Fisheries and Oceans Canada | Pêches et Océans Canada
Ecosystems and Oceans Science | Sciences des écosystèmes et des océans

Canadian Science Advisory Secretariat (CSAS)

Proceedings Series 2024/019

Newfoundland and Labrador Region

Proceedings of the Regional Peer Review of 2J3KL Witch Flounder Assessment

Meeting dates: May 10–11, 2022
Location: Virtual Meeting

Chairpersons: Aaron Adamack and Katherine Skanes
Editor: Cassandra Konecny

Science Branch
Fisheries and Oceans Canada
PO Box 5667
St. John’s, NL, A1C 5X1

April 2024

Canada

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.

Published by:

Fisheries and Oceans Canada
Canadian Science Advisory Secretariat
200 Kent Street
Ottawa ON K1A 0E6

http://www.dfo-mpo.gc.ca/csas-sccs/
csas-sccs@dfo-mpo.gc.ca

ISSN 1701-1280
ISBN 978-0-660-70933-8 Cat. No. Fs70-4/2024-019E-PDF

Correct citation for this publication:

DFO. 2024. Proceedings of the Regional Peer Review of the 2J3KL Witch Flounder Assessment; May 10–11, 2022. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2024/019.

Aussi disponible en français :

MPO. 2024. Compte rendu de l’examen par les pairs régional sur le 2J3KL évaluation de la plie grise; du 10 au 11 mai 2022. Secr. can. des avis sci. du MPO. Compte rendu 2024/019.

TABLE OF CONTENTS

SUMMARY iv
PRESENTATIONS 1
OVERVIEW OF THE CHEMICAL AND BIOLOGICAL OCEANOGRAPHIC CONDITIONS ON THE NEWFOUNDLAND AND LABRADOR SHELF 1
Abstract 1
Discussion 1
OCEAN CLIMATE IN NEWFOUNDLAND AND LABRADOR WATERS 1
Abstract 1
Discussion 2
FLATFISH TELEMETRY PROGRAM 2
Abstract 2
Discussion 3
WITCH FLOUNDER AGING 3
Abstract 3
Discussion 3
STRUCTURE, TRENDS, AND ECOLOGICAL INTERACTIONS IN THE MARINE COMMUNITY OF THE NEWFOUNDLAND AND LABRADOR BIOREGION - WITCH FLOUNDER DIET 4
Abstract 4
Discussion 4
ASSESSMENT OF WITCH FLOUNDER IN 2J3KL 5
Abstract 5
Discussion 5
2J3KL WITCH FLOUNDER AGE-BASED, CATCH-AT-LENGTH ANALYTICAL MODEL DEVELOPMENT 6
Abstract 6
Discussion 7
DRAFTING OF SCIENCE ADVISORY REPORT (SAR) BULLETS 7
RESEARCH RECOMMENDATIONS 8
REFERENCES CITED 8
APPENDIX I – TERMS OF REFERENCE 9
APPENDIX II – AGENDA 11
APPENDIX III – LIST OF PARTICIPANTS 12

SUMMARY

The Regional Peer Review Process to assess Witch Flounder (*Glyptocephalus cynoglossus*) in Northwest Atlantic Fisheries Organization (NAFO) Divisions (Divs.) 2J3KL was held May 10–11, 2022 virtually via Microsoft Teams.

In addition to these Proceedings, publications to be produced from this meeting include a Science Advisory Report and a comprehensive Research Document. All publications will be made available online by the Canadian Science Advisory Secretariat (CSAS).

PRESENTATIONS

OVERVIEW OF THE CHEMICAL AND BIOLOGICAL OCEANOGRAPHIC CONDITIONS ON THE NEWFOUNDLAND AND LABRADOR SHELF

Presenter: David Bélanger

Abstract

Biogeochemical oceanographic conditions on the Newfoundland and Labrador (NL) Shelf (NAFO Divs. 2J3KL) are presented and interpreted against long-term (2003–20 for satellite data, and 1999–2020 for Atlantic Zone Monitoring Program [AZMP] in situ observations) average conditions in the region. Satellite observations of ocean colour indicated that the timing of the spring phytoplankton bloom was either early (2J3K) or near normal (3L), but that bloom magnitude varied more with above- (3L), near- (3K), and below-normal spring production in 2J, 3K, and 3L, respectively. Integrated nitrate (50–150 m) and chlorophyll a (0–100 m) inventories have increased to mainly near or above normal levels since the mid-2010s with chlorophyll remaining on average at near-normal levels for the 2018–20 period. Low chlorophyll values for 2021 are likely because of missing data from the cancelled spring and fall AZMP surveys in the index calculation. The abundance of copepod – largely driven by small copepod taxa such as *Pseudocalanus* spp. – and non-copepods decreased during the second half of the 2010s. The abundance of the large, energy-rich, *Calanus finmarchicus* copepods increased during the same period with a positive impact on overall zooplankton biomass. The recent trend in zooplankton community structure toward larger, more energy-rich, species including *Calanus finmarchicus*, and less smaller copepods and non-copepods, contrasts with the situation observed during 2005–15 period and may increase the efficiency of energy transfer from lower to upper trophic levels.

Discussion

Referring to the spring bloom indices plots for 2J, 3K, and 3L, a participant asked whether there is a trend of an earlier spring bloom since 2015. The response was that there is no clear trend in the magnitude of the bloom but that there are trends in the timing of the bloom in 2J, 3K, and 3L since 2015. With the exception of a few datapoints, the bloom shifts from a positive anomaly (occurring later in the year) towards a negative anomaly (occurring earlier in the year). Other participants also struggled to see the trend of an earlier spring bloom since 2015 (particularly in 3L). There was some discussion about potentially modelling the data to test for a trend in data however another participant suggested aggregating the data across 2J3KL instead to determine at a broader spatial scale if there is a clearer signal in the data. The presenter uploaded a new plot, with average anomalies in the spring bloom indices across 2J3KL. This plot was presented to the meeting the following day and participants agreed that the new plot showed a trend towards earlier spring blooms since 2015 in 2J3KL.

OCEAN CLIMATE IN NEWFOUNDLAND AND LABRADOR WATERS

Presenter: Frédéric Cyr

Abstract

The NL climate experiences fluctuations at decadal time scales, with potential impacts on the ecosystem productivity. Information about the physical environmental conditions in this system has been collected since the late-1940s. The monitoring was further enhanced, with the addition

of biogeochemical sampling and better spatio-temporal coverage, with the creation of the AZMP in 1998. This information collected and disseminated as part of the AZMP is generally used in numerous regional, national, and international stock assessments. We provide here an overview of the environmental conditions in NL waters over the recent years, with a focus on year 2021, one of the warmest years on record. These observations will be viewed in relationship to the climate fluctuations that occurred during the recent decades.

Discussion

A participant asked if there is a known mechanism behind the pattern of an increased frequency of extreme temperatures in recent decades. They also asked why in this region (specifically Station 27 – an oceanographic monitoring site located immediately off St. John's Harbour) positive temperature anomalies coincide with negative salinity anomalies, instead of a positive correlation between temperature and salinity. The response was that an increase in the frequency of extremes is expected with climate change. While it cannot be concluded that climate change is necessarily the cause of this pattern, an increase in climate variability with climate change would be expected. This is particularly the case in this sub-polar area due to the proximity of the Arctic to this region. The response to the second question was that in warmer periods there is likely to be more sea-ice melt and therefore more freshwater inputs into the Labrador Current that flows north to south along the coast of NL. This current passes through Station 27, where these patterns in temperature and salinity are observed.

A participant asked a follow-up question on melting sea-ice and climate change. They mentioned that in past presentations given on the oceanographic conditions for the NL Region (at other meetings), signs of climate change have not been apparent in the data. They asked whether the melting of Arctic sea-ice over the past years/decades has had an influence on the dynamics and variability in ocean conditions in the region in recent years. The response was that sea-ice cover has been declining since 1969 when they started measuring it and that the role of these freshwater fluxes are an active area of research.

FLATFISH TELEMETRY PROGRAM

Presenter: Emilie Novaczek

Abstract

An update was provided on the Witch Flounder telemetry research, currently underway as part of the new Flatfish Telemetry Program by Fisheries and Oceans Canada (DFO)-NL Groundfish. The objective of this project is to use acoustic telemetry to track Witch Flounder movement, behaviour, and survival to inform assessment and stock rebuilding. The project will investigate movements within the stock areas (habitat use, seasonal migration), and movements across stock boundaries. These data can also be used in stock modeling to inform estimates of survey catchability and natural mortality.

This is a new project, however it capitalizes on multimillion dollar investments in telemetry infrastructure already maintained throughout the region, including but not limited to an extensive inshore and offshore acoustic array maintained by DFO-NL Groundfish (>100 receivers) and the offshore Northern Cod Acoustic Telemetry (NCAT) project array (75 receivers). Through data-sharing and collaboration, we can monitor movements across a much larger area than would otherwise be feasible.

Field work for this project began in 2021, including the deployment of three deep-water receivers to extend NCAT gates from 500 m–750 m depth and acoustic tagging of 133 Witch Flounder in NAFO Divs. 2J and 3K. Witch Flounder were captured by trawl with a modified cod

end (steel capture box), between 278–516 m depth. A minimum taggable size threshold of 30 cm was observed to keep the tag weight below 2% of body weight in air, and transmitters were attached externally with a T-bar tag following best practices for supporting fish welfare, growth, and tag retention (Runde et al. 2022). Witch Flounder appear to be very resilient to capture and tag insertion (<1% mortality rate during tagging).

The first detections for this project will be retrieved this year; pending the return of sufficient detections, analysis will begin on post-tagging survival and movement patterns within or beyond stock boundaries. Funding has been renewed for this project and additional transmitter and receiver deployments are planned for 2022–23.

Discussion

A participant asked for clarification on what was meant by the statement, “extending the array into more suitable Witch Flounder habitat,” and what is considered to be suitable Witch Flounder habitat. The response was that the inshore receiver array is very extensive and has good coverage but is targeted to areas where cod are found and not to areas where Witch Flounder (that are moving inshore) are necessarily found. Placing receivers in deeper, inshore habitats such as Trinity Bay would expand coverage into areas where Witch Flounder coming inshore would more likely be found. The participant asked a follow-up question as to whether there has been any evidence of large-scale inshore migrations in the tagged Witch Flounder. The response was that it is too early in this project to say.

WITCH FLOUNDER AGING

Presenter: Karen Dwyer

Abstract

Historically, Witch Flounder in the Newfoundland Region were aged using whole otoliths; however, the ager responsible for this retired in 1994 and was not replaced. In 2017, industry commissioned a report on Witch Flounder ageing and expressed interest in resuming ageing for this species. There are no age validation studies on witch flounder age reading methods; the first few years can be corroborated using length frequency modes but fish older than this must have ages validated using either mark/recapture tagging or bomb radiocarbon analysis for best practices. Under the Fish Stock Provisions, funding was made available to bridge this knowledge gap.

Bomb radiocarbon analysis was carried out and indicated that whole otoliths are likely underestimating true age of Witch Flounder. The depth at which Witch Flounder are located as larvae may complicate the level of C14 found in the otoliths compared to the current chronology for the Northeast/Greenland Halibut reference chronology. Additionally, the first year of growth is difficult to determine because of a protracted larval stage.

More work would need to be done to answer some of the still outstanding questions in order to carry out mass production of ageing Witch Flounder.

Discussion

A participant asked whether otoliths were collected after 1994 (this is when the individual who had previously aged Witch Flounder otoliths retired). The response was that otoliths were collected after the individual retired (i.e., no gap in timeseries) and that once those otoliths are validated then this timeseries (or portions of it) could be used to generate growth curves through time for use in assessments.

A participant noted that there was a difference in ageing results when whole otoliths versus otolith sections were used to age Greenland halibut (Dwyer et al. 2016) and asked if a similar difference was seen here. The presenter responded that the ageing difference between methods (whole otoliths vs. otolith sections) was approximately 10 years in Greenland halibut after the age of 10, but that the difference was variable across ages and not necessarily the same for Witch Flounder.

STRUCTURE, TRENDS, AND ECOLOGICAL INTERACTIONS IN THE MARINE COMMUNITY OF THE NEWFOUNDLAND AND LABRADOR BIOREGION - WITCH FLOUNDER DIET

Presenter: Mariano Koen-Alonso

Abstract

No abstract provided.

Discussion

Ecosystem Production Potential (EPP) Model

A participant noted that Witch Flounder have generally shown increases in biomass over time and do not seem to be following the same trend that forage fish-dependent finfish are experiencing. Building on this point, another participant asked whether changes in energy flow within the benthic component of the EPP model could be isolated to further investigate what might be driving the changes seen in Witch Flounder biomass. The presenter responded that the model does not currently track changes at the scale that would be needed to explain changes in Witch Flounder dynamics. The presenter noted that the model does track production through different channels and analysis (sensitivity, configurations of pathways) indicates that there is distinction in what happens to organisms that depend on benthic production vs. pelagic production. There is ongoing work towards improving the benthic component of the model through the incorporation of additional functional groups (e.g., benthic invertebrates) which will hopefully produce some indicators from approximately 2010 onwards.

A participant asked if it was possible to add a measure of uncertainty to the results of the EPP model. The response was that the metric presented is a ratio of the catches and an indicator of the upper limit of cumulative catches which is derived from the model. While it is possible to generate different summary statistics from the model output, the indicator is taken from the model as the 25 percentile of the generated distribution from simulation runs. This indicator is meant to be a general guideline as to what the ecosystem can sustain rather than a hard limit.

Witch Flounder Diet

A participant noted that polychaetes are a main component of the Witch Flounder diet and asked if there was any evidence of prey-switching occurring in any other groundfish species studied or if any other species are known to consume polychaetes (i.e., snow crab or haddock). The participant was interested in knowing if competition for food between Witch Flounder and other species is a concern or could be a concern in the future. The response was that, while there is some overlap in diet with other species, there is nothing to indicate competition between Witch Flounder and other species at this point nor is there evidence of drastic diet changes in other species. There is insufficient information on diets of snow crab and haddock to provide information on their specific diets, however the distribution of haddock is very limited in in this area (mainly 3L).

A participant asked if there have been any indicators of increased benthic productivity as a result of increasing bottom temperatures. The presenter responded that, in terms of benthic productivity, it is too soon to say if there have been changes as the analysis is incomplete.

ASSESSMENT OF WITCH FLOUNDER IN 2J3KL

Presenter: Laura Wheeland

Abstract

Information available to evaluate stock status of Witch Founder in NAFO Divs. 2J3KL consisted of commercial landings data (1960–2021) and information from Canadian fall Research Vessel (RV) trawl surveys (1977–2021). This stock has been under moratorium in Canadian waters since 1995, and in the NAFO regulatory area since 1998. There have been recent coverage issues in the DFO RV surveys, with gaps particularly in the deep water. Inshore strata have not been sampled since 2010. The 2021 fall survey was incomplete and cannot be used for the assessment of this stock. RV surveys indicate that following a contraction of the stock to shelf slope areas through the 1990s, the distribution of the stock has expanded in recent years, returning to deep channels occupied in the mid-1980s. A general increase has been observed in indices of abundance and biomass since the early-2000s. Work was presented addressing the 2018 Research Recommendation to “improve the definition of the pre-recruit index”. Various length-based proxies for incoming cohorts were examined. The impact of missing survey areas indicated that recruitment is likely underestimated in some years as the inshore has a variable but sometimes large number of small fish when surveyed. A series of recent positive pre-recruit and recruitment anomalies indicate improved recruitment in this stock. A proxy (Catch/Exploitable Biomass estimate) indicates fishing mortality is currently low. In 2020 the stock was at 89% of the limit reference point (LRP), below the LRP with an 82% probability. Stock status in 2021 cannot be determined as the RV survey in this year was incomplete.

Discussion

Commercial Fishery

A participant noted that before the moratorium, the Witch Flounder fishery was not necessarily a strong directed fishery, and most landings were by-catch from other directed fisheries. Another participant asked if there have been any changes in the profile of the commercial fisheries that are catching Witch Flounder as by-catch. The response is that there have not been any notable changes and that the majority is consistently from the fishery for Greenland halibut, however, there has been a slight increase in by-catch in the past few years during the redfish fishery.

A participant commented that some of the historical catch data seems like higher catches than the fishery could have sustained and may warrant further investigation into where the catches were coming from and the reliability of these data. Another participant mentioned some methods that could be used to investigate the high historic catches further, such as looking into which NAFO Divs. and countries these catches came from and comparing the distribution of Witch Flounder to the catches of other commercial fisheries that occurred during the same time period. The presenter also noted that in some cases flatfish were historically reported as unspecified flounder. These have been taken into account for the American Plaice landings, for example, and might be worth looking into further for Witch Flounder. Participants noted that further investigation into the reliability of these data would help determine where a population model that uses these catch data should begin (i.e., whether to include the historical catches or start the model later in the timeseries).

Pre-Recruitment Index

There was a suggestion by meeting participants to add another length bracket to refine the pre-recruitment index (8.5 cm–16.5 cm) and track individuals above this size threshold but below exploitable size (30 cm). The meeting was in agreement that having one bracket to track the recruits (9.5 cm–17.5 cm) and one bracket to track recruits into the fishery (17.5 cm–25.5 cm) would be better than just one pre-recruitment index. There was some discussion on whether to exclude the inshore strata in the calculation of the recruitment indices given these strata are no longer sampled in the multispecies survey. Meeting participants agreed that if the indices are to be used as some indicator of future recruits into the fishery/fishable biomass, then excluding the inshore strata to reduce variability/noise in the signal is a more useful way to calculate the indices. Participants noted that further research should be done on understanding the contributions of inshore areas to the stock and to the fishery.

Stock Status

A participant asked what role fishing mortality might be in driving Witch Flounder stock dynamics based on the levels of fishing mortality during the period of rapid decline in the stock not being much different than the current levels of fishing mortality (i.e., during rebuilding). The response was not to overinterpret these data and we cannot say exactly what drove the decline of the stock and there are a lot of unknown parameters such as natural mortality and catchability. It was also noted that what was presented here is a proxy for fishing mortality based on catch and relative survey indices, and not an absolute estimate for fishing mortality.

A participant asked if there would be another assessment in less than the typical five year period since the stock was close to the limit reference point. The response was that if there is a change in stock status (or suggestion that the status might change), this would trigger an early assessment for the stock based on the process defined for this stock (DFO 2019).

2J3KL WITCH FLOUNDER AGE-BASED, CATCH-AT-LENGTH ANALYTICAL MODEL DEVELOPMENT

Presenter: Noel Cadigan

Abstract

We developed an exploratory age-structured catch-at-length model and fit it to:

1. a time-series of length-based survey indices for 2J3KL Witch Flounder, and
2. estimates of the annual total fishery catch biomass.

Our model estimation did not require information on the length compositions of the fishery catches, although estimation will be improved if these data are available. Our purpose was to provide a basis for developing an integrated stock assessment model and to identify research priorities to achieve this. This model is not being proposed for use in the assessment at this time. Our model was formulated in a state-space framework with process errors applied to the natural mortality rates (M). Our model-based biomass trends and stock status evaluation were similar to the survey index results provided in the most recent stock assessment. In addition, our model also provided estimates of M and fishing mortality rates. Important research priorities identified included:

1. investigating change in survey catchability which could be confounded with change in M,
2. integrating fishery length samples and historic age measurements in the model estimation,
3. more exploration of uncertainty in fishery catches, and

4. conducting retrospective analyses and simulation self-tests.

Discussion

A participant asked a question about how fishing mortality (F) is modelled (separable model) and whether the random walk is flattening the pattern with age. The response was that overall F was fairly consistent since around 2010 and therefore how the age patterns of a very low F value are modelled won't have large impacts on the output. For the ten years where the F value was relatively higher, a separable model seems reasonable, especially with the information available. A participant noted that the baseline M estimates are lower at the middle ages but then get higher at the older ages and asked whether this was a senescence effect or a catchability effect. The response was that M is likely confounded with issues with catchability (Q) and could be that larger individuals are distributing themselves outside the survey areas at times. There was some discussion with respect to how the unverified historic ageing data could be used in the model where there may be some issues in reliability. The presenter suggested aggregating the data where the ages are less reliable, for example having a plus group for ages greater than ten (or at whatever point they become less reliable).

A participant noted that the size distribution of catches could be constrained to be more within the range of lengths that we would expect (e.g., above 25 cm). They also suggested once the age validation study is completed that an observation equation could be applied to correct the older ages in the existing ageing data. The presenter responded that if there is age information on the catches available then it could be used as data in the model. Further, once more information is available on the ageing data and the reliability of different ages is known then this could also be used in the model fitting.

A participant asked if this model was going to be used by the rebuilding working group and if there is potential to estimate a new LRP based on the spawning stock biomass and generate exploitation rate reference points for the rebuilding plan. The response was that the model is still in development and should not be used in the rebuilding plan.

DRAFTING OF SCIENCE ADVISORY REPORT (SAR) BULLETS

There was discussion while drafting the first bullet on environmental indicators whether or not a trend towards warmer waters, an earlier spring bloom, and a larger proportion of energy-rich copepods benefit Witch Flounder and more generally, fish production. The group settled on a wording of the bullet that highlights while there may be benefits of these environmental changes to ecosystem productivity and some fish species, total biomass remains below pre-collapse levels.

There was some discussion on the bullet concerning fishing mortality and whether or not to highlight that fishing mortality (calculated from a survey-based proxy) is at its lowest level relative to the rest of the time series. It was decided not to include this piece of information in the bullet as there is no directed fishery for Witch Flounder and no management measures have been implemented to alter by-catch, which remains steady, or reduce fishing mortality. These F-proxy levels will be documented in the research document for this assessment.

When drafting the ecosystem-level bullet discussing the reliance of Witch Flounder on benthic invertebrates in contrast to forage fish species, there was discussion on how best to phrase the second part of the bullet which highlights the divergence in trends between Witch Flounder and other functional groups. There was discussion on whether to compare Witch Flounder trends to other functional groups, other finfish, or other species specifically. Further, there was discussion on whether the wording 'stalled rebuilding' should be used to describe the trends in other finfish.

Due to the specific use of the word ‘rebuilding’ in fisheries management, the decision was made to change this wording to compare trends in Witch Flounder to other finfish which have shown ‘stalled biomass growth’ since the mid-2010s.

RESEARCH RECOMMENDATIONS

- Continue work to validate and update aging data for this stock (not aged since 1994), facilitating the examination of potential changes in population age-structure, growth rates, and age at maturity.
- Continue to explore population modeling approaches for this stock to facilitate stock projections and quantification of spawning stock biomass, mortality rates, etc.
- Continue examining movement of Witch Flounder, including potential seasonal movements.
- Examine changes in stock distribution over the survey time series with respect to habitat and fishing, with a focus on impacts of changing ocean climate.
- Explore existing datasets and ongoing larval surveys for potential link between inshore larvae with stock status/recruitment (including nursery habitat in Trinity Bay).
- Identified need for information on benthic community dynamics and Witch Flounder prey field. Explore avenues for increasing sampling of benthic fauna, such as polychaetes.
- Explore the relationship between the physical and biogeochemical environments and the ecosystem productivity as a whole.

REFERENCES CITED

DFO. 2019. Stock Assessment of Witch Flounder (*Glyptocephalus cynoglossus*) in NAFO Divisions 2J3KL. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/053.

Dwyer, K.S., Treble, M.A., and Campana, S.E. 2016. Age and growth of Greenland Halibut (*Reinhardtius hippoglossoides*) in the Northwest Atlantic: A changing perception based on bomb radiocarbon analyses. Fish. Res. 179: 342–350.

Runde, B.J., Buckel, J.A., Bacheler, N.M., Tharp, R.M., Rudershausen, P.J., Harms, C.A., and Ben-Horin, T. 2022. Evaluation of six methods for external attachment of electronic tags to fish: assessment of tag retention, growth, and fish welfare. J. Fish Biol. 101(3): 419–430.

APPENDIX I – TERMS OF REFERENCE

2J3KL Witch Flounder Assessment

Regional Peer Review – Newfoundland and Labrador Region

May 10-11, 2022

Virtual Meeting
St. John's, NL

Chairpersons: Katherine Skanes and Aaron Adamack, DFO Science

Context

The status of the Witch Flounder (*Glyptocephalus cynoglossus*) stock in Northwest Atlantic Fisheries Organization (NAFO) Divisions 2J and 3KL was last assessed in May 2018 (DFO 2018, Wheeland et al. 2019).

The current assessment is requested by the DFO Resource Management Branch to provide the Minister with detailed advice on the status of the stock in order to inform decisions for upcoming fishing season(s).

Objectives

- Consider ecosystem status where the assessed stock occurs based on an overview including relevant summaries of oceanographic conditions, biological community structure and trends, and pertinent knowledge of ecological interactions (e.g., predator, prey) and stressors (e.g., anthropogenic impacts).
- Report on statistics with respect to bycatch of Witch Flounder in other fisheries.
- Assess and report on the current status of the 2J3KL Witch Flounder stock, and identify any major sources of uncertainty. In particular, assess survey biomass relative to the LRP, recruitment, and biological characteristics including size composition and distribution.

Expected Publications

- Science Advisory Report
- Research Document
- Proceedings

Expected Participation

- Fisheries and Oceans Canada (DFO) (Science and Resource Management Branches)
- NL Provincial Department of Fisheries, Forestry and Agriculture
- Academia
- Indigenous groups
- Industry
- Non-government organizations

References

DFO. 2018. Stock Assessment of Witch Flounder (*Glyptocephalus cynoglossus*) in NAFO Divisions 2J3KL. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2018/053.

Wheeland, L., Rogers, B., Rideout, R., and Maddock Parsons, D. 2019. Assessment of Witch Flounder (*Glyptocephalus cynoglossus*) NAFO Divisions 2J3KL. DFO Can. Sci. Advis. Sec. Res. Doc. 2019/066. iv + 57 p.

APPENDIX II – AGENDA

Regional Peer Review – 2J3KL Witch Flounder Assessment

Co-Chairs: Aaron Adamack & Katherine Skanes, Science Branch, DFO

May 10-11, 2022

Virtual Meeting – MS Teams Platform

Tuesday, May 10, 2022

10:00	Welcome/Opening Remarks/ToR (Co-Chairs)
10:15	Overview of the Chemical and Biological Oceanographic Conditions on the Newfoundland and Labrador Shelf (D. Belanger)
10:45	Ocean Climate in Newfoundland and Labrador Waters (F. Cyr)
11:15	Break
11:30	Flatfish Telemetry Program (E. Novaczek)
11:45	Witch Flounder Aging (K. Dwyer)
12:00	LUNCH
1:00	Structure, Trends, and Ecological Interactions in the Marine Community of the Newfoundland and Labrador Bioregion - Witch Flounder Diet (M. Koen-Alonso)
2:00	Assessment of Witch Flounder in 2J3KL (L. Wheeland)
3:00	2J3KL Witch Flounder Age-Based, Catch-at-Length Analytical Model Development (N. Cadigan)
4:00	Adjourn

Wednesday, May 11, 2022

10:00	Drafting of SAR Summary Bullets and Conclusions (All)
TBD	Research Recommendations (All)
TBD	Upgrading of Working Paper (All)
12:00	LUNCH - ADJOURN
4:00	Meeting will continue and adjourn at 04:00 pm if time required

Notes:

- Agenda remains fluid – breaks to be determined as meeting progresses.
- This agenda may change depending upon daily progress.
- All times referenced are based on Newfoundland standard time.
- The platform for the virtual meeting will be MS Teams.
- Note that the FTP Site software is not supported by Google Chrome. Internet Explorer or Microsoft Edge web browsers are recommended.
- Please use the MS Teams links provided for each individual day to ensure attendance at the correct meeting.

APPENDIX III – LIST OF PARTICIPANTS

Name	Affiliation
Kris Vascotto	Atlantic Groundfish Council (AGC)
Lottie Bennet	DFO National Capital Region - Fish Population Science
Erin Carruthers	Fish, Food and Allied Workers Union (FFAW)
Tony Wright	Makivik Corporation
Jin Gao	Marine Institute - Memorial University
Noel Cadigan	Marine Institute - Memorial University
Dale Richards	DFO NL – Center for Science Advice
Eugene Lee	DFO NL – Center for Science Advice
Robyn Lee	DFO NL – Resource Management
Aaron Adamack	DFO NL – Science
Brian Healey	DFO NL – Science
Bob Rogers	DFO NL – Science
Cassandra Konecny	DFO NL – Science
David Bélanger	DFO NL – Science
Emilie Novaczek	DFO NL – Science
Frédéric Cyr	DFO NL – Science
Jonathan Coyne	DFO NL – Science
Katherine Skanes	DFO NL – Science
Laura Wheeland	DFO NL – Science
Mariano Koen-Alonso	DFO NL – Science
Mark Simpson	DFO NL – Science
Paul Regular	DFO NL – Science
Rajeev Kumar	DFO NL – Science
Rick Rideout	DFO NL – Science
Robert Deering	DFO NL – Science
Ron Lewis	DFO NL – Science
Victoria Healey	DFO NL – Science
Karen Dwyer	DFO NL – Science
Colin Webb	Nunatsiavut Government
Gemma Rayner	Oceans North
Rebecca Schijns	Oceana Canada
Vanessa Byrne	Government of NL – Provincial Department of Fisheries, Forestry and Agriculture
Aaron Dale	Torngat, Wildlife, Plants & Fisheries Secretariat