Review of Compass Lexecon's Report

"Recommendations for Excessive Share Limits in the Northeast Multispecies Fishery"

July 9, 2014

Prepared by

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TOR 1: Describe the method or process used by Compass Lexecon for determining the maximum possible allowable percentage share of the market for fishery access privileges and/or quota leasing that would prevent an entity from obtaining an excessive share of access privileges allocated in the Northeast Multispecies Fishery.

TOR 2: Evaluate the strengths and weaknesses of the proposed method or process developed by Compass Lexecon (e.g. whether defining excessive shares in terms of market power is appropriate and adequate). Evaluate whether the approach outlined by Compass Lexecon is reasonable for setting excessive share limits in fisheries managed through catch shares in general. As part of the TOR, comment on any constraints that may hinder application of the proposed approach.

TOR 3: Evaluate application of the proposed methods or process to the Northeast Multispecies Fishery. Are Compass Lexecon's conclusions regarding market power in both the final product (seafood) and production (quota) market valid and based on appropriate economic principles? If there is disagreement with what Compass Lexecon recommended, clearly state that and your reason why.

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Executive summary

The report entitled, "Recommendations for Excessive-share Limits in the Northeast Multispecies Fishery," outlines a seven step process for evaluating and establishing a cap on catch shares. The recommendations rely heavily on a measure of market concentration called the Herfindahl-Hirschman Index (HHI). The premise is that more highly concentrated markets lend themselves to strategic manipulation by the largest market share participants in the market. The Horizontal Merger Guidelines of 2010 establish threshold values of the HHI with 1500 and below corresponding to an "unconcentrated market."

CL concluded that both the final product market and access privileges market do not currently exhibit strategic exercise of market power. Further they concluded that the markets will remain competitive in the future. CL recommended a 15.5% cap on Annual Catch Entitlement as a maximum holding. Their conclusions, especially with respect to future exercise of market power, do not have a sound theoretical or empirical foundation. The recommendation of 15.5% is *ad hoc*.

One solution that potentially can satisfy the goals of Amendment 18 would be to require that 10-20% of ACE be made available on an open market to facilitate price discovery and maintain access to shares for all participants.

Background

The New England Fishery Management Council (NEFMC) is preparing Amendment 18 to the Northeast Multispecies Fishery Management Plan (FMP). Amendment 18 Goals are:

1. Promote a diverse groundfish fishery, including different gear types, vessel sizes, ownership patterns, geographic locations, and levels of participation through sectors and permit banks;
2. Enhance sector management of effectively engage industry to achieve management goals and improve data quality;
3. Promote resilience and stability of fishing businesses by encouraging diversification, quota utilization and capital investment; and
4. To prevent any individual(s), corporation(s), or other entity(ies) from acquiring or controlling excessive shares of the fishery access privileges.

Under Goal 4, Amendment 18 would establish an excessive share threshold for the fishery consistent with National Standard 4 of the Magnuson Stevens Fishery Conservation and Management Act. To develop a thoughtful, theoretically sound, and implementable approach to Goal 4, the NEFMC contracted the economic consulting firm Compass Lexecon to conduct an empirical analysis to determine if excessive shares existed in the fishery today, and establish an approach to determine if share holdings were excessively concentrated in the future. Compass Lexecon (CL) completed its study and submitted its final report to the NEFMC on December 31, 2013.

At the request of the NEFMC a review panel has been convened to provide a peer review of Compass Lexecon's report (see Annex 2 for review panel TOR). The peer review panel was comprised of 3 experts provided through a contractual arrangement between NMFS Office of Science and Technology and the Center for Independent Experts (CIE) and one expert contracted by the NEFMC (see Annex 3 for panelist names and affiliations). The peer review panel was chaired by a member of the NEFMC's Science and Statistical Committee (SSC). Peer reviewers were provided with the Compass Lexecon final report, a multispecies fishery background document, the meeting announcement, and the TORs for the peer review. The review panel meeting took place in Salem, MA on June 12-13, 2014.

Description of Kruse's Role in the Review Activities

Dr. Jamie Brown Kruse was contracted by NEFMC to provide an expert review of the Compass Lexicon Report. Appendix 2 contains a copy of the contract for service which specifies services similar to those provided by the experts contracted through the Center for Independent Experts. Dr. Kruse has published research pertaining to market concentration in general and specifically related to permits (limited access privileges). In addition, she served as NOAA's Chief Economist in 2010 while on leave from East Carolina University. Her experience and research record is unique and complementary to the three experts contracted through the CIE. She reviewed all materials provided prior to the June 12-13 meeting and attended the public meeting on June 12 asking clarifying questions of representatives of Compass Lexecon, Glenn Mitchell and Steven Peterson. She attended the peer review panel meeting the following day and contributed comments to the Summary Report. Following the June 12-13 meeting in Salem, MA, she provided comments on the draft of the Summary Report and prepared an independent review of the Compass Lexecon report. The review report that responds to the terms of reference is contained in this document.

Summary of Findings for each Term of Reference

TOR 1: Describe the method or process used by Compass Lexecon for determining the maximum possible allowable percentage share of the market for fishery access privileges and/or quota leasing that would prevent an entity from obtaining an excessive share of access privileges allocated in the Northeast Multispecies Fishery.

Compass Lexecon (CL) utilized a seven step process to evaluate the potential for exercise of market power through control of excessive shares of access to the Northeast Multispecies fishery. Briefly, the steps reported by CL include:

1. Assess quota information.
   Quantitative fishery data was obtained from NMFS by permit/MRI. A variety of fishing industry stakeholders were informally interviewed to gain perspective on the industry, insight on the working of the market for groundfish, and the methods of exchange of permits and annual fishing entitlements. Transcripts of public meetings were reviewed as well as the annual sector and permit bank reports.
2. Assess competitive information.
   Since the proposed procedure to evaluate excessive shares will rely on the Herfindahl-Hirschman Index (HHI), there are two categories of markets that must be evaluated to

determine the relevant size of the market: the market for landed fish and the market for allocated access privileges.

3. Check threshold condition.
   This step amounts to checking whether the catch limit on each specie is sufficiently restrictive so as to mimic the limited quantity that a profit maximizing monopoly supplier would choose to bring to the market. In the case of a monopoly supplier, limiting supply to drive up price would yield profit well above a competitive rate of return. These so called monopoly profits are also called monopoly rent.
4. Establish concentration targets. CL determine that the concentration target that should maintain an unconcentrated ACE distribution is an HHI below 1,500 for each stock.
5. Determine share limit-market concentration relationship. Using an upper limit on HHI of 1500, CL report that share cap of 15.5% if market share is evenly distributed will maintain an HHI below the 1,500 target. If the market is characterized by a one or two large "dominant" holders with the remaining permit owners at the 1-2% level then a share cap of 25% would satisfy the "below 1500 upper limit target."
6. Identify regulatory and practical constraints.
   CL identify the current reporting methods of individual ownership of permits that does not assign percentage ownership at the individual level as a potential constraint. They conclude that utilizing permit ownership by group ID as an initial threshold condition sufficient with the proviso that participants in noncompliant trades could provide additional information at the individual level.
7. Recommend an excessive shares cap.
   CL recommend that an excessive share cap on permit owner of 15.5% of available PSC by specie.

TOR 2: Evaluate the strengths and weaknesses of the proposed method or process developed by Compass Lexecon (e.g. whether defining excessive shares in terms of market power is appropriate and adequate). Evaluate whether the approach outlined by Compass Lexecon is reasonable for setting excessive share limits in fisheries managed through catch shares in general. As part of the TOR, comment on any constraints that may hinder application of the proposed approach.

<u>Defining excessive shares in terms of market power</u>. There is a long history behind the study of firms' ability to strategically and profitably control prices within a market by limiting output. Monitoring and regulation of the exercise of market power goes back to the earliest U.S. antitrust laws that are still enforced today (Sherman Antitrust Act of 1890 and Clayton Act). There are several factors that affect a firm's ability to wield and sustain such market or monopoly power. One factor is the size of the firm or coalition of firms relative to the market. Other factors include whether there are barriers to entry in the market or excess capacity. The creation of a permit system that limits the amount and kind of fish landed creates barriers to entry at the same time that it serves the purpose of managing Northeast groundfish to prevent overfishing.

An alternative purpose for setting an excessive share limit on holdings is to support Goal 1 of Amendment 18 "Promote a diverse groundfish fishery, including different gear types, vessel sizes, ownership patterns, geographic locations, and levels of participation….." Cost efficiency may favor certain ownership patterns and vessel sizes. Further, economies of scope and scale

may lead to the expansion and acquisition of permits. If maintaining small operators is implied by the diversity goal, setting restrictive share limits may come at the expense of industry profitability.

Strengths and Weaknesses of Proposed Method.

The evaluation of the proposed process developed by CL is organized along the lines of the seven step format they adopted:

1. Assess quota information.

   Quantitative fishery data was obtained from NMFS by permit/MRI. Identifying the scope of permit control by individuals and therefore defining the unit of analysis for permits is challenging. In general, a Group ID is assigned to a unique combination or two or more individuals that hold a stake in one permit/MRI or more. Individuals can be stakeholders in several group ID's. Consequently the % share of PSC for each stock for each group ID can be calculated however, the % share for each stock for each individual cannot be derived from the data. While this is a weakness in the ability to assess ownership and control, it is a limitation due to the current reporting structure.

   CL collected qualitative data but in an unsystematic way that limited its usefulness. Approximately 50 fishing industry stakeholders were interviewed to collect qualitative information. In addition, information was solicited through survey forms and a public webinar. Invitations were distributed to more than 800 individuals by email and were virtually ignored. No mention on attempted follow up and application of Dillman's survey principles was mentioned.

   Public meeting transcripts and sector and permit bank annual reports were reviewed for additional information. No qualitative data methods such as factor analysis were applied to organize or lend statistical support to the interview and observational data.

2. Assess competitive information. Two categories of markets were of interest: the market for landed fish and the market for allocated access privileges.

   Landed fish. CL describe the market for the thirteen stocks of landed groundfish as competitive and global in scope. CL do not clearly articulate what the relevant market definition should be. "We leave open the question of determining the relevant market for the output of the fishery."(page 40) The CL determination of competitiveness is based on qualitative interviews and on low calculated species landing HHI's by group ID.

   Access Privileges: Since there is a limited number of Northeast fisheries groundfish permits, and annual catch entitlements these markets are clearly defined. The alignment of multispecies landings with a vessel's portfolio of ACE is a nontrivial management challenge. Depending on environmental conditions, biophysical processes, and timing, the prospect of landing untargeted species (bycatch) can limit a vessel's ability to pursue a target specie. With insufficient ACE to cover untargeted bycatch, target species ACE may go unfilled. This leads to the possibility that the untargeted species becomes a constraining or "choke" stock. The potential therefore does exist that control of ACE for a crucial constraining stock can also lead to broader control of a target specie. The relevant market for access privileges could be partitioned

by stock/ACE or could be studied at the permit/PSC level. The unit of ownership control could be at the individual, group ID, or sector level. Due to data availability, CL have focused on ACE holdings by sector and group ID for each specie. However, the ability to determine whether individuals are exercising market power is limited because information on permit transactions and ACE trading prices is not reliably available.

3. Check threshold condition.
   A strength of the identified threshold condition (100% utilization of ACL) is that it depends on information that is currently collected and thus measureable on an annual basis. A weakness is that this condition is based on a simplistic single product, static, deterministic model. This industry is characterized by a multiproduct production process subject to significant, market, weather, and biological uncertainty. CL report substantial underutilization of ACL. "In FY10, FY11, FY12, there were four, six and eight stocks respectively, where less than 50% of the groundfish sub-ACL was caught." (page 38) In other words, the observation that the catch limits were not constraining can be interpreted in a number of ways. One explanation is that the uncertainty associated with environmental and market conditions coupled with the potential to shut down the fishery if total ACL is met for a specie leads to underutilization of ACL. A second explanation that cannot be eliminated by the threshold condition is that there is strategic reduction in landings to reap extraordinary profit.

4. Establish concentration targets. CL have adopted an HHI of 1500 as a target concentration level. This corresponds directly with the HHI of an "unconcentrated market" according to the Horizontal Merger Guidelines (HMG) issued by the U.S. Federal Trade Commission and the U.S. Department of Justice on August 19, 2010 to replace the guidelines originally issued in 1992. In addition, the 2010 HMG also state the presumption that any merger that raises the HHI less than 100 points is unlikely to have adverse competitive effects. A strength of this concentration target is that it is unequivocal and quantifiable. A weakness is that a single measure has been adopted from the 2010 HMG without consideration of other methods outlined in the HMG.

   CL have elected to apply this target at the Group ID level on stock permits. While the analysis of the underlying stock right embodied in the permit is the proper instrument, group ID is probably less informative than currently unobservable individual market shares and transactions at the permit level. Further, as noted by the authors, the sector structure has the potential for fostering coordination. The 2010 HMG gives special attention to coordinated interaction and coordinated effects theory. The agencies note that coordinated effects can include concerns about conduct that is not otherwise condemned by the antitrust laws. At the sector level CL report HHI for ACE holdings of sectors by species that range from 817 to 2880 for 2012. This places two species (Redfish and White Hake) over the 2500 HHI target in the HMG described as "highly concentrated" markets.

5. Determine share limit-market concentration relationship. The relationship between the sum of the squared market shares of all market participants and the HMG is mathematical. If the HMG guidelines are accepted indicators of unconcentrated (HHI<1500) moderately concentrated (1500<HHI<2500), and highly concentrated (HHI>2500) markets, then the calculation of HHI/market concentration is a straight

forward process.

6. Identify regulatory and practical constraints. As pointed out by CL, the current method used to record permit ownership is a stumbling block to understanding exactly who has decision-making control over the permit(s) and how much is actually held by the decision-maker.

7. Recommend an excessive shares cap. The CL recommended share limit of 15.5% is both a strength and a weakness. Granted it provides a well-defined target (strength). However, this measure is *ad hoc* (weakness). It's relationship to theory is tenuous at best. It does not effectively "identify the conditions where entities could exert inordinate control of quota." (quoted from terms of reference)

TOR 3: Evaluate application of the proposed methods or process to the Northeast Multispecies Fishery. Are Compass Lexecon's conclusions regarding market power in both the final product (seafood) and production (quota) market valid and based on appropriate economic principles? If there is disagreement with what Compass Lexecon recommended, clearly state that and your reason why.

The proposed methods and process are quite simplistic. The theory they appeal to does not capture the multiproduct nature of the fishery harvesting process.
Product market: If the relevant final product market is in fact global in nature, the sheer number of vessels supports their conclusion that the final product market is competitive. CL do not address specialized local final product markets.
Production (quota) market: As discussed above, there are several ways to evaluate the market for fishery access privileges. The instrument that could be traded may be the permit, potential sector contribution, or the annual catch entitlement. The control/ownership entity may be defined by the individual, the group ID, or the sector. The thinnest market (most vulnerable to exercise of market power) would be at the permit level where reporting of transactions and trading prices is not standardized. The greatest potential for coordination is at the sector level. CL concluded that the sectors do not and will not exercise market power in fishery access privileges. Their conclusions were based on discussions with sector managers and others. While their conclusions may be correct, they are not scientifically supported. The qualitative data collection process and analysis was not systematic or rigorous. Of the quantitative information available, ACE holdings HHI by sector approaches highly concentrated (above 2500) for two stocks and moderately concentrated (between 1500 and 2500) for eleven stocks. CL note that sector members have independent control of the ACE holdings. However, economic theory would indicate that conditions exist where the members could find it in their best interest to coordinate their control of ACE holdings.

TOR 4: Review and comment on the data requirements necessary for applying the proposed methods or process.

The proposed method can be implemented with current information that is reported to NOAA and NEFMC. Tracking individual permits in a manner that allows a more accurate picture of concentration of control would enhance the proposed process.

TOR 5: Provide any recommendations for further improvement.

A reporting structure for both permit and ACE transactions that is open and accurate would improve the process.

A more theoretically sound approach would utilize current estimates of the industry cost structure and prices to estimate profit for different gear types and vessel sizes. This would give a more complete picture of whether a dominant position has supported successful and profitable exercise of market power.

Hold Out Market: If the purpose of Amendment 18 Goal 4 is limit the exercise of market power, then other alternatives or additions to a hard cap on shares may be considered. One way of maintaining a clear path of access to the market for all participants, is to use a "hold out" proportion of 10% to 20% of stock/ACE that is placed in an open market with full information on prices. Allowing current participants to access a portion of the ACE through a centrally-organized market can make it difficult and costly for entities to control excessive shares of fishery access privileges. Organization and oversight of the market at the NEFMC level would be one option with the revenue from the sales going back to the sectors to distribute to sector members in proportion to their PSC. The fishery-wide open market for ACE would promote price discovery by stock and help alleviate ACE/stock portfolio coordination issues for operators. With current underutilization of ACL noted by the authors, prices in the hold out market should be relatively low.

Conclusions and Recommendations

CL have articulated a process for determining the maximum possible allowable percentage share of the market for fishery access privileges. The process relies on the Herfindahl-Hirschman Index that is a traditional and accepted measure of market concentration updated in the 2010 Horizontal Merger Guidelines. Using HHI as a target, CL back out a maximum allowable share of 15.5% that roughly aligns with an HHI of a little more than 1500 if market shares are about equal. Although fairly simple to implement, the determination that market shares above 15.5% create conditions that foster inordinate control are not well supported by theory. A much more complete theory that reflects the biological and product market uncertainties and the multiproduct nature of the production process would be necessary to determine a theoretically sound approach.

I recommend direct calculation of the HHI to identify potentially excessive concentration. A target of 1500 by groupID and ACE/stock is a reasonable maximum target. This is the concentration threshold utilized by CL in step 4 of their process.

As an alternate to hard caps, the NEFMC may want to consider an open "hold out" market as described in the previous section for a proportion of ACE. A hold out proportion was adopted in the market for SO_2 emissions permits in the implementation of the Clean Air Act Amendments of 1990. Forcing a portion of total ACE onto a market limits the ability of permit holders or sectors to restrict access to ACE for a particular stock. Also the price and volume information contained in a "hold out" market is valuable to individual permit owners, policy makers and the NEFMC.

Critique of the NMFS Review process including suggestions for improvements of both process and products.

The process that I participated in gave sufficient time to evaluate and contact with the authors to understand their recommendations better. Interaction with other learned professionals, NMFS Northeast Science Center, and members of the Northeast Fishery Council also led to a broader understanding of the industry and the challenges of implementing an excessive share cap. I have no substantive suggestions for improving the review process—I believe it worked very well.

Appendix 1: Bibliography of materials provided for review

Mitchell, Glenn and Steven Peterson, "Recommendations for Excessive-Share Limits in Northeast Multispecies Fishery," December 31, 2013.

National Marine Fisheries Service, "The Design and Use of Limited Access Privilege Programs," Lee G. Anderson and Mark C. Holliday, eds. U. S. Department of Commerce, National Oceanic and Atmospheric Administration, NOAA Technical Memorandum NMFS-F/SPO-86, November 2007.

New England Fishery Management Council in cooperation with National Marine Fisheries Service, "Overview of the Northeast Multispecies Fishery Management Plan," May 21, 2014.

New England Fishery Management Council, "Meeting Notice Peer Review of Compass Lexicon Final Report, June 12 and 13, 2014, Hawthorne Hotel, Salem, MA," notice date May 22, 2014.

New England Fishery Management Council, Contract for Service, "Peer Review of Compass Lexecon's Report titled, Recommendations for Excessive Share Limits in the Northeast Multispecies Fishery," signed and dated May 20, 2014.

Statement of Work, External Independent Peer Review by Center for Independent Experts, "Evaluation of the study: Recommendations for Excessive Share Limits in the Northeast Multispecies Fishery," May 20, 2014.

Appendix 2: Contract for Service

NEW ENGLAND FISHERY MANAGEMENT COUNCIL
CONTRACT FOR SERVICE
funded under award #NA10NMF4410008

Project Title: Peer Review of Compass Lexecon's Report titled "Recommendations for Excessive Share Limits in the Northeast Multispecies Fishery."

Contract Period: June 1, 2014 to August 1, 2014

Cost: Total not to exceed [redacted]

Contractor:
Dr. Jamie Brown Kruse
Director, Center for Natural Hazards Research
East Carolina University
Brewster Building A112
Greenville, NC 27858
krusej@ecu.edu
Phone 252.328.5784

Services:

- Review Compass Lexecon's Report *"Recommendations for Excessive Share Limits in the Northeast Multispecies Fishery"*
- Participate as a panelist in 2 day peer review meeting June 12-13, 2014.
- Submit a peer review report and collaborate with the review panel Chair and other panelists to produce a joint summary report. Final report is due no later than 30 days after the peer review meeting.

Deliverables: Independent final report and contribution to the joint summary report.

Payment Terms: **Rate**: [redacted] **Duration:** Not to Exceed 16 Days

Airfare and hotel accommodations will be arranged by the Council. A voucher for other travel expenses (e.g., per diem, ground transportation) will be provided to the contractor via email prior to the June 12-13 meeting. Claims for travel must be submitted before December 1, 2014.

Stipend of [redacted] per day, not to exceed 16 days, will be paid upon acceptance of the final report.

Technical Monitor: For the purposes of this agreement, Rachel Feeney will be the Council's principal liaison and technical monitor. The technical monitor will have the responsibility for monitoring overall performance under the contract.

Authorized by: Sandra Stone Date: 5/20/14

Sandra Stone, Contracting Officer

Accepted by: Jamie Brown Kruse Date: 5/20/14

Dr. Jamie Brown Kruse

Either party upon written notice may cancel this contract anytime

Appendix 3: Peer Review Panel Terms of Reference

The peer review shall be conducted based on the following Terms of Reference (ToRs):

1. Describe the method or process used by Compass Lexecon for determining the maximum possible allowable percentage share of the market for fishery access privileges and/or quota leasing that would prevent an entity from obtaining an excessive share of access privileges allocated in the Northeast Multispecies Fishery.

2. Evaluate the strengths and weaknesses of the proposed method or process developed by Compass Lexecon (e.g., whether defining excessive shares in terms of market power is appropriate and adequate). Evaluate whether the approach outlined by Compass Lexecon is reasonable for setting excessive share limits in fisheries managed through catch shares in general. As part of this TOR, comment on any constraints that may hinder application of the proposed approach.

3. Evaluate application of the proposed methods or process to the Northeast Multispecies Fishery. Are Compass Lexecon's conclusions regarding market power in both the final product (seafood) and production (quota) market valid and based on appropriate economic principles? If there is disagreement with what Compass Lexecon recommended, clearly state that and your reason why.

4. Review and comment on the data requirements necessary for applying the proposed methods or process.

5. Provide any recommendations for further improvement.

Appendix 4. Panel Membership or other pertinent information from the panel review meeting

Review Panel Chair

Dr. Eric Thunberg
(NEFMC Science and Statistical Committee
NOAA HQ Office of Science & Technology

Review Panelists

Dr. Trond Bjorndal
SNF Centre for the Applied Research at NHH
Bergen, Norway

Dr. Jamie Brown Kruse
Director, Center for Natural Hazards Research,
East Carolina University
Greeneville, NC USA

Dr. Andrew Schmitz
Department of Food and Resource Economics
University of Florida
Gainesville, FL USA

Dr. Quinn Weninger
Department of Economics
Iowa State University
Ames, Iowa USA

Appendix 5. Terms and Acronyms

HHI (Herfindahl-Hirschman Index) - An index created by taking the sum of the square of the market share of all firms in a defined relevant market. For example a monopoly, with 100% market share would yield an HHI of 10,000 (100^2=10,000). A duopoly with two equal sized firms each with 50% market share would yield an HHI of 5,000 (50^2+50^2). A highly competitive market with 100 firms each with 1% market share yields an HHI of 100.

Market Power – The ability of an entity or coordinated group to profitably influence market price. This can be achieved through control of a crucial input or the ability to restrict total output in the market sufficiently to drive up prices.

MRI (Moratorium Right Identifier) unique identifying number attached to a Northeast multispecies permit.

PSC (Potential Sector Contribution) – The proportion of total landings of a particular stock associated with an individual MRI over a particular period.

Sector – Voluntary self-selected group of fishermen that are allocated a portion of the available catch.