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Proceedings of the Regional Peer Review of the Assessment of American Lobster (*Homarus americanus*) in Newfoundland

**October 16-17, 2019
St. John's NL**

**Chairperson: R. Collins
Editor: B. Rogers**

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Fisheries and Oceans Canada
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Foreword

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

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SUMMARY

A Regional Peer Review Process for the Assessment of American Lobster (*Homarus americanus*) in Newfoundland was held October 16, 2019 in St. John's, Newfoundland and Labrador (NL). The purpose of the meeting was to assess the status of the American Lobster resource in four regions: the Northeast Region (Lobster Fishing Areas [LFAs] 3–6), the Avalon Region (LFAs 7–10), the South Coast Region (LFAs 11–12), and the West Coast Region (LFAs 13–14) and provide data to be used in the updated Integrated Fisheries Management Plan (IFMP).

Participation included Fisheries and Oceans Canada (DFO) Science, Ecosystems Management, and Resource Management Branches; fishing industry; academia; and the Office of the Auditor General of Canada.

Detailed rapporteur's notes of the discussion that followed each presentation were produced. This Proceedings Report includes abstracts and summaries of meeting presentations, as well as a list of research recommendations. The meeting's Terms of Reference, agenda, and list of participants are appended.

INTRODUCTION

A Regional Peer Review Process for the Assessment of American Lobster (*Homarus americanus*) in Newfoundland was held October 16, 2019 in St. John's, NL. The purpose of the meeting was to assess the status of the American Lobster resource in four Lobster Fishing Areas (LFAs): the Northeast Region (LFAs 3–6), the Avalon Region (LFAs 7–10), the South Coast Region (LFAs 11–12), and the West Coast Region (LFAs 13–14) and provide data to be used in the updated Integrated Fisheries management Plan (IFMP).

Participation included DFO Science, Ecosystems Management, and Resource Management Branches, fishing industry, academia, and the Office of the Auditor General of Canada.

This Proceedings Report includes abstracts of presentations and summaries of meeting discussions. Additional information can be found in the Science Advisory Report (SAR) or from references cited therein.

PRESENTATIONS

OVERVIEW OF RECENT TRENDS IN PHYSICAL OCEANOGRAPHIC CONDITIONS ON THE NEWFOUNDLAND SHELF

Presenter: F. Cyr

Abstract

We present on the physical oceanographic conditions in the Northwest Atlantic for the four regions. 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 has been predominantly positive, causing colder than normal air temperature above the Northwest Atlantic in winter. This was especially evident in 2015. The long historical time series at Station 27 (since 1948) confirms the influence of NAO on 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 for all four assessment regions (Northeast Coast, Avalon, South Coast and West Coast). These areas exhibited 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). Only the West Coast and the South Coast have sustained SST above 12°C on average during the summer (June-Sept.), while the bottom temperatures in the Northeast and Avalon regions have gradually cooled after their peak in 2011–12. The bottom temperature on the South and West Coast regions is still high, with 2018 being close to 1.5 standard deviations above average. Climate projections from [Canadian scientists](#) project that summer temperatures in Atlantic Canada will continue to increase over the 21st century.

Discussion

A participant asked whether the temperature threshold calculated from the offshore Station 27 was truly reflective of the temperature threshold experienced by lobster, due to the spatial discrepancies between Station 27 and lobster habitat. The presenter clarified that they used satellite SST data from within a fixed area for each of the four lobster regions. It was further clarified that the tool used to collect this data is very coarse and may not represent actual lobster habitat. Instead, it may represent the overall thermal habitat in the surrounding waters

and should be utilized for between region comparisons, not necessarily finer scale habitat studies. A participant noted a recent study published on Atlantic Cod concurred with the results presented. Another participant noted that the National Oceanic and Atmospheric Administration has another tool which does work on a finer scale than the one presented here, and may be useful for future studies.

A participant asked if the current NAO was representative of historical NAO values, and whether the NL Shelf is affected in the same way it was historically. Previous studies of the Cold Intermediate Layer (CIL) suggest a very similar environment to that of the 1990s. Changes in SST are more reflective of warmer summers and do not reach deep enough to affect the CIL. The effects of the NAO are likely reduced compared to historical records due to changes in global temperatures. These changes may require a reinterpretation of NAO results in future assessments.

HABITAT ASSOCIATIONS OF JUVENILE AMERICAN LOBSTER IN THREE NEARSHORE AREAS OF NEWFOUNDLAND

D. Lancaster, R. Gregory, P. Sargent, and K. Matheson.

Presenter: D. Lancaster

Abstract

American lobster (*Homarus americanus*) is a commercially important species along the east coast of North America. Juvenile lobster recruitment has been studied extensively in the south of their range but attempts to investigate recruitment, settlement, and habitat associations of juvenile lobster <40 mm carapace length (CL) along the Newfoundland coast have been largely unsuccessful. We investigated juvenile lobster density, habitat, and depth associations in three regions of Newfoundland using 18 scuba surveys (8 dives Port Saunders 2017, 7 dives Placentia Bay 2018, and 3 dives Fortune Bay 2018) over 9,138 m² of seabed within 200 meters of shore, from September 28 to October 2, 2017 and September 30 to October 4, 2018. In Placentia Bay, lobster densities of all size groups was low (mean 0.01 m⁻²) and no juvenile lobsters were observed. Port Saunders and Fortune Bay had relatively higher lobster density (0.09 and 0.40 m⁻², respectively); >65% were juveniles. We assessed depth distribution of lobster in Fortune Bay. All juvenile lobster were associated with shallow (<6 m) habitat and showed no overlap with commercially-sized adult lobster (≥82.5 mm CL), which we observed entirely at greater depths (to 17 m). Our survey sites were dominated by cobble and pebble habitat with a mix of kelp, eelgrass, and unvegetated substrates. We found no significant habitat specific associations in any region. On the contrary, our results showed a distribution pattern in association with the availability of substrate types.

Discussion

A participant asked if these habitat associations were confirmed in the literature. The presenter clarified that there is not much literature surrounding juvenile habitat for lobster in Newfoundland, with most information coming from Nova Scotia and Maine. These studies suggested that juveniles prefer cobble habitat. The presenter expressed her surprise that juvenile lobsters in Newfoundland were found in relatively high densities on multiple substrate types.

A participant asked at what time of year this survey takes place. The presenter clarified that it takes place in late September and early October. It was asked whether temperature data were collected during this survey. Temperature was collected from dive logs and showed consistency between years, with the average being about 11°C.

A participant asked if DFO was attempting to create a longer time series of juvenile lobster densities using this survey. To the presenter's knowledge, no plans were in place to create a time series from this survey. It was asked whether the same observers were used in both years of this survey. The presenter noted that some observers were the same and others were not, but the methodology was the same between years and observers.

A participant asked if this survey was a true census or if some lobster may have been missed. It was clarified that this was not a census and some lobster were inevitably missed through tradeoffs between survey search time and ground covered, in addition to the effect of habitat on visual detectability. Small lobster were easily missed when covering larger areas and would require thorough observation in each area to ensure a true census. It was also noted that this survey was meant to be preliminary, with observers learning throughout the survey. If the survey was to continue, a change in methodology would likely be employed to fully account for missed lobsters.

A participant noted that the Placentia Bay site had little to no kelp or eel grass within it and asked whether this area contained similar amounts of the other habitat types as other study areas. The presenter noted that this site did contain similar amounts of the other habitat types. The participant also asked if the same methodology used in this survey was used in other surveys in Maine and Nova Scotia. The presenter clarified that other studies did not use the same methodology, which may influence comparison of the results. The habitat associations observed in other areas are also likely present in Newfoundland, but finer scale investigation is required. The density of lobsters may also impact the association of juvenile lobster to certain habitats. Newfoundland has a lower density of lobster compared to Maine or Nova Scotia, but warming water temperatures in the region may influence lobster density, and therefore habitat associations, in the future. There is some evidence of this in other areas.

A participant asked which literature was being used to classify lobster life stages. The presenter clarified that they used Wahle and Steneck (1991) to classify lobster life stages. It was noted that other classification keys could be used, though they provide slightly different results.

AN ASSESSMENT OF AMERICAN LOBSTER (*HOMARUS AMERICANUS*) IN NEWFOUNDLAND

E. Coughlan, D. Mallowney, and K. Baker.

Presenter: E. Coughlan

Abstract

The American Lobster (*Homarus americanus*) is distributed near shore around the island of Newfoundland and along the Strait of Belle Isle portion of the Labrador coast. Major life history events (i.e., molting, mating, egg extrusion, and hatching) generally take place during mid-July to mid-September, following the fishing season.

The fishery is localized and prosecuted from small open boats during an 8–10 week spring fishing season. Traps are set close to shore, at depths generally less than 20 m. Fishing effort is controlled through restrictive licensing and daily trap limits. Regulations prohibit the harvest of undersized (<82.5 mm CL) and ovigerous (egg-bearing) lobster. In addition, there is a voluntary practice called v-notching, which involves cutting a shallow mark in the tail fan of an ovigerous female. The mark is retained for 2–3 molts and notched females cannot be retained in the fishery. The practice thus serves to protect proven spawners even when they are not brooding eggs externally. The number of licenses is currently around 2,300 and trap limits range from 100 to 300 depending on the Lobster Fishing Area (LFA).

This stock was last assessed in 2016 and is currently assessed every three years. The present assessment of this stock is requested by Resource Management, DFO, to provide current information on the status of the resource and data that will be used in the updated IFMP. The LFAs were assessed based on four regions: Northeast (LFAs 3–6), Avalon (LFAs 7–10), South Coast (LFAs 11–12), and West Coast (LFAs 13–14). The key indicators for the assessment are reported landings, mean catch per unit effort (CPUE), and relative survival index.

Reported landings in 2019 were at their highest level in a century, with total reported landings of 4,400 t. This reflects increasing trends in the South and West Coast Regions, while reported landings in the Northeast and Avalon Regions remain near historic lows. Since 2004, the CPUE index (unstandardized) has steadily increased to recent highs in the South and West Coast Regions, while it has remained unchanged at low levels in the Northeast and Avalon Regions. Most size frequency distributions clearly show a sharp drop at legal size and few lobsters surviving to larger sizes, suggesting higher fishing pressure in the South and West Coast Regions, relative to the Northeast and Avalon Regions. V-notching was shown to have a high level of efficacy at protecting egg-bearing females from fishing mortality. In all four regions, the majority of large surviving lobster in the population were v-notched females.

Discussion

Participant from LFA 11 noted that, from 2016–19, data collected from the first day on the water of each season showed an increasing trend in landings. It was also suggested that logbook data reported to DFO in this area was accurate due to the lack of other commercial species in the area.

A participant inquired if there are more lobster harvesters in this area, or are they fishing harder than in previous years. Another participant noted that the number of harvesters has likely decreased, but that there has been a shift in harvesting patterns. Historically, harvesters would stop harvesting lobster when the cod fishery opened, and focus would primarily shift to cod, but this is no longer the case.

A participant asked if catchability changes with size and sex; for example, are males more catchable than females or, are larger lobster more catchable than smaller lobsters? The presenter was unsure what the current literature says about differing catchability in lobster.

A participant enquired as to whether some anomalies seen in the length frequency data were a result of rounding to the nearest 2 cm bin in the measurement data. Another participant noted that they would need to dig into the data and question individual observers as to why this data shows the observed pattern.

A participant noted that, in a fishery that targets males and potentially repeatedly counts large females, the sex ratios would be skewed towards females at larger sizes. It is unclear why sex ratios may be skewed for smaller lobsters, as this stands contrary to the current understanding of catchability of lobsters. It was further noted that this pattern is observed in some areas of Nova Scotia. Temperature and seasonality were also suggested as potential drivers of skewed sex ratios on an LFA scale. A participant noted that male and female catchability was similar, with males becoming more catchable as they became larger.

The presenter enquired whether there have been observed decreases in the size of ovigerous lobsters on the South Coast. Participants suggested that this is being observed. A participant asked if re-notching lobster changes our interpretation of the number of notched females. It was suggested that re-notching, particularly of large lobsters, may cause a skew in the length frequency data towards large notched females due to the way in which data is pooled after it is

collected. One participant noted that if you want a lobster to live, you need to v-notch it. Further discussion on v-notching was deferred until the end of the meeting.

A participant asked if the number and location of modified traps was consistent across years and LFAs, as well as how many modified traps were deployed each year. The presenter noted that there is not a large amount of data pertaining to modified traps, suggesting few deployments. The presenter further noted that the number and location of traps were not consistent between years, but that there is only one modified trap per harvester. It was also clarified that the modified traps are deployed during the fishing season. A participant asked why the modified traps were deployed during the fishery. The presenter clarified that this data was collected as part of the commercial data sampling program. Some concerns were raised with respect to unstandardized data and the effect of commercial gear on the catchability of lobster in the modified traps. It was suggested that standardization of modified trap data should be undertaken. The presenter noted that some preliminary programs and analyses are being undertaken with respect to this.

One participant asked what was the significance of the 72–74 mm CL. The presenter was unsure of its significance and suggested it may be a holdover from previous assessments.

A participant asked why this analysis was undertaken during the commercial season. The presenter noted that the data is collected during commercial fishing activities. There were concerns that the presence of other fishing gear during the commercial season would reduce the catchability in all traps, including modified traps. It was suggested that the modified trap survey be undertaken at a different time of the year. It was also suggested that this sampling program be discussed in more detail at the end of the meeting. The presenter also noted that plans were in place to examine this data in greater detail using a host of covariates.

Exploratory Analysis Discussion

A participant noted that Delury depletions work very well if effort is constant; in fact, it assumes such. If effort is changing, Delury depletion may be inaccurate. The participant then asked, if there had been any corrections to the data to account for changing effort. It was noted that, at this point, the analysis is still in the exploratory phase and effort has not been corrected. Upon further discussion, it was determined that the effort data may be corrected as it is cumulative effort data which consists of the cumulative number of pots in 5 day increments. The observed patterns, or lack thereof, in the Delury depletion analysis may be due to reduced effort in Avalon and Northeast areas. A participant mentioned that there might also be nothing to deplete as the season generally starts strong but catches drop off quickly.

A participant asked if the purpose of this analysis is to correct for unreturned log books. It was clarified that this was the purpose of the exploratory analysis. It was then asked whether the portion of log book returns can be included to scale logbook landings. It was noted that, in theory, log book landings should be the same or higher than the official recorded landings from purchase slips, if done correctly. A participant then enquired, how do we know if this is working, or if it's merely a reflection of data coming in? The goal of this analysis is to account for incomplete logbook returns. If predicted landings look similar to reported landings then reported landings are likely accurate. Analysis suggests that the Avalon and Northeast areas have low levels of logbook returns, with bumped up logbook landings being higher than reported landings. It was suggested to remove 2013 from analysis as it's not in the Delury depletions analysis.

A participant asked about the resolution on the temperature probe data within the modified trap survey. Specifically, is it possible to link daily temperature with lobster catches? This has not been explored with this data set, but future analysis and expansion of the temperature probes survey can certainly investigate these questions.

A participant asked about the rationale for using 110 mm CL for the L_{inf} value in the Beverton-Holt mortality analysis. It was clarified that previous studies indicated that 110 mm CL was an average L_{inf} for lobster in Newfoundland. Additionally, it is suggested to use ~70% of the maximum length of a species when undertaking these analyses, which happened to coincide with ~110 mm.

A participant asked about mortality; specifically, how much of the total mortality is natural mortality and how much is fishing mortality? The ability to separate these two types of mortality is important when considering how much a population can be manipulated by harvesting. It was clarified that other areas use a natural mortality of 0.15, although the origin of the number is unknown. It was noted that the level of natural mortality is important to determine. Another participant noted that, in many jurisdictions, different indices are used to address the impact of exploitation on growth and other metrics in lobsters, rather than attempting to quantify natural and fishing mortality separately.

A participant expressed concern in regard to the assumption that all LFAs and regions have the same L_{inf} as growth difference are known to occur between regions. Further assessment of this analysis likely requires sensitivity analyses with regards to the value of L_{inf} as well as K .

A participant asked if both the K and Z values were fixed in the Beverton-Holt mortality analysis, or if they were allowed to vary between areas? It was clarified that K was fixed and implicit in this equation, and that this parameter could be expressed solely as total mortality (Z). It was further questioned, Is K the K from von Bertalanffy growth curves? If so, it's strongly related to L_{inf} , and therefore it makes sense for K to be fixed since L_{inf} is fixed. It was noted that the methods used are very sensitive to L_{inf} , but that should be of little consequence as the output is treated as a relative index, and regardless of what values are input, the trends are what should be of interest. Counter to this, it may not be appropriate to compare Z between regions knowing that growth is different between regions. It was suggested that removing the axis, or standardizing the data so as to present a mortality anomaly are possible solutions, and that the value of L_{inf} or K should not influence our interpretations of the trends.

It was suggested that this study be modified to correlate the CPUE of pre-recruit lobsters caught in modified traps to recruited lobsters the following year, within the same trap. The number of traps within a LFA may preclude some analyses of this data. A participant asked whether the presenter had tried to relate CPUE of pre-recruits to number of recruits instead of relating landings of pre-recruits to recruits. It was noted that no relationship was apparent, although this seems illogical since a relationship between pre-recruits and recruits in landings should also be apparent in CPUE. It was suggested that the modified trap survey be expanded and standardized to incorporate more traps and area as it is the only pre-recruit signal.

A participant asked what was the definition of pre-recruit length? It was clarified that pre-recruits are considered to be lobsters 74–80 mm CL. A further question about information surrounding 1-year old lobsters was available, similar to the work described by previous presenters. It was noted that the smallest settlers are likely to be unseen as they are the most shelter restricted. As well, the modified traps wouldn't catch these very small lobsters and the size groupings used (<72 mm CL) wouldn't likely show any patterns of very small lobster.

A participant asked, because this is an input control fishery, is it worthwhile attempting to quantify either removals or biomass? Will quantifying these things change how this species is managed? There were concerns that estimating total biomass may not be worth the effort. It was expressed that calculating exploitation rate via some metric or a series of metrics is important. Some jurisdictions do calculate both biomass and exploitation, but these areas have much more data. Additionally, there are signals from certain regions that changes are happening in the stock whereas other regions are showing no indications of impacted biomass

from harvesting. Since lobster is a recruitment fishery, it is important to know what is coming into the population in future years. This can be accomplished by expanding as-sea sampling and the modified trap survey and hence, more effort and money should be allocated to these programs. Additional fishery independent data sources would also help to assess this species.

A participant posed the question as to why the South and West Coast areas are doing better than other areas. They suggested that it may be driven by temperature. They noted that it generally takes 6–9 years for lobster to enter the fishery and that the current fishery is likely driven by a large recruitment event in the early 2010s, when water temperatures were higher. Additionally, sex ratios and size ratios in the South and West Coast areas suggest that exploitation in these areas may be high. It was noted that the survival index supports few survivors in a given year in the South and West Coast regions as compared to the Northeast and Avalon regions. These indications of higher exploitation are not necessarily reason for concern as other jurisdictions show much greater change in size and sex ratios and their fisheries are very productive.

It was noted that, while most of the focus and effort should be put on quantifying recruitment, any future assessments that incorporate modelling will require greater accuracy in total landings. Should more effort be made to achieve accurate landings or are trends in landings sufficient regardless of the scale? A participant enquired, If the returns on logbooks were better, would the logbook catches be used instead of the purchase slips? It was suggested to use both, as logbook data only extends back to 2010. It was noted that achieving a better grasp on the actual lobster landings is important and has been a research recommendation in past assessments.

A participant noted that normally one would estimate logbook landings against total landings to estimate logbook returns and asked if the concern in this particular case was the lack of accurate landings. The presenter clarified that the number of Fish harvesters was calculated from logbook returns and then compared against the total recorded landings. Logbook landings accounted for ~60–80% of the recorded landings, although this still didn't account for the landings not captured by purchase slips. It was suggested that a table containing the relevant logbook return information be presented in future assessments.

A participant noted that a large amount of information can be gleaned from the presented data and analyses, but it is only being touched on here. Information such as sex ratios, size histograms, and size ratios do provide an important picture of what is happening in the stock.

A participant requested further clarification on figures and slides presented on length-based survival. The goal of these figures and slides was to give a summary and “scorecard” of exploratory analyses. Three analyses were presented: estimation of length-based survival; logbook landings bumped up by return rate to estimate if reported landings are accurate; and Delury biomass estimations to see if biomass could be estimated. Using the South Coast region as an example, the estimates of survival and exploitation should equal 1, and exploitation must come from some value of landings. If survival plus exploitation equals 1, then the analysis may be accurate, but if the survival plus exploitation does not equal 1 there is a problem in the analysis. It was noted that all four regions show very different patterns. This is not unexpected as the analyses are meant to show if accurate exploitation and survival parameters are being estimated in each region. A participant pointed out that a value of 1 means that both the method and the data are good, but that those are two separate questions. Is there evidence to suggest that the method works equally well across all regions and the only difference is data quality? Evidence seems to suggest that the South and West Coast regions have accurate landings data whereas the Avalon and Northeast regions do not. Also, the South Coast region seems to have an accurate estimate of biomass based on the Delury depletion analysis, although this may be

due to lack of depletion in the other regions. Another participant suggested that it was more likely due to the amount of lobster caught, with smaller catches being easily sold locally and not to the processors.

There was discussion surrounding whether or not to include the indices generated in the exploratory analyses in the assessment of this stock. It was generally accepted that these indices and analyses warrant further work but may contribute to future assessments.

General Discussion

A participant asked about unreturned log books, and the extent of problems created by them. In past years there were many unreturned logbooks, but the number of returns has been increasing in recent years. It was suggested that harvesters who do not return logbooks not receive a license in the next year. This condition is currently on licenses, but is not widely enforced.

There were also concerns about the accuracy of logbooks, as harvesters sometimes fill logbooks long after the season ends.

A participant pointed out that different regions show different sizes when females become ovigerous (a proxy for maturity), but the minimum landing size is the same for all areas in Newfoundland. It was suggested that the minimum landing size be revisited using updated maturity studies and applied to each region separately.

A participant asked why nominal effort, number of lobster harvesters, and number of trap days were not included in the assessment presentation. It was clarified that this information was included in the scaled up logbook landings. Additionally, there was no information included on the number of traps per year. This information was also included in the logbook landings, but could be presented explicitly in future assessments. It was suggested that nominal effort be described as maximum potential effort in the future.

A participant noted that the large increases in lobster seen across multiple jurisdictions is likely due to increased survival in Stage 1-Stage 3 larvae, the stages in which the majority of recruitment mortality occurs. This survival is also tightly linked to local abundance of *Calanus finmarchicus*. It was suggested that more studies and assessment of plankton biomass be undertaken in the future to better understand lobster recruitment dynamics.

A participant asked about the reason for higher landings in South and West Coast regions in recent years. It seems likely that increased water temperatures are creating more favorable environmental conditions for lobster in many jurisdictions, including Newfoundland.

RESEARCH RECOMMENDATIONS

The following research recommendations were discussed and developed:

1. Test sensitivity to different L_{inf} values in the Beverton-Holt mortality analysis.
2. Expand and standardize the modified pre-recruit trap survey.
3. Get a better grasp on the magnitude of local sales, where purchase slips are not submitted (carry over from last Regional Peer Review).
4. Update metrics of maturity for each of the four regions.
5. Expand dive surveys as a way of obtaining fishery-independent data.
6. Further investigate abundance and biomass of plankton in inshore areas and relate that to lobster recruitment.

-
7. Explore ways to standardize CPUE indices (e.g., temperature, soak times).

REFERENCES CITED

Wahle, R.A., and Steneck, R.S. 1991. Recruitment habitats and nursery grounds of the American lobster *Homarus americanus*: a demographic bottleneck? Mar. Ecol. Prog. Ser. 69: 231–243.

APPENDIX I: TERMS OF REFERENCE
Assessment of American Lobster in Newfoundland
Regional Peer Review – Newfoundland and Labrador Region

October 16, 2019
St. John's, NL

Chairperson: Roanne Collins

Context

The status of American Lobster (*Homarus americanus*) in LFAs 3-14C was last assessed in 2016 (DFO, 2016). The present assessment of these stocks was requested by Resource Management to provide current information on the status of the resource and provide data that will be used to update the Integrated Fisheries Management Plan.

Objectives

- Assessment of American Lobster in four regions: Northeast (LFA 3-6), Avalon (LFA 7-10), South Coast (LFA 11-12), and West Coast (LFA 13-14).

Expected Publications

- Science Advisory Report
- Research Document
- Proceedings

Expected Participants

- DFO - Science and Resource Management Branches
- Government of Newfoundland and Labrador - Department of Fisheries and Land Resources
- Indigenous groups
- Fishing Industry
- Academia
- Other invited experts

References

DFO. 2016. [Assessment of American Lobster in Newfoundland](#). DFO Can. Sci. Advis. Sec. Sci. Advis. Rep. 2016/052.

APPENDIX II: AGENDA

Regional Peer Review Assessment of American Lobster in NL Region

October 16, 2019, St. John's, NL

Memorial Room - Northwest Atlantic Fisheries Centre
80 East White Hills Road, St. John's

Chair: Roanne Collins

Wednesday, October 16

Time	Topic	Presenter
09:00	Opening Remarks and Introductions	Chair
-	Overview of the physical oceanographic conditions on the Newfoundland and Labrador shelves	F. Cyr
-	Habitat associations of juvenile American lobster in three nearshore areas of Newfoundland	D. Lancaster
-	Lobster Assessment: 1. Northeast (LFAs 3-6) 2. Avalon (LFAs 7-10) 3. South Coast (LFAs 11-12) 4. West Coast (LFAs 13-14)	E. Coughlan

Thursday, October 17

Time	Topic	Presenter
09:00	Reviewer Reports	A. LeBris & A. Cook
-	Conclusions and Summary Bullets	All
-	Research recommendations	All
-	Upgrading of working paper	E. Parrill
-	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 and may change.

APPENDIX III: LIST OF PARTICIPANTS

Name	Affiliation
Arnault LeBris	Marine Institute
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