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Proceedings for the Zonal Peer Review Pre-COSEWIC Assessment for American Plaice

Meeting dates: October 22-24, 2019
Location: St. John's, NL

Chairperson: K. Dwyer
Editor: K. Robert

Science Branch
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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.

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SUMMARY

A meeting of the Zonal Peer Review Process on the Pre-COSEWIC (Committee on the Status of Endangered Wildlife in Canada) Assessment for American Plaice (*Hippoglossoides platessoides*) was held from October 22 to 24, 2019 in St. John's, Newfoundland and Labrador (NL). The overall objective of this meeting was to peer review existing Fisheries and Oceans Canada (DFO) information relevant to the COSEWIC status assessment for American Plaice in Canadian waters while considering data related to the status of, trends of, and threats to this species inside and outside of Canadian waters, as well as the strengths and limitations of the information.

These Proceedings include an abstract for each presentation, a summary of the relevant discussions, and key conclusions reached at the meeting. In addition, a Research Document resulting from the meeting will be published on the DFO Canadian Science Advisory Secretariat's (CSAS) Website.

INTRODUCTION

DFO Science Branch held a Zonal Peer Review Process October 22–24, 2019 in St. John's, NL. The overall objective of the meeting, as described in the Terms of Reference (ToR, Appendix 1), was to peer review existing DFO information relevant to the COSEWIC status assessment for American Plaice in Canadian waters while considering data related to the status of, trends of, and threats to this species inside and outside of Canadian waters, as well as the strengths and limitations of the information available.

Meeting participants were from DFO Science, Species at Risk Program, and Resource Management, COSEWIC Marine Fish Species Specialist Subcommittee (SSC), Fish Food & Allied Workers Union (FFAW), and the Atlantic Groundfish Council (AGC).

The Proceedings include an abstract for each presentation, a summary of the relevant discussions, and the key conclusions reached at the meeting. In addition, a Research Document resulting from the meeting will be published on the DFO CSAS Website.

The meeting proceeded with presentations as per the Agenda (Appendix 2). This document has followed the order of the meeting.

PRESENTATIONS

OVERVIEW OF THE TERMS OF REFERENCE, MEETING INTRODUCTION

Presenter: M. Simpson

The Chair noted that the overall objectives of the meeting were to peer-review existing DFO information that may be relevant to the anticipated COSEWIC status review for American Plaice in Atlantic Canadian waters, to consider data related to the status of, trends of, and threats to this species inside and outside of Canadian waters, and evaluate the strengths and limitations of the information available.

A brief overview of the COSEWIC assessment process, including the role of the DFO CSAS science advisory process in context of the assessment process, as outlined in the meeting ToR (Appendix 1) was given.

Discussion

A participant mentioned that a Recovery Potential Assessment (Morgan et al. 2011) was developed following the last Pre-COSEWIC Assessment for American Plaice (Busby et al. 2007) and COSWEIC report (COSEWIC 2009),and questioned whether or not a listing decision for this species had been made yet. It was stated that no listing decision has been made yet for this species. Participants had discussions regarding the species listing process. It was mentioned that there is a listing working group made up of science advisors and biologists in the National Capital Region (NCR).

A participant questioned whether there is any international context to the American Plaice fisheries management for the Flemish Cap area (Northwest Atlantic Fisheries Organization [NAFO] Div. 3M). It was mentioned that Div. 3M is beyond the 200 nm limit of Canadian waters, and is managed by NAFO. It was noted that American Plaice is not part of the Transboundary Resource Assessment Committee (TRAC) assessments.

REVIEW OF PREVIOUS COSEWIC, OVERVIEW OF AMERICAN PLAICE LIFE HISTORY

Presenter: L. Wheeland

Abstract

An overview of American Plaice biology and life history was presented, summarizing information available in Busby et al. (2007). American Plaice are distributed in the Western and Eastern Atlantic, in Canada ranging South from Baffin Bay. Habitat is variable for this species, occurring across a wide range of depth and temperatures, and across most bottom types, though oxygen requirements are unknown. Feeding habits are highly opportunistic, with diet varying by season, area, and individual size. American Plaice are group synchronous, batch spawners. Spawning typically occurs in spring into summer across widespread areas. Dispersal of eggs and larvae are not well understood, but it is not thought that these drift far from spawning grounds. Seasonal movements of adults are evident in the Gulf of St. Lawrence, though there is currently no evidence of large scale migrations in other regions. Little work has been done on the genetic structure of American Plaice populations across the Canadian Atlantic.

Discussions

One participant made known a new primary research paper on American Plaice recruitment synchrony in Newfoundland and Labrador populations (Kumar et al. 2019), updating the understanding on this process since the Busby et al. (2007) review.

It was noted that little work has been undertaken on the genetic structure of the species in Canadian waters.

A participant highlighted that it is not possible to find any advice from the International Council for the Exploration of the Sea (ICES) for this species. It was explained that there are no targeted fisheries for American Plaice in Europe as that species is not used for human consumption in that part of the world. A participant pointed out that even though some research has been undertaken on similar species in Europe, it would be difficult to compare the results.

OVERVIEW OF PHYSICAL AND BIOGEOCHEMICAL OCEANOGRAPHIC CONDITIONS IN THE NORTHWEST ATLANTIC

Presenters: F. Cyr and D. Belanger

Abstract

We present on the physical and biogeochemical oceanographic conditions in the Northwest Atlantic with special attention given to the Newfoundland and Labrador shelves, the Grand Bank, the Gulf of St. Lawrence, and the Scotian Shelf.

The Northwest Atlantic is subject to the large scale influence of atmospheric sea level pressure fields (commonly monitored with the North Atlantic Oscillation index [NAO]) that influence the distribution of air temperatures above the North Atlantic. Since 2012, the Winter NAO was predominantly positive, causing colder than normal air temperatures above the North Atlantic in Winter (most notably in 2015). The long historical time series at Station 27 (since 1948) confirms the influence of NAO on the water temperature and the existence of decadal cycles in the physical environmental conditions. For the more recent period (since 1980), sea surface temperature (SST) and bottom temperatures are available. They both exhibit a cool period from the mid-1980s to the mid-1990s, followed by a warm period between the mid-2000s to the mid-2010s (that peaked in 2011–12). After 2012, another cooling period emerged and is partially

driven by the positive NAO phase mentioned above that led to the increased convection in the Labrador Sea as well as the production of a large volume of cold Labrador Sea water (in a fashion similar to the early-1990s). The year 2018 exhibited a return to normal conditions.

Nitrate concentrations have remained mostly below normal across the Northwest Atlantic since the American Plaice status was last assessed in 2009. Nitrate markedly decreased in the Gulf of St. Lawrence and on the Scotian Shelf since 2015. Concentrations in 2018 were among the lowest in 20 years. Low nutrient levels resulted in limited primary production in the Northwest Atlantic, especially on the Newfoundland Shelf and the Grand Bank where chlorophyll concentration in the first 100 m of the water column remained mostly below normal between 2009 and 2016 before increasing to near or above normal levels in 2017–18. Chlorophyll generally increased in the Gulf since 2009, reaching levels slightly above normal in more recent years. On the Scotian Shelf, chlorophyll has remained mostly near normal over the past 10 years. Zooplankton abundance generally increased across the zone since 2009 and has remained above normal on the Newfoundland Shelf and the Grand Bank for the past three to four years with remarkably strong positive anomalies on the Grand Bank since 2016. In the Gulf and on the Scotian Shelf, zooplankton abundance recently declined from above normal in the mid-2010s to near normal in 2017–18. Zooplankton biomass has been oscillating between negative and positive anomalies since 2009 on the Newfoundland Shelf, and reached its highest levels in 20 years in 2018. On the Grand Bank, biomass remained near normal between 2009 and 2016, before increasing to above normal levels for the first time in approximately 10 years. Biomass has been especially low in the Gulf where mostly negative anomalies are observed since 2008. On the Scotian Shelf, biomass has primarily remained near normal since 2004.

Discussions

Discussions took place regarding surface and bottom water temperatures. A participant questioned whether there was a lag between the sea surface and bottom water temperatures. It was clarified that although a decoupling can be observed, it should not be defined as a lag.

With regards to zooplankton species composition, it was emphasized that high abundance and low biomass typically indicates the presence of small bodied individuals. A participant noted that an increase in the abundance of the smallest body sized copepod species was observed, especially in the recent years. It was added that following the increase in abundance of the small bodied copepods species, an increase of the anomalies' range was also observed.

A participant questioned if the observed changes in water temperatures (induced by the larger volume of Arctic waters that reach the East coast) have an impact on zooplankton. It was noted that the increased volume of colder water entering the East coast coincides with a higher abundance of Arctic copepods species in that area. It was stated that more research would be needed in order to confirm a causal relationship between the increase in the Arctic water volume and the observed changes in the zooplankton species abundance and composition. A participant noted that the cold waters coming from Labrador doesn't seem to reach the Scotian Shelf. There are indications that an increase in the small copepods species abundance may have a negative impact on American Plaice survival; therefore, it was suggested that the change in zooplankton composition (from large to small bodied copepod species) be added to the threat section of the Research Document.

The presenter explained that there are several gaps in the Subdivision 3Ps data time series for the oceanographic indicators discussed, making it difficult to compare in this context. Thus, 3Ps data were not presented at this meeting.

Participants discussed the selection pressures in Designatable Units (DUs) with respect to the various habitats within them. A participant mentioned that it would be relevant for DU discussions

within COSEWIC to include the differences between primary and secondary production levels among the different areas as well as the anomalies.

NEWFOUNDLAND AND LABRADOR BIOREGION ECOSYSTEM PRODUCTIVITY AND OVERVIEW

Presenter: L. Wheeland (for M. Koen-Alonso)

Abstract

No abstract provided.

Discussions

Discussions started amongst meeting participants with the presentation of the American Plaice stomach content analysis results. A participant suggested that the fish stomach content composition may be linked to prey availability as opposed to prey size. The considerable differences in fish communities among the management units (MUs) were noted and suggested as a factor affecting the stomach contents.

Only data for NL were presented, however, It was stated that the Gulf Region has stomach samples for 2018–19 and that these data would be available in the future, once analyzed and peer reviewed

It was mentioned that there are other components of the ecosystem that influence American Plaice populations that may not be captured in trawl surveys (e.g., predators). A participant questioned whether predation by Grey Seals (*Halichoerus grypus)* would have increased. It was illuminated that although there is currently no available data on Grey Seal predation on this species, Harp Seal (*Pagophilus groenlandicus*) stomach content data (Stenson 2013) indicate that Harp Seal predation would not be a significant driver of American Plaice mortality.

A participant raised the point of the absence of two years of trawl surveys in the overall analysis of the stock biomass index due to the inconsistent coverage during these years. It was noted that very little information is available from the pre-collapse period. Discussion occurred on whether the presented trawl survey data support the statement of the recent decline (2015 onwards) in ecosystem biomass in NAFO Divs. 2J, 3K.

REGIONAL STOCK OVERVIEWS

BAFFIN BAY, DAVIS STRAIT, UNGAVA BAY (NAFO SUBAREA 0, SFAS 0,1, 2EX, 3)

Presenter: S. Atchison

Abstract

The abundance index, distribution, and area occupied values of American Plaice were assessed for the Arctic DU. Assessment data was taken from two multispecies, stratified random, bottom trawl surveys conducted by the Central and Arctic Region; the survey to assess stocks of Greenland Halibut (*Reinhardtius hippoglossoides*) in the NAFO Subarea 0 (Divisions 0A and 0B), and the survey to assess stocks of Northern and Striped Shrimp (*Pandalus borealis* and *P. montagui*) in Shrimp Fishing Areas (SFAs) 0, 1, 2EX, and 3. Although the areas assessed in these surveys overlap geographically (e.g., Baffin Bay encompasses NAFO 0A, SFA0 and SFA1; Davis Strait encompasses NAFO 0B and SFA2EX; and Ungava Bay encompasses SFA3) differences in survey design and equipment prevented the datasets from being combined. Life

history information (e.g., length at age, maturity, mortality) has occasionally been collected for this species during these surveys; however, the small amount of data available was not included in this analysis.

In Baffin Bay Division 0A the abundance index remained relatively steady from 1999–2017 with large uncertainties around the data for most years surveyed. Northern 0A was surveyed three times from 1999–2017, with American Plaice caught in the last year surveyed (2012). With few years of survey data available, trends in abundance index cannot be determined for SFA0 or 1. There is a large gap in Davis Strait survey data in Division 0B from 2002–10 which, along with the overlapping standard error values, precludes assumptions regarding the overall relative stability of the abundance index of 0B. However, the abundance index from SFA2EX varied in the first part of the time series (2005–12) and remained above the mean from 2013–18. In Ungava Bay the abundance index for SFA3 had zero or low abundance in the first two years of the survey and varied between 2007–13, with the abundance index remaining above the mean from 2013–18. The northernmost distribution of American Plaice was extended from the previous report to 73°N and Ungava Bay was added to the DU. Area occupied remained below 10% in all areas.

Discussions

Discussions took place concerning the survey's depth range as well as the American Plaice distribution in the Arctic. It was noted that abundance data were collected at a depth that ranged from 400–1,500 m. A participant suggested that an important part of the American Plaice population might have been left out by not surveying the shallow section of the ecosystem (0-400 m). It was mentioned that in this area, waters shallower than 400 m are notably colder than the deeper regions, and notable abundance of American Plaice have not been evident in other scientific sampling in shallow waters adjacent to the survey area. It was mentioned that data from non-standardized ecosystem surveys in shallower areas would be available and it was suggested the information be added to the Research Document. A participant proposed to incorporate the information from the inshore surveys (e.g., species' absence/presence data by set) to the distribution maps.

Participants discussed the abundance and Design-Weighted Area of Occupancy (DWAO) graphs that were presented. A participant suggested to be careful in any description of trends in these data, as there is no consistent survey coverage in that area. It was mentioned that the Arctic DU was last assessed as Data Deficient in 2009.

The fisheries and surveys that occur outside the Canadian Exclusive Economic Zone (EEZ) were also discussed. West-Greenland survey data indices trends were presented and it was noted that these data have been assessed at NAFO.

NEWFOUNDLAND AND LABRADOR (SUBAREA 2 + DIV. 3K, DIVS. 3LNO, SUB 3Ps, SUB 3Pn)

Presenter: L. Wheeland

Abstract

There are three stocks of American Plaice in the Newfoundland and Labrador (NL) region: Labrador and Northeast Newfoundland (Subareas 2+Div. 3K), the Grand Bank (Divs. 3LNO), and Subdivision 3Ps. All three stocks are currently closed to directed fishing. American Plaice also occur in Subdivision 3Pn. These areas are surveyed by annual multispecies, stratified-random, bottom trawl surveys in the spring (Divs. 3LNOPs) and fall (Divs. 2HJ3KLNO). The length of the survey time series varies by division. Coverage and gear used has changed over time. No

notable changes have occurred in area occupied, with American Plaice found throughout the area surveyed by DFO-NL. The highest abundance and biomass in this region are located on the Grand Bank. Trends in survey indices were considered for all areas. In addition, output from an age-structured population model (ADAPT) and a surplus production model were examined for Divs. 3LNO and Subdiv. 3Ps, respectively; these model outputs are considered the best source of information on population trends available for these stocks. There is no model available for Subarea 2+3K or Subdivision 3Pn. There have been significant declines in abundance, biomass, and numbers mature across all stocks, as well as decreases in size and/or age at maturity. There has also been a contraction of age and/or size structure, particularly in Divs. 3LNO and Subdiv. 3Ps, with few old or large fish evident in these populations. Since the last Pre-COSEWIC assessment (Busby et al. 2007), the populations in 3LNO, 3Ps, and 3Pn have been relatively steady, while some increases are noted in 2+3K.

Discussions

2+3K

A participant suggested taking a look at the survey coverage, as there are gaps; implying that the American Plaice populations decline could have been underestimated. It was noted that surveys consistently cover the areas of highest American Plaice abundance, therefore any impacts of missed strata on overall trends should be minimal.

In-depth discussions took place concerning the impact of survey gear changes on DWAO. It was noted that the change in gear did not seem to have an impact but the expansion of the surveys to deeper waters did. A participant questioned if the inshore data were included in the survey coverage. It was explained that, although there are many gaps, the inshore data were included in the survey coverage when available. A participant made the suggestion to explore the impacts of expanding the surveys to deeper waters on the DWAO indices by comparing to work done by Busby et al (2007) (index strata). It was pointed out that the area of occupancy has not decreased much with the decline of the stocks; therefore, COSEWIC's quantitative criteria for the status assessment of wildlife species *B* (Small Distribution Range and Decline or Fluctuation) would not apply.

Participants discussed how the age at maturity is significantly lower than the generation time. A participant suggested to look closer at the generation time calculation and it was explained that a standard equation, which is described in the COSEWIC (2009) Status Report, has been used to calculate the generation time.

3LNO

A participant inquired why 2007 was used as a reference year for calculating the rate of decline for 3LNO stocks. It was explained that the last COSEWIC population assessment of these stocks was held in 2007. Using 2007 as a reference point allows for exploration of any changes that may have occurred since the last population assessment. It was noted that minimal changes have been observed the these stocks since the last COSWEIC assessment.

A participant noted the difference in the number of mature individuals between spring and fall 1995: a value lower in the spring than in the fall. It was pointed out that this may be explained by the fact that these are survey indices and are relative values (not absolute); catchability can be different between seasons.

A participant highlighted that the Virtual Population Analysis (VPA) output represent a very concise summary of the information and suggested to use the VPA output instead of other survey indices. It was agreed upon that the VPA output represent the best source of information for 3LNO.

A participant explained that the mature stage of American Plaice fish can sometimes be problematic to identify, at least, in the Southern Gulf of St. Lawrence stocks. The participant questioned if there was any issue with maturity class identification in other regions. It was mentioned that the staging criteria has not changed across years, but that there is an observation bias linked to the experience of the observers. It was specified that experienced employees were responsible for the stage classification of fish during the years in which declines were observed.

A participant asked if the impacts that fisheries have on population dynamics (age at maturity and generation time) could be reversed. It was noted that there is no known records of fisheries impacts being reversed.

A participant asked if the current state of the population has been taken into account in the generation time calculation. It was noted that according to the current International Union for Conservation of Nature (IUCN) guidelines on generation time calculation, it is the pre-exploitation rates that should be calculated; therefore, the current state of the population was not taken into account in the calculation.

3Ps

For estimation of stock size within 3Ps, a Bayesian surplus production model was used; however, results presented here were to be considered preliminary. An update of the model is to be fully reviewed at the upcoming stock assessment for 3Ps American Plaice. Participants had in-depth discussions on the model parameters and outputs. It was noted that the model does not take age structure into account. Also noted, the Bayesian model works on biomass, and gives a better picture of the population's past and current state than survey indices, but it does not allow for the retrieval of any information regarding the population’s abundance.

3Pn

It was stated that very limited information is available for 3Pn (no data available after 2014).

A participant asked whether any length data are available for that area. If those data were available, it would then be possible to estimate fish maturity. It was mentioned that length data are available, but as no changes were observed in the area or abundance indices, length at maturity was not estimated.

SCOTIAN SHELF (4VWX)

Presenter: D. Themelis

Abstract

In the DFO Maritimes Region (NAFO Div. 4VWX5), American Plaice is widely distributed on the Scotian Shelf, with the exception of the Bay of Fundy, with areas of high concentration on Banquereau, Sable Island, and Browns Banks. Trends in abundance and distribution were examined using the 4VWX RV survey, an annual survey that has sampled all of 4VWX5Y during July and August since 1970 with various bottom trawls using a stratified random design. All strata have been sampled every year with the exception of those in 4VW in 2018. The survey series shows that the overall distribution of American Plaice (catch in numbers and kg per tow) did not change much between 1970 and 2000, but has declined from 2000–19, particularly in Eastern Scotian Shelf strata. From the start of the survey series in 1970 to 2019, minimum trawlable abundance of American Plaice has declined 75%, from about 153 million to 35 million fish, while total biomass has declined 86% from 39,000 t to 5,000 t. Using a fork length >30 cm to indicate maturity, numbers of mature fish have declined 85%, from about 45 million fish to approximately

7 million fish. The DWAO was variable but stable in the survey from 1970-2008, but has more recently declined. The average area occupied by American Plaice declined 60% from approximately 133,000 km^2 in 1970–72 to 80,000 km^2 in 2016–19.

American Plaice are managed within a complex of four flatfish species and two MUs (4VW and 4X flatfish) until 2014, at which point regulations began to require that all landed flatfish be separated and identified to species. Landings declined from around 4,000 t in the early-1990s to less than 1,000 t in the early-2000s, and further to less than 50 t since 2013. Landings from 2014–18 have been all from the Eastern Scotian Shelf (4VW) by commercial fisheries using mobile bottom trawl gear and targeting Haddock (*Melanogrammus aeglefinus*), Redfish (*Sebastes fasciatus and S. mentella*) and Pollock (*Pollachius virens)*. At-sea observers of commercial fishing sets have also observed American Plaice in fisheries targeting Scallop (*Placopecten magellanicus*), Sea Cucumber (*Cucumaria frondosa*), Shrimp, and Silver Hake (*Merluccius bilinearis*).

Discussions

The presenter specified that the data used were obtained from Summer surveys only. It was also mentioned that all strata were sampled each year, with the exception of 2018, during which only a few sets were surveyed in 4W. A participant inquired about the area covered during the trawl surveys.

A participant asked about gear and vessel changes. It was said that although there were vessel and gear changes, for most species, conversion factors have not been used. It was noted that the American Plaice decline in abundance on the Scotian Shelf happened a few years after declines were observed in the other regions. A participant proposed examining the American Plaice stock trends from the United States. The presenter mentioned that although they have not looked at the American Plaice stock trends from the United States, they have looked at the trends in 5Z. There is very little American Plaice in 5Z and there has not been much change in the trends over the years.

It was noted that there are complete survey strata in which American Plaice are not captured. A participant suggested that it could be explained by the impacts of Grey Seal predation and lack of prey in those areas, among other things. An in-depth discussion took place regarding the potential impact of Grey Seal predation on the abundance of American Plaice on the Scotian Shelf. It was noted that the species area of occupancy on the Scotian Shelf differs substantially across years as well as from the trends observed in the other regions.

NORTHERN GULF OF ST. LAWRENCE (4RS)

Presenter: J. Ouelette-Plante and J. Gauthier

Abstract

The DFO Quebec Region has conducted annual Summer surveys of the Northern Gulf of St. Lawrence (NGSL [NAFO Divisions 4RS and the Northern part of NAFO Division 4T]) since 1984. Three vessel trawl tandems (*Lady Hammond* – Western IIa, *Alfred Needler* – URI, *Teleost* – Campelen) have been used. Two comparative fishing experiments have been conducted (1990, 2004–05) to estimate the catchability difference between the vessel/trawl combinations and to derive conversion factors that enable the production of a continuous series. Updated indicators prepared for the 2011 RPA of American Plaice of the Maritime DU were presented during the 2019 Pre-COSEWIC meeting. These indicators were produced in *Lady Hammond* – Western IIa equivalent so they could be compared to those of the Gulf and Maritimes regions that are also part of the Maritime DU. Only strata that have been consistently covered over the time series

were included in the index of abundance. The 1984 Summer survey data were not used since too many survey strata have not been sampled. Indices of abundance were produced for total American Plaice population as well as mature and immature stages. Information used to differentiate between the immature and mature portions of the total population is based on Gulf region maturity at length data. Females of total length ≥26 cm and males of ≥19 cm were considered mature (DFO 2011). Indices for mature and immature components of the American Plaice population are available starting in 1987, since length data were not collected for the 1985-1986 period.

Surveys indicate that American Plaice is a widely distributed species across the entire NGSL region including the lower estuary, with concentrations observed at the head of the Laurentian, Esquiman, and Anticosti channels, as well as all along the Western coast of Newfoundland. They are mostly found at depths ≤275 m and are present on both flanks of the Laurentian Channel but absent from the deeper center of the channel. Between 1985 and 2018, the area occupied by American Plaice in the NGSL represents on average 75,520 km^2, or nearly 70% of the surveyed area (109,412 km^2). There is a noticeable increase in the DWAO index starting in 2003, with American Plaice occupying more than 80% of the surveyed area between 2003 and 2018. The D95 indicates a period of relative stability between 1985 and 2002, followed by an increase in 2003 and a second period of stability since.

The index of total population abundance for NGSL American Plaice fluctuated over the 1985–2018 period with a general increasing trend. A similar increasing trend is observed for total biomass. Estimated minimum trawlable abundance of American Plaice is over 163 million individuals in 2018, of which more than 107 million individuals (66%) are estimated to be mature. The total biomass is estimated at around 26,000 t.

The trend in abundance for NGSL American Plaice was estimated by regression of the log-transformed annual survey abundance indices for the mature component of the population. The regression using the entire survey dataset (1987–2018) was statistically significant ($p < 0.05$) with a positive slope, indicating an increase in the adult population over time.

There has never been an important fishery directing for American Plaice in NAFO Divisions 4RS and this fishery has never been managed by quota. Most of the American Plaice reported landings are from bycatch in fisheries targeting other species. Over 65% of the landings originated from NAFO Div. 4R. Considerable variation over the years is found with the type of fishing gear used to land American Plaice as well as different fisheries contributing to the reported landings. For the first time since 2008, no fisheries were directing to American Plaice in 2017 and 2018 (note that these results are still preliminary).

With regards to changes occurring in the Gulf of St. Lawrence, it has been shown that deep waters have become warmer and oxygen levels have decreased. So far, these changes have not caused detectable effects on American Plaice. In fact, American Plaice was the fish species with the highest occurrence in the captures of the 2018 NGSL Summer survey, being present in 81% of fishing sets. In terms of community, the NGSL moved from a fish-dominated ecosystem in the early 1990s to an invertebrate dominance (largely driven by the Northern Shrimp) until the early 2010s. In recent years a massive arrival of Redfish (*Sebastes mentella*), is causing a return to a fish-dominated ecosystem. Redfish now account for >80% of the catches in the NGSL DFO survey.

The presentation also included information of different studies showing the presence of eggs and larvae of American Plaice at different time periods and at various locations in the NGSL. A brief presentation of the diet of American Plaice was also presented, although the stomachs came from a very localized area of the Estuary. At-sea observer data were presented, with extrapolations of American Plaice at-sea discards in five fisheries.

Discussions

A participant inquired about the overlap in data between the Southern and the Northern Gulf of St. Lawrence areas. Participants had in-depth discussions on how to account for such overlap in the analysis. It was concluded that the analysis undertaken by Quebec Region accounted for the overlap.

A participant asked why the number of trawl survey sets varies so much across the time series. It was explained that in some years, two vessels were used simultaneously, which led to a higher total number of tows by strata. The potential impact of vessel change on DWAO was discussed. It was suggested that vessel changes could contribute to the observed increase in DWAO.

A participant noted that American Plaice seems relatively absent from the Laurentian Channel. It was suggested to consider the Laurentian Channel as a boundary between the Northern and Southern Gulf of St. Lawrence. A participant pointed out that the data presented show the American Plaice distribution only at a specific time of the year (i.e., in August). The species distribution in that area at other times of the year is unknown. It is possible that movement could occur between the Northern and Southern Gulf regions through the Laurentian Channel at other times of the year.

Participants discussed NAFO landings data. It was pointed out that considering Canada reports all its landings to NAFO, the Canadian reported catches should not differ; however, because the stakeholder groups do not always agree on landings, there are differences between NAFO landings and Canadian reported catches, especially in the recent years.

In-depth discussions were held on the potential impact of the Redfish fishery on American Plaice bycatch. It was pointed out that the American Plaice distribution in the Northern Gulf of St. Lawrence has altered since 1985. A participant suggested that it could be explained by an increase in population or by the fact that the area where the species used to be found is now considered unsuitable due to a change in the environment conditions (e.g., temperature; salinity; oxygen levels). A participant suggested that the species distribution changes may be linked, among other things, to the changes in oxygen levels (i.e., lower in some areas).

SOUTHERN GULF OF ST. LAWRENCE (4T)

Presenter: D. Ricard

Abstract

American Plaice in the Southern Gulf of St. Lawrence (NAFO Division 4T) was last assessed in March 2016 using data to 2015 and providing science advice for the 2016–20 fishing seasons. The latest assessment put the population in the critical zone and predicted a continued decline under all catch scenarios examined (0 t, 100 t and 250 t). Increased levels of natural mortality on older age classes, most likely caused by increased predation by Grey Seals, was found to be the main factor behind the lack of recovery of the stock. The interim year update of stock status indicator was conducted in 2018. The stock status indicator in 2018 was at its lowest point in the time series and the stock remains in the critical zone. Despite record low biomass and abundance of American Plaice in the Southern Gulf of St. Lawrence, the stock distribution has remained ubiquitous and the distribution indices have been fairly constant for the past 15–20 years. The stock is scheduled to be re-assessed in 2021.

Discussions

A discussion was held regarding the VPA results that were presented. It was explained that as the model cannot directly account for demographics (e.g., in this case a decrease in older fish

strata), natural mortality had to be increased in the recent years so that the model could indirectly account for it.

A participant presented the conversion factors that were used during the Witch Flounder (*Glyptocephalus cynoglossus*) assessment to account for the survey overlap between the Northern and Southern Gulf of St. Lawrence areas. It was mentioned that a similar process could be used to ensure continuity and comparability of the American Plaice data in the Northern and Southern Gulf of St. Lawrence surveys, but that this has not been applied at this time.

A participant inquired about the impact of the increase in American Plaice mortality on the computation of generation time and how to quantify those changes. It was suggested to use a mixed effect type of model to take into account the different components of the different DUs. A participant queried whether an updated model would need to be peer reviewed. It was explained that if there was any change in the model framework, a peer review would be necessary. It was noted that the different options that can be used to show the decline in mature individuals are described in the IUCN guidelines.

Participants discussed the impact of vessels and gear changes on perceptions of natural mortality. It was noted that there are available data on individual growth history. A participant pointed out that the observed population trends for the Northern and Southern Gulf populations differ (i.e., slight increase in the Northern Gulf vs. decrease in Southern Gulf).

DISCUSSIONS

COSEWIC ASSESSEMENT PROCESS AND CRITERIA

A general discussion on American Plaice population connectivity and discreteness and COSEWIC DUs structure took place. A participant questioned whether the DU structure should be revised. It was noted that very little genetic information is available to assess populations discreteness. A participant suggested that depth preference could be linked to the species distribution. It was mentioned that the biological differences between Scotian Shelf and Grand Bank populations could be explained in part by the fact that glacial ice retreats from these areas occurred at different times (Shaw et al. 2006). It was noted that DU structure is a COSEWIC decision and not an outcome of this CSAS process.

The discussions also focused on whether it would be possible to combine different MUs indices in order to obtain a trend for each DU area that was defined in the last COSEWIC report. It was noted that it would not be possible to combine certain MUs indices in the Newfoundland Region due to the use of different vessels, fishing gears, survey season and/or survey period. It was suggested to use one of the larger MUs for which the trends are representative of the Region to obtain a trend for the whole DU area.

Clarifications were made on COSEWIC DU rescue guidelines; it was specified that a given DU cannot be rescued by another DU.

THREATS

Participants had in-depth discussions on the various threats to American Plaice.

A participant recommended looking at the impact of predation on the different life stages of the species (i.e., not only in adults, but also larvae and the young of the year). A participant pointed out that the size of available prey has an impact on the American Plaice productivity. The potential impact of Redfish populations and fisheries on American Plaice were discussed. A participant questioned whether the two species distribution overlap. It was noted that although

the two species' distribution overlap, they are usually separated by depth, however it was noted that an increasing Redfish fishery has the potential to increase overall American Plaice bycatch.

ROUNDTABLE/ DESIGNATABLE UNITS (DUS)

The participants discussed the proposed approach for the COSEWIC DUs status assessment, to assist the status report author in future deliberations. It is noted the decision on DU structure is taken by COSEWIC in their assessment, not within this CSAS process.

Arctic DU

A participant questioned if Ungava Bay should be included in the Arctic DU. Participants agreed that although the Ungava Bay habitat is fairly different from the Arctic DU area, that it is recommended to be included in the Arctic DU. It was noted that the American Plaice Arctic DU was last assessed by COSEWIC as Data Deficient in 2009. A participant pointed out that there is currently much more data available on the Arctic populations than when it was previously assessed by COSEWIC. Participants agreed that including a brief description of the geography and oceanography would be added to the habitat section of the Research Document

Newfoundland and Labrador DU

It was agreed that three indices that represent three different areas within the previously defined NL DU would be used for the NL DU status assessment. Each index would be presented independently, and COSEWIC will determine how these three stocks will be treated for their assessment.

Concerns were raised about joining all NL stocks into a single DU based on differing life history characteristics and notable differences in ecosystem and oceanographic conditions, particularly between the areas off the South Coast of NL (Subdiv. 3Ps) and the waters east of Labrador and Northeastern Newfoundland.

Maritimes DU

The group agreed upon the recommended approach of presenting the indices of the different MUs separately.

Concerns were raised by participants regarding the Species at Risk Act Listing process, especially regarding the workload and the process timelines. The group had discussions on the *Species at Risk Act* processes timelines, including COSEWIC assessment and Listing processes. These discussions also focused on the implications of the new *Fisheries Act* on the department's Post-COSEWIC processes. A participant questioned if the RPA format should be reviewed. It was reiterated that following the previous Pre-COSWEIC meeting for this stock (Busby et al. 2007), the resulting COSEWIC report (COSEWIC 2009) and listings, and the subsequent RPA (Morgan et al. 2011), no *SARA* decision has been made for this species as of the time of this meeting.

CONCLUSIONS

Meeting participants felt the Working Paper presented sound scientific analyses based on the best available information on American Plaice, and is acceptable for publication as a Research Document, pending revision following discussions of the meeting. Sincere efforts were made in the science peer review process to acknowledge and address all comments and concerns raised by meeting participants provided they were appropriate and within the confines of acceptable peer review practice.

RESEARCH RECOMMENDATIONS

- Research on American Plaice larval dispersal. A participant suggested a similar modelling approaches as Le Corre et al. (2019) could be applied for American Plaice.
- Quantify American Plaice diet composition (especially for Arctic populations), interspecies competition (e.g., with Yellowtail flounder), and predation
- Research on length and age at maturity and hypoxia tolerance for Northern Gulf population.
- Undertake tagging studies to quantify and/or update information on American Plaice movements, distribution, and stock mixing.
- Inform on population structure though genetic research.
- Data collection on size at maturity according to sex, and aging in Arctic populations.
- Examine commercial fishery data to characterize of bycatch in the Arctic.
- Update of 3LNO populations productivity information (i.e., changes in spawning time and depth distribution).
- Study on American Plaice size distribution and growth changes among different areas (i.e., difference between Northern Gulf stock and others).
- Development of indices for the inshore portions of the populations as characteristics (e.g., growth) can differ between inshore and offshore environments.

REFERENCES CITED

Busby, C.D, Morgan, M.J., Dwyer, K.S., Fowler, G.M., Morin, R., Treble, M., Maddock Parsons, D., and D. Archambault. 2007. Review of the structure, the abundance and distribution of American plaice (*Hippoglossoides platessoides*) in Atlantic Canada in a species-at-risk context. DFO Can. Sci. Advis. Sec. Res. Doc. 2007/069. 94p.

COSEWIC. 2009. COSEWIC assessment and status report on the American Plaice *Hippoglossoides platessoides*, Maritime population, Newfoundland and Labrador population and Arctic population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 74 pp.

DFO. 2011. Recovery Potential Assessment of the Maritime Designatable Unit of American Plaice (*Hippoglossoides platessoides*). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2011/043.

Kumar, R., Cadigan, N.G., and M.J. Morgan. 2019. Recruitment synchrony in spatially structured Newfoundland and Labrador populations of American plaice (*Hippoglossoides platessoides*). Fish. Res. 211:91–99.

Le Corre, N., Pepin, P., Han, G., Ma, Z., and P.V. Snelgrove. 2019. Assessing connectivity patterns among management units of the Newfoundland and Labrador shrimp population. Fish. Oceanogr. 28(2):183–202.

Morgan, M.J., Bailey, J., Healey, B.P., Maddock Parsons, D., and R. Rideout. 2011. Recovery potential assessment of American Plaice (*Hippoglossoides platessoides*) in Newfoundland and Labrador. DFO Can. Sci. Advis. Sec. Res. Doc. 2011/047. iv + 32 p.

Shaw, J., Piper, D.J.W., Fader, G.B.J., King, E.L., Todd, B.J., Bell, T., Batterson, M.J., and D.G.E. Liverman. 2006. A conceptual model of the deglaciation of Atlantic Canada. Quat. Sci. 25(17-18):2059–2081.

Stenson, G.B. 2013. Estimating consumption of prey by Harp Seals, (*Pagophilus groenlandicus*) in NAFO Divisions 2J3KL. DFO Can. Sci. Advis. Sec. Res. Doc. 2012/156. iii + 26 p.

APPENDIX 1: TERMS OF REFERENCE

Terms of Reference

Pre-COSEWIC Assessment for American Plaice

Zonal Peer Review – Newfoundland and Labrador, Maritimes, Gulf, Quebec, and Central and Arctic Regions

October 22-24, 2019
St. John's, NL

Chairperson: Karen Dwyer

Context

The implementation of the federal Species at Risk Act (SARA), proclaimed in June 2003, begins with an assessment of a species' risk of extinction by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). COSEWIC is a non-government scientific advisory body that has been established under Section 14(1) of SARA to perform species assessments, which provide the scientific foundation for listing species under SARA. Therefore, an assessment initiates the regulatory process whereby the competent Minister must decide whether to accept COSEWIC's assessment and add a species to Schedule 1 of SARA, which would result in legal protection for the species under the Act. If the species is already on Schedule 1 of SARA, the Minister may decide to keep the species on the list, reclassify it as per the COSEWIC assessment, or to remove it from the list (Section 27 of SARA).

Fisheries and Oceans Canada (DFO), as a generator and archivist of information on marine species and some freshwater species, is to provide COSEWIC with the best information available to ensure that an accurate assessment of the status of a species can be undertaken.

American Plaice (*Hippoglossoides platessoides*) was listed on COSEWIC's 2018 Call for Bids to produce a new status report.

American Plaice (NL population) was originally assessed as Threatened in 2009 (COSEWIC 2009) due to an approximately 96% decline in abundance over a 47 year time series (about three generations). This population occurs from the southwestern corner of Newfoundland, eastward north of the Laurentian Channel to the southern limit of the Grand Bank and northward to Hudson Strait. While overfishing was considered the cause of the decline, natural mortality also increased in the 1990s when the largest part of the decline occurred.

American Plaice (Maritime population) was originally assessed as Threatened in 2009 (COSEWIC 2009) due to a decline in abundance of mature individuals of 86% in the Gulf of St. Lawrence, and 67% on the Scotian Shelf over a 36 year time series (about 2.25 generations). This population occurs on Georges Bank, in the Bay of Fundy, on the Scotian Shelf and in the Gulf of St. Lawrence. While overfishing was considered the cause of the decline, natural mortality also increased in the 1990s when the largest part of the decline occurred.

Objective

The overall objective of this meeting is to peer-review existing DFO information relevant to the COSEWIC status assessment for American Plaice in the Newfoundland & Labrador and Maritimes Designated units, considering data related to the status and trends of, and threats to this species inside and outside of Canadian waters, and the strengths and limitations of the information. This information will be available to COSEWIC, the authors of the species status report, and the co-chairs of the applicable COSEWIC Species Specialist Subcommittee. Publications from the peer-review meeting (see below) will be posted on the CSAS website.

Specifically, DFO information relevant to the following will be reviewed to the extent possible:

1. Life history characteristics
    - Growth parameters: age and/or length at maturity, maximum age and/or length
    - Total and natural mortality rates and recruitment rates (if data are available)
    - Fecundity
    - Generation time
    - Early life history patterns
    - Specialized niche or habitat requirements
2. Review of designatable units

    Available information on population differentiation, which could support a COSEWIC decision of which populations below the species' level would be suitable for assessment and designation, will be reviewed. Information on morphology, meristics, genetics and distribution will be considered and discussed.

    See COSEWIC Guidelines for recognizing Designatable Units.
3. Review the COSEWIC criteria for the species in Canada as a whole, and for each designatable units identified, if any. See Wildlife Species Assessment: COSEWIC Assessment Process, Categories and Guidelines.

    COSEWIC Criterion – Declining Total Population

    a. Summarize overall trends in population size (both number of mature individuals and total numbers in the population) over as long a period as possible and in particular for the past three generations (taken as mean age of parents). Additionally, present data on a scale appropriate to the data to clarify the rate of decline.

    b. Identify threats to abundance— where declines have occurred over the past three generations, summarize the degree to which the causes of the declines are understood, and the evidence that the declines are a result of natural variability, habitat loss, fishing, or other human activity.

    c. Where declines have occurred over the past three generations, summarize the evidence that the declines have ceased, are reversible, and the likely time scales for reversibility.

    COSEWIC Criterion – Small Distribution and Decline or Fluctuation: for the species in Canada as a whole, and for designatable units identified, using information in the most recent assessments:

    d. Summarize the current extent of occurrence (in km^2) in Canadian waters.

    e. Summarize the current area of occupancy (in km^2) in Canadian waters

    f. Summarize changes in extent of occurrence and area of occupancy over as long a time as possible, and in particular, over the past three generations.

    g. Summarize any evidence that there have been changes in the degree of fragmentation of the overall population, or a reduction in the number of meta-population units.

    h. Summarize the proportion of the population that resides in Canadian waters, migration patterns (if any), and known breeding areas.

COSEWIC Criterion - Small Total Population Size and Decline and Very Small and Restricted: for the species in Canada as a whole, and for designatable units identified, using information in the most recent assessments:

i. Tabulate the best scientific estimates of the number of mature individuals;

j. If there are likely to be fewer than 10,000 mature individuals, summarize trends in numbers of mature individuals over the past 10 years or three generations, and, to the extent possible, causes for the trends.

Summarize the options for combining indicators to provide an assessment of status, and the caveats and uncertainties associated with each option.

For transboundary stocks, summarize the status of the population(s) outside of Canadian waters. State whether rescue from outside populations is likely.

4. Describe the characteristics or elements of the species habitat to the extent possible, and threats to that habitat

   Habitat is defined as “in respect of aquatic species, spawning grounds and nursery, rearing, food supply, migration and any other areas on which aquatic species depend directly or indirectly in order to carry out their life processes, or areas where aquatic species formerly occurred and have the potential to be reintroduced”.

   The phrasing of the following guidelines would be adapted to each specific species and some could be dropped on a case-by-case basis if considered biologically irrelevant. However, these questions should be posed even in cases when relatively little information is expected to be available, to ensure that every effort is made to consolidate whatever knowledge and information does exist on an aquatic species’ habitat requirements, and made available to COSEWIC.

   a. Describe the functional properties that a species’ aquatic habitat must have to allow successful completion of all life history stages:
      In the best cases, the functional properties will include both features of the habitat occupied by the species and the mechanisms by which those habitat features play a role in the survivorship or fecundity of the species. However, in many cases the functional properties cannot be described beyond reporting patterns of distribution observed (or expected) in data sources, and general types of habitat feature known to be present in the area(s) of occurrence and suspected to have functional properties. Information will rarely be equally available for all life history stages of an aquatic species, and even distributional information may be missing for some stages. Science advice needs to be carefully worded in this regard to clearly communicate uncertainties and knowledge gaps.

   b. Provide information on the spatial extent of the areas that are likely to have functional properties:
      Where geo-referenced data on habitat features are readily available, these data could be used to map and roughly quantify the locations and extent of the species’ habitat. Generally however, it should be sufficient to provide narrative information on what is known of the extent of occurrence of the types of habitats identified. Many information sources, including Aboriginal Traditional Knowledge (ATK) and experiential knowledge, may contribute to these efforts.

   c. Identify the activities most likely to threaten the functional properties, and provide information on the extent and consequences of those activities:
      COSEWIC’s operational guidelines require consideration of both the imminence of

each identified threat, and the strength of evidence that the threat actually does cause harm to the species or its habitat. The information and advice from the Pre-COSEWIC review should provide whatever information is available on both of those points. In addition, the information and advice should include at least a narrative discussion of the magnitude of impact caused by each identified threat when it does occur.

d. Recommend research or analysis activities that are necessary:
Usually the work on the other Guidelines will identify many knowledge gaps. Recommendations made and enacted at this stage in the overall process could result in much more information being available should a Recovery Potential Assessment be required for the species.

5. Describe to the extent possible whether the species has a residence as defined by SARA

SARA s. 2(1) defines Residence as “a dwelling-place, such as a den, nest or other similar area or place, that is occupied or habitually occupied by one or more individuals during all or part of their life cycles, including breeding, rearing, staging, wintering, feeding or hibernating.”

6. Threats

A threat is any activity or process (both natural and anthropogenic) that has caused, is causing, or may cause harm, death, or behavioural changes to a species at risk or the destruction, degradation, and/or impairment of its habitat to the extent that population-level effects occur. See Threats and Limiting Factors section in Instructions for the Preparation of COSEWIC Status Reports.

List and describe threats to the species considering:

- Threats need to pose serious or irreversible damage to the species. It is important to determine the magnitude (severity), extent (spatial), frequency (temporal) and causal certainty of each threat.
- Naturally limiting factors, such as aging, disease and/or predation that limit the distribution and/or abundance of a species are not normally considered threats unless they are altered by human activity or may pose a threat to a critically small or isolated population.
- Distinction should be made between general threats (e.g. agriculture) and specific threats (e.g. siltation from tile drains), which are caused by general activities.
- The causal certainty of each threat must be assessed and explicitly stated as threats identified may be based on hypothesis testing (lab or field), observation, expert opinion or speculation.

7. Manipulated Populations

An increasing number of wildlife species have seen their distribution or genetic make-up manipulated by humans, deliberately or accidentally. COSEWIC has developed guidelines to help determine the eligibility of populations for inclusion in wildlife species status assessments. Information available to DFO should be provided to facilitate such determination. See COSEWIC Guidelines on Manipulated Populations.

8. Other

Finally, as time allows, review status and trends in other indicators that would be relevant to evaluating the risk of extinction of the species. This includes the likelihood of imminent or continuing decline in the abundance or distribution of the species, or that would otherwise be of value in preparation of COSEWIC Status Reports.

Expected Publications

- Proceedings

- Research Document

Expected Participation

- DFO: Science, Resource Management and SARA program
- COSEWIC sub-committee chairs
- Industry
- Province of NL

References

COSEWIC. 2009. COSEWIC assessment and status report on the American Plaice *Hippoglossoides platessoides*, Maritime population, Newfoundland and Labrador population and Arctic population, in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 74 pp

DFO 2008. Proceedings of the Review of DFO Science Information for American plaice (*Hippoglossoides platessoides*) Relevant to Status Assessment by COSEWIC. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2007/042.

APPENDIX 2: AGENDA

Pre-COSEWIC Assessment for American Plaice

Chairperson: Karen Dwyer

October 22-24, 2019
Memorial Room – Northwest Atlantic Fisheries Centre
80 East White Hills Road, St. John's NL

Tuesday, October 22

Time	Topic	Presenter
09:00	Opening remarks and overview of Regional Peer Review Process	*K. Dwyer*
-	Overview of TOR, Meeting Introduction	*M. Simpson*
-	Review of previous COSEWIC, overview of American Plaice life history	*L. Wheeland*
-	Zonal Physical and Biological Oceanographic Overview	*F. Cyr* *D. Belanger*
-	Ecosystem Productivity and Overview	*M. Koen-Alonso* *L. Wheeland*
Regional Stock Overviews: Trends in surveys and mature individuals, population model updates (where applicable), distribution and area occupied, fishery overviews. Other updates as applicable.		
-	Baffin Bay, Davis Strait, Ungava Bay - NAFO Subarea 0 - SFAs 0,1, 2EX, 3	*S. Atchison*
-	Newfoundland and Labrador - Subarea 2 + Div. 3K - Divs. 3LNO - Subdivision 3Ps - Subdivision 3Pn	*L. Wheeland*
-	Scotian Shelf (Divs. 4VWX)	*D. Themelis*

Wednesday, October 23

Time	Topic	Presenter
Regional Stock Overviews, continued.		
09:00	Northern Gulf of St. Lawrence (Divs. 4RS)	*J. Ouellette-Plante* *J. Gauthier*
-	Southern Gulf of St. Lawrence (Div. 4T)	*D. Ricard*
-	Discussion on Combined Indices	*All*
-	Threats	*L. Wheeland* *All*

Thursday, October 24

Time	Topic	Presenter
09:00	Discussion	*All*
-	Conclusions	*All*
-	Research recommendations	*All*
-	Upgrading of working paper	*K. Dwyer*
-	ADJOURN	-

Notes:

- Health breaks will occur at 10:30 a.m. and 2:30 p.m. Refreshments can be purchased from the cafeteria.
- Lunch (not provided) will normally occur 12:00-1:00 p.m.
- Agenda remains fluid.
- This agenda may change.

APPENDIX 3: LIST OF PARTICIPANTS

Name	Affiliation
Karen Dwyer (Chair)	DFO, Science – NL
Karine Robert (Rapporteur)	DFO, Science – NCR
Brittany Keough	DFO, Science – NL (CSAS office)
Erika Parrill	DFO, Science – NL (CSAS office)
Eugene Lee	DFO, Science – NL (CSAS office)
Sheila Atchison	DFO, Science – C&A
Johanne Gauthier	DFO, Science – Québec
Jordan Ouellette-Plante	DFO, Science – Québec
Daniel Ricard	DFO, Science – Gulf
Lisa Robichaud	DFO, Species at Risk Program – Gulf
Daphne Themelis	DFO, Science – Maritimes
Bob Rogers	DFO, Science – NL
David Belanger	DFO, Science – NL
Frédéric Cyr	DFO, Science – NL
Joanne Morgan	DFO, Science – NL
Laura Wheeland	DFO, Science – NL
Mark Simpson	DFO, Science – NL
Chelsie Tricco	DFO, Resource Management – NL
Dana Yetman	DFO, Species at Risk Program – NL
Justin Strong	Fish, Food, and Allied Workers Union
Nicole Rowsell	Department of Fisheries and Land Resources
Steve Devitt	Atlantic Groundfish Council
Ross Claytor	COSEWIC
Alan Sinclair	COSEWIC – Author