northeast U.S. Implementation Team (NEIT), which is a multi-disciplinary team that advises on NARW issues surrounding status and conservation and includes DFO and Transport Canada members. At the July meeting, the NEIT discussed objectives, including deliberations on identified right whale conservation priorities. Updates from the Population Evaluation Tool (PET) sub-group, of the NEIT, include that there will be a Center for Independent Experts review of the draft Population Viability Analysis (PVA). Next, the NEIT will meet in the fall or winter and the PET sub-group will finalize the PVA.

Ms. Heidi Schaefer provided an update on several key SAR including the NARW and Atlantic salmon. Ms. Schaefer spoke to detections and sightings of NARW remarking that the majority of sightings in Canadian waters have been in the Gulf of St. Lawrence. As of August 28, 2022 there have been 908 NARW visual encounters in Canadian waters by aircraft and boat (for a total of 1,084 NARWs sighted, including duplicates) and 581 definite NARW near real-time acoustic detections). DFO has detected three entangled whales in Canadian waters this year, all in the Gulf of St. Lawrence. Despite efforts, none have been re-located on-water. Ms. Schaefer stated that also as of August 28th DFO has made 118 preliminary ID’s (i.e., meaning that they still require some QA/QC) of individuals including 3 mother/calf pairs in Canadian waters. As of August 28th, the seasonal closure area (closed until November 15, 2022) in the Gulf of St. Lawrence covers approximately 24,409 km2 and the temporary closure areas cover approximately 9,539 km2. A series of 15-day temporary closures to non-tended fixed gear and trap and pot commercial fisheries occurred in Georges Bank, the Bay of Fundy, and the Cabot Strait. Ms. Schaefer noted that a key component of the Canadian program to protect NARW includes the Ghost Gear Fund. In Budget 2022, the Government of Canada is investing an additional $10 million into the Fund to support 44 new projects in 2022 and 2023. Through the Fund, more than 891 dedicated gear retrieval trips have taken place, removing approximately 1,303 tonnes of ghost gear from Canadian coasts, and over 155 km of rope.

Ms. Schaefer provided an update on Atlantic salmon. She noted that there are no changes to the previous updates provided on the status of the decision whether or not to list nine populations of Atlantic salmon under the SARA, however, DFO anticipates being able to provide a more substantive update at the Spring 2023 meeting. Ms. Schaefer mentioned that DFO is currently in the process of developing elements of the Wild Atlantic Salmon Conservation Strategy. The policy, plan and future strategy will guide collective actions to restore and maintain healthy wild Atlantic salmon populations in Canada. Over the following months DFO will be leading discussions to support co-development of the Strategy with rights holders and Indigenous organizations, government partners, and conservation organizations who collaborate on the protection, conservation and recovery of wild Atlantic salmon, as well as recreational fishing associations and the general public.

Ms. Schaefer also provided updates on other SARA listings and recoveries. Public consultations are anticipated for the on-going process to develop listing recommendations for Shortfin Mako, Lumpfish, and Sei Whale either later in 2022 or in 2023. Harbour Porpoise (Northwest Atlantic population) was reassessed and confirmed as special concern, therefore DFO will be initiating a process to develop a listing recommendation for this population. Relevant upcoming Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assessments include: brook floater, leatherback sea turtle (Atlantic population) in November 2022 and loggerhead sea turtle, Atlantic sturgeon (Maritimes population and St. Lawrence population), American plaice (several populations), and Atlantic salmon (several populations). Work continues on several recovery documents for species including the leatherback sea turtle, loggerhead sea turtle, white shark, and NARW. DFO anticipates providing more information on the progress of these documents at the Spring 2023 meeting.

**Discussion of 2022 TRAC Results - Yellowtail Flounder Update**

Ms. Talya tenBrink and Ms. Tara McIntyre gave the update on the science advice for Georges Bank Yellowtail Flounder from the TRAC. The presentation began with a review of the Terms of Reference. These were:

* Update results for the latest information from NMFS and DFO fisheries survey, including discard estimates and research surveys, and to characterize the uncertainty of estimates;
* Provide catch advice for 2023 based on the Limiter Approach and exploitation rate (i.e. ratio of 2023 quota/2022 survey biomass) and describe any adjustments to the limiter, including impacts on the advice given to the TMGC;
* Update and comment on trends in realized exploitation, relative fishing mortality (F), and total mortality (Z); and
* Examine results funded by the research set aside program that could provide context to the TRAC catch advice.

The Limiter Approach was developed during the 2020 TRAC meeting. At the November 2021 TMGC intersessional, the Limiter Approach was recommended for use in development of catch advice for 2023. The Limiter Approach is a tool intended to support development of catch advice when catches are low, the condition of the stock is poor, and changes year to year are indistinguishable from survey “noise.” To apply the Limiter Approach, the TMGC and TRAC designated upper and lower bounds around the averaged survey biomass indices from the most recent DFO and NMFS surveys considered at TRAC. These bounds are 1,000 metric tons (mt) at the lower limit, and a range of 7,300 mt to 8,500 mt at the upper limit. A constant catch advice is then designated; if the average survey biomass in a given year falls outside the established bounds, then the TRAC would need to reconsider whether the constant catch advice continues to be appropriate for the stock. The constant catch advice is 200 mt. Two sets of average survey biomass for 2022 were generated because of a missing value for the 2022 DFO survey. The first, which did not adjust for the missing survey, was 1,500 mt. The second was adjusted for the missing 2022 DFO survey, and was 1,211 mt. Both of these values fell within the biomass limits. Thus, TRAC recommends maintaining the constant catch advice of 200 mt. TMGC set the quota at 200 mt in 2022.

Next, they reviewed catch and discards. Combined Canadian and U.S. catch in 2021 were 51 mt. The majority of catches were from discards (92 percent in 2020, 98 percent in 2021). Catch has gone down, and stayed down since about 2014. 2020 U.S. discards estimates (which were not available previously) were revised from ~ 2 to 57 mt. The high degree of uncertainty in these discard estimates stems from a loss of observer coverage during the COVID-19 pandemic. This uncertainty is likely to be explored further within an upcoming research track assessment.

A review of surveys followed. The three survey biomass indices (DFO, NMFS spring, and NMFS fall) for Yellowtail Flounder on GB were rescaled to their respective means for the years 1987–2007. The 2020 NMFS spring and fall surveys were not conducted due to COVID-19. The DFO 2022 survey data are not available due to a change in vessel and an absence of conversion factor. The NMFS fall 2021 and spring 2022 surveys both had the second lowest numbers in the past 50+ years. Survey catch at age has also been low in recent years (especially for age 1 and age 2) and survey recruitment is relatively low compared to historical values. Spatially, the surveys show a lot of zeros.  Estimates of relative abundance from the NMFS spring and fall surveys now account for tow specific area swept, incorporating differences in wing spread and tow duration. Those index estimates are very similar with very low impact on overall biomass estimate and the estimates for ages are also very similar.

They then provided a brief overview of the empirical approach, which previously used to develop catch advice by applying a 7 percent exploitation rate to average survey biomass. When adjusted for 2022 DFO survey data, the empirical approach would result in a recommendation of 85 mt. In comparison, the constant catch advice recommended via the Yellowtail Limiter results in an exploitation rate of 16.5 percent.

Lastly, they shared special considerations for the Yellowtail catch advice, including a note that the results from the most recent surveys are considered valid for use despite the lack of a DFO 2022 survey, an update on the U.S. transition to the Catch Accounting and Monitoring System (CAMS) and resulting impacts to data availability, information on uncertainty in discard estimates for 2020, and a note about survey adjustments resulting from the work of Miller et al. (2021).

**Discussion of 2022 TRAC Results - Cod Update**

Ms. tenBrink and Ms. McIntyre gave the update on the Science advice from the TRAC on Eastern Georges Bank Atlantic Cod. As with Yellowtail, the terms of reference were covered first; these were:

* Update the following biological and fishery indicators of the state of cod in the EGB management area with previously missing 2020-2021 data, as well as available 2021-2022 data: condition factor, swept area survey biomass indices, fishery and survey catch at length and age, relative F, total Z, and catch;
* Provide an update on any recent assessments for bordering or overlapping stocks;
* Compare the length-weight, growth and maturity assumptions in Data Limited Methods tool (DLMtool) against the available survey data and determine if the assumptions remain valid;
* Comment on changes in survey and fishery indicators and provide advice within the range identified by the Management Procedures selected by TMGC; and
* Develop criteria to determine when DLM outputs would be considered invalid.

They then reviewed the survey distribution for the DFO survey and the NMFS spring and fall surveys. The biomass indices are still low but an updated age 3+ distribution from DFO spring 2022 survey (with no conversion) shows fish being caught in northeast and southeast quadrants where not much was caught previously. The NMFS spring 2021 survey shows greater distribution across the bank, but the NMFS spring 2022 shows fish catch mostly on western quadrants; a difference between the DFO and NMFS spring 2022 surveys. For length frequency, in the NMFS spring and fall surveys, the lengths of the fish are clustered around 40-75 cm. There is a peak at lengths 40-45 cm in the NMFS 2021 fall survey. For growth, younger fish are experiencing good growth in recent years, while old fish (5+ years) are not. These trends have no impact on catch advice, but are something to monitor.

Next, they reviewed the indicators discussed in the terms of reference for the years 2020, 2021, and 2022. For the fisheries indicators, there was a decrease in landings and catch, but the proportion of the quota that was caught was similar to last year. Fish size increased slightly for the Canadian catch in 2020. In the 2019 fishing year, the 2015, 2016, and 2017 year classes contributed more to the catch. In the 2020 fishing year, this was not evident from the Canadian catch. The 2018 year class dominated the 2020 Canadian catch. For the survey indicators, the peak length frequency for the DFO survey increased to 61 cm, although there is not a strong peak. For the NMFS spring survey, it was 55 cm, also with no strong peak. Survey catch at age was only available from the DFO survey, and the 2017 and 2018 year classes were dominant. Swept area abundance on the DFO survey decreased significantly to 1.1 million fish. This variability is consistent with annual survey trends. For example, values were high in 2016 and then decreased by more than 85 percent in 2017. Condition decreased for both males and females on the DFO survey. It increased from 2019 for both males and females on the NMFS spring survey. Total and Relative Mortality was not calculated at last year’s TRAC. F was not calculated for this year’s TRAC. Based on the data available this year, there is no drastic change in stock status and we have a current basis for a change in catch advice from the last model run in 2018.

Next, they reviewed the U.S. domestic assessment. The Plan B smoothing approach estimates the rate of change in the recent three years of the smoothed survey biomass to be 0.611. This multiplier is applied to the average of the recent three years of catch (1,193 mt) to produce the catch advice for 2022 of 729 mt. The Plan B smoothing approach is fully described in NEFSC (2015) and available as an R package. It states that the alternative catch advice with the multiplier of 0.632 was 754 mt. This was a result of the sensitivity run which changed the multiplier to 0.632. Framework Adjustment 63 set the Georges Bank cod FY2022 overfishing limit (OFL) and acceptable biological catch (ABC) as 754 mt for the Georges Bank area.  The quota went from 1,752 mt to 754 mt from 2021 to 2022, a 57 percent reduction.

Next, they gave an overview of cod in the 4X5Y area. The area has a two sub-component structure. Directed fishing for cod in 4X5Yb was prohibited in the 2019-2020 fishing year, so removals have been bycatch only since then, leading to the lowest removals on record. The assessment cycle is multi-year. There was a framework in 2018, followed by an assessment with a population model with three year projections and exceptional circumstances. The assessment is updated until the projections expire and then the cycle is repeated.

They then gave an overview of the DLMtool and the testing simulation assumptions. The parameters in the simulation are based on survey data up to 2018 and can be tested against survey information since then. The parameters that feed into the projection (length-weight, growth, and maturity) are tested annually. If empirical data departs from the assumptions, then the projections for the DLMtool depart from reality and are no longer considered valid. The length-weight assumption and maturity assumption hold true through 2022. When the growth parameters were updated with 2021 (NMFS spring survey ages) and 2022 data, there was drift in both absence of fish (uncertainty) and change in growth. The changing growth concerns indicate that they may be close to breaking the DLMtool assumptions soon.

Based on the approved Management Procedures (MP) selected by the TMGC, the advice for 2023 is 520 mt and remains appropriate. Available survey and fishery indicators generally remained consistent with the previous years, indicating that productivity of the stock remains low and there is no notable change in the state of the stock. There is a need to continue annual evaluation of whether the assumptions made in the projections of the DLMtool remain realistic, particularly if further evidence of higher than assumed growth emerges. The current application of the DLMtool is only intended as a short-term solution and should be replaced or supplemented with at least one functioning population model as soon as possible. The TRAC strongly recommends a benchmark for this stock.

Special consideration for the catch advice were also shared, including a note that estimated removals in recent years in U.S. catches are a source of uncertainty, that further investigation is needed into the ecological role of cod and the potential implications of these changes on the recent productivity trends, and that investigation into the recent levels of natural mortality (M) on EGB is recommended. As with the presentation on GB Yellowtail, it was noted that the U.S. commercial fishery data processing system is undergoing a change to CAMS. Also of consideration is a difference in the aging methodologies used by NMFS and DFO. This difference is in the assumed birth date for EGB cod, with NMFS labs assuming fish are all born on January 1st and DFO labs assuming fish are all born on February 1st. For analyses using integer ages (i.e. whole age), the impact of this difference is limited to only fish sampled in the month of January; calculations of partial age are impacted regardless of month sampled. It was noted that there is apparent improvement in growth of young fish and their relatively high abundance compared to the recent years in 2021; the NMFS fall survey must be monitored to see if the signal persists as the fish age and increase their contribution to the population.

Additionally, the U.S. is conducting a research track on Atlantic cod and an update was provided to TRAC this year and is anticipated for next year’s meeting. Finally, TRAC noted that the current application of the DLMtool was only intended as a short-term solution and should be replaced with at least one functioning population model as soon as possible, particularly in light of apparent changes in growth of incoming year classes and the outstanding needs of both U.S. and Canadian Managers (i.e. reference points, stock status, etc).

**Discussion of 2022 TRAC Results - Haddock Update**

Ms. tenBrink and Ms. McIntyre provided an update on the Science Advice for Eastern Georges Bank (EGB) Haddock. The terms of reference were covered first. These were:

* Update the following biological and fishery indicators of the state of Haddock in the EGB management area with previously missing 2020-2021 data, as well as available 2021-2022 data: condition factor, swept area survey biomass indices, fishery and survey catch at length and age, relative F, Z, and catch;
* Identify and comment on changes in survey and fishery indicators (relative to the 2021 TRAC);
* If available for the EGB management area, provide catch advice for 2023 based on the research track assessment model
	+ One year of projections;
* If the research track assessment cannot be applied, comment on applying the 2021 TRAC’s 2022 catch advice for 2023;
* Recommend fishing reference points based on the EGB haddock analytical assessment.

Combined Canada and U.S. EGB Haddock catches in 2021 were 7,526 mt and represented 53 percent of the combined 14,100 mt quota. Recent strong year classes for EGB haddock include 2000, 2003, 2010, and 2013. The 2013 cohort (age 8) made up 33 percent of the total catch, followed by the 2018 year class (age 3) at 24 percent. Catches of age 1 fish were the highest since the 2013 cohort.

Next, they reviewed survey data. The DFO survey included up to 2021 for model input. 2022 had new fishing gear and protocol, but there is no conversion factor available yet. The NMFS Spring and Fall surveys included up to 2021 for model input and the NMFS spring survey for indicators. They also shared multiple changes to the survey abundance indices from the 2022 Research Track:

* New length-based conversion factor (Miller 2013) of Bigelow catch for post-2009 NMFS spring and fall survey data leading to lower abundance indices at age;
* New season-by-year biomass calibration factors leading to lower biomass index for both spring and fall survey;
* NMFS fall survey strata 29 and 30 are included in EGB abundance indices: importance of EGB haddock distribution in fall;
* NMFS spring survey, Yankee 41, abundance indices (1973-1981) is dropped due to the limited number of observations and inability of the model to estimate selectivity.

A review of the swept area survey biomass index followed. For 2021, all three surveys showed low biomass with an average about 26,500 mt. The NOAA Fisheries spring survey biomass was 13,000 mt for 2022. The 2022 DFO survey unconverted swept area biomass is 22,600 mt, but the converted biomass was expected to be lower. The surveys show conflicting signals. The NOAA Fisheries fall and DFO surveys have consistent trends, a sharp increase coming in with the strong 2013 year-class and sharp decrease since 2018, but the NMFS spring survey did not show the large variations. The survey abundance indices at age show that the 2013 year-class has disappeared faster than the 2003 year-class. No fish older than age 8 were found in the NMFS spring survey, and no fish older than age 10 were found in the 2021 NMFS fall and 2022 DFO survey. With the sharp decrease in biomass in the last few years, slight increases in EGB Haddock length-at-age have been observed in the fishery and survey. In terms of 2021 year-class strength, the 2021 NMFS fall survey, and the 2022 DFO and NMFS spring surveys suggest that the EGB Haddock 2021 year-class is the largest since 2013. Condition was low from 2002-2017, coincident with the period with high haddock biomass and fewer small-size copepod on GB. Some improvements have been seen in the three most recent years.

Next, they discussed the assessment model. The state of the model is based on the EGB Haddock model developed in the Haddock Research Track. The research track “Mest” model has a time period of M increase hard-wired into the model (2010-2019; M=0.473). Alternative configurations of the model were examined, and evaluation of model performance metrics suggest it is sufficient to characterize stock status.

Spawning stock biomass (SSB) for EGB Haddock has declined sharply since 2016. The current SSB estimate for 2021 is 15,351 mt, which is below the median SSB of 25,235 mt for the time series (1969-2021). Fully-selected F was estimated at 0.79 and 0.76 for 2020 and 2021, respectively, which were the highest values since 2007. In terms of recruitment, which can be highly variable, better recruitment tends to occur when SSB is above 20,000 mt. The EGB haddock stock has produced several exceptionally strong year classes since 2003. The median recruitment for the time series (1968-2020 year class) is 8.8 million. The preliminary estimate of the 2020 year-class is 111 million.

Next, they discussed the fishing reference point. The fishing mortality reference point (Fref)=0.26, derived from the 2002 Virtual Population analysis model output adopted by the TMGC, is no longer appropriate as an Fref for EGB Haddock. The performance of MPs with different update interval (U) and number of recent years of data in terms of trade-offs between annual mean catch, spawning stock biomass in 2021, and average annual variability in catch from a retrospective forecasting was used for Fref selection. The F40%spr=0.367, calculated with the last 5 years and updated every 3 years, outperform longer period average MPs, with higher yields, intermediate variability, and higher biomass outcomes. The TRAC suggests F=0.367 as the new fishing reference point for TMGC discussion. Using that proposed Fref, the assumption for the 2022 Total Allowable Catch (TAC) is 14,000 mt. The full quota for EGB Haddock has never been utilized in any year since 2004, when the TMGC began setting TAC. In the past 10 years, between 27 and 53 percent of the TAC was realized. The TRAC agreed to use 7,526 mt (close to 53 percent of the 2022 TAC) as the assumed 2022 catch in the projection. Considering the uncertainties of M in the near future, catch projections for 2023 were conducted under two different M scenarios for EGB haddock. The Low M scenario assumes a return to the historical M=0.2 in 2022-2023 and the High M (M=0.516) scenario assumes that future (2022-2023) M will stay the same as 2010-2021. Under the Low M scenario, the median catch in 2023 at “Fref” 0.367 will be 4,601 mt. Under the High M scenario the median catch in 2023 at Fref will be 2,784 mt.

Based on that information, they shared the following TRAC advice and Special Considerations.

* Advice
	+ The TRAC did not reach consensus on which scenario is more likely; however, the TRAC does agree that a decrease in catch advice is necessary.
	+ There was consensus not to use the Low M scenario for EGB Haddock Catch advice in the short term. The options discussed were to use High M or to use the range of projected catch bounded by the High M and Low M scenarios.
	+ Rationale for both approaches are presented in detail in the TRAC EGB Haddock TRAC Status Report (TSR).
* Special Considerations
	+ The stock abundance is expected to decrease from a historical high in the next few years due to the exit of the strong 2013 year-class from the stock and fishery. Density-dependent factors influencing EGB Haddock maturity, growth, and associated changes in fishery selectivity will be reduced.
	+ As the base model has its time period of M increase hard-wired into the model, a number of models with alternative M configurations were examined for the updated years (2020-2021). Despite the uncertainties of M in recent years, SSB estimated from all models shows a consistent trend over time with low values in 2021.
	+ The 2021 NMFS Fall survey and the 2022 DFO and NMFS spring surveys all suggest that the 2021 year-class is the largest since 2013.
	+ The base model used in this analysis was not supported by all members of the Haddock Research Track working group. The TRAC also recognized that the EGB and GB Haddock models developed in the Haddock Research Track are not consistent with each other and, as recommended by the Haddock Research Track peer review panel, future work to harmonize the models would be useful.

**TMGC Report & Guidance for 2023**

The TMGC co-chairs, Mr. Alain D’Entremont for Canada and Ms. Libby Etrie for the U.S., provided the results of the September TMGC meeting and the shared TAC recommendations for EGB cod, GB yellowtail flounder, and EGB haddock for 2023.

For EGB cod, the TMGC concluded that the most appropriate combined TAC in 2023 was 520 mt, which represents an 8 percent decrease from 2022. This TAC was chosen consistent with TRAC catch advice for 2023 and in order to balance the utilization of other species, signals in survey indices, and consideration of risks to the stock.

For GB yellowtail flounder, the TMGC agreed with the TRAC recommended combined TAC of 200 mt for 2023, which was developed using the limiter tool. This combined TAC is status quo with 2022. The TMGC will continue to develop a strategy to be applied in a case where average survey biomass falls outside of the bounds of the limiter tool.

For EGB haddock, the U.S. and Canadian delegations were unable to come to agreement on a shared TAC for 2023 upon the conclusion of the TMGC meeting. The Canadian proposal was 4,000 mt, while the U.S. proposal was 3,238 mt. The U.S. noted that its upcoming domestic Management Track assessment for GB haddock would potentially provide room for further negotiation. The TMGC agreed that further attempts to come to agreement could occur after the Management Track and prior to DFO/industry consultations in early October for the Gulf of Maine Advisory Committee (GOMAC).

Several items remained in need of further work by the TMGC upon the conclusion of its meeting, and as such several TMGC Intersessionals were planned. The first, which would occur in September 2022, prior to October 7th at the latest, would include further negotiations on EGB haddock. The second would occur in March or April of 2023 and include discussions regarding updated domestic Atlantic cod assessment(s) and the strategy for survey biomass falling outside the bounds of the Yellowtail Limiter. Finally, the TRAC is working on a timing paper as part of an effort to make long term improvements to the timing of the transboundary management process; the TMGC will receive the timing paper and discuss potential changes.

**TRAC Groundfish Allocations**

Irene Andruschenko shared the allocation shares for Canada and the U.S. on Georges Bank through fishing year 2023. First she reviewed a map of the relevant management zones, then showed the allocation formula and context for utilization and resource distribution. The initial sharing formula was based on the weighting of country utilization and resource distribution from surveys by 60 percent. Thereafter, the percentage weighting was changed by 5 percent annual increments until the weightings reached 10 percent country utilization from landings and 90 percent resource distribution from surveys. This sharing agreement was implemented in 2003, with the end of the transition to a 90:10 resource distribution-to-utilization weighting in the 2010 fishing year. The TMGC agreed to use the percentage of the total landings by country from 1967 to 1994 (inclusive), as the measure of country utilization. With the smoothing of survey distribution, resource distribution in 2021 was 25 percent U.S., 75 percent Canada for Cod, 42 percent U.S. and 58 percent Canada for Haddock, and 48 percent U.S. and 52 percent Canada for Yellowtail. The resulting allocations shares for 2023 are 26 percent U.S. and 74 percent Canada for cod, 42 percent U.S. and 58 percent Canada for Haddock, and 53 percent U.S. and 47 percent Canada for Yellowtail.

**TRAC 2023 Terms of Reference (TORs) and Future Meeting Schedule**

The next TRAC meeting will be held July 11-13, 2023 in St. Andrews, New Brunswick.

*Cod:*

● Update the following biological and fishery indicators of the state of cod in the

EGB management area with previously missing data, as well as available 2022-2023 data: condition factor, swept area survey biomass indices, fishery and survey catch at length and age, relative F, Z, and catch.

● Provide an update on any recent assessments for bordering or overlapping stocks

● Compare the length-weight, growth and maturity assumptions in DLMtool against the available survey data.

● Evaluate the assumptions and comment on the validity of the DLMtool.

● Comment on changes in survey and fishery indicators and provide advice identified by the Management Procedure selected by TMGC.

*Haddock:*

● Update the following biological and fishery indicators of the state of haddock in the EGB management area with previously missing 2022 DFO spring survey data, as well as available 2022-23 data: condition factor, swept area survey biomass indices, fishery and survey catch at length and age, relative F, Z, and catch.

● Identify and comment on changes in survey and fishery indicators (relative to the

2022 TRAC).

● Update the EGB assessment model with the latest data and provide catch advice for 2024 (one year of projections) for EGB management area

● Provide an update on any recent assessments for bordering or overlapping stocks.

● [Subject to TRAC intersessional, clarification on and recommend 2022 Fref, provide more information on tradeoffs on alternatives, recommend how the Fref will be updated including frequency.]

*Yellowtail Flounder:*

● Update results for the latest information from NMFS and DFO fisheries survey, including discard estimates and research surveys, and characterize the uncertainty of estimates.

● Provide catch advice for 2024 based on the limiter approach and exploitation rate (i.e., ratio of 2024 quota/2023 survey biomass). Describe any adjustments to the limiter, including impacts on the advice given to TMGC.

● Update and comment on trends in realized exploitation, relative F, and Z.

● Examine available survey results funded by the research set aside program that could provide context to the TRAC catch advice.

*Allocation Shares:*

● Review the biomass distribution relative to the U.S./Canada boundary, and update results with the 2022 survey information. Incorporate the swept area biomass conversions when data is available.

*Other:*

● Report on any changes to the surveys that might impact the assessments such as changes to vessels, timing, area coverage, etc. Describe any potential impacts of these changes.

● Discuss, as appropriate, the impacts of COVID-19 restrictions in each country on achieving or completing work on any TORs, including any alternatives to address data shortfalls.

● Update on the DFO EGB Cod plans, Atlantic Cod Research Track Working Group and Yellowtail Flounder Research Track Working Group.

● Draft terms of reference for the 2024 TRAC assessment of Eastern Georges

Bank Atlantic Cod, Eastern Georges Bank Haddock, and Georges Bank

Yellowtail Flounder.

*Expected Publications:*

● TRAC Transboundary Status Reports for the EGB Haddock, EGB Cod and GB Yellowtail Flounder management units.

● TRAC Reference Documents for Allocation Shares.

*Participation:*

● DFO Maritimes scientists and managers

● NMFS Greater Atlantic Region scientists and managers

● Canadian and U.S. fishing industry

● NEFMC and Scientific and Statistical Committee (SSC) representatives

● U.S. State and Canadian Provincial (New Brunswick and Nova Scotia) representatives

● Public and stakeholders/rightsholders

**Other Business**

As a follow-up from discussions in previous years, both countries provided updates on Atlantic herring. Ms. Emily Gilbert, a Fishery Policy Analyst with GARFO, began with an overview of U.S. Atlantic herring management. Ms. Gilbert started with an overview of the 2023-2025 Atlantic Herring Specifications. On August 18, 2022, NMFS implemented a rebuilding plan for Atlantic Herring based on the results of the June 2020 Herring management track stock assessment. The herring stock is not subject to overfishing, but is overfished and recruitment continues to stay at historic low levels. The NEFMC began developing the rebuilding plan in October 2020. The rebuilding plan relies on the NEFMC’s ABC control rule. Analyses completed during the development of Framework 9 (which established the rebuilding plan) indicated that the stock could rebuild in five years, assuming long-term average recruitment. Under the aforementioned ABC control rule, when biomass (B) is at or above 50 percent of the biomass that can support harvest of the maximum sustainable yield (BMSY) or its proxy, ABC is the catch associated with an F of 80 percent of the maximum rate of fishing mortality (FMSY) or its proxy. When biomass falls below 50 percent of BMSY or its proxy, F declines linearly to 0 at 10 percent of BMSY or its proxy. The Council is currently developing specifications for 2023-2025 based on the ABC control rule and projections from the June 2022 management track assessment. The SSC met August 4, 2022 to review OFL and ABC recommendations for the specifications. Final action will take place at the September 27th to 29th Council meeting. The OFLs are 29,138 mt for 2023, 32,233 mt for 2024, and 40,727 mt for 2025. The ABCs are 16,649 mt for 2023, 23,409 mt for 2024, and 28,181 mt for 2025. The OFL for 2023 was lower than the existing OFL recommended for 2023, and the ABC was higher. These changes are due to the fact some of the assumptions that feed into the model that is used to generate short-term biomass projections were updated as part of the 2022 management track assessment.

Ms. Gilbert also discussed concerns with the New Brunswick weir transfer process. When setting specifications for herring, the Council deducts an amount to account for management uncertainty (currently 4,669 mt), which includes projected catch in the New Brunswick weir fishery. The amount of catch deducted is analyzed in each specification action and is generally based on an average of previous years’ landings. The current buffer is based on a 10 year average of landings. If NMFS determines that the New Brunswick weir fishery landed less than a prescribed threshold (currently 3,012 mt) of herring through October 1, NMFS subtracts 1,000 mt from the management uncertainty and reallocates that amount to the Annual Catch Limit (ACL) and Area 1A sub-ACL (Inshore Gulf of Maine). The threshold to determine if 1,000 mt can be transferred is also considered in the development of specifications and is currently calculated using the same ratio as a previous trigger and management uncertainty buffer - based on a ratio of 0.645. Generally, NMFS has published a transfer notice in late October or early November, giving the fleet until the end of the fishing year (December 31) to catch that additional allocation in Area 1A. This transfer has been critical to the fishery with recent low allocations. In recent years, the timing of if and when the New Brunswick weir transfer is completed has impacted the timing of the opening of Season 2 in Area 1A.

The main concern with the New Brunswick weir transfer is data access. Data for the fishery is not maintained by NOAA, so they must rely on DFO for estimates. There are infrequent landing updates through the 4VWX Herring reports, but otherwise landings must be requested through personal communications - which means NMFS staff may not know the caveats of the data and data transfer can be delayed. Additionally, data from January 1st to October 1st are not complete by October 1st. In recent years, landings reported at the end of the fishing year have increased from landings reported on October 1st. This has resulted in the transfer threshold and sometimes the management uncertainty buffer being exceeded. There has also potentially been a change in effort in the fishery - there has been an increasing trend in recent years along with winter fishing. If more landings are occurring after October 1st than previously assumed, the October 1st transfer evaluation date may not be appropriate for current fishery conditions. Next, Ms. Gilbert showed a table of the transfer threshold, the preliminary landings at the time of transfer, and the final landings for the last ten years. In the last 10 years, there were four years where NMFS completed the New Brunswick weir transfer because preliminary landings data as of October 1st indicated that the fishery had landed less than the threshold amount, but final landings data showed that landings ultimately exceeded the threshold. Even in years when landings did not ultimately exceed the threshold, there was still a large difference between the preliminary and final landings data, especially in the last five years. In 2018 and 2020, the New Brunswick weir landings ultimately exceeded the management uncertainty buffer.

Lastly, Ms. Gilbert shared an update on the Industry Funded Monitoring (IFM) Program. The NEFMC IFM Omnibus Amendment was approved in February 2020. This action implemented standards for the development and administration of the IFM programs in NEFMC-managed fisheries and established a new IFM program in the herring fishery. The herring IFM program was designed to help provide increased accuracy in catch estimates. COVID-19 delayed IFM coverage in the herring fishery until July 1, 2021. NMFS has funding to cover the administrative costs of IFM through March 31, 2023 - without dedicated permanent funding, the IFM program will be on hold beginning April 1, 2023. The COVID-19 pandemic led to many challenges with administering IFM. The NMFS observer coverage waiver was in place through June 2021, and there was a high observer/monitor attrition rate. The NEFSC reconstituted the observer program with COVID-19 restrictions and new virtual classroom training. No NEFSC in-person travel to sampling stations was allowed, nor was in-person outreach allowed. It was difficult to maintain a monitoring cadre for a fishery with low effort, and there were service provider deployment logistics to contend with for portside sampling.

To follow, Jennifer Ford from DFO, gave science updates on the stock status of Atlantic herring and a review of tagging studies. Southwest Nova Scotia and Bay of Fundy herring stock status has generally been decreasing in recent years. In 2021, the acoustic index of SSB was 203 kilotonnes (kt). It was the lowest observed value in the time series. The stock has been lower than the limit reference point (LRP) since 2018. Because there is uncertainty in the origin of herring collected in the southwest New Brunswick weir fishery, DFO conducted a review of tagging studies in the Bay of Fundy, Gulf of Maine, and Scotian shelf in 2021. The results were briefly shared at the U.S./Canada Steering Committee meeting in 2021 and [a review paper](https://journal.nafo.int/Volumes/Articles/ID/670/Review-of-tagging-studies-on-Atlantic-herring-emClupea-harengusem-in-relation-to-transboundary-movement-in-the-Bay-of-FundyGulf-of-MaineScotian-Shelf-region-of-the-Northwest-Atlantic) was published in August 2022. Juvenile herring in the coastal Gulf of Maine and Southwest New Brunswick (SWNB) nursery areas generally show only movements between these two areas. These nursery areas are believed to include herring that hatched from the U.S. and Canadian spawning grounds, contrary to the current management assumption for the weir fishery in SWNB. Adult herring are understood to primarily return to their natal spawning area. Mixing of adults from different spawning grounds (including transboundary mixing) occurs during the summer feeding and overwintering seasons. Canadian spawners have been observed to overwinter in New England and U.S. spawners have been observed to overwinter in Nova Scotia. Herring tagged on Canadian spawning grounds have been recaptured in the SWNB weir fishery, refuting the assumption that all herring landed in this fishery are of U.S. origin. The tagging data suggest that the weir fishery comprises a mix of herring hatched from spawning grounds in Canada and the U.S. The biases associated with recapture data from tagging programs precludes estimation of any proportions of stock mixing.

**Closing Remarks**

Mr. Pentony and Mr. Gillis provided closing remarks to the group, thanking them for their participation and valuable discussions. They noted that their respective delegations would work together in the coming months to come to a consensus on haddock allocations. As such, the dates for the next year’s TMGC and Steering Committee meetings were not decided at this time.