Fisheries and Oceans Canada | Pêches et Océans Canada
Science | Sciences

C S A S | ***S C C S***

Canadian Science Advisory Secretariat | **Secrétariat canadien de consultation scientifique**

Proceedings Series 2008/028 | **Compte rendu 2008/028**

Proceedings of the Maritimes Region Science Advisory Process on the Assessment of Scallops (*Placopecten magellanicus*) in Scallop Fishing Area (SFA) 29 West of Longitude 65°30'W

Compte rendu de la réunion du Processus consultatif scientifique de la Région des Maritimes au sujet de l'évaluation du pétoncle géant (*Placopecten magellanicus*) de la zone de pêche du pétoncle 29 à l'ouest de la longitude 65° 30' O

30 April 2008

Le 30 avril 2008

Bedford Institute of Oceanography
Dartmouth, Nova Scotia

Institut océanographique de Bedford
Dartmouth (Nouvelle-Écosse)

Mark Showell
Meeting Chair

Bedford Institute of Oceanography
1 Challenger Drive, P.O. Box 1006
Dartmouth, Nova Scotia
B2Y 4A2

Mark Showell
Président de la réunion

Institut océanographique de Bedford
1 Challenger Drive, C. P. 1006
Dartmouth (Nouvelle-Écosse)
B2Y 4A2

January 2009

janvier 2009

Canada

Foreword

The purpose of these Proceedings is to document the activities and key discussions of the meeting. The Proceedings include research recommendations, uncertainties, and the rationale for decisions made by the meeting. Proceedings 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.

Avant-propos

Le présent compte rendu a pour but de documenter les principales activités et discussions qui ont eu lieu au cours de la réunion. Il contient des recommandations sur les recherches à effectuer, traite des incertitudes et expose les motifs ayant mené à la prise de décisions pendant la réunion. En outre, il fait état de données, d'analyses ou d'interprétations passées en revue et rejetées pour des raisons scientifiques, en donnant la raison du rejet. Bien que les interprétations et les opinions contenus dans le présent rapport puissent être inexacts ou propres à induire en erreur, ils sont quand même reproduits aussi fidèlement que possible afin de refléter les échanges tenus au cours de la réunion. Ainsi, aucune partie de ce rapport ne doit être considéré en tant que reflet des conclusions de la réunion, à moins d'indication précise en ce sens. De plus, un examen ultérieur de la question pourrait entraîner des changements aux conclusions, notamment si l'information supplémentaire pertinente, non disponible au moment de la réunion, est fournie par la suite. Finalement, dans les rares cas où des opinions divergentes sont exprimées officiellement, celles-ci sont également consignées dans les annexes du compte rendu.

Proceedings of the Maritimes Region Science Advisory Process on the Assessment of Scallops (*Placopecten magellanicus*) in Scallop Fishing Area (SFA) 29 West of Longitude 65°30'W

30 April 2008

Bedford Institute of Oceanography
Dartmouth, Nova Scotia

Mark Showell
Meeting Chair

Bedford Institute of Oceanography
1 Challenger Drive, P.O. Box 1006
Dartmouth, Nova Scotia
B2Y 4A2

January 2009

Compte rendu de la réunion du Processus consultatif scientifique de la Région des Maritimes au sujet de l'évaluation du pétoncle géant (*Placopecten magellanicus*) de la zone de pêche du pétoncle 29 à l'ouest de la longitude 65° 30' O

Le 30 avril 2008

Institut océanographique de Bedford
Dartmouth (Nouvelle-Écosse)

Mark Showell
Président de la réunion

Institut océanographique de Bedford
1 Challenger Drive, C. P. 1006
Dartmouth (Nouvelle-Écosse)
B2Y 4A2

janvier 2009

ISSN 1701-1272 (Printed / Imprimé)

Published and available free from:
Une publication gratuite de :

Fisheries and Oceans Canada / Pêches et Océans Canada
Canadian Science Advisory Secretariat / Secrétariat canadien de consultation scientifique
200, rue Kent Street
Ottawa, Ontario
K1A 0E6

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

CSAS@DFO-MPO.GC.CA

Printed on recycled paper.
Imprimé sur papier recyclé.

Correct citation for this publication:
On doit citer cette publication comme suit :

DFO. 2009. Proceedings of the Maritimes Region Science Advisory Process on the Assessment of Scallops (*Placopecten magellanicus*) in Scallop Fishing Area (SFA) 29 West of Longitude 65°30'W; 30 April 2008. DFO Can. Sci. Advis. Sec. Proceed. Ser. 2008/028.

TABLE OF CONTENTS

SUMMARY

A Maritimes Region Science Advisory Process (SAP) was held 30 April 2008 at the Bedford Institute of Oceanography, Dartmouth, Nova Scotia, to assess the status of scallops (*Placopecten magellanicus*) in Scallop Fishing Area (SFA) 29 west of longitude 65°30'W. Participation in this meeting included Fisheries and Oceans Canada (DFO), non-DFO scientists, Nova Scotia Department of Fisheries and Aquaculture, New Brunswick Department of Fisheries, fisheries representatives, and non-governmental organizations. The results of this meeting are expected to inform decisions related to the management of this scallop resource.

SOMMAIRE

Une réunion a eu lieu le 30 avril 2008, dans le cadre du Processus consultatif scientifique de la Région des Maritimes, à l'Institut océanographique de Bedford, situé à Dartmouth, en Nouvelle-Écosse. Elle avait pour but d'évaluer l'état du stock de pétoncle géant (*Placopecten magellanicus*) de la zone de pêche du pétoncle (ZPP) 29 à l'ouest de la longitude 65° 30' O. Participaient à cette réunion des représentants de Pêches et Océans Canada, des scientifiques de l'extérieur du MPO, ainsi que des représentants du ministère des Pêches et de l'Aquaculture de la Nouvelle-Écosse, du ministère des Pêches du Nouveau-Brunswick, de l'industrie de la pêche et d'organisations non gouvernementales. Les résultats de la réunion devraient pouvoir éclairer les décisions au sujet de la gestion de cette ressource en pétoncles.

INTRODUCTION

The meeting was convened on 30 April 2008 at 9:15 AM. After welcoming participants (Appendix 1) and doing a round of introductions, the Chair of the meeting, M. Showell, provided a brief introduction to the meeting. The Chair noted that this was first and foremost a science peer-review meeting, which means that the first responsibility of participants was to provide an objective review of the information that would be presented by the Population Ecology Division (PED) of the Department of Fisheries and Oceans (DFO) assessment team which had been responsible for the work. To assist in this review, 2 formal reviewers had been invited to attend the meeting: Drs. K. Trzcinski and I. Jonsen, both of PED. In addition, the Chair encouraged other DFO Science staff to provide a critical review of the information presented. The Chair noted that there were a number of other invited participants with expertise and knowledge about scallops and scallop fishery, and active participation in the discussion was encouraged. Secondly, the Chair noted that this was a DFO science advisory meeting, and the final product would be a Science Advisory Report (SAR) representing DFO Science Branch advice to the Fisheries and Aquaculture Management (FAM) Branch.

The Terms of Reference for the meeting were reviewed (Appendix 2), including the objectives of this meeting, which were to:

1. Assess the status of SFA 29 west of 65^{o}30' scallop stocks by subarea as of the end of 2007.
2. Evaluate bycatch of lobster and other non-scallop species during the 2007 fishery.
3. Evaluate the consequences of different harvest levels by subarea during the 2008 fishery of stock abundance and exploitation rates.

To address these objectives, a working paper was prepared, with the intention to proceed to a research document, once accepted. This Proceedings report is the record of the discussion. A Science Advisory Report (SAR)[1] was also produced out of this meeting.

The Agenda (Appendix 3) was reviewed, with no further additions or corrections.

[1] DFO. 2008. Assessment of Scallops (*Placopecten magellanicus*) in Scallop Fishing Area (SFA) 29 West of Longitude of 65º30'W. DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2008/039.

REVIEW OF THE STATUS OF SFA 29 SCALLOPS

Working Paper: Scallop Fishing Area 29: Stock Status and Update for 2008. CSA Working Paper 2008/09.
Presenter: S. Smith
Rapporteurs: C. Frail and M. Lundy

Presentation Highlights:

A total of 246 t of scallop meats were landed in SFA 29 against a Total Allowable Catch (TAC) of 250 t in 2007. The quotas for subareas C and D were exceeded, while landings did not reach the TAC in subareas A and B. Commercial catch rates and survey indices for commercial size scallops (shell heights ≥100 mm) indicate little change in stock status in 2007 compared to 2006. Catches of scallops in the 2007 survey with shell heights <50 mm were above average throughout the SFA 29 area, with the higher densities in the till/silt bottom type in subareas A and B. Abundance estimates of this size class are qualitative at best, given the selectivity of the survey gear, and the actual strength of these year-classes (2005 and 2006) will need to be confirmed by the 2008 survey. Analysis of daily catch rate data using a depletion model indicated that the 2007 catch levels of 12 t for Subarea A resulted in a median exploitation rate of 0.54. This high rate may be more indicative of local conditions than the whole subarea, as fishing was limited to just a few locations in Subarea A. The median exploitation rates for the other subareas were 0.21 for C, 0.16 for Subarea D and 0.13 for Subarea B. The balance between biomass gains through recruitment and growth and losses due to mortality, are not known for the SFA 29 area. Keeping exploitation in 2008 at levels in the range of the expected growth in biomass in subareas B, C and D should result in small or negligible declines in population biomass, assuming minimal recruitment occurs. That is, catches for 2008 would be in the order of 65, 22, and 61 t in subareas B, C and D, respectively. Applying the same rationale to Subarea A would result in a recommended catch of less than 1 t in Subarea A. Given that the highest densities of the 2005 and 2006 year-class were observed in Subarea A, the fishery should be limited there to improve the survival of these young scallops. Observer coverage of the scallop fishery in SFA 29 was low in 2007 due to priorities being given to the coverage of other fisheries at the same time and no coverage of the East of Baccaro fleet due to contractual issues. Bycatch of lobster by the SFA 29 scallop fishery in 2007 was estimated at less than 0.1% of the number of lobsters landed by the Lobster Fishing Area (LFA) 34 lobster fishery in the SFA 29 area in 2006/2007. Estimated landings of other fish and invertebrate species based upon the observer data indicated that, as seen in previous analyses, crabs, skates, flounders and sculpins made up the largest proportion of the bycatch species.

Questions and Comments:

General

Both reviewers were complimentary to the assessment team regarding the obvious amount of work that had gone into preparation of the assessment and quality of the presentation. The level of detail included in the Working Paper was impressive, and above the norm for most assessments.

Commercial Fishery

The commercial fishery is conducted in 5 subareas within SFA 29 (A to E). All subareas but D opened for the 2007 season on June 11, with Subarea D opening June 13. Subareas D and C closed on June 22 and July 10, respectively, with the landings exceeding the TAC in both cases. Subareas A and B closed on July 21, with the TAC not caught in either area.

The management plan for this fishery sets a 100 mm minimum shell height for retained scallops; scallops with a shell height >100 mm are considered commercial size and those 90–100 mm are considered recruits for the following year.

It was noted that there is commercial catch rate information in Table 3 for months when the fishery was closed (for example, East of Baccaro in August). Investigation revealed this was due to an incorrect assignment of fishing area.

Catch rates have declined since 2001, and are now at their lowest, or near lowest levels. It was noted that while catch rates had declined over the time series, they had remained relatively stable since 2005 or 2006.

The comment was made that based on Figures 3 and 4, daily catch rates for the 2007 fishery did not appear to be declining in some subareas (Subarea B) over the season. However, these figures were tabled as an exercise to illustrate the time when the fishery would have closed if a 20% decline in catch rate was used as a reference point for an in-season type of management.

Daily mean catch rate data for the 2007 season were analyzed using a Leslie depletion model, assuming a closed population, that is, no recruitment, minimal natural mortality, minimal growth and constant catchability over the season. This approach was seen to have merit but the analysis did not use a DeLury log model, and the rationale was not clear. At this point in time, it was thought appropriate to keep with a simple approach, and the Leslie method was the only one considered.

The exploitation rate from the analysis is considered conservative because the depletion model is based only on areas that can be fished.

It was pointed out that the analysis only included a single year's data, and that it would be more useful to include information from all available years and to look for changes in catchability over time. While problems with landings data from past years have, to this point, prevented their inclusion in the analysis, these issues are being addressed.

Discussion focused on the exploitation rates estimated from the Leslie depletion analysis. Using the landings data presented in the working paper seemed to produce slightly different exploitation rates than those reported. However, the analysis was based on the portion of the landings data for which corresponding catch rates were available, and as result some differences are to be expected.

Questions were raised about possible differences in fishing power between the Full Bay and East of Baccaro fleets. While the gear used by each is similar, the method of deployment differs, as the Full Bay vessels tow from the starboard side while the East of Baccoro vessels use a stern mounted A-frame. These differences were though to be relatively insignificant. Catchability by fleet had been considered in previous versions of the analysis, but no differences were found; a table with the results of this analysis was added to the Research Document.

It was suggested that including a table with the priors used in the model would be useful, as would adding additional information to Table 4 to show the percent of the variance explained by the model. These can be included in the final Research Document.

Research Survey

Annual surveys in SFA 29 have been conducted since 2001, when the current fishery started. The survey design has changed over time, from a simple random design in 2001, stratified (using subareas A–E) random design from 2002–2004 and finally stratified based on surficial bottom type since 2005.

Several survey vessels have been used over the time series. Comparative fishing experiments have been conducted in the past, but operational problems during the experiments confounded the results. There was no comparative fishing work in 2007. Potential differences in catchability between vessels are assumed to be small.

A new, more detailed bottom type map series is now available, which will permit more refined classification of the various substrates. The question was posed as to how the new bottom type map might influence survey analysis and stock status. The new interpretation of surficial geology appears to correspond better with scallop catches rates than the previous version, and should reduce variance and increase the precision of the abundance estimates. In future, the survey time series should be recalculated using the new maps.

Industry expressed interest in these new maps and inquired if copies could be made available. This information is not available immediately as precise details on distribution have yet to be determined.

Clappers (articulated scallop shells indicating recent mortality) were notable in the 2006 survey, but not abundant in 2007.

A large number of small scallops (<50 mm) were caught in the survey in subareas A, B and D, potentially indicating a strong year-class, which may recruit to the fishery in 4 to 6 years. Similar large numbers of this size class were reported this year in surveys on Browns Bank, the Brier/Lurcher area (Scallop Production Area 3) and, to some extent, on German Bank.

In general, the research survey showed little correspondence between the abundance of recruits (<100 mm) and subsequent abundance of commercial sizes, with periods of high abundance apparently not supported by previous high abundance of recruiting year-classes. This is of concern, as it is possible the survey is not effective in estimating abundance, and precludes fitting population models to the survey data. The abundance of the most recent cohort should be monitored closely, to see if it tracks through time.

A mixed effect model was used with a von Bertalanffy growth curve to estimate the effect of bottom type on growth using 2006 and 2007 data separately; and this methodology was judged to be the best approach. Bottom type was found to have a significant effect on asymptotic meat weight. Given the patchiness of the scallop distribution and differences in growth rate between areas, it was suggested that fitting a spatial covariance parameter would improve the model.

It was noted that the new surficial geology classifications would influence the growth analysis in a manner similar to survey abundance estimates. Growth data will be re-analyzed using the new surficial geology interpretation for next year's assessment.

The question of how warmer water might affect growth rates was raised. Ocean dynamics are known to be complicated, and depth and tidal effect are also important. Individual effects may be difficult to determine, but the overall influence on productivity can be seen.

The timing of the research vessel survey was questioned, as October corresponds to a period where lobsters are molting and vulnerable to damage. Approximately 100 lobsters are caught each year in the survey and most are soft. It is possible that more lobsters are being damaged, but not caught - more information on the encounter rate would be useful. Underwater camera information indicates that either very few lobsters are seen (subareas C and D), or that they are in locations that are not available to the survey gear (Subarea B). The camera data was supported bycatches seen in the survey and observer data from commercial trips. Work on details of molt timing, such as examining blood proteins, has been conducted for two years. However, molting is driven by changes in water temperature, and inter-annual variation may make it difficult to time the scallop survey to minimize lobster damage.

Fishery Bycatch

Information on lobster bycatch is available from both the scallop research survey and from observer records. In the scallop survey, lobster catch rates were highest in Subarea B at 3 lobsters/tow. In subareas A, C and D, the catch rate was generally less than 1 lobster/tow. On observed trips, a similar pattern was seen, with most lobsters caught in Subarea B.

Highest lobster bycatches are seen in Subarea B, and a closed area had been implemented in the past for this reason. In terms of possible strategies for the deployment of observers, if lobster bycatch is the most important issue, vessels fishing in Subarea B should be targeted.

It was noted that the lobster bycatch was a very small proportion (<0.1%) of the lobsters landed by the Lobster Fishing Area (LFA) 34 fishery in the SFA 29 area, and that the majority of the lobsters were returned to the water alive and uninjured. Lobster landings in SFA 29 have declined less than adjacent areas and LFA 34 as a whole, suggesting the influence of this scallop fishery on the lobster population is small.

Several general points were raised regarding observer coverage. Coverage levels were lower in 2007 compared to previous years, and this had an impact on estimation of bycatches and discards. Enhanced observer coverage is likely in 2008, as DFO is funding additional observer deployments to increase information on bycatches, particularly that of SARA (*Species at Risk Act*) species.

Industry was under the impression that observers deployed to other scallop fisheries were using different protocols for the collection of bycatch information. This was clarified – observers record catch estimates of all species in the catch for all fisheries. Industry also noted differences in observer coverage levels between the Area 29 scallop fleet and that of the offshore scallop. The Industry position is that these inequities should be documented, and DFO should implement a policy that requires similar fleets to be covered at similar levels.

Bycatch information on a number of other species was presented. It was noted that in many cases, the catch weights would be overestimates as the observers generally record a minimum weight of 1 kg for a given species. Regardless, the inclusion of this information was seen as an important step in quantifying incidental mortality. The degree of impact the fishery has on the ecosystem is dependent on the bottom type. The delineation of high risk bottom types and possible ecosystem damage would be advantageous.

Stock Status and Advice

The population biomass of commercial size scallops is not expected to increase dramatically in the next few years. However, based on available information, keeping exploitation in 2008 at levels close to the expected growth in biomass, while assuming minimal recruitment should result in small or negligible declines in population biomass.

It was noted that given the seven year history and the fact there are no reference points established, the current precautionary harvest strategy based on production is appropriate until more information is gathered and recruitment is confirmed.

Industry questioned why the approach to the assessment of resource status in SFA 29 differed from that used in the Bay of Fundy, where an exploitation rate upper limit of 0.2 was used. Proposed catches from the current analysis are considerably lower than previous years, were seen as too conservative and would likely present a challenge to the livelihood of the fishermen. It was thought that the exploitation rate limit used in the adjacent Bay of Fundy scallop assessment would produce higher levels of catch. In the Bay of Fundy, the surveys successfully track recruitment and year-classes, allowing for the application of population models to evaluate exploitation rates and future catches. The difficulty in tracking year-classes in SFA 29 limits our ability to evaluate future catches. It was noted that while the advice on catch levels was from the analyses presented at this meeting, the final TAC's will be determined by FAM through the advisory process. A request was made for a range of TAC's and associated biomass consequences to be included in the final advice of catches (Table 15). A range of catches can be provided, but there is no reference point upon which to base a risk analysis. The effect of different catches in this case can be seen by subtracting the catch from the population biomass.

REVIEW OF SCIENCE ADVISORY REPORT

Last bullet – change "Of this bycatch, approximately 20% of the lobsters were dead or injured" to "A majority of the lobsters caught in the scallop fishery are released back into the water alive and uninjured."

In 'Lobster Bycatch' section, refer to estimate of total lobster numbers caught only, remove estimated number injured or dead. For observer data on lobster condition, refer to total numbers, not percentages.

In 'Other Considerations' section, remove first paragraph on lobsters – repetitive.

Various minor editorial changes.

CONCLUSIONS AND NEXT STEPS

Presenters were thanked for their excellent presentations and for all the hard work that went into this assessment. Reviewers were thanked for the helpful comments and suggestions. Participants were thanked for their willingness to engage in the discussion.

An editorial meeting to review and finalize the Science Advisory Report was held on 15 May 2008, and the Proceedings of this meeting (this document) will be distributed to participants once it has been finalized.

APPENDICES

Appendix 1. List of Participants

Assessment of SFA 29 West of 65º30' Scallop
Maritimes Region Science Regional Advisory Process

Ron Trites Boardroom
Bedford Institute of Oceanography
Dartmouth, Nova Scotia

30 April 2008

ATTENDEES

Name	Affiliation
Amero, Keith	Full Bay Scallop Association (FBSA)
Bertram, Doug	Full Bay Scallop Association (FBSA)
Butler, Maureen	DFO Maritimes / FAM
Claytor, Ross	DFO Maritimes / PED
Cronk, Ron	NB Dept. of Fisheries
Frail, Cheryl	DFO Maritimes / PED
Fry, Joy	Atlantic Herring Co-op/ Full Bay Scallop Association
Fuller, Susanna	Ecology Action Centre (EAC)
Giroux, Brian	Scotia-Fundy Mobile Gear Association/ East of Baccaro scallop license holders
Greening, Linde	NS Fisheries and Aquaculture
Hazelton, Reg	Full Bay Scallop Association (FBSA) / O'Neil Fisheries
Hazelton, Vance	Full Bay Scallop Association (FBSA)
Hubley, Brad	DFO Maritimes / PED
Hurley, Peter	DFO Maritimes / PED
Jonsen, Ian	DFO Maritimes / PED
Lundy, Mark	DFO Maritimes / PED
Newell, Michael	LFA 34
Nickerson, Bernie	SFA 29 - Yarmouth/Digby
Pezzack, Doug	DFO Maritimes / PED
Risser, Winifred (Junior)	SWNS/ East of Baccaro scallop license holders
Robicheau, Rod	Atlantic Herring Co-op/ Full Bay Scallop Association
Rowe, Sherrylynn	DFO Maritimes / PED
Showell, Mark	DFO Maritimes / CSA
Smith, Stephen	DFO Maritimes / PED
Spinney, Ashton	LFA 34
Stewart, Dick	Atlantic Herring Co-op/ Full Bay Scallop Association
Sweeney, Anne	DFO Maritimes / SWNS
Trzcinski, Kurtis	DFO Maritimes / PED
Wadman, Glenn	Full Bay Scallop Association (FBSA)

Appendix 2. Terms of Reference

Assessment of SFA 29 West of 65º30' Scallop
Maritimes Region Science Regional Advisory Process

30 April 2008
Ron Trites Boardroom

TERMS OF REFERENCE

Context

In support of the fishery for SFA 29 (west of 65º30') scallop DFO Maritimes Fisheries and Aquaculture Management Branch has asked Science Branch for an assessment of resource status and the consequences of various harvest levels for the coming fishing season. The current meeting is a scientific review of the assessment and projections undertaken in support of the 2008 fishery.

Objectives

- Assess the status of SFA 29 west of 65º30' scallop stocks by subarea as of the end of 2007.
- Evaluate bycatch of lobster and other non-scallop species during the 2007 fishery.
- Evaluate the consequences of different harvest levels by subarea during the 2008 fishery on stock abundance and exploitation rate.

Outputs

CSAS Science Advisory Report
CSAS Proceedings
CSAS Research Document

Participation

DFO Science
DFO Fisheries & Aquaculture Management
Aboriginal communities / organizations
Provincial (NS and NB) governments
Industry

Appendix 3. Agenda

Assessment of SFA 29 West of 65°30' Scallop
Maritimes Region Science Regional Advisory Process

Ron Trites Boardroom
30 April 2008

DRAFT AGENDA

9:00 - 9:10	Introduction
9:10 - 10:00	Presentation of SFA 29 analyses
10:00-10:30	Break
10:30-12:00	Review of analyses
12:00-13:30	Lunch
13:30-16:00	Review of SAR
16:00	Adjournment