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Proceedings of the Regional Peer Review Meeting on the Assessment of the Northern Contingent of Atlantic Mackerel (*Scomber scombrus*)

**February 20-22, 2023
Mont-Joli, QC**

**Chairperson: Marie-Julie Roux
Editor: Sonia Dubé**

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Foreword

The purpose of these Proceedings is to document the activities and key discussions of the meeting. The Proceedings may include research recommendations, uncertainties, and the rationale for decisions made during the meeting. Proceedings may also document when data, analyses or interpretations were reviewed and rejected on scientific grounds, including the reason(s) for rejection. As such, interpretations and opinions presented in this report individually may be factually incorrect or misleading, but are included to record as faithfully as possible what was considered at the meeting. No statements are to be taken as reflecting the conclusions of the meeting unless they are clearly identified as such. Moreover, further review may result in a change of conclusions where additional information was identified as relevant to the topics being considered, but not available in the timeframe of the meeting. In the rare case when there are formal dissenting views, these are also archived as Annexes to the Proceedings.

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SUMMARY

This document outlines the proceedings of the regional peer review meeting on the assessment of the northern contingent of Atlantic mackerel (*Scomber scombrus*). This meeting, which was held on February 20-22, 2023 at the Maurice Lamontagne Institute in Mont-Joli, brought together about fifty participants from DFO's science and fisheries management Branch, the fishing industry, Aboriginal organizations, universities, provincial representatives and environmental non-governmental organizations. These proceedings detail the essential parts of the presentations and discussions held during the meeting, as well as the recommendations and conclusions made.

INTRODUCTION

The Quebec Region of Fisheries and Oceans Canada (DFO) is responsible for assessing several stocks of fish and invertebrate species harvested in the Estuary and Gulf of St. Lawrence. Most of these stocks are periodically assessed as part of a regional peer review process that is conducted at the Maurice Lamontagne Institute in Mont-Joli. This document outlines the proceedings of the meeting on the assessment of the northern contingent of Atlantic mackerel held on February 20-22, 2023.

Canada evaluates the northern contingent every two years and as of the last assessment in 2021. The Fisheries Resource Management Branch has requested scientific advice on Atlantic Mackerel for the 2023 and 2024 fishing seasons.

These proceedings report on the main points discussed in the presentations and deliberations stemming from the activities of the regional stock assessment committee. The regional peer review meeting is a process open to all participants who are able to provide a critical outlook on the status of the assessed resources. Accordingly, participants from outside DFO are invited to take part in the committee's activities within the defined framework for this meeting (Appendices 1 and 2). The proceedings also list the recommendations made by the meeting participants.

ASSESSMENT

The chair of the meeting, Marie-Julie Roux, welcomed participants and briefly went over the peer review process, the objectives and the agenda (Appendix 3). The scientist, Elisabeth Van Beveren, opened the meeting by highlighting the contributions of the numerous collaborators. A summary of the previous assessment (2021) was presented as well as the terms of reference for the peer review, the objective of which is to provide science advice on the status of the northern contingent of Atlantic mackerel for the 2023 and 2024 fishing seasons.

UPDATE OF KNOWLEDGE

Genetic structure of Atlantic mackerel

Audrey Bourret presented the results of genetic studies on the population structure. The analyses indicate that the Northwest Atlantic mackerel stock is distinct from the Northeast Atlantic stock, with no evidence of transatlantic migration found. These analyses also show a distinction between the northern and southern spawning contingents of the Northwest Atlantic stock. There is small but significant genetic differentiation. According to the results of these studies, some mixing occurs between the southern and northern contingents while they are in Canadian waters and U.S. waters, respectively.

- There was a brief discussion on an ongoing project that aims notably to examine temporal and spatial variability in the genetic composition of Atlantic mackerel in the Northwest Atlantic, which would also improve the genetic assignment of fish to the southern and northern contingents.

Consumption of mackerel by various predators

A study of the predation pressure on mackerel by various predators (northern gannet, tuna, grey seals, cetaceans, groundfish) in Canadian and U.S. waters suggests an overall increase in predation-induced mortality in mackerel over time, with high inter-annual variability.

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- Long-term annual data are available only for groundfish.
 - Little data are available for cetaceans.
 - One study indicates that mackerel are an important prey for tuna.
 - Predation by northern gannet is likely significant compared with other predators.
 - Examining in greater depth the impact of the increase in grey seals would be useful.
 - It was concluded that the proportion of mackerel in the diet of each of these predators is not really known.
 - Despite the uncertainty surrounding these data, participants agreed that the contribution of predation to natural mortality is increasing.

Egg survey and spawning area

An egg survey has been carried out in the southern Gulf since 1979, the results of which are used notably to calculate the total egg production index. It is generally accepted that individuals spawn in the southern Gulf in June and then disperse through Atlantic Canada to migrate to the U.S. coast, where they overwinter. However, some eggs and larvae have been found outside the southern Gulf, notably over the Scotian Shelf and around Newfoundland, although the current densities remain low. The 2022 survey in Newfoundland confirms that very low egg densities do indeed occur.

Caroline Lehoux presented the 2022 egg survey and described the revised approach. The new method appears to be effective and reproducible in obtaining estimates for non-sampled stations. Total egg production is not sensitive to different parameter choices. The baseline was therefore used in the model. Estimates from surveys not well synchronized with the egg-laying season were retained.

- This confirms that the southern Gulf has been and still remains the main spawning area.
- Questions were raised about the actual situation around Newfoundland. Industry representatives expressed reservations about the results. According to Science, there is no reason to believe that a great deal of spawning occurs around Newfoundland.
- Regarding the presence of juveniles in Newfoundland, the possibility of larval drift was raised.
- Concerning the 2022 egg survey, the issue was not bias, but rather that there was uncertainty about certain years. Only the years 1991 and 1999 were removed. The importance of obtaining samples earlier in the season in the coming years to reduce uncertainty was also mentioned. Participants were quite confident about the approach used.

Knowledge of mackerel by the industry in Newfoundland

The presentation by Abe Solberg of the Fish, Food and Allied Workers Union (FFAW) focused on the Newfoundland industry's knowledge of mackerel. The survey approach was briefly described. The results indicate a perceived high abundance of mackerel. It was noted that fishing takes place outside the spawning season (July).

- Questions arose over the difference in adult abundance observed between the industry's observations and the assessment model results.
- However, the sensitivity analysis suggests that, even if spawning stock biomass (SSB) were at 50%, the stock would still remain in the Critical Zone.

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- For many participants, the results presented by the industry are not inconsistent with the results of the assessment model. Mackerel is a schooling fish, which explains why a perception of high local abundance remains possible even when the stock is in the Critical Zone. No evidence has been obtained to confirm significant local spawning around Newfoundland.
 - It was suggested that a sampling program be developed around Newfoundland from June to August. Adults should be monitored during the spawning season.
 - It was noted that the fishing season varies from year to year.

Fishery, sampling and inputs

The history of the global mackerel fishery was outlined, followed by a portrait of the commercial fishery in the Atlantic Provinces and Quebec. This is a primarily inshore fishery where a variety of gear types are used (gillnets, mechanical jiggers, seines, weirs and traps), which vary by region and time of year. Mackerel are also harvested in a food fishery, bait fishery and a popular recreational fishery. According to preliminary data, mackerel landings in Canadian waters totalled 4,505 t in 2021 (TAC = 4,000 t) and 74 t in 2022 (TAC = 0 t). Mackerel landings in U.S. waters totalled 8,053 t in 2021 and 3,302 t in 2022, of which 20–80% likely came from the northern contingent. Upper and lower limits for the catch in the recreational fishery in the model were estimated and presented for the first time.

Commercial sampling in 2022 was carried out with different gear types, and its distribution varied. In addition, few or no samples were obtained in June. Nevertheless, a very consistent signal of the dominance of age-2 fish was obtained.

Catch-at-age (CAA) was estimated for all years using the currently available data. The length-weight relationship used was presented. Fecundity-at-age was reviewed. The results presented indicate that the order of magnitude of the proposed new values is higher than that of the old values. The weights-at-age were also reviewed. The results obtained correspond fairly well to the estimates used previously.

- Some participants said they would like to have a clearer picture of mackerel bycatch in other fisheries. It was mentioned that certain licence conditions require that bycatch be reported, while others do not.
- The participants saw merit in estimating upper and lower limits for the catch in the recreational fishery in the model.
- As noted in the previous assessment, some data were incomplete or even missing altogether in certain sectors (e.g. Newfoundland seiners).
- It was noted that the number of samples obviously has an impact on the assessment.
- It is difficult to say what happened in the 1980s in terms of CAA values. An age class seems to have disappeared.
- Given the change observed in the CAA values in 2022, there are three possible options: exclude the CAA values for 2022, try to correct the values, or keep them the way they are. It was decided that the 2022 samples would be included with a correction.
- It was noted that the gonadosomatic index is consistent with the observed increase in fecundity-at-age.
- For weight-at-age, participants thought that the new results, which target the egg-laying period (June-July), improved the model.

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- In conclusion, there was no opposition to the inputs presented and used in the model (CAA, weight-at-age, fecundity-at-age). There was therefore a consensus regarding the inputs.

ASSESSMENT OF THE RESOURCE STATUS

Assessment model: description and results

Elisabeth Van Beveren provided an overview of the assessment model used (structure, inputs, sensitivity). SSB, fishing mortality and age-1 recruitment in the northern contingent were calculated using a censored statistical catch-at-age model. Data used in the model included recorded landings, annual egg index, catch-at-age, weight-at-age, the proportion of mature females in the population, and estimated fecundity-at-age.

The modelling results were presented. The SSB of the northern contingent of mackerel estimated with the revised assessment model was at its lowest values in 2021 and 2022 (40% and 42% of the LRP, relative to 79% and 56% of the LRP in 2019 and 2020, respectively). Recent average recruitment (2012–2022) is at 27% of previous levels (1969–2011). There have been no signs of a substantial recruitment event since 2015.

- It is difficult to accurately estimate the rate of mixing between the two stocks (northern vs. southern contingents), which creates uncertainty.
- The uncertainty associated with unaccounted-for landings was explicitly taken into account in the model by imposing upper and lower limits on the estimated annual catch (fishery removals).
- Limits of 20% and 80% (instead of 25% and 50%, as in the previous assessment) were used to estimate the northern contingent caught in the U.S. fishery by providing the upper and lower limits for the total catch (fishery removals).
- Given the evidence of the significant contribution of predation to natural mortality among other things, a value of 0.3 was used for natural mortality (M) (instead of 0.27 in the 2021 assessment). The participants considered this value to be appropriate. Informing the model with an M that varied over time seemed difficult and highly arbitrary.
- There was therefore no opposition to the proposed assumptions (e.g. starting series in 1969, keeping the years 1969–1975, including the 2022 samples for CAA with a correction, retaining most years in the egg index).
- It was noted that the stock had been in the Critical Zone for a decade. The fishing mortality rate decreased following the closure of the fishery in 2022.

Short-term projections

The probability of the SSB exiting the Critical Zone by 2025 ranges from 37.5% under a TAC of 0 t to 17.5% under a TAC of 8,000 t. The probability that the SSB in 2025 will be greater than in 2023 ranges from 78.5% (75–82%) under a TAC of 0 t to 32.5% (29–36%) under a TAC of 8,000 t. The probability of the SSB exiting the Critical Zone by 2025 under a baseline scenario assuming no Canadian fisheries removals is 38.5% (38–39%). The probability that the SSB in 2025 will be greater than in 2023 in the same scenario is 81% (78–84%).

- The use of the Beverton-Holt stock-recruit relationship (1969–2022) was compared with an average of recruitment in the years 2011–2022. This was the weak link in the projections and it was difficult to choose either option.

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- The decision was made to use the average value of both options in the science advice. The level of uncertainty will be mentioned.
 - Participants wondered about the possibility of having more data on recruitment. It would be beneficial to have more information on age structure, in particular. An ongoing program would be very helpful, particularly in the current context of the closure of the fishery, which restricts commercial sampling.
 - It would be useful to add a scenario to the projection table with no recreational fishing. However, a distinction must be made between short-term projections and projections to rebuild the stock.

Ecosystem considerations

Some ecosystem considerations were revisited, including the current high rate of predation on mackerel. However, habitat loss or degradation does not cause any known concerns for this stock. During the time the stock was declining into the Critical Zone (2005–2011), the total landings were high and the fishing pressure estimated by the model was above the reference level. There is currently no evidence that natural mortality increased during that period or that recruitment was low.

- However, it was noted that natural mortality in the early 1990s clearly played a role. In addition, the lack of recruitment pulses in the 1990s was mentioned. For some participants, the decline began during those years. This was a prolonged decline.
- The potential impact of climate change on spawning was raised.
- It was noted that, with low abundance, the resilience of the stock may be lower.
- Participants were reminded that recruitment in pelagic species is naturally very sporadic.
- There were also questions about the definition of the habitat. It appears to refer to the bottom habitat (rather than the pelagic habitat).
- Frequent incursions of mackerel had apparently been observed in the Estuary. The stock seems to disperse widely, even in recent years. Participants wondered about how these changes should be taken into account in the model.

CONCLUSION

INTERIM YEARS

The participants agreed to assess the stock status of the northern contingent of Atlantic mackerel for two years (science advice for the 2023 and 2024 fishing seasons). The next scientific review is scheduled for the winter of 2025.

RESEARCH

Future research topics and issues mentioned include:

- Genetic structure of the Northwest Atlantic stock (mixture of southern and northern contingents);
- Newfoundland egg survey (4R and a portion south of Newfoundland);
- Mackerel fecundity in the Northwest Atlantic;

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- Natural mortality;
 - Examination of processes that affect recruitment in the assessment;
 - A review of the recruitment index.

HIGHLIGHTS AND RECOMMENDATIONS

The key points were presented, and commented on by participants. Comments concerning stylistic changes and rewording were not reported.

- In the key point on SSB and recruitment, industry participants wanted it to be noted that the observations of fishers do not agree with the results presented. This item would instead be included in the sources of uncertainty.
- The wording regarding the SSB will be revised by referring to the revised assessment model.
- In the key point on recruitment, a comparison will be made to the 1969–2011 period.
- With respect to the probability of the SSB leaving the Critical Zone by 2025, the following wording was agreed upon: based on a reference scenario that assumes no removals by Canadian fisheries.
- Following earlier discussions, the key point on the decline of the stock was reworded as follows: The stock's decline into the Critical Zone (2005–2011) was associated with high total landings and estimated fishing mortality above the reference level, with no further reduction in stock productivity and no known evidence of habitat degradation or loss.
- A key point was added regarding predation on mackerel.
- In the conclusion, it was decided not to include a recommendation that is more the responsibility of Management.

The participants concluded that:

The stock's decline into the Critical Zone (2005–2011) was associated with high total landings and estimated fishing mortality above the reference level, with no further reduction in stock productivity and no known evidence of habitat degradation or loss.

The northern contingent of mackerel has been in or near the Critical Zone since 2011. The available evidence indicates the stock rebuilding potential is currently limited by a truncated age structure, low recruitment, and high predation pressure.

APPENDIX 1 – TERMS OF REFERENCE

Assessment of the northern contingent of Atlantic Mackerel (*Scomber scombrus*) Regional Peer Review – Quebec Region

February 20-22, 2023
Mont-Joli, Quebec

Chairperson: Marie-Julie Roux

Context

Atlantic Mackerel (*Scomber scombrus*) are a highly migratory transboundary species with two distinct spawning contingents in the Northwest Atlantic. The southern contingent has historically spawned in the Mid-Atlantic Bight from April to May whereas the northern contingent spawns primarily in the Southern Gulf of St. Lawrence in June and July. Both contingents overwinter in deeper warmer waters off the continental shelf. The U.S. fishery takes place during the winter along the New England coast and lands both contingents, whereas landings in Canadian waters are thought to consist entirely of mackerel from the northern contingent. Canada evaluates the northern contingent every two years and as of the last assessment in 2021, this stock was still in the Critical Zone according to the Precautionary Approach.

In 2022, Fisheries Management closed both the commercial and bait fishery for the first time. Mackerel were previously harvested commercially and for bait across the Atlantic Provinces and Quebec in an open competitive fishery using a variety of gear types (gillnets, mechanical jiggers, seines, weirs, and traps). Mackerel are also harvested through a popular recreational fishery that remained open, but for which there is a daily possession limit of 20 fish per person per day since May 2021. While each regional fishery implements its own license conditions, mackerel are managed on a national level. Representatives from the industry, Indigenous Groups, and other stakeholders participate in a “Rebuilding Plan Working Group” organized by Fisheries Management.

In contrast to Canada, the U.S.A. assesses both spawning contingents as one unit. An update of their scientific advice was made in 2021. The U.S.A. concluded that the stock was overfished and overfishing was occurring.

The spawning stock biomass, fishing mortality, and recruitment of northern contingent mackerel are estimated by DFO using a custom statistical catch-at-age model. This model fits to an annual egg index, catch-at-age and so-called censored catches. Specifically, the uncertainties in unaccounted for Canadian catch as well as catch by the fishery in the U.S.A. are accounted for explicitly in the model through the estimation of catch between the recorded landings and an estimate of maximum fishery removals.

The last assessment of mackerel in Canada took place in February 2021. The stock was below its Limit Reference Point (LRP) and is now subject to a rebuilding plan under the Fish Stocks Provisions (FSP). The Fisheries Resource Management Branch has requested scientific advice on Atlantic Mackerel for the 2023 and 2024 fishing seasons, including an assessment of stock status and scientific information to inform the rebuilding plan; relevant information on the biology of the fish and environmental conditions affecting the stock, information on whether habitat loss or degradation has occurred and contributed to the stock's decline, and an assessment of the time (T_{min}) the stock would take to rebuild to a rebuilding target in the absence of all fishing ($F=0$).

Objectives

Provide scientific advice on the status of the northern contingent of Atlantic mackerel for the 2023 and 2024 fishing seasons and provide information that will feed into the rebuilding plan. This advice will include:

- Stock structure information and definition of the assessed unit: an update of mackerel genomics describing the population structure across the Atlantic and within the Northwest Atlantic.
- An assessment of the potential magnitude and trends of mackerel consumption by individual predators (e.g., Atlantic bluefin tuna, northern gannets, spiny dogfish and grey seals).
- An assessment of the relative importance of the southern Gulf and adjacent ecosystems for mackerel spawning, including
 - A summary of existing knowledge on mackerel spawning across Atlantic Canadian waters.
 - Results of the 2021 and 2022 western and southern Newfoundland egg survey.
- An update on the status of Atlantic mackerel, including:
 - A summary of fishery statistics up to the 2022 fishing season (Canada and U.S.A.).
 - A summary of the biological and fishery data used as input into the stock assessment model.
 - An update of the egg survey index.
 - A presentation on the results of the stock assessment model (estimates of fishing mortality, spawning stock biomass, abundance at age) as well as spawning stock biomass projections for the years 2023-2025 under different TAC scenarios.
 - An update of stock status with respect to the Precautionary Approach and agreed upon reference points.
- Specific elements to inform the update of the rebuilding plan:
 - Estimation of a T_{min} , which is the time the stock would take to rebuild to a rebuilding target in the absence of all fishing ($F=0$).
 - A summary of available knowledge on the ecosystem considerations including variations in life history parameters, species interactions (e.g., predators, prey) and environmental conditions that affect growth, survival, and recruitment of mackerel across their distribution, and how they are accounted for in the assessment and how they can affect rebuilding.
 - Describe probable causes of the stock's decline, including whether habitat degradation or loss has occurred and whether it has contributed to the stock's decline.
- Identification and prioritization of research projects to be considered for the future

Expected Publications

- Science Advisory Report
- Proceedings
- Research Document

Expected Participation

- Fisheries and Oceans Canada (DFO) Science and Fisheries Management
- Fishing industry

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- Provincial government representatives
 - Aboriginal Communities / Organizations
 - Academia
 - Environmental NGOs

APPENDIX 2 – LIST OF PARTICIPANTS

Name	Affiliation	Febr. 20	Febr. 21	Febr. 22
Beaudry-Sylvestre, Manuelle	DFO Science	X	X	X
Bernier, Denis	DFO Science	X	-	-
Bois, Samantha	ACPG	X	X	-
Boudreau, Mathieu	DFO Science	X	X	X
Boudreau, Mélanie	DFO Science	X	X	X
Bourret, Audrey	DFO Science	X	X	X
Burbank, Jacob	DFO Science	X	-	-
Castonguay, Martin	DFO Science	X	X	X
Cawthray, Jenness	DFO Fisheries Management	X	X	X
Chamberland, Jean-Martin	DFO Science	X	X	X
Cogliati, Karen	DFO Science	X	X	X
Corbett, Emma	Prov. of Newfoundland	X	X	X
Curti, Kiersen	NOAA	X	X	X
Cyr, Charley	DFO Science	X	X	X
Dubé, Sonia	DFO Science	X	X	X
Dunn, Erin	DFO Fisheries Management	X	X	X
Duplisea, Daniel	DFO Science	X	X	X
Emblanc, Quentin	DFO Science	X	X	X
Ferguson, Annie	Prov. of New Brunswick	X	-	-
Ferguson, Louis	MFU-UPM	X	X	X
Giard, David	DFO Fisheries Management	X	X	X
Giffin, Melanie	PEIFA	X	X	X
Girard, Linda	DFO Science	X	X	-
Jones, Trevor	Fisher	X	X	X
Lagacé, Nicolas	Prov. of New Brunswick	-	X	X
Lehoux, Caroline	DFO Science	X	X	-
Lelièvre, Lauréat	Fisher	X	X	X
Lévesque, Laurence	DFO Science	X	X	X
MacMillan, Robert	Prov. of PEI	X	X	X
Martin, Lucas	UQAR	X	X	X
Monger, Julie	LNSFA	X	-	-
Mitchell, Vanessa	Maritime Aboriginal Aquatic Resources Secretariate	X	-	-
Munden, Jenna	Herring Science Council	X	X	X
Murphy, Hannah	DFO Science	X	X	-
Nadeau, Paul	LNSFA	X	-	-
Nicholas, Hubert	Membertou First Nation	-	X	-
Pardo, Sebastian	Ecology Action	X	X	X
Pellerin, Mathieu	DFO Fisheries Management	X	X	X
Plourde, Stéphane	DFO Science	X	X	X
Rousseau, Shani	DFO Science	X	X	X
Roux, Marie-Julie	DFO Science	X	X	X
Scarratt, Michael	DFO Science	X	X	X
Schijns, Rebecca	OCEANA	X	X	X
Schleit, Katie	Oceansnorth	X	-	-
Senay, Caroline	DFO Science	X	-	-
Smith, Andrew	DFO Science	X	X	X
Solberg, Abe	FFAW	X	X	X
Townsend, Kathryn	Maritime Aboriginal Aquatic Resources Secretariate	-	X	X
Turcotte, François	DFO Science	X	X	X
Vautier, Jeffrey	Processor	X	X	X
Van Beveren, Elisabeth	DFO Science	X	X	X
Zabihi-Seissan, Sana	DFO Science	X	X	X

APPENDIX 3 – AGENDA

Assessment of the northern contingent of Atlantic mackerel (*Scomber scombrus*)

February 20-22, 2023 (Hybrid meeting)

Chair: Marie-Julie Roux

February 20, 2023

Time (EST)	Subject	Presenter
8:30	Introduction	M.-J. Roux
8:40	Participants presentation	M.-J. Roux
8:50	Summary of the last Science Advisory Report + Terms of Reference	E. Van Beveren
9:00	Stock structure	A. Bourret
9:10	M : Evaluation of various predators	E. Van Beveren
9:55	Egg index : knowledge of spawning zones + Newfoundland egg survey of 2021 and 2022	E. Van Beveren
10:25	<i>Break</i>	
10:40	Newfoundland Fish Harvesters' Knowledge of Atlantic Mackerel	A. Solberg (FFAW)
11:15	Fishery statistics	E. Van Beveren
11:30	Sampling in 2022	E. Van Beveren
11:45	Catch-at-age (start)	E. Van Beveren
12:00	<i>Lunch break</i>	
13:00	Catch-at-age (follow-up)	E. Van Beveren
13:30	Egg survey statistic	C. Lehoux
14:30	<i>Break</i>	
14:40	Fecundity-at-age	M. Boudreau
15:05	Weight-at-age	M. Boudreau
15:30	Maturity-at-age and L50	E. Van Beveren
15:40	End of day 1	

February 21, 2023

Time (EST)	Subject	Presenter
8:30	Overflow and/or summary of day 1	M.-J. Roux
8:40	Stock assessment model	E. Van Beveren
9:40	Projections, Tmin	E. Van Beveren
10:10	<i>Break</i>	
10:25	Rebuilding plan update: Ecosystem considerations + probable causes of decline	E. Van Beveren
10:45	Futur research projects	E. Van Beveren
10:50	End of day 2	

February 22, 2023

Time (EST)	Subject	Presenter
8:30	Overflow and/or summary of day 2	M.-J. Roux
8:40	Additional model runs	E. Van Beveren
8:50	Summary of advice	E. Van Beveren and participants
10:50	End of day 3	