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June 30, 2020

VIA ELECTRONIC MAIL

Michael Pentony, Regional Administrator
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930

Re: **Supplement to Fisheries Survival Fund's Comments on Framework Adjustment 59 to the Northeast Multispecies Fishery Management Plan**

Dear Regional Administrator Pentony:

On behalf of the Fisheries Survival Fund ("FSF"), we write to supplement the comments we submitted on June 15, 2020 regarding the New England Fishery Management Council (the "Council")'s proposed Framework Adjustment 59 to the Northeast Multispecies Fishery Management Plan ("Framework 59"). In our June 15 comments, we voiced concerns with the Council's complete and utter reliance on its scientific and statistical committee ("SSC") in dictating the terms of annual catch limits of GB yellowtail flounder. Particularly, we noted on June 15 that SSC's untoward power regarding GB yellowtail flounder likely violates Article II of the United States Constitution.

The SSC consists of a Council-appointed group made up of "Federal employees, State employees, academicians, or independent experts." 16 U.S.C. § 1852(g)(1)(C). The United States Constitution simply does not allow such a group, with no accountability, and whose decisions have no meaningful method of being reviewed, to effectively set United States domestic and international policy. Yet that is what Framework 59 contemplates.

On June 29, 2020, the Supreme Court released its decision in *Seila Law LLC v. Consumer Fin. Prot. Bureau*, No. 19-7, 2020 WL 3492641. The Supreme Court's *Seila* decision further clarifies and confirms that NMFS' and the Council's outsized reliance on the SSC is unconstitutional.

In *Seila*, the Supreme Court held "that the CFPB's leadership by a single individual removable [by the President] only for inefficiency, neglect, or malfeasance violates the separation of powers." *Seila* Op., 11. Chief Justice Roberts, writing for the Court, explained,

> Article II provides that "[t]he executive Power shall be vested in a President," who must "take Care that the Laws be faithfully executed." Art. II, §1, cl. 1; id., §3. The entire "executive Power" belongs to the President alone . . .
>
> [L]esser officers must remain accountable to the President, whose authority they wield. As Madison explained, "[I]f any power whatsoever is in its nature Executive, it is the power of appointing, overseeing, and controlling those who execute the laws." 1 Annals of Cong. 463 (1789). That power, in turn, generally includes the ability to remove executive officials, for it is "only the authority that can remove" such officials that they "must fear and, in the performance of [their] functions, obey." *Bowsher*[*v. Synar*], 478 U.S. [714], at 726 (internal quotation marks omitted).

Seila Op., 11-12.

Because the CFPB's Director could only be fired by the President for cause, *Seila* concluded that the Executive did not have sufficient constitutional control over his administrative agency. The reasoning behind the Court's ruling is straightforward: "Only the President (along with the Vice President) is elected by the entire Nation. And the President's political accountability is enhanced by the solitary nature of the Executive Branch, which provides a single object for the jealousy and watchfulness of the people." *Id.*, 22 (quotation omitted). In order words, the Supreme Court yesterday confirmed that, in the Executive branch, the Executive must make the rules. To be otherwise would be to destabilize the very basis of electoral democracy.

The Council's and NMFS' complete and total reliance on the SSC subverts this state of affairs. Neither the President, the Department of Commerce, nor the Council have any true control over the SSC's determination of a GB yellowtail flounder catch limit. In fact, neither the President, the Department of Commerce, nor the Council have any true control over the members of the SSC themselves. There is no process in place to remove an SSC member, whether for cause or not. *See generally* Operating Agreement Between the New England Fishery Management Council; NOAA Fisheries Service Greater Atlantic Regional Fisheries Office; NOAA Fisheries Service Northeast Fisheries Science Center; and NOAA Fisheries Service Office of Law Enforcement, Northeast (October 2014). In this sense, SSC members are even more insulated from Executive removal than the CFPB Director—who, even before yesterday's *Seila* decision, *could* be fired for cause. *See Seila* Op., 11.

Yet Framework 59 gives the SSC, an unelected and virtually unremovable body, complete and total authority—to be trumped by no one, not even the Executive—to set catch limits and thereby constrain the United States in international negotiations with Canada. Framework 59 asserts that SSC's catch-limit mandate may not be questioned by the Council, the Department of Commerce, or the President himself. Yesterday's Supreme Court decision in *Seila* confirms that this undermining of Executive authority is unconstitutional.

FSF therefore respectfully requests that any Final Rule modify Framework 59 to clarify that the Council may set catch limits without illegitimate and unconstitutional control by the SSC. This is a time-sensitive issue, as negotiations for next year's transboundary stocks total allowable catch levels are getting underway. Thank you for your careful consideration of this letter, along with FSF's previous comments. Please feel free to contact us at any time if you require additional information.

Respectfully submitted,

David E. Frulla
Andrew E. Minkiewicz
Bezalel A. Stern
Counsel for Fisheries Survival Fund

COMMONWEALTH OF MASSACHUSETTS

THE GENERAL COURT

STATE HOUSE, BOSTON 02133-1053

June 30th, 2020

The Honorable Neil Jacobs, Ph.D.
Assistant Secretary of Commerce for Environmental Observation and Prediction
Acting Under Secretary of Commerce for Oceans and Atmosphere
National Oceanic and Atmospheric Administration
1401 Constitution Avenue, NW, Room 5128
Washington, DC 20230

Mr. Michael Pentony
Regional Administrator
National Marine Fisheries Service, Greater Atlantic Region
55 Great Republic Drive
Gloucester, MA 01930

Dr. Jon Hare
Science and Research Director
Northeast Fisheries Science Center
166 Water Street
Woods Hole, MA 0254

Dear Under Secretary Jacobs, Mr. Pentony, and Dr. Hare:

The current waiver from the requirement of At Sea Monitoring (ASM) in the Northeast groundfishery is a critically important safeguard not only for the health and safety of those engaged in this fishery, but also for preventing the spread of the COVID-19 virus, and should not be ended as our nation continues to confront devastating impacts of this disease. Accordingly, I write to join with Congressmen Moulton and Congressman Keating and the Massachusetts Fishing Partnership to request that you extend this waiver and the essential health protections that it provides.

Clearly the men and women engaged in commercial fishing are at significant and cognizable risk from infection from COVID-19 due to the inherent conditions of their working environment at sea, which requires them to be close to each other in confined wheelhouses and crew spaces, and working in close proximity to each other on decks to haul and tend gear, sort and stow fish, and maintain and repair the equipment necessary to the operation of a fishing vessel. Because of these known conditions that are conducive to the spread of COVID-19, these harvesters have taken substantial steps to protect themselves from that threat, and they continue to do so. They should not now be forced to contend with the new and serious threat to their health posed by the imposition on board vessels of observers, who have not been part of those efforts and could well become agents and victims of viral transmission as they move between vessels in the groundfish fleet. While the data collected by these observers is neither irrelevant nor without some value, these attributes are not outweighed by the clear health threat to themselves, vessel crews, and the public posed by requiring ASM at this time.

Our nation continues to witness and experience tragic loss of life, human suffering and economic devastation from the COVID-19 virus, and across the country rates of transmission in many states are rising sharply, demonstrating the importance of taking and continuing practical steps to prevent or mitigate that transmission. Extending the waiver from ASM is one of those steps, and one that should continue in the face of the ongoing threat we must confront effectively.

Thank you for your attention to this request, and please do not hesitate to contact me if I may be of further assistance.

Sincerely,

Senate Minority Leader Bruce Tarr

CC: Governor Baker

Senator Warren

Senator Markey

Massachusetts Congressional Delegation

Massachusetts Coastal Caucus

Mayor Theken

Mayor Walsh

Gloucester City Council

New England Fishery Management Council

Massachusetts Director of Marine Fisheries McKiernan

Massachusetts Fisherman's Partnership

Northeast Seafood Coalition

New England Fishery Management Council
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John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

June 30, 2020

Mr. Chris Oliver
Assistant Administrator for Fisheries
National Marine Fisheries Service
1315 East-West Highway
Room 14636
Silver Spring, MD 20610

Dear Mr. Oliver:

Thank-you for providing the Regional Fishery Management Councils the opportunity to review the draft Procedural Guidance for Changing Assessed Stock Status from Known to Unknown (National Marine Fisheries Service Procedure 01-101-11). We welcome development of this guidance. This is a complicated topic and we appreciate the diligent efforts of your staff. Our staff, Scientific and Statistical Committee, and Council reviewed the document. We would like to offer the following comments in an effort to improve the final guidance. Our comments are informed by a number of situations we've encountered over the past few years.

As an underlying principle, the Council believes that the agency's stock status determinations should always be based on the Best Scientific Information Available (BSIA). The draft guidance does not consistently adhere to this principle in those scenarios when it suggests that stock status or status determination criteria (SDC) should revert to some previous determination. The implication is that old certainty is automatically better than new uncertainty. This leads to tortured discussions of, for example, when an old assessment is too old and why an earlier status determination criteria is preferable to new advice that says criteria cannot be determined. These approaches seem to be substituting the use of expediency for BSIA. Perhaps the agency is concerned about the management response if an overfished stock is later determined to be in an unknown status, but we think that rather than revert to a previous status, a better approach would be to identify possible management responses should this occur.

This leads to another apparent shortcoming in the guidance. In those cases where a new assessment fails and an old assessment is rejected (e.g. Scenario C3), the guidance does not indicate how to revise management decisions that were based on this old assessment. To illustrate: if the assessment that determined a stock was rebuilt is later rejected and the status is changed to unknown, what happens to the rebuilding plan that was terminated based on the prior determination? We would not expect the guidance to attempt to address every conceivable situation, but it should at least acknowledge that application of the guidance may require re-evaluation of past management responses.

Our last general concern is that the guidance does not acknowledge the rapidly changing environmental conditions that we are experiencing. In some places the guidance refers to comparisons of current conditions to historic conditions as a fallback when status is unknown (e.g. "…stock biomass remains near historic lows…"; "…indices are down relative to previous indices…"). This implicit assumption that stock dynamics are stationary may not be supported by the evidence. As noted in National Standard 1 guidelines, MSY is determined "…under prevailing ecological, environmental conditions and fishery technological characteristics…" Just because status determination criteria are undefined does not mean they are not affected by warming temperatures or different selectivity in the fishery. A careful qualitative examination of these factors may provide evidence that the historic indices do not represent what is achievable at present.

The comments that follow are specific to the proposed scenarios. Clearly, as noted earlier, a policy document cannot identify and address every situation that a Council may encounter. Nevertheless, we believe it is important to highlight situations that we have faced already that do not appear to be addressed.

SCENARIO A – Changes to Management Units

While it may be easiest to rollover existing status determinations to the new stock structure, it may not be logical to do this. If the new stock structure results in splitting a stock, there is increased potential for overfishing at least one stock. This is because there is no reason to expect, a priori, that each stock's contemporary abundance is appropriately high with respect to historic abundance or current dynamics, or that fishing effort will be spread proportionately across stocks. The appropriate advice may be that status is unknown. This would encourage managers and scientists to coordinate new assessments and, if necessary, changes to the management plan.

As a minor point, this scenario seems to use the terms management unit and stock complex interchangeably. In a multispecies fishery, status is determined for stocks or stock complexes, not the management unit. Since the guidelines for National Standard 3 define management unit as "…a fishery or that portion of a fishery identified in an FMP as relevant to the FMP's management objectives," we recommend using the term stock or stock complex in its place.

SCENARIO B – Aging Stock Assessments

While we agree that an outdated assessment should lead to a reconsideration of stock status, we believe that the ten-year standard proposed here is inappropriate. This does not seem to be based on any analysis of the issue, but instead seems linked to the National Stock Assessment Performance Measure. As noted in a footnote, the ten-year standard in that instance does not necessarily mean adequate for fishery management purposes, but is used only for budget formulation and prioritization. There are numerous studies that indicate assessment results and projections are valid for management purposes for only around three years. This is particularly true when oceanic conditions are changing or when assessments have severe retrospective patterns. As such, it is difficult to accept that any assessment that is older than five years is adequate for management purposes – including status determinations.

Another issue with this scenario is that it ignores completely whether any management interventions have been implemented since the old assessment. It also ignores that even in the absence of a stock assessment there may be indications in the data that support a modification. If catches are dramatically reduced after an overfishing definition, why is it justified to retain the old determination? If survey indices have changed over time, why is a previous biomass determination valid for up to ten years? Focusing solely on the age of the assessment does not appear to allow consideration of these other factors.

SCENARIO C – Stock Assessment Does Not Provide Sufficient Information to Support a Stock Status Determination

In our view, this is the most critical section of the guidance, and is the section most relevant to our recent experience. This is also the scenario that is the most difficult to prepare since there are seemingly an infinite number of possible assessment results. An example from the introductory description in the draft guidance highlights this problem. While in some regions a lower tier assessment may be consistent with the SDC as defined on the FMP, in our region the lower tier assessments often are not consistent and do not provide alternative SDCs.

Scenario C1 – Reject New Assessment, Accept Previous Assessment Model With New Data

This scenario seems straightforward and we have no comments to add.

Scenario C2 – Reject New Assessment, Use Previous Assessment Results With No New Data

We have several concerns with this scenario. In our experience, when peer reviews have rejected a new assessment, and the old assessment with new data, often they do not state that the previous assessment results should be used for management advice, including status determination criteria. They may conclude that the status of the stock is unknown[1], and at times, they may reach different conclusions for the overfished and overfishing status. Sometimes they go so far as to state the status determination criteria are unknown. This creates a conflict that is not addressed by this scenario. A scientific review has concluded that the stock status is currently unknown, yet the scenario recommends using a previously determined status. This does not seem consistent with BSIA and is rooted in the belief that uncertainty is not scientific, and that old certainty is somehow more valid than new uncertainty.

Another issue is that the SDCs are supposed to be based on "objective and measureable criteria." If the assessment is rejected, the established criteria can no longer be measured. This is ignored in the scenario's approach. This approach also assumes the old SDC remain valid, which may not be the case. Our recent Southern Red Hake stock assessment illustrates this concern. The peer review re-ran the assessment model and wrote "As a result, the WG (Working Group) concluded the AIM model should not be used for estimating reference points and stock status for red hake, and the SARC Panel agreed with this conclusion." In light of a conclusion like this, how can the agency justify maintaining the previous stock status?

Scenario C3 – Reject New Assessment, Flawed Previous Model

[1] See, for example, 2017 assessment of witch flounder; 2014 assessment of Georges Bank yellowtail flounder; 2020 assessment of Southern red hake; 2012 assessment of Gulf of Maine winter flounder.

This scenario seems straightforward, but also unlikely. The Terms of Reference for our stock assessments do not typically ask the review panel to verify that a previous assessment was valid. Doing so would dramatically increase the workload for the panel and the assessment scientists. Also, our experience has been that there is great reluctance to criticize the work of a previous review panel. We can cite numerous examples where dramatic changes in the understanding of past stock status are not attributed to any previous errors but are explained away as "new data has revised our earlier understanding of stock status." Even the Southern Red Hake example cited above did not go so far as to state the previous assessment was flawed and the status determination was invalid.

SCENARIO D – Stock Assessment Deviates From SDC Specified in the FMP

The Council fully supports this scenario: status determinations should be based on the SDC that are specified in the FMP. Indeed, Amendment 13 to the Northeast Multispecies FMP adopted this concept in 2004. We note that Amendment 13 differentiated between changes to the parameter (i.e. FMSY, F40%, etc.) and the numerical estimate of that parameter. Numerical estimates are automatically updated based on assessment results. A recent amendment to our Atlantic Herring FMP immediately implements any changes to the parameter or the numerical estimate if approved at a stock assessment. The concerns expressed in this scenario can be mitigated if, as in the Greater Atlantic Region, stock assessments are required to report results using both current and any proposed new status determination criteria.

Where this scenario falls short, however, is when the assessment results cannot be compared to existing status determination criteria and do not provide new criteria. This has happened several times with the rejection of a previously accepted analytic assessment and the adoption of an empirical approach. Review panels have not suggested new SDCs for several of these approaches. This leads to a situation where there is an accepted assessment model without SDCs, and no way to compare the current results to the previous SDCs. This situation is increasingly common and does not appear to be covered by any of the scenarios.

An example is the witch flounder stock assessment in 2017.[2] The analytic assessment was rejected, an empirical approach was adopted, and the review panel said SDCs were unknown. The Council modified the FMP to adopt these results, but the agency disapproved that measure and relied on the earlier status determination criteria. As a result, we have SDCs based on an assessment that was rejected, and no way to measure current status against those SDCs.

Other Issues

It may be helpful if the guidance document addressed situations where either overfishing or overfished status can be determined, but not both. These two metrics appear linked under the Magnuson-Stevens Act. It is difficult to understand how one can be determined if the other cannot – particularly when it comes to specifying SDCs.

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[2] Northeast Fisheries Science Center 2017. 62nd Northeast Regional Stock Assessment Workshop (62nd SAW) Assessment Summary Report. US Dept. Commer, Northeast Fish Sci Cent Ref Doc. 17-01; 37p.

In closing, the Council would like to thank the agency for its efforts to address changes in stock status from known to unknown. I hope that our comments will help improve the final version. We would be happy to discuss our comments with your staff if that would be helpful. Perhaps the agency can provide a revised version at the September Council Coordination Committee meeting for review by the Councils before the guidance is finalized.

Sincerely,

Dr. John Quinn
Chairman

CC: Samuel Rauch
RFMCs

New England Fishery Management Council
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John F. Quinn, J.D., Ph.D., Chairman | Thomas A. Nies, *Executive Director*

July 1, 2020

Mr. Michael Pentony
Regional Administrator
Greater Atlantic Regional Fisheries Office
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930

Dear Mike:

On February 4, 2020, the Council sent a letter forwarding its proposal for recreational measures for fishing year 2020 for Gulf of Maine cod and Gulf of Maine haddock for all modes (private and for-hire – party and charter):

Gulf of Maine cod
- Open Season: September 15-30 and April 1-14
- Bag Limit: 1 fish
- Minimum Size: 21 inches

Gulf of Maine haddock
- Open Season: May 1 – February 28 and April 1-30
- Bag Limit: 15 fish
- Minimum Size: 17 inches

Since that time, members of the for-hire recreational groundfish fishery, wrote to the Council and NMFS requesting flexibility in the Gulf of Maine cod and Gulf of Maine haddock management measures for fishing year 2020. The for-hire sector is restricted due to federal and state guidelines on carrying anglers and are projecting losses from the COVID-19 pandemic until the situation improves.

At its meeting on April 14, the Council discussed that a Recreational Advisory Panel meeting and Groundfish Committee meeting would be held prior to the June Council meeting to review the request. The Recreational Advisory Panel and Groundfish Committee both met on June 15 to hold that discussion.

Based on discussions of the Groundfish Plan Development Team, the Recreational Advisory Panel, and the Groundfish Committee, and on state restrictions for the for-hire fleet, the Council passed the following motion at its meeting on June 25:

> That the Council revise the recommendation for for-hire fishing for GOM cod to add two weeks (September 8-14 and October 1-7) to the current September 15-30 season for cod for FY2020 only. (11 in favor, 4 against and 1 abstention)

The Council's rationale for this recommendation is that late in fishing year 2019 and early in fishing year 2020 the for-hire recreational groundfish fleet was shut-down due to the emergency public health response to COVID-19. Even as for-hire businesses regain operational status, state-specific workplace safety guidelines are limiting vessel capacity. Allowing for lost access this spring to be targeted in the fall reflects the recent Recreational Advisory Panel recommendation at its June 15 meeting. The for-hire mode is a minor contributor to overall Gulf of Maine cod mortality and concerns about any potential increased private mode effort in fishing year 2020 may be mitigated by enhanced cod bycatch avoidance tools while targeting haddock, produced by the Commonwealth of Massachusetts.

Thank you for considering these comments. Please contact me if you have questions.

Sincerely,

Thomas A. Nies

Thomas A. Nies
Executive Director

New England Fishery Management Council
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John F. Quinn, J.D., Ph.D., Chairman | Thomas A. Nies, *Executive Director*

July 2, 2020

Mr. Michael Pentony
Regional Administrator
Greater Atlantic Regional Fisheries Office
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930

Dear Mike:

At its June Council meeting, the Council discussed how the COVID-19 National Emergency is directly and negatively impacting the groundfish fishery – including the commercial and recreational fleets, and how to respond through Emergency Actions and other forms of relief. The Council sent a letter on July 1, 2020 regarding revisions to its proposal for 2020 recreational measures. This letter focusses on an Emergency Action request for the commercial groundfish fishery. An additional letter will be sent regarding the Council's request with respect to the redfish exemption area.

Emergency Action Request

The Council cites the unforeseen COVID-19 pandemic as the primary reason for the following emergency action request for the sector and common pool segments of the fishery:

Sectors

That the Council requests GARFO initiate an Emergency Action for the groundfish fishery in light of COVID-19 measures to include:

1) Allow sectors to carryover more than 10% of their unused FY2019 into FY2020 for GOM haddock, GB haddock, American plaice, and witch flounder, consistent with GARFO memo to Council on June 3, 2020.
2) Request GARFO evaluate the de minimis carryover provision to enable sectors to allow de minimis carryover of FY2019 ACE to be more than 1% of the FY2020 sector sub-ACL of stocks without fear of triggering a pound for pound payback in FY2021. This analysis should look at all stocks with carryover.
3) Upon conclusion of the FY2019 reconciliation process, allow sectors who do not have the maximum allowed carryover of the stocks above to trade with sectors who do in order to allow all sectors the chance of replenishing their carryover in light of COVID-19 (within the same trading window).

(15 in favor, 1 against and 0 abstention)

Common Pool

That the Council recommend to the Regional Administrator an Emergency Action to allow the Common Pool fleet to roll over any unused Lease DAS for the common pool. In addition to the 10 regular DAS they are currently allowed to carry over.

(15 in favor, 1 against and 0 abstention)

The Council and fishing industry expressed concerns about the health and safety of captains and crew discussing state restrictions and national policy. The Council believes that temporary changes to carryover measures will provide much needed economic relief and flexibility for the sector and common pool segments of the commercial groundfish fishery. The commercial fishery lost revenues in the end of fishing year 2019 due to low ex-vessel prices as sales plummeted to levels below production costs as a result of the national and global disruption in the food supply chain and faced losses from to earlier investments in quota that could not be landed by the end of the 2019 fishing year.

The Council appreciates the assistance of GARFO and NEFSC staff in the preparation of Groundfish Plan Development Team analysis (enclosed), which the Council hopes will hasten the review process by GARFO.

Please contact me if you have questions.

Sincerely,

Thomas A. Nies

Thomas A. Nies
Executive Director

CC: Dr. Jon Hare, NEFSC

Enclosure: Groundfish Plan Development Team memo re carryover, June 17, 2020

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John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

MEMORANDUM

DATE: June 17, 2020

TO: Groundfish Committee

FROM: Groundfish Plan Development Team

SUBJECT: **COVID-19 emergency action requests – possible carryover changes for the commercial groundfish fishery**

The Groundfish Plan Development Team (PDT) met via webinar on May 6, 2020; June 5, 2020; and June 17, 2020 to discuss COVID-19 emergency action requests for the commercial groundfish fishery, and continued its work by correspondence.

Overview

This memorandum summarizes PDT discussion on possible carryover changes for the commercial groundfish fishery in response to the COVID-19 pandemic and incorporates information provided by the National Marine Fisheries Service. The PDT discussed the state of the management system including current carryover provisions, possible management ideas for changes to carryover to provide relief to the fishery from the economic impacts of COVID-19, and a summary of data to help evaluate carryover options. The PDT discussed the available tools to address requests to change carryover for the commercial fishery, and whether the PDT expects these would be beneficial to the commercial groundfish fishery in terms of timing and potential to provide relief.

Background

At the April 2020 Council meeting, the Council discussed the impacts of COVID-19 on the groundfish fishery. Several organizations representing the commercial groundfish fishery - Associated Fisheries of Maine, Northeast Seafood Coalition, Maine Coast Fishermen's Association, and Maine Coast Community Sector - requested relief from certain provisions in the sector program. Specifically, they asked for an increase in the maximum allowable carryover from fishing year 2019 to fishing year 2020. These organizations noted that the commercial fishery is losing money due to low ex-vessel prices as recent sales have plummeted to levels below production costs. Sector vessels face losses from their earlier investments in quota that cannot be landed by the end of the season. This situation has resulted from the national and global disruption in the food supply chain.

After discussing the requests, the Council passed the following motion (16/0/1):

> That the Council write a letter to GARFO requesting guidance on mechanisms that could be utilized to enable Northeast Multispecies Sectors to carryover more than 10% of their unused FY 2019 ACE into FY 2020, including approaches that would enable Sectors to have a higher percentage of de minimis carryover available to them for use without potential penalty in FY 2020. Also request guidance on possible flexibility for common pool DAS carryover including number of DAS and type of DAS i.e. allocated or leased and the time period for use. Request GARFO provide this information prior to the June Council meeting, ideally at the Groundfish Advisors/Committee meeting, so if appropriate and necessary the Council could consider requesting emergency action to facilitate a solution that would help alleviate the economic and operational implications of COVID-19.

Following the Council discussion, some members of the common pool wrote to the Council requesting flexibility in the type of relief provided. For example, a participant with a Handgear A permit explained he does not fish under DAS, and requested that the Council also consider allowing the common pool to carry over unused quota into the new fishing year.

Sectors

Current ACE carryover provisions

- Groundfish sectors may carry over unused ACE up to 10% of their allocated FY 2019 ACE, provided that the total unused sector ACE carried forward for all sectors[1] from FY 2019 plus the total FY 2020 ACL does not exceed the ABC for FY2020.
- If the total potential catch (total ACL + carryover) would exceed the ABC, then NMFS adjusts the maximum amount of carryover, down from 10%, to an amount that limits the total potential catch to be equal to the ABC of the following fishing year.[2]
- If an ACL overage occurs and sector catch (including carryover used) exceeds the sector sub-ACL (which does not include carryover), sectors are responsible for a pound-for-pound payback, minus the *de minimis* amount of carryover set by NMFS.
- The *de minimis* amount is 1 percent of the 2020 sector sub-ACL. NMFS has the authority to change the *de minimis* amount.
- State operated permit banks may not carry over unused ACE.

See Appendix for a brief history of carryover actions.

Based on preliminary data provided by GARFO, each sector would be allowed to carry over unused ACE, up to 10-percent of its 2019 allocation, from fishing year 2019 to 2020 for four stocks: Georges Bank (GB) haddock; Gulf of Maine (GOM) haddock; American plaice; and witch flounder. Each sector would be allowed to carry over unused witch flounder ACE, up to 10% of its 2019 allocation because most sectors have less than 10% unused ACE and that would keep total potential catch in 2020 below the ABC. If all sectors had higher amounts of unused ACE, then NMFS would have been required to reduce the maximum carryover. Sectors may not

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[1] Excludes state permit banks

[2] Result of a lawsuit on FW50 provisions: Conservation Law Foundation v. Pritzker, et al. (Case No. 1:13-CV-0821-JEB), April 4, 2014

carry over GB yellowtail flounder. All other allocated stocks would have the maximum carryover reduced below 10 percent to prevent 2020 catch from exceeding the 2020 ABC.

For the four stocks that would not require a reduction in carryover to stay below the ABC, it would be possible to increase each sector's carryover limit above 10 percent without the new potential catch limit exceeding the ABC (see Table 1). GB haddock carryover could increase approximately 2.6 percentage points. GOM haddock could increase approximately 3.7 percentage points. Plaice carryover could increase approximately 1.0 percentage points. Witch flounder carryover could increase approximately 1.3 percentage points. These estimates are based on preliminary 2019 catch data and account for the prohibition of carryover by permit banks.

Table 1 - Potential sector ACE carryover from FY 2019 to FY 2020

Stock	Potential revised max carryover (%)	Current max carryover (mt)	Potential increase in max carryover (mt)	Potential revised max carryover (mt)
GOM haddock	12.6	5,241	1,357	6,598
GB haddock	13.7	812	304	1,116
American plaice	11.0	141	14	155
Witch flounder	11.3	64	5	69

Preliminary FY19 carryover data, DMIS, run May 13, 2020; May 20, 2020

All sectors had more than 10% of their ACE of the two haddock stocks available to carryover. Some sectors did not have 10% of their ACE of plaice and witch flounder left to carry over and so would not benefit from raising the 10% cap. For plaice, one sector did not have enough available ACE to carry over the full 10%, and an additional sector did not have enough available ACE to allow additional carry over if the carryover cap is raised. For witch flounder, nine sectors have less than the maximum available ACE to carry over, and an additional two sectors do not have enough available ACE to allow additional carryover under a raised cap.

Table 2 – Number of sectors impacted by a possible raised carry over cap from FY 2019 to FY 2020

Stock	Number of sectors with available ACE to have 10% cap	Number of sectors with available ACE to have raised cap above 10%
GOM haddock	16	16
GB haddock	16	16
American plaice	15	14
Witch flounder	7	5

Preliminary FY19 carryover data, DMIS, run May 13, 2020; May 20, 2020

Possible sector carryover options

Sector carryover option #1: Maximum ACE carryover

Mechanism: An increase to the maximum permissible ACE carryover would require either a Council action or an emergency action, if justified. There is no existing authority for NMFS to increase ACE carryover beyond 10 percent. The implementing regulations at 50 CFR 648.87(b)(1)(i)(C)(1) require NMFS to adjust the maximum ACE carryover *down* from 10 percent to an amount that prevents total potential catch from exceeding the ABC, but do not authorize any increase.

Timing: Increased ACE carryover could provide benefits to industry through the potential for increased catch, revenue, and flexibility. There could be an immediate benefit for vessels or stocks that have high effort before the worsening winter weather, and for any sector that transferred in ACE during 2019 that it was not able to harvest. Announcing any plan to increase ACE carryover could allow industry to plan their operations around the increased ACE.

Final carryover numbers will not be available for the June Council meeting - sector ACE carryover is generally ready by the end of July. This is due to delayed reports (dealer, VTR, eVTR) that come in after the last week of the fishing year, followed by reconciliation, any necessary post-year trading window (only if there are overages), then freezing the 2019 data set before calculating final carryover.

Risk: Allowing additional carryover could increase the risk of an ACL overage, or that overfishing could occur. If an ACL overage occurs and sectors have caught above the sector sub-ACL (which does not include carryover), sectors are responsible for a pound-for-pound payback, minus the *de minimis* amount of carryover. For each stock, management uncertainty is estimated using the following criteria: enforceability and precision of management measures, adequacy of catch monitoring, latent effort, and catch of groundfish in non-groundfish fisheries. The management uncertainty buffer is set at 5 percent for the four stocks that do not require a reduction in carryover. That buffer has not changed since 2013, but the Groundfish Plan Development Team has recently documented that data generated on observed trips are not representative of the whole fleet and reflects differences in discarding of legal-sized fish on unobserved trips relative to observed trips. Thus, it is possible the existing uncertainty buffer is not sufficient to account for true uncertainty. GB haddock, GOM haddock, and American plaice are healthy stocks, but witch flounder is overfished with unknown overfishing status and is currently in a rebuilding program.

Sector carryover option #2: De minimis carryover

Mechanism: NMFS could change the *de minimis* carryover using the authority granted to the Regional Administrator at 50 CFR 648.87(b)(1)(i)(C)(*2*)(*ii*).

Timing: *De minimis* carryover is triggered only if Year-2 catch of a stock exceeds both the sector sub-ACL and the total ACL catch. We will not know if *de minimis* carryover is triggered until after the conclusion of FY2020 and reconciliation sector catch data. Given that a change to *de minimis* would only be useful if there were overages in FY2020, it is possible that this change could be incorporated into an action to retroactively set the *de minimis* for FY2020.

Risk: For each stock, management uncertainty is estimated using the following criteria: enforceability and precision of management measures, adequacy of catch monitoring, latent effort, and catch of groundfish in non-groundfish fisheries. The management uncertainty buffer is set at 5 percent for the four stocks (GB haddock, GOM haddock, plaice, and witch flounder) that do not require a reduction in carryover. That buffer has not changed since 2013, but the Groundfish Plan Development Team has documented that data generated on observed trips are not representative of the whole fleet and reflects differences in discarding of legal-sized fish on unobserved trips relative to observed trips. Thus, it is possible the existing uncertainty buffer is not sufficient to account for true uncertainty under the current monitoring system and reducing that buffer by increasing *de minimis* carryover might not be justified. However, three of these stocks (GOM haddock, GB haddock, and plaice) are healthy and experiencing strong recruitment that may balance the potential risk of overfishing posed by an increased *de minimis* carryover. Witch flounder, however, is overfished with unknown overfishing status and is currently in a rebuilding plan.

PDT Discussion

GARFO staff shared that they have completed initial analysis on possible carryover options, and from this identified four stocks that have the possibility of allowing greater than 10% sector carryover and still remain under the ABC – GOM haddock, GB haddock, American plaice, and witch flounder. GARFO staff explained that more detailed information on sector carryover is included in the response to the Council's request for guidance on carryover ahead of the June Groundfish Advisory Panel and Groundfish Committee meetings. The PDT discussed recent utilization of these stocks, questioning whether increasing carryover of these stocks is likely to provide much relief to sectors, given low utilization (see Table 3 below). There was some discussion that an increase in plaice carryover may be helpful to individual vessels but maybe not benefit all sectors, as well as consideration of how increasing carryover of plaice might impact permit holders who primarily lease quota. Witch flounder has a higher predicted utilization (see Table 3).

The PDT noted that there are potential impacts from the current lack of monitoring data with observer waivers and questioned what this might mean with respect to management uncertainty. The PDT discussed a need to look into whether there have been recent effort changes, as anecdotally the PDT has heard vessels are not fishing due to a lack of market from restaurants closing, but also hearing that some vessels are fishing as they are finding new markets (e.g. frozen, direct to consumer). See summary and figures below.

The PDT discussed sector carryover in recent years, noting that carryover has not been utilized at high levels in the past (see for example, FY 2018 carryover report: https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports/Sector_Monitoring/FY18%20Year%20End%20Carryover_for_HTML.htm. However, the PDT recognizes that the current COVID-19 pandemic is an unprecedented event, and carryover could have more utility for sectors to help cope with the economic impacts of COVID-19.

Summary of data

- See the 2019 fishing year to date catch information for sectors for in-season catch information by stock: https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports//Sectors/Sector_Summary_2019.html
- The figures below denote the "COVID-19" period as beginning in March. This is when the pandemic began to impact the U.S. East Coast - following the COVID-19 Emergency Declaration widespread social distancing and stay at home orders were put in place beginning March 16, with the requirements varying by state. Mid-March is also when restaurants closed regionally, causing a sharp market disruption, and causing the supply chain for the groundfish fishery to shift to home-based, direct-to-consumer markets.
- Total revenue from groundfish stocks in FY19 was $2.4 million less ($46.7 million) than the average from the previous three fishing years ($49.1 million, Figure 1), while landings were 4.7 million pounds higher than the previous three years (Figure 2), reflecting decreases in average groundfish prices (Figure 5).
- Average groundfish price was generally lower in all months of FY 2019, but dropped more during COVID-19 crisis months than observed in recent FY (Figure 5). Some decline in average groundfish price was also seen in the months just prior to the COVID-19 period, which may be reflective of disruptions in markets both globally and in other regions of the U.S (e.g. West Coast) due to the pandemic.
- Prices for cod, haddock, winter flounder and yellowtail flounder appear to have decreased most during the COVID-19 period (Figure 8).
- Strongest impacts from COVID-19 may have occurred in the month of April:
    - Total groundfish landings and revenue decreased in April of FY 2019, a deviation from previous fishing years trends where these metrics have generally increased (Figure 4, Figure 6), following high effort, which did not occur in FY 2019 (Figure 3).
- Utilization appears to have deviated for several stocks, while many appear similar (Figure 7):
    - Utilization appears to have deviated most for American plaice, which did not increase in the last quarter of the FY as observed in recent FYs.
    - The utilization trend for GB cod west also appears to be lower, with a much slower increase in utilization than in previous FYs.
    - GOM cod utilization in April is slightly lower than the previous three FYs, despite being similar to previous FYs in all previous months.

Common Pool

Current DAS carryover provisions

- Vessels in the common pool can carry over up to 10 Days At Sea (DAS). There is no carryover of leased DAS or C DAS. Carryover of DAS is prioritized (A, then B regular, then B reserve) and carried-over DAS are used first in the new year.
- The common pool does not have any provision for sub-ACL carryover between fishing years, but may carry over trimester total allowable catch (TAC) between trimesters within a fishing year.

Possible common pool carryover options

Common pool carryover option #1: DAS carryover

Mechanism: A change to the maximum permissible DAS carryover or the types of DAS (e.g., allocated or leased) that may be carried over would require either a Council action or an emergency action, if justified. There is no existing regulatory authority for NMFS to increase DAS carryover.

Timing: Increased DAS carryover could provide benefits to industry through the potential for increased catch, revenue, and flexibility. There could be an immediate benefit for vessels or stocks that have high effort before the worsening winter weather, and for any vessel that leased in DAS during 2019 that it was not able to use.

Risk: If no change is made to allow common pool trimester TACs to carry over from 2019 to 2020, then the biological impact should be negligible. An increase in the number of DAS available for use by the common pool without an increase to the quotas could increase the rate at which the common pool reaches its quota. However, the common pool does not appear to be limited by available DAS. Several permit categories that are more prevalent in the common pool (Handgear A and B, small-vessel category) do not use DAS and would not benefit from increased DAS carryover. Allowing leased-in DAS to carryover would potentially have greater effect for vessels that leased in DAS and subsequently did not use them, but this is likely to be an even smaller segment of the industry.

Common pool carryover option #2: Common pool sub-ACL carryover (Trimester TAC carryover between fishing years)

Mechanism: A change to allow sub-ACL carryover for the common pool would require either a Council action or an emergency action, if justified. The FMP does not include sub-ACL carryover for the common pool and there is no existing authority for NMFS to allow sub-ACL carryover.

Timing: Allowing sub-ACL carryover could provide immediate benefit to industry to allow them to plan their operations around the increased sub-ACL. This is particularly true for members of the common pool who do not fish under DAS and would not benefit from an increase in DAS carryover. Allowing sub-ACL carryover would minimize the risk that an increase in the number of DAS available would result in an increase in the rate at which the common pool reaches its quota, should a change to the maximum DAS carryover occur.

Risk: Allowing sub-ACL carryover could increase the risk of a sub-ACL or ACL overage. If a sub-ACL overage occurs (i.e., the common pool catch of a particular stock exceeds all three trimester TACs for that stock combined), the sub-ACL for that stock that is allocated to common pool vessels is reduced by the amount equal to the overage for the following fishing year, regardless of whether the ACL is also exceeded. The risk of a sub-ACL overage is of greatest concern for those stocks in rebuilding plans. If carryover of common pool sub-ACL were to be allowed, the total FY 2020 ACL, plus sector carryover, plus any common pool carryover cannot exceed the FY 2020 ABC.

PDT Discussion

The PDT discussed some consideration of whether increasing DAS carryover would help the common pool, as they might still be limited by quota, and particularly by trip limits on GOM cod. For example, if the DAS effort controls are liberalized too much then additional effort controls (changes in trip limits, area closures) may need to be implemented later in the fishing year by Regional Administrator to ensure that the common pool catch remains under the TAC. It was noted that the B DAS program is closed for FY 2020 and no B DAS have been used in the other special access programs since 2015. Thus, carryover of additional B DAS would not provide any relief for the common pool. The PDT discussed both DAS and quota utilization by the common pool, considering whether the common pool is limited by either. GARFO staff explained that there is a lot of fluctuation in common pool effort from year to year, being such a small group of vessels, that it can be difficult to track utilization patterns. The PDT also noted that some portion of the common pool, such as Handgear A permits, do not fish under DAS, and so increasing DAS carryover would not provide relief to these common pool participants (see Tables 7-9 below). Additionally, the PDT noted that DAS are used by the common pool on trips for other target fisheries, such as monkfish and dogfish.

Summary of data

- See the 2019 fishing year to date catch information for common pool for in-season catch information by stock: https://www.greateratlantic.fisheries.noaa.gov/ro/fso/reports//common_pool/Common_Pool_Summary_2019.html
- Patterns in groundfish landings, revenue, price, and days absent were similar as those of sectors, except that groundfish landings and revenue in the common pool did not decrease in April of FY 2019 (Figure 4 and Figure 5).
- DAS carry over usage in the common pool has been consistent in recent years (FY 2015 to FY 2019) (Table 4).
- DAS leasing activity in the common pool has declined slightly from FY 2015 to FY 2019 (Table 4).
- Common pool vessels have leasing restrictions based on vessel horsepower (HP) and length – described below in Table 5 and Table 6. In considering how many common pool vessels are being constrained by DAS available to lease for FY 2019, the most constrained MRI had 129.3 A DAS available to lease from eight other MRIs based on its HP baseline, and for vessel length the most constrained MRI had 444.9 A DAS available to lease from 23 other MRIs based on its length baseline.
- In FY 2019, six MRIs leased in 177.8 DAS (all category A permits) (Table 4). Some leases (about 60 DAS) occurred between permits held by the same individual. Of those six MRIs leasing in DAS, three MRIs had a total of 9.3 unused leased DAS. A fourth MRI with unused leased DAS joined a sector for FY 2020.
- In FY 2019, nine MRIs leased out 177.8 DAS (Table 4). Of those, four MRIs were in CPH as of 4/30/20. None of the remaining five took a groundfish trip in FY 2019.

Tables and Figures

Table 3 - Stock-level catch and utilization predictions for FY 2020 from the Quota-Change Model. Subset from Table 111 in Framework 59. The four stocks that could have greater than 10% sector carryover are highlighted.

Stock	Sub-ACL (mt)	Predicted Catch (mt)	Predicted Utilization
GB Haddock West	103,849	4,426	4.3%
GOM Haddock	11,918	2,734	22.9%
Redfish	11,173	4,894	43.8%
Plaice	2,889	1,105	38.4%
Pollock	23,830	2,935	12.3%
White Hake	2,004	1,839	91.8%
GB Winter Flounder	501	498	99.4%
GB Cod West	851	826	97.0%
Witch Flounder	1,275	872	68.4%
SNE Winter Flounder	462	314	67.9%
GOM Cod	267	267	99.9%
GB Haddock East	16,084	692	4.3%
GB Cod East	185	132	71.7%
GOM Winter Flounder	272	95	35.0%
CC/GOM Yellowtail Flounder	651	178	27.3%
GB Yellowtail Flounder	93	27	29.1%
SNE/MA Yellowtail Flounder	12	12	99.8%

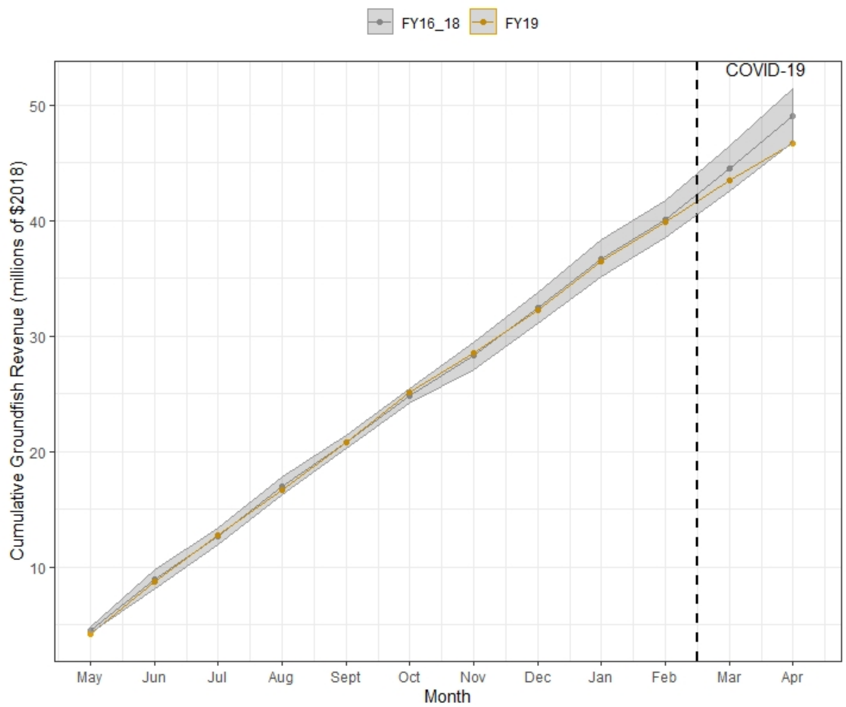

Figure 1 - Cumulative groundfish revenue (millions of $2018) on all commercial (sector and common pool) groundfish trips by month during the fishing year. Revenue standardized to the year 2018. Average monthly cumulative revenue from Fishing Years 2016-2018 shown in grey (mean +/- one standard deviation), while total cumulative revenue from FY 2019 are shown in orange. The start of the COVID-19 crisis on the U.S. East Coast is denoted by the dotted line.

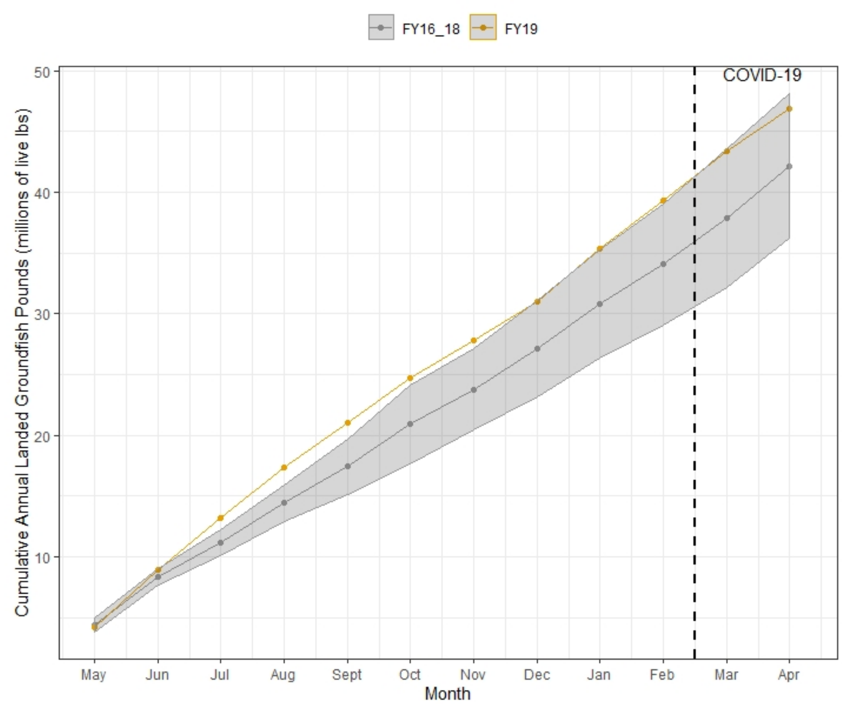

Figure 2 - Cumulative groundfish landings (millions of live lbs) on all commercial (sector and common pool) groundfish trips by month during the fishing year. Average monthly cumulative landings from Fishing Years 2016-2018 shown in grey (mean +/- one standard deviation), while total cumulative landings from FY 2019 are shown in orange. The start of the COVID-19 crisis on the U.S. East Coast is denoted by the dotted line.

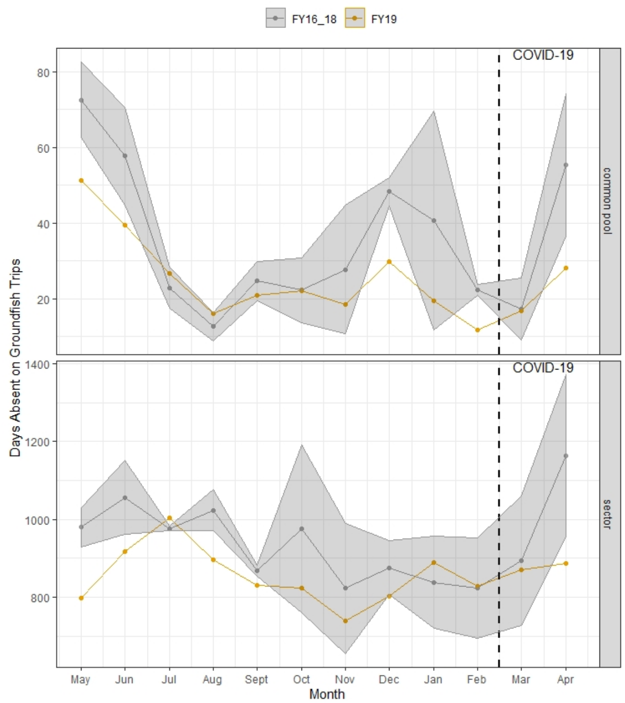

Figure 3 - Monthly days absent (DA) spent on common pool (top) and sector (bottom) groundfish trips by month. Mean DA per month over the last three fishing years (FY 2016-FY2018) are shown in grey while total DA for FY 2019 is shown in orange. Pre- and Post- COVID-19 crisis periods are shown by the dotted line. Note y-axis scales vary across panels.

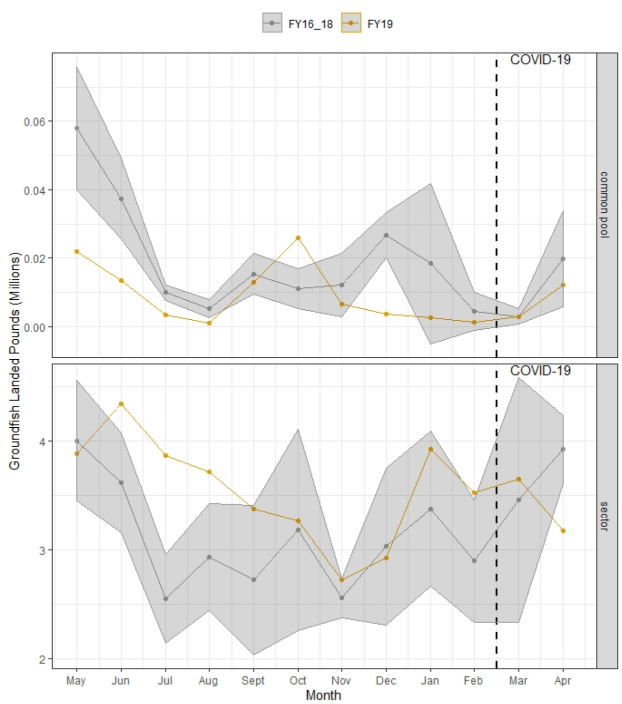

Figure 4 - Monthly common pool (top) and sector (bottom) groundfish landed pounds on groundfish trips. Mean landings per month over the last three fishing years (FY 2016-FY2018) are shown in grey while total monthly landings for FY 2019 is shown in orange. Pre- and Post- COVID-19 crisis periods are shown by the dotted line. Note y-axis scales vary across panels.

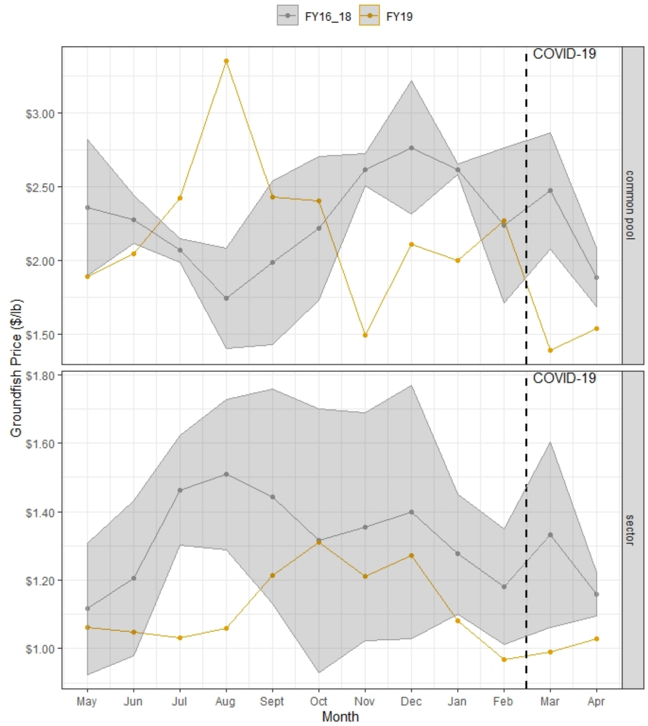

Figure 5 - Monthly common pool (top) and sector (bottom) aggregate groundfish price across all landed stocks. Average price per month over the last three fishing years (mean +/- one standard deviation) are shown in grey while average monthly price for FY 2019 is shown in orange. Pre- and Post- COVID-19 crisis periods are shown by the dotted line. Note y-axis scales vary across panels.

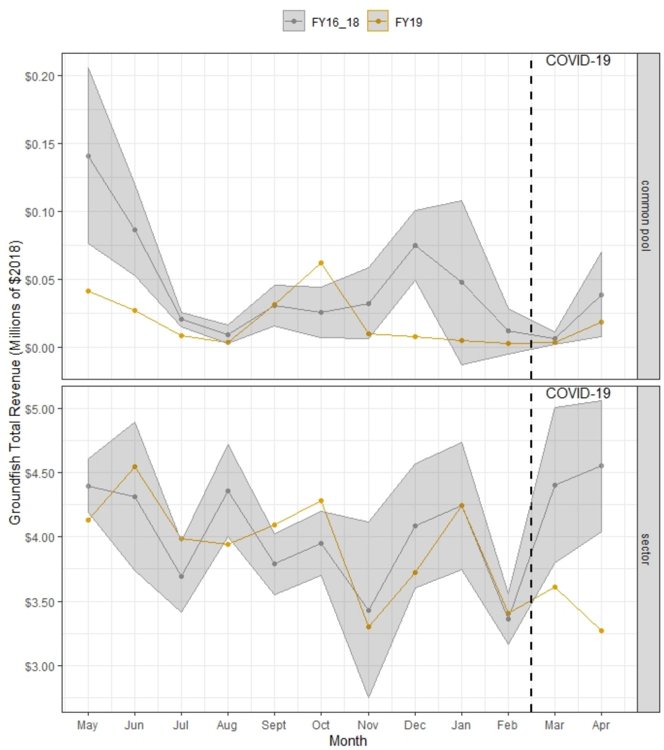

Figure 6 - Monthly common pool (top) and sector (bottom) landed revenue from all groundfish stocks on groundfish trips. Average revenue per month over the last three fishing years (mean +/- one standard deviation) are shown in grey while total monthly revenue for FY 2019 is shown in orange. Pre- and Post- COVID-19 crisis periods are shown by the dotted line. Note y-axis scales vary across panels.

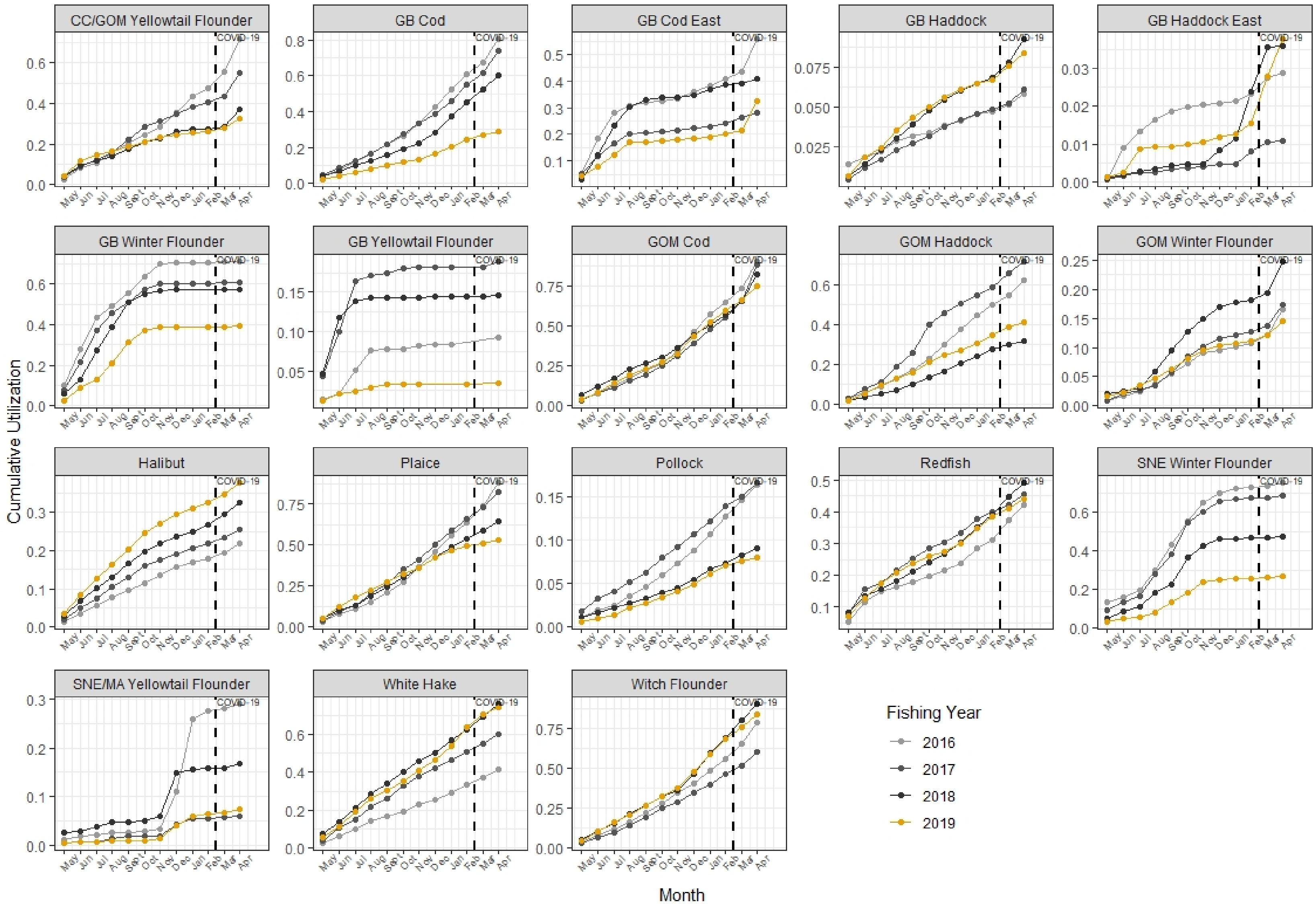

Figure 7 - Cumulative utilization by month (total live landed pounds as a proportion of the commercial sub-ACL) and fishing year. Utilization does not include discards. Pre- and Post- COVID-19 crisis periods are shown by the dotted line. Note y-axis scales vary across panels.

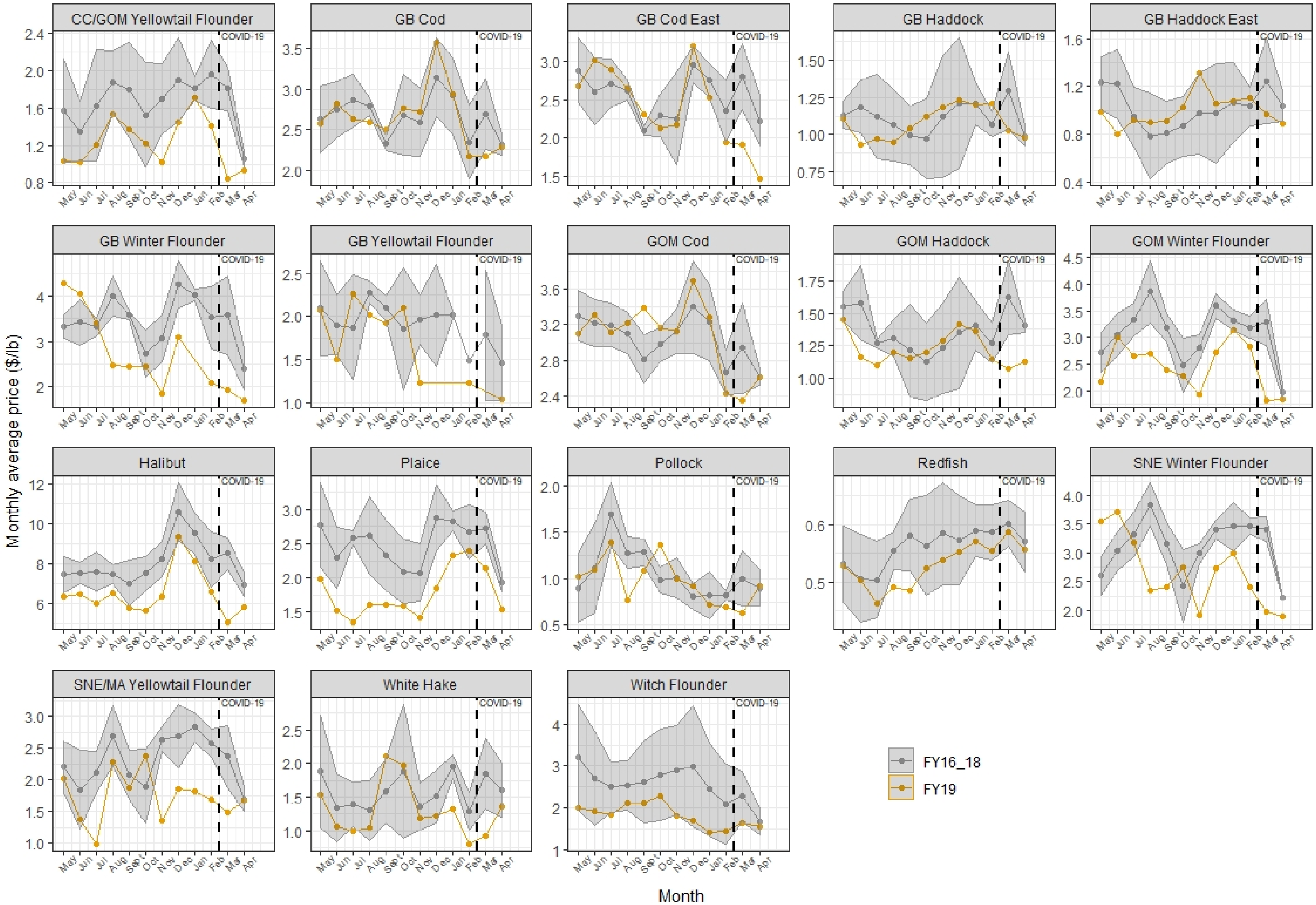

Figure 8 - Average monthly price by stock. Average price per month over the last three fishing years (mean +/- one standard deviation) shown in grey while total monthly revenue for FY 2019 shown in orange. Pre- and Post- COVID-19 crisis periods are shown by the dotted line. Note y-axis scales vary across panels.

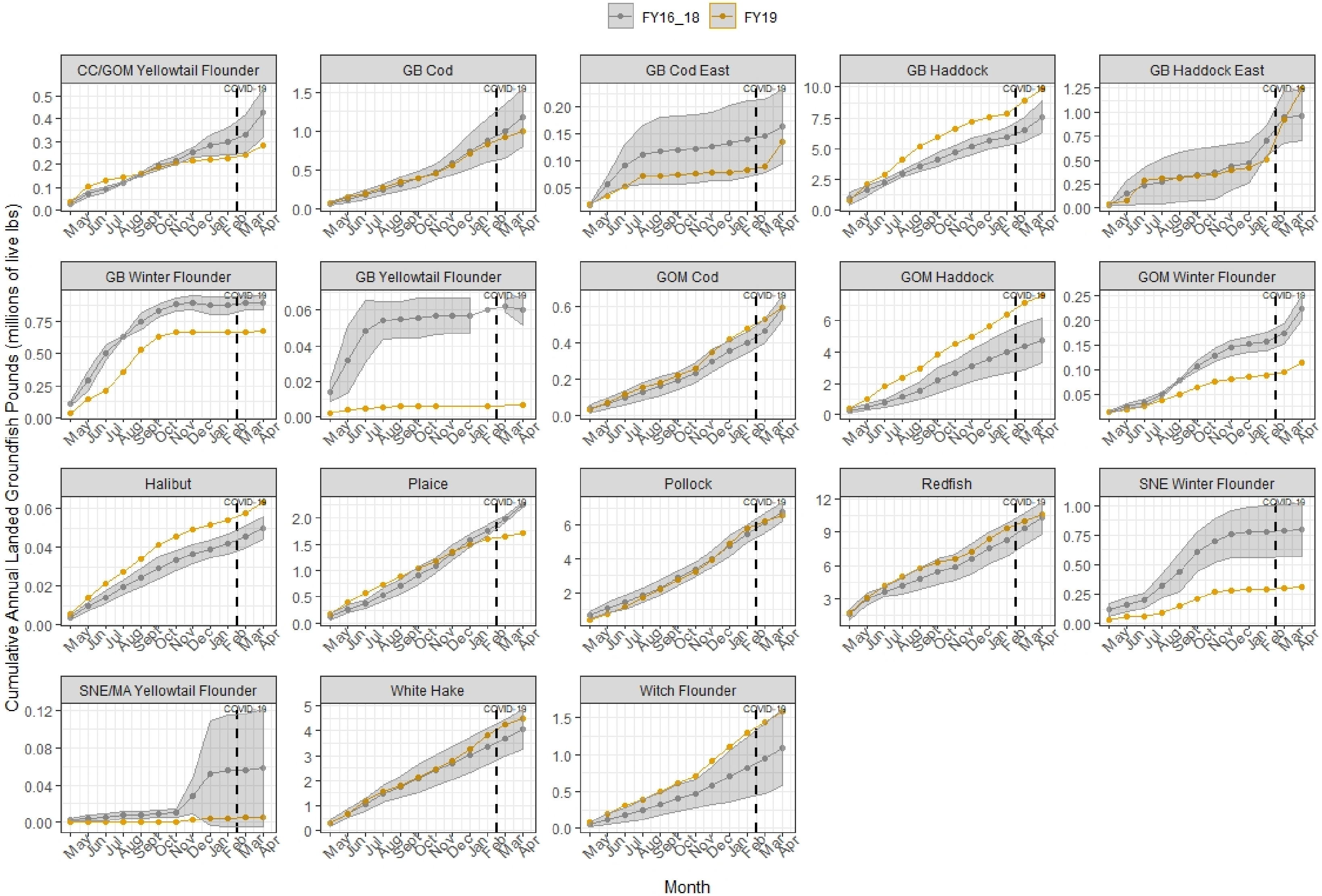

Figure 9 - Cumulative landed pounds by month (total live landed pounds as a proportion of the commercial sub-ACL) and fishing year. Average landings per month over the last three fishing years (mean +/- one standard deviation) are shown in grey while total monthly landings for FY 2019 is shown in orange. Pre- and Post- COVID-19 crisis periods are shown by the dotted line. Note y-axis scales vary across panels.

Table 4 – Summary of common pool DAS carryover and leasing by fishing year.

FY	Number of MRIs with Base Allocation	Number of MRIs with Carryover	Number of MRIs with Lease In	Number of MRIs with Lease Out	DAS Base Allocation	DAS Carryover	DAS Lease In	DAS Lease Out
2015	413	151	10	20	1,989.1	1,143.6	318.3	-318.3
2016	397	142	13	20	1,871.3	1,064.1	329.1	-329.1
2017	397	148	8	13	1,965.2	1,112.7	191.8	-191.8
2018	393	150	8	10	1,940.6	1,150.5	179.0	-179.0
2019	387	141	6	9	1,896.1	1,095.8	177.8	-177.8

Source: GARFO, run on May 15, 2020

Table 5 - Common pool DAS available to be leased, number of MRIs with DAS to lease, and active MRIs charged DAS - A DAS by vessel horsepower (HP)* for FY19.

Vessel HP Category	DAS Available	MRI Count	Active MRIs*
1 - 399	2,006 - 2,992	94 - 146	21
400+	0 - 2,006	0 - 94	7

*A vessel may only lease DAS from vessels with baseline HP greater than or equal to 80% of their own baseline HP.
Source: GARFO, run on June 3, 2020

Table 6 - Common pool DAS available to be leased, number of MRIs with DAS to lease, and active MRIs charged DAS - A DAS by vessel length* for FY19.

Vessel Length Category	DAS Available	MRI Count	Active MRIs*
1 - 29	2,983 - 2,992	144 - 146	0
30 - 49	2,079 - 2,983	98 - 144	18
50 - 79	411 - 2,079	18 - 98	10
80+	0 - 411	0 - 18	0

*A vessel may only lease DAS from vessels with baseline length greater than or equal to 90% of their own baseline length.
Source: GARFO, run on June 3, 2020

Table 7 – Common pool trips, vessels, landings (live mt), and groundfish landings (live mt) by charge type; all commercial groundfish permit categories; FY 2016-2019.

FY	DAS (Categories A, D, F)				Non-DAS (C, HA, HB)				Total			
	Trips	Vessels	Landings (live mt)	Groundfish Landings (live mt)	Trips	Vessels	Landings (live mt)	Groundfish Landings (live mt)	Total Trips	Total Vessels	Total Landings (live mt)	Total Groundfish Landings (live mt)
2016	546	37	1,531.9	114.9	601	91	70.1	51.7	1,147	128	1,601.9	166.6
2017	440	39	1,121.1	70.7	478	103	59.0	44.8	918	142	1,180.1	115.5
2018	436	40	1,144.7	55.9	420	78	69.3	45.6	856	118	1,214.0	101.5
2019	398	30	973.8	48.3	320	75	32.2	17.5	718	105	1,006.0	65.8

Permit and DMIS data as of 5/29/20; GARFO; run on June 17, 2020

Table 8 - Common pool trips, vessels, landings (live mt), and groundfish landings (live mt) by charge type; commercial groundfish permit categories excluding Handgear B; FY 2016-2019.

FY	DAS (Categories A, D, F)				Non-DAS (C and HA)				Total			
	Trips	Vessels	Landings (live mt)	Groundfish Landings (live mt)	Trips	Vessels	Landings (live mt)	Groundfish Landings (live mt)	Total Trips	Total Vessels	Total Landings (live mt)	Total Groundfish Landings (live mt)
2016	546	37	1,531.9	114.9	303	24	46.6	38.8	849	61	1,578.4	153.8
2017	440	39	1,121.1	70.7	177	16	21.0	15.4	617	55	1,142.2	86.2
2018	436	40	1,144.7	55.9	176	15	17.9	12.7	612	55	1,162.6	68.6
2019	398	30	973.8	48.3	147	17	14.8	6.4	545	47	988.5	54.6

Permit and DMIS data as of 5/29/20; GARFO; run on June 17, 2020

Table 9 - Common pool trips, vessels, landings (live mt), and groundfish landings (live mt) by charge type; non-DAS permits; FY 2016-2019.

	C				HA				HB			
FY	Trips	Vessels	Landings (live mt)	Groundfish Landings (live mt)	Trips	Vessels	Landings (live mt)	Groundfish Landings (live mt)	Trips	Vessels	Landings (live mt)	Groundfish Landings (live mt)
2016	25	3	4.7	2.7	278	21	41.9	36.1	298	67	23.5	12.8
2017	Trips: 177		Vessels: 16		Landings: 21.0		GF Landings: 15.4		301	87	38.0	29.4
2018	61	3	8.3	4.5	115	12	9.6	8.2	244	63	51.4	32.8
2019	60	3	11.0	3.5	87	14	3.8	2.8	173	58	17.5	11.2

Permit and DMIS data as of 5/29/20; GARFO; run on June 17, 2020

Appendix: History of carryover actions

Sector ACE carryover

Amendment 16 implemented ACE carryover (in conjunction with ACE transfers) to increase the flexibility of fishermen to adapt when allocated ACE is not aligned with catch rates. The Council noted that the ability to carry forward small amounts of ACE into the next allocation period would reduce incentives to fish right up to the maximum allowed amount. The biological effects analysis highlighted that allowing carryover increases the risk that mortality targets could be exceeded, but indicated that the risk is limited because maximum carryover is limited to ten percent of the ACE for each stock and carryover does not accumulate over time.

During the Council's development of FY 2013 measures, Council staff and NMFS recognized that the maximum carryover (10 percent of FY 2012 sector ACE), if used in conjunction with the much lower catch limits being put in place, could cause overages of the ACL, ABC, and, for GOM cod, the OFL. An emergency action concurrent with the Framework 50 final rule limited maximum carryover of GOM cod (only), to prevent the potential carryover plus ACL from exceeding the OFL. In the same action, NMFS used its authority under 305(d) to clarify the carryover accounting process for future years. That change created a *de minimis* amount of carryover that would not be subject to the pound-for-pound payback accountability measure (AM). The actual *de minimis* amount was not determined in that action but would be low enough to prevent the possibility of catch exceeding ACL. Therefore, only catch above ACL would require payback. A subsequent rulemaking (79 FR 31050; May 30, 2014) set the *de minimis* amount to 1 percent of the Year 2 sector sub-ACL.

In 2014, the U.S. District Court for the District of Columbia vacated the portion of Framework 50 and its associated rule allowing carryover that would allow total potential catch that exceeds the ABC. In response to the Court's order, NMFS implemented an emergency action (79 FR 36433; June 27, 2014) that revised carryover measures for FY 2013. A two-tiered accountability evaluation was adopted that required any sector that used FY 2012 carryover ACE in FY 2013 to pay back the carryover used, except for a *de minimis* amount. This accountability measure was triggered only if catch exceeded both the total ACL and the sector sub-ACL for the stock.

In Framework 53 (80 FR 25110; May 1, 2015), the Council revised the ACE carryover provisions to reduce the maximum carryover available if the total available catch (carryover plus ACL) for the upcoming fishing year would exceed the ABC. The final adjustment to the maximum carryover possible for each sector is based on final fishing year catch for the sectors and each sector's total unused allocation; and is proportional to the cumulative PSCs of MRIs participating in the sector. Framework 53 retained the 2-tiered evaluation. If an ACL overage occurs and sectors have caught above the sector sub-ACL (which does not include carryover), sectors are responsible for a pound-for-pound payback, minus the *de minimis* amount of carryover set by NMFS. Currently, the *de minimis* amount is 1 percent of the sector sub-ACL. NMFS has the authority to change the *de minimis*. While the regulations do not specify a limit to the *de minimis* amount, the rulemaking that set the current level of 1 percent provided justification that a 1-percent *de minimis* would be within the management uncertainty buffer that is used to reduce the ABC to the ACL. These carryover provisions remain in effect today.

DAS carryover

Framework 24 implemented DAS carryover provisions in 1998. Due to a concern that unforeseen circumstances may result in either forfeiture of DAS or fishing under unsafe circumstances, such as bad weather conditions or mechanical breakdowns near the end of the year, the Council developed a measure to allow vessels to carry over up to 10 unused multispecies DAS from one fishing year to the next. The Council implemented DAS carryover to promote safety by reducing risk and increasing planning flexibility, while not compromising the conservation impact of the DAS program. DAS-sanctioned vessels carry over unused DAS based on their DAS allocation minus total DAS sanctioned.

The Council began the DAS reduction program in 1994 with the implementation of Amendment 5. The final stages of the reduction program took place under Amendment 7 in 1996 and 1997. By 1997, as allocations became broadly restrictive, vessel owners were developing annual fishing strategies that would maximize their economic benefit from a limited fishing opportunity. For many owners, that meant reserving some DAS for the end of the fishing year when other vessels would have run out of DAS. If weather, mechanical breakdown, or other circumstance prevented the vessel from using all its allotted DAS, those valuable DAS would be lost. These restrictions incentivized some vessels into fishing under unsafe conditions rather than lose the fishing time. In response, the Council allowed the 10-DAS carryover, to promote safety by reducing the vessel owners’ risk and increasing their planning flexibility without compromising the conservation impact of the DAS program.

Framework 24 asserted DAS carryover would not result in any measurable biological impact because it would not result in any increase in the overall DAS allocated. Positive economic impacts were expected to be limited to vessels that were able to use DAS they would otherwise have lost, but most vessels (<20%) at that time did not fish their DAS allocations to within 10 DAS of the total. The social impact was predicted to be positive, but very small.

Timeline/History of ACE Carryover Actions

Date	Cite	Summary
March 29, 2013	78 FR 19368	FW 50 proposed rule.
May 3, 2013	78 FR 26172	FW 50 Interim Final Rule and **3** parallel emergency actions, including one to modify the maximum carryover of GOM cod from FY 2012 to FY 2013. Used 305(d) to clarify how to account for sector carryover for FY 2013 and for FY 2014 and beyond to reconcile conflicts between the sector carryover program and the conservation objectives of the FMP and how to account for carryover catch consistent with the national standards.
August 29, 2013	78 FR 53363	FWs 48 and 50; and FY13 Sector Ops Final rule.
March 17, 2014	79 FR 14635	Carryover proposed rule. Proposed *de minimis* carryover level for 2014 to complete the process laid out under 305(d) in conjunction with the FW 50 final rule.
April 4, 2014	Conservation Law Foundation v. Pritzker, et al. (Case No. 1:13-CV-0821-JEB)	Court Order to vacate the portion of Framework 50 and its associated rule allowing carryover catch. Court determined sector carryover combined with the total ACL for the upcoming fishing year could not exceed the ABC.
June 27, 2014	79 FR 36433	Temporary Rule; Emergency Action to revise carryover in response to the court order. Revised carryover from 2012 to 2013 and required payback for any sector using carryover if both the sector sub-ACL and the total ACL for a stock were exceeded.
March 9, 2015	80 FR 12394	FW 53 proposed rule; Sector Carryover. Proposes to reduce the maximum available carryover down from 10 percent to ensure that total potential catch does not exceed the ABC.
May 1, 2015	80 FR 25110	FW 53 final rule; Implemented sector carryover changes as proposed. Created current system.

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John F. Quinn, J.D., Ph.D., Chairman | Thomas A. Nies, *Executive Director*

July 6, 2020

Mr. Michael Pentony
Regional Administrator
Greater Atlantic Regional Fisheries Office
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930

Dear Mike:

On April 27, 2020, GARFO published an interim final rule to allocate Annual Catch Entitlement (ACE) to sectors and approve sector exemptions (*Federal Register* Vol. 85 No. 81, pp. 23229-23240), with a comment period closing on May 27, 2020. Among the sector exemptions approved was a reduction in the size of the redfish exemption area. Unfortunately, the announcement of the rule did not overlap well with the April Council meeting (April 14-16) and the comment period closed before the June Council meeting (June 23-25). The Council respectfully requests GARFO consider its enclosed recommendations.

At its June Council meeting, the Council discussed the commercial groundfish sectors' opposition to recent changes to the boundaries of the redfish exemption area and the process for reducing the area. The Council was informed of the Groundfish Advisory Panel's request for reinstatement of the fishing year 2019 area and the Groundfish Committee's tasking of the Plan Development Team (PDT) to examine the data used by GARFO.

The PDT received a presentation by GARFO staff on June 17 on the redfish area exemption analysis to better understand the approach and data used. The PDT provided the following feedback:

- Comparison of only redfish-declared trips to the completed analysis would be helpful.
- Additional maps adjusted for confidentiality showing where redfish targeted (observed) hauls have occurred and additional statistics may be informative (but may not show a different conclusion).
- The PDT did not draw conclusions of the analysis. A written, methodological summary document prepared by GARFO would facilitate deeper review, if a more detailed evaluation of the analysis is requested by the Council for the PDT to review.

Council Request

The Council made the following motion:

> To write a letter to GARFO requesting that the Agency immediately issue a rule reverting the Redfish Exemption Area back to its FY 2019 state and urge the agency to work collaboratively with Sectors and their members to understand the nature of the fishery,

the exemption as refined in FY 2015 and if necessary develop modifications for future rulemaking.

(13 supporting /1 against /2 abstentions).

The redfish stock is rebuilt and is an under-utilized species. The Council strongly urges GARFO to reinstate the boundaries of the redfish exemption area to allow sectors to access a healthy resource and help feed the American public, including through a recent USDA program developed in response to the COVID-19 National Emergency. The Council's recommendation is also consistent with the recent Executive Order on Promoting American Seafood Competitiveness and Economic Growth (issued May 7, 2020). Going forward, the Council encourages collaboration with the sectors in the exemption process.

While the Council heard that redfish landings in fishing year 2020 appear to be higher than those in fishing year 2019 – even with the smaller area – it is possible that this is because different vessels are fishing for redfish this year. Opportunities to sell redfish to the USDA, and the early 2020 sale of vessels and permits belonging to Carlos Rafael, may have restored some effort to the fishery.

Please contact me if you have questions.

Sincerely,

Thomas A. Nies

Thomas A. Nies
Executive Director

------ Original message------
From: lisaanncod
Date: Tue, Jul 14, 2020 2:27 AM
To: Janice Plante;Tom Nies;
Cc: Jon Hare;Brett Alger;Michael Pentony;Sarah Bland;
Subject: Lisa Ann 3

I am writing to comment on Amendment 23. I am amazed that New England seems to be far behind in technology such as E.M. This is used all over the world and seems to work for compliance and to gather scientific information. I have been in the max retention project with 100 percent monitoring along with dockside monitoring and it really has not changed my day to day routine. It's actually refreshing just to go to work snd do my job without having observrr safety checks at 1 a.m and a pile of questions throughout the day. I do worry about cost to vessels as I do with the observer program as well but I think e.m will be a cheaper alternative and yield better data. I think this whole Covid 19 pandemic has shown E.M to be a useful tool as the observer program has been shut down, we are still collecting 100 percent of our trips thru E.M. I think the technology is here and it should be used and be pursued to make it a alternative for all fishing vessels. As everyone is well aware there are major problems with the observer program (Human effect) like l didn't see that! I'll go down below and you do what you need to do, or let me help you throw those over and not write it down. This is not helping our industry one bit. As someone who lands 10 to 15 percent of the tac of GOM Cod a year. We need to show that the cod are there and the locations to better understand the population and distribution or lack there of if that's the case. I understand that e.m is intrusive but look around, there are cameras everywhere you go, stores, highways, walking trails, people's homes and so on. I think it should be up to the individual person to have E.M or Observers but if you want data that does not have any bias that's up to you.

Sorry for jumping around with my thoughts I'm towing while I'm writing this.

Thanks, Jim Ford
F/V Lisa Ann III

July 20, 2020

Thomas Nies, Executive Director
50 Water Street, Mill 2
Newburyport, MA 01950

Dear Tom,

As you know, we are convening the 2021 Haddock Research Track assessment. We very much appreciate Dr. Jamie Cournane's participation as a working group member for this research track assessment, and I am writing to request her service as Chair of the working group.

This particular research track assessment presents unique challenges, covering two domestic haddock stocks and a transboundary stock. As this will be our first research track assessment with another country, we are seeking someone who will employ a fair, diplomatic, and transparent approach to the Chair role, in addition to someone who has a keen understanding of the complex nature of the assessments. Several of my staff have worked closely with Jamie through the years, and we think her haddock and transboundary expertise would be a great fit for the Chair of this working group. In addition, Jamie also has demonstrated the ability to bring together diverse groups and perspectives, which is essential for this role. Although many of our past benchmark assessment working groups have been chaired by NEFSC staff, we have had non-NEFSC staff as working group chair. For example, Jessica Coakley from MAFMC chaired the most recent summer flounder benchmark working group very successfully.

We recognize that NEFMC staff are very busy in a normal year, and Jamie is currently serving on the Index Based Methods Research Track working group. NEFSC is prepared to provide support to the working group chair, which could include scheduling and meeting logistics support (in person and/or video conference), rapporteurs, and support relative to working group report generation.

Please let us know if Jamie and NEFMC are interested in this opportunity. If you have any questions, please let me know, or reach out to Mike Simpkins for further information.

Sincerely,

Jonathan Hare, Ph.D.
Science and Research Director

Phone: 774-392-3113
Email: jon.hare@noaa.gov

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John F. Quinn, J.D., Ph.D., Chairman | Thomas A. Nies, *Executive Director*

July 22, 2020

Jonathan Hare, Ph.D.
Science and Research Director
NOAA\NMFS Northeast Fisheries Science Center
166 Water Street
Woods Hole, MA 02543

Dear Jon,

We greatly appreciate the consideration you showed Dr. Jamie Cournane in asking if she could chair the haddock Working Group. Unfortunately, that will not be possible. As the Council's staff groundfish analyst, Jamie's primary responsibility is completing the analyses necessary to support Council actions for the Northeast Multispecies fishery.

In this role she leads the groundfish Plan Development Team, participates in the Transboundary Resource Assessment Committee and the Transboundary Management Guidance Committee, attends all groundfish assessment meetings, participates in other working groups (such as the recent working group for Atlantic cod stock structure and the current Index-Based Assessments Working Group), and prepares framework and amendment documents for Council actions. These activities require preparation for detailed discussions at every one of our five Council meetings each year plus at least that number of committee and Advisory Panel meetings.

Again, I appreciate your request, but I will not add to her job responsibilities at this time by assigning her to chair the Haddock Assessment Working Group. Please let me know if you have any questions.

Sincerely,

Thomas A. Nies

Thomas A. Nies
Executive Director

COMMONWEALTH OF MASSACHUSETTS

THE GENERAL COURT

STATE HOUSE, BOSTON 02133-1053

July 23rd, 2020

The Honorable Neil Jacobs, Ph.D.
Assistant Secretary of Commerce for Environmental Observation and Prediction
Acting Under Secretary of Commerce for Oceans and Atmosphere
National Oceanic and Atmospheric Administration
1401 Constitution Avenue, NW, Room 5128
Washington, DC 20230

Mr. Michael Pentony
Regional Administrator
National Marine Fisheries Service, Greater Atlantic Region
55 Great Republic Drive
Gloucester, MA 01930

Dr. Jon Hare
Science and Research Director
Northeast Fisheries Science Center
166 Water Street
Woods Hole, MA 0254

Dear Under Secretary Jacobs, Mr. Pentony, and Dr. Hare:

Thank you for extending the waiver for the requirement of At-Sea Monitoring (ASM) in the Northeast groundfishery through July 31, 2020. This action was critical to protecting the health and safety of the men and women in the Massachusetts commercial fishing industry.

While COVID-19 trends in the Northeast have been generally positive, many coastal areas continue to see cases rising, including Suffolk, Bristol, and Barnstable counties here in Massachusetts, all of Rhode Island, and Virginia Beach County, Virginia. As Senator Tarr's June 30, 2020 letter to you, the commercial fishing industry remains among the most vulnerable to COVID-19 due to the inherent conditions of their working environment at sea. Furthermore, the US Centers for Disease Control and Prevention (CDC) has warned that this fall and winter will likely see a secondary outbreak of COVID-19.

Despite the initial extension of ASM waivers in the Northeast groundfishery, the issues outlined in Senator Tarr's letter of June 30, 2020 persist today. Therefore, in the interest of protecting our commercial fishing communities and to prevent exacerbating the spread of COVID-19, we strongly urge you to extend the ASM requirement waiver until a time when it is safe to resume this form of monitoring.

Thank you for your attention to this request, and please do not hesitate to contact me if I may be of further assistance.

Sincerely,

Senate Minority Leader Bruce Tarr

Senator Mark Montigny

Senator Diana DiZoglio

Representative Ann-Margaret Ferrante

Representative Susan Gifford

Representative Will Crocker

Representative Angelo Scaccia

Representative Theodore Speliotis

Representative Lenny Mirra

Representative Steven Howitt

CC: Governor Baker

Senator Warren

Senator Markey

Massachusetts Congressional Delegation

Massachusetts Coastal Caucus

Mayor Theken

Mayor Walsh

Gloucester City Council

New England Fishery Management Council

Massachusetts Director of Marine Fisheries McKiernan

Massachusetts Fisherman's Partnership

Northeast Seafood Coalition

New England Fishery Management Council
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July 24, 2020

Dr. Alex Hansell
Stock Assessment Specialist
Massachusetts Division of Marine Fisheries
251 Causeway Street, Suite 400
Boston, MA 02114

Dear Alex:

Dan McKiernan has recommended you represent the Massachusetts DMF on the Council's Groundfish Committee and Monkfish Plan Development Teams (PDT). The Groundfish PDT is currently supporting the Council's work on setting catch limits and management measures for groundfish stocks in the commercial and recreational groundfish fisheries and improving the commercial fishery monitoring program.

PDT members are expected to contribute to discussion, analysis, and document preparation, often under difficult timelines. I appreciate your willingness to assist in these tasks. Further, PDTs are tasked with providing objective analyses to the Council. For this reason, PDT members are not allowed to address the Committee or Council in order to advocate for any specific Council decisions unless they are presenting a PDT position. This task is normally the responsibility of the PDT Chair.

Dr. Jamie Cournane, Groundfish PDT Chair, will be contacting you shortly with more information. Feel free to contact her at your convenience by email (jcournane@nefmc.org) or telephone: 978-465-0492, ext.103. Currently our Deputy Director, Chris Kellogg is overseeing the Monkfish PDT and will be available to answer any questions, ckellog@nefmc.org.

I am pleased to appoint you to both the Groundfish and PDTs. Please contact me if you have any additional questions or concerns.

Sincerely,

Thomas A. Nies

Thomas A. Nies
Executive Director

cc: Daniel McKiernan, MA DMF

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930

July 28, 2020

Dr. John F. Quinn, Chairman
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, Massachusetts 01950

Dear John:

We approved Framework Adjustment 59 to the Northeast Multispecies Fishery Management Plan (FMP). The final rule implementing Framework 59 filed at the Office of the Federal Register on July 28, 2020, and the rule was effective upon filing. A detailed discussion of the approved measures is included in the final rule.

In the rule implementing Framework 59, we corrected a citation in the regulations regarding the windowpane flounder accountability measures. We also revised the regulatory text to clarify our existing authority to approve new gear standards as recommended by the Council.

If you have questions about our approval of Framework 59, please contact Pete Christopher, Groundfish Branch Chief for Sustainable Fisheries, at (978) 281-9288.

Sincerely,

Michael Pentony
Regional Administrator

cc: Tom Nies, Executive Director, New England Fishery Management Council
Dr. Jon Hare, Director, Northeast Fisheries Science Center

XII Northeast Fishery Sector, Inc.
67 Creelman Drive,
Scituate MA 02066
August 1, 2020

Comments on Amendment 23 Public Hearing Document

Mr. Chairman and Council members:

XII Northeast Fishery Sector, Inc. (Sector 12) is one of the smaller sectors established under the provisions of Amendment 16. Comprising 18 enrolled multispecies permits, we have 7 active vessels, 5 of which are home ported in Scituate Harbor. These five vessels are heavily dependent on the groundfish fishery.

Sector 12 has an interesting history. It originated as one of two Northeast Fishery Sectors representing New Hampshire fishermen. Following the 2012 Gulf of Maine cod disaster declaration, fishing activity declined to the point where the two sectors consolidated to increase efficiency. In 2016, a group of fishermen seeking a more unified approach to contracting with ASM providers acquired the dormant sector. Ironically, the issue that stimulated our genesis brings here again today.

Our five active groundfish vessels comprise three gillnetters and two draggers, ranging in length from 50 to 55 feet. All operate primarily as day boats with a crew size of 2 or 3. All are heavily dependent on groundfish, deriving an estimated 50% to 75% of revenue from the multispecies stocks. Daily landings average about 2,000 to 2,500 lbs. including non-groundfish species.

All Sector 12 vessels are family owned. Many have been operated by the same crews for many years.

I fear that the preferred alternatives presented in the public hearing document will end that legacy. The economic analysis provided in the DEIS fails to understand and to account for the disproportionate impact ASM costs will have on smaller vessels, especially day boats whose short trips produce comparatively small landings.

Although landings have risen recently, prices, which had been declining gradually during that time frame dropped dramatically by 40% to 50% with the business closures caused by the COVID19 pandemic. Among the drivers of this loss of value are the closure of restaurants and food service businesses and loss of processing capacity due to health risk and difficulty in obtaining workers.

Presently, profit margins for our boats, which had been narrowing, have disappeared. This presents a growing safety risk due to delayed routine maintenance and discretionary repairs. Crew shares, which are based or net revenue after deduction of trip costs, have shrunk to the point where loyalty rather than expected compensation has become the primary reason to stay fishing.

Despite the assertion by the DEIS that Sector specific contracts with ASM providers have stabilized rates, our experience is totally contradictory. Our average daily rate in 2017 was about $400.00. By 2019 this had increased to about $700.00, a 75% increase in only two years. Moreover, these rates do not include additional training costs which were authorized in late 2018. It is certainly reasonable to expect that additional costs will accrue due to the imposition of safety protocols once monitoring resumes.

We find the assumptions and conclusions presented in DEIS Appendix VI to be deeply flawed and disconnected from reality. Part of the problem is that, with 2018 as the most recent year analyzed, the data are not representative of reality and the conclusions are erroneous. For example, the analysis asserts that 197 vessels are active in the fishery. There are probably less than 100 vessels participating, with a substantial number of these making only a few trips in order to catch just their allocated ACE.

Declining participation in the fishery is leading to lower levels of ACL attainment for many stocks. This is demonstrated by the dramatic decline in ACE lease prices. With the exception of Gulf of Maine cod, most lease rates have dropped by about 50%, revealing a growing recognition that the fishery cannot fully utilize all current allocations. This phenomenon nullifies the argument that removal of the management uncertainty buffers, touted as a benefit of 100% monitoring, will have a significant effect on the value of the fishery.

Likewise, the argument that more monitoring leads to better stock assessments, presumably making higher allocations available, fails a cost benefit test. Certainly, better assessments are a goal to which we can all aspire, but simply adding more monitoring is not a cost-effective way to achieve them.

Perhaps most egregious is the claim that adding aggregate value to the fishery is an overall good. The analysis correctly identifies differences in the ability of vessels in the identified size classes to withstand additional monitoring costs. It is undoubtedly true that a vessel that can catch, process and land 15,000 lbs. per day at sea can absorb external costs better than a vessel that can only land 2,000 lbs. However, the tacit assumption that owners of “inefficient” vessels will simply transition to something capable of covering these imposed costs in incorrect and insulting.

For our members, the choice of a vessel and a fishery is an expression of a lifestyle, not solely an economic decision. We fish as a community reflecting the capacity of our harbor and its infrastructure to support a vessel. We make day trips to nearby grounds to enable captains and crews to spend time with their families ashore. We fish for species which are in local demand to help feed our community.

Finally, there is the issue of food security. Fishermen feed people. If there are less fish caught and landed, our seafood will come from somewhere else. The public was shocked last March when supply chains collapsed, and supermarket shelves were emptied by panic buying. Making local fisheries unaffordable decreases food security. We do not want to increase food supply vulnerability by making poor management choices.

Do not assume that there will be a smooth transition should this Amendment be adopted. Instead, there will be a hyper-consolidation into large vessels operated by vertically integrated businesses. This is the very issue about which the public spoke passionately during the development of Amendments 16 and 18. The results of this Amendment will effectively nullify the protections for fleet diversity supported by both the public and the actions of previous Councils.

The Council needs to carefully reflect on the consequences of this action. If passed as proposed, it will beget irreversible changes in this fishery. There is no reset button.

The best choice for now is to vote for the “no action” alternatives and to remand the issue back to the PDT. The Council also needs to begin a comprehensive discussion over monitoring including such issues as perverse incentivization, enforcement's role in compliance and development of technological innovation.

Thank you for considering these comments.

For the members of Sector 12,

Frank Mirarchi

From: Michael Pierdinock [mailto:cpfcharters@yahoo.com]
Sent: Monday, August 03, 2020 10:00 AM
To: Tom Nies <tnies@nefmc.org>
Subject: Coments to Executive Order on Promoting American Seafood Competitiveness and Economic Growth

FYI, see below

----- Forwarded Message -----
From: Michael Pierdinock <cpfcharters@yahoo.com>
To: Randy Blankinship - NOAA Federal <randy.blankinship@noaa.gov>
Sent: Monday, August 3, 2020 09:56:09 AM EDT
Subject: Re: Atlantic HMS Advisory Panel Meeting Sept. 9-10 Via Conference Call/Webinar

Randy:

The recent Executive Order made no mention of recreational fishing that provides a mechanism to put food on the plate and feed the public. Fresh and saltwater fishing (including clamming, oystering, lobstering, etc.) by many for subsistence is ongoing especially during these tough times. During COVID this provided a mechanism to put food on the plate to feed ones family but also for one's mental wellbeing to get out of one's home with safe distancing and other protective measures during lockdown.

We recommend that the Executive Order include removing barriers to America Fishing for the recreational and for hire fleet. We observe select species of fish in tremendous numbers yet our seasons and bag limits do not reflect such. Expanded seasons and bag limits are being considered for select species this fall especially for the for hire fleet as a result in a reduction in landings during COVID and detrimental impact to the for hire fleet during COVID restrictions and closures. Such relief is needed this fall and next season.

If you have any questions please email or give me a call. Please confirm receipt of this email.

Thanks

Capt. Mike Pierdinock
CPF Charters "Perseverance" - New Bedford
Stellwagen Bank Charter Boat Association - President
Recreational Fishing Alliance - Massachusetts Chapter Chairman
(617) 291-8914

On Thursday, July 30, 2020 05:12:32 PM EDT, Randy Blankinship - NOAA Federal <randy.blankinship@noaa.gov> wrote:

Dear Atlantic Highly Migratory Species (HMS) Consulting Parties,

We are planning to hold the Fall 2020 Atlantic HMS Advisory Panel meeting as a conference call/webinar on Wed., September 9, and Thurs., September 10. We are still working on the agenda, but for now please plan for the call to run the full two days. We are planning to discuss ongoing regulatory actions and pertinent topics that we are looking for AP member feedback on.

More information regarding the agenda, call times, and logistics will be sent your way once they are finalized. If you have a suggestion about the agenda, please let me know by August 7, and we will do our best to accommodate those requests. Meeting materials will be posted on the HMS website prior to the meeting, and you can find the meeting materials and the wrap-up presentation from the Spring 2020 meeting here.

I also want to take this opportunity to bring another opportunity for input to your attention.

On May 7, 2020, the President of the United States signed an Executive Order on Promoting American Seafood Competitiveness and Economic Growth. The purpose of this Executive Order is "to strengthen the American economy; improve the competitiveness of American industry; ensure food security; provide environmentally safe and sustainable seafood; support American workers; ensure coordinated, predictable, and transparent Federal actions; and remove unnecessary regulatory burdens." The Atlantic HMS Management Division invites input on ways to reduce burdens on domestic fishing and to increase production within sustainable fisheries. Recommended actions may include changes to regulations, orders, guidance documents, or other similar actions. Please feel free to provide any input you may have to me via email or at the HMS Advisory Panel meeting.

I hope you are well, and if you have questions please let me know.

Regards,

Randy Blankinship
Chief, Atlantic Highly Migratory Species Management Division
Office of Sustainable Fisheries
NOAA Fisheries | U.S. Department of Commerce
Office: (727) 824-5399
www.fisheries.noaa.gov

From: James Fletcher <bamboosavefish@gmail.com>
Sent: Thursday, August 6, 2020 10:22 AM
To: Chris Moore <cmoore@mafmc.org>; Batsavage, Chris <chris.batsavage@ncdenr.gov>; Chris Kellogg <ckellogg@nefmc.org>
Subject: Council discussion Executive order discussion

Recreational Boating & Fishing Foundation 13.1 million fish in salt water, in light of **EXECUTIVE ORDER** council discuss & justify recreational allocation of around 50% of most species when much of recreational allocation result in dead discard. Justify not utilizing total length / retention of all catch. JUSTIFY 13.1 MILLION VS. 325 MILLION RESULTING IN 92% TO 93% IMPORTED SEAFOOD DISCUSS mandatory electronic / cell phone reporting by all recreational fishing in EEZ USING BLUE FINA DATA APP {INVITE BLUE FIN DATA TO PARTICIPATE PLEASE!}

--
James Fletcher
United National Fisherman's Association
123 Apple Rd.
Manns Harbor, NC 27953
252-473-3287

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

August 7, 2020

Senator Roger Wicker
Chairman, U.S. Senate Committee on Commerce,
Science, and Transportation
512 Dirksen Senate Building
Washington, DC 20510

Dear Senator Wicker:

Thank-you for asking the Council whether the Real Economic Support That Acknowledges Unique Restaurant Assistance Needed to Survive Act of 2020 (or the RESTAURANTS Act of 2020) (S. 4012) would benefit the U.S. fishing industry. While the Council cannot comment directly on the legislation, we would like to relay to you concerns we have heard from the New England fishing industry about the restaurant industry.

Much of the seafood caught in New England has been sold to the restaurant industry. From the iconic species of cod, scallops, and lobster to the newer favorites such as monkfish, fishermen have relied on restaurant demand as a key market. With the closing of restaurants due to COVID-19, that market vanished overnight. Fishermen have repeatedly told us that this resulted in a dramatic decline in demand and plummeting prices.

While fishermen are searching for new markets for their products, they are hopeful that the restaurant demand will return. The gradual re-opening of New England states and reports of restaurants that have permanently closed suggests that will be a slow process. A strong restaurant industry should increase demand for U.S. seafood, helping our fishermen recover from their COVID-19 related setback.

Again, thank-you for considering the impact of the restaurant market on the fishing industry. I hope this information is helpful.

Sincerely

John F. Quinn

Dr. John Quinn
Chairman

Amendment 23 Public Comments David Goethel

My name is David Goethel. I am owner and operator of the Ellen Diane in Hampton, NH.I have been in the fishing industry for 53 years and I am a former three term council member. I am currently a groundfish advisor and member of NTAP. In all my years of fishery management, I have never seen a council action go so far off the rails as amendment 23. Because I have had a good working relationship with a the various people involved in this process, I want you to know my harsh comments are not directed at any individual, but rather at the organism which has completely failed New England groundfish fishermen and their communities.

In general, this amendment does not meet its stated goals and objectives or purpose and need. It confuses biology and enforcement setting up a police state in the process. The council preferred alternative will create massive mortality on both fish and shellfish resources in the false name of science and be directly responsible for crimes against nature. It will waste enormous sums of money and bankrupt all but the largest boats.

I will go through the document and detail its shortcomings and possible remedies. The list is lengthy.

The goals and objectives and purpose and needs section will have to be rewritten if the council approves monitoring levels above status quo. Suggested language could be: The goal of this amendment is to remove as many fishing boats and communities as possible while setting up a command and control police state administered by NOAA Fisheries. The need for this action is because numerous NOAA employees believe all fishermen are cheating and cannot be trusted. Further NOAA does not wish to be embarrassed nationally or internationally by a future Carlos Rafael.

Since defending the true goals and objectives and purpose would be legally impossible, lets focus on highlighted existing statements that are not met.

Goal 4: minimize adverse effects on communities and infrastructure. 100% monitoring will eliminate entire communities and infrastructure.

Objective 1: Maintain optimum yield. Impossible with the number of vessels that will be bankrupted.

Objective7: Maintain a diverse groundfish fishery. 100% monitoring will only allow a handful of very large vessels to remain.

Objective 10: minimize mortality of bycatch. 100% monitoring leads to nearly 100% mortality of everything that comes on board. Any coverage level beyond NEFOP, which is biologically damaging enough, is unnecessary mortality and a crime against nature.

The council and NOAA have apparently confused improving accuracy of the existing system with a belief that 100% monitoring will be 100% accurate and precise. Nothing could be further from the truth. The current system is inaccurate for three major reasons, which despite numerous requests for discussion, have not been addressed by the council or NOAA Fisheries observer staff. First, only one observer goes on trip boats and a number of tows go unobserved while the observer sleeps. Second, a number of observers use volume to volume extrapolations which should be banned in the groundfish fishery. They produce fantastic discard estimates. Fish are not randomly distributed in a haul. I had a recent tow where 1 windowpane became 21 lbs. and one 2.5 lb. summer flounder became 43 lbs. I could write at length why overestimating discards is very dangerous for assessments, but your scientists should be able to tell you why. Third, is the issue of measuring error. Weighing fish on a wildly moving vessel is nearly impossible even with gravity compensated scales, never mind spring scales. Matters are made worse by not taring the scale after the measuring basket is wet and muddy. It is further eroded by introducing measuring error over and over as a couple of small fish are weighed at a time instead of waiting to measure them all together. I have raised these issues with both the council and observer program to no avail. I will not consider this amendment complete until these issues are researched and addressed by the council. At the moment, you are both precisely wrong and inaccurate.

Uncounted catch: Council staff and NOAA Fisheries have spent an inordinate amount of time trying to prove observer bias and uncounted catch when industry members could have agreed to both. The current observer program has morphed into a beast that is hardly recognizable to fishermen and observers from years past. From the invasive and totally unnecessary daily safety inspection to the killing of vast numbers of live crabs and lobsters, as well as prohibited species like thorny skates and wolfish, the current ASM program has demoralized captains and crews with this disastrous increase in mortality of creatures that are returned to the sea alive on unobserved trips. Many captains cut their trips short in disgust and I cut my fishing year short after a month and half of continuous coverage. My crew threatened to quit in disgust at the increased workload and frequent disregard for the resource. During that period 4 separate observers picked up live lobsters and crabs with fish picks and virtually all left lobsters in baskets for extended periods of time in subfreezing weather causing either mortality or claw dropping. Would the folks who want 100% monitoring submit to having a fish pick put through their head or chest? I think not!

The council needs to create a section in the document to remove observers from the safety business. This is the domain of the Coast Guard and a current CG safety sticker should be sufficient. Further, another section should be created to have ASM's only deal with groundfish discards. Prohibited species, lobsters and crabs should be returned to the ocean as fast as possible as is currently done on unobserved trips.

The government appears obsessed with uncounted catch as the sole source of assessment error and has even concocted a fantastic calculation which is on pgs. 39-42 of the biological impacts statement. It concludes by stating that up to 1100 tons of cod are illegally discarded. I read this analysis while standing in line at the king of fantasy, Disneyland. After letting out a very audible WTF which caused my wife to immediately disarm me of her smart phone, I had plenty of time to reflect on the fact that old Walt had been bested in fantasy by NOAA. Why a fantasy, because in case no one noticed dead cod float. I am sure someone would have noticed over 2,000,000 lbs. of cod floating around the ocean. But seriously, there is uncounted catch of cod and it is probably substantial. The New England lobster fishery currently deploys upwards of 5,000,000 traps and take 3-400,000 trips per year. Cod and other groundfish go into traps for both food and shelter. If each trap caught only one 3lb. cod per year this would amount to about 660 metric tons of uncounted cod bycatch. Do you know how many observed trips were targeted for lobster boats and what the assumed discard rate for cod is? Targeted trips are 17(SBRM) and the assumed discard rate is zero lbs.(January council correspondence NOAA 2018 year end accounting tables 7-9, no estimated discards)!

So, in light of these outstanding issues what could I support? I could only support status quo after all the aforementioned deficiencies are addressed and corrected. At least status quo is based on science! The fixed percentage ASM rates are arbitrary and capricious. I will never support cameras because they violate captains and crews' civil liberties. I do not support dockside monitoring because it is a duplication of functions covered by the JEA with the states and uniformed and plain clothes NOAA enforcement.

Finally, I want to go through the DEIS and address some statements. First the economic analysis may be comprehensible to economists, but it is indecipherable to lay people. The analysis needs to be simple and straightforward for the public. For example, if a boat fishes 100 days and grosses $100,000 then its observer cost is $71,000. Construct a table with gross on one axis and number of days fished on the other, populate the table with observer costs and the public can easily see the cost. If you want to go further put in assumed other costs by size and days absent and the true costs of this program will be readily apparent.

Below is a list by document number of issues that are in need of further clarification or inaccurate statements.

7.4.2.3 Not true, Boats that can move to other fisheries have already done so. Those of us that are left groundfishing inshore are only doing so because we have no choice. Increased monitoring costs equal decreased revenue until bankruptcy.

7.4.2.4.1 Higher monitoring rates will decrease costs. Not true, both observers and their companies are here to make money. Both the companies and observers make money by deploying from a distance. The observer gets a travel stipend and the company gets to bill for more hours. I have seen numerous cases where observers living in the seacoast were not deployed to local vessels and those vessels received observers based in southern New England or even upstate NY!

7.4.2.6 Compliance is high and enforcement is unnecessary when fishermen believe the quotas and biological reference points represent what they see on the grounds. Enforcement is not enhanced by monitoring. If enforcement is the goal get rid of the biological pretense and send a guy with a gun. It would be cheaper and less detrimental to the resource. The tens of millions of dollars to be wasted on 100% monitoring could be put to far better use investigating the numerous outstanding issues with ground fish assessments.

In conclusion, it should be obvious now that amendment 23 has numerous substantial, fatal flaws. I would suggest it be withdrawn from a final vote and sent back to committee and advisors for further work. Absent this, three things will occur. Sectors will collapse because a number of boats will either retire or join the common pool. This will leave insufficient fish for those who remain in sectors to balance their books. The common pool is grossly prejudicial to day boats because you are charged 24 hours for each day absent even if you only fish a fraction of that time. Most dayboats do not have sufficient ice capacity to be gone 24 hours and it is often unsafe for them. Even so, some will try. The second thing that will occur is the discard of massive amounts of fish in the common pool as vessels fish up to the individual species limits. The final problem will be how NOAA fisheries explains to congress how it wasted north of $100,000,000 on a failed management system. All that will occur against a backdrop of lawsuits against NOAA over wanton disregard for the resource and failure to protect people's civil liberties. If you think the questions were hard over Mr. Rafael, wait until you see what occurs as fallout from this amendment.

Thank you for your time and I would be happy to answer any questions about the issues I have raised.

So, what has occurred since I wrote my previous statement in March for public hearings that were never held? Well, Covid 19 has swept and continues to sweep the land, commercial fishing was declared an essential industry to feed America, observers were withdrawn, fish and shellfish prices dropped substantially, and fishermen had to come to grips with trying to operate safely when social distancing and mask wearing are impossible. Also, the study fleet fishermen continue to provide the only reliable estimates of catch and discards from the fishery on 100% of their trips at a fraction of the cost of ASM proving once again you get more with carrots then with sticks.

What did not occur, the ocean has not been littered with dead fish absent observers and NOAA has not performed its essential function of the trawl survey.

How do these developments effect comment on Amendment 23? Well, the amendment has become entirely irrelevant to life today. The council should just cancel it and move on to issues related to life in the pandemic.

Consider the following: NOAA and the NGO's, from the safety of their homes are demanding a return of the observers, which in an act of utmost hypocrisy, they have declared essential. Meanwhile NOAA will not do the trawl survey on their state-of-the-art giant ship, because it would be too dangerous for government employees to go to sea during the pandemic. However small fishing boats are being required to take observers starting August 14 during the pandemic because discard information is more important than people's lives. So, I would ask that the following be done. Take all NOAA leadership, NGO's and council members and PDT who think observers are essential and have them all be monitored by observers for 60 days and see who catches the virus. After all you lead by example, not from the safety of your house. Fishermen should not be the guinea pigs for your covid transmission experiment. We all know this will never happen because fishermen are expected to do as we say not as we do. So, if the people forcing observers on captains and crew in this pandemic will not lead by example, lets try 100% monitoring on other segments of society. I would propose, following the Amendment 23 logic, that heroin addicts and felons released from prison, be monitored 100% of the time because they are a danger to the resources of the United States. How long do you suppose it will be before they find a dead junkie despite 100% monitoring or a felon robs a 7/11 while a monitor sleeps in the car? My somewhat facetious point is that monitoring will not stop bad behavior. But worse than that, junkies and felons will never have 100% monitoring because they have civil rights and civil liberties. So where does that leave fishermen? We are not even second -class citizens, we are something lower.

To help understand how fishermen feel about 100% monitoring it would help to understand how people of color fear and loath the police. Time magazine had an essay in July entitled “We are always in crisis” which stated “We were a community that was over policed, under constant surveillance. To them we were dangerous. Born into poverty, most of us Black and brown, we needed to be controlled, to be kept in line.” The essay goes on from there but this quote sums up how fishermen feel about monitoring. You may get us to fear you, but you will never earn cooperation or respect with these tactics.

So, if blatant hypocrisy and social injustice are not enough to convince you to pull the plug on this amendment how about some science. In his paper entitled “Catch shares drive fleet consolidation and increased targeting but not spatial effort concentration nor changes in location choice in a multispecies trawl fishery” Kuriyama and multiple co-authors in the Canadian Journal of Fisheries and Aquatic Science found that increasing monitoring to 100% in the West Coast groundfish fishery changed neither where people fished or discard rates from prior spot monitoring. It just wasted 100's of millions of dollars.

Wasting the money once in one fishery may have been unavoidable, but doing it again is just a massive waste of scarce resources.

Finally, the council and NOAA should consider that final approval of this Amendment by the Secretary of Commerce may not happen. President Trump has issued an executive order that regulators decrease regulatory burden and increase productivity in essential businesses. This amendment grossly increases regulatory burden and will cause productivity to drop dramatically as fishermen retire or join the common pool. This is the wrong amendment at the wrong time. Pull the plug in September, but in the meantime before August 14, send NOAA a letter requesting no deployment of observers until there is a vaccine or a cure for this pandemic. Do not play Russian Roulette with fishermen's lives. We are not third -class citizens.

Since fishermen could not have an in person public hearing, where all my documentation could be presented in person, I will provide by mail all written comments and reference documents.

ESSAY

WE HAVE ALWAYS BEEN IN CRISIS

BY JAQUIRA DÍAZ

One night during the fall of 2019, the day before the release of my first book, I was driving home alone after a reading at a bookstore near Miami when I saw flashing lights in my rearview mirror. It was after 10 p.m. on a weeknight, and there were hardly any other cars on the road.

I hadn't been speeding. I hadn't been drinking. I hadn't broken any laws. There was no discernible reason I could find for being pulled over by the police. Except for the obvious: I was driving through a wealthy white suburb, and something about me and my small Honda Civic stood out. To this police officer, I clearly did not belong there.

Hands shaking, heart pounding in my chest, I slowed and pulled over, then quickly found my driver's license, registration and proof of insurance before the cop could make his way to my car.

It took him a long time to get out of the police cruiser. The longer I sat there, under the cover of darkness, no other cars passing, no other lights in the distance, the more I shook.

There is a trauma response with which some of us are all too familiar when encountering the police—anxiety, the urge to empty our bladders. We think, *How do I make myself seem smaller, less dangerous?* We think, *How do I make him see that I'm polite, that I'm complying, that I'm not a threat?* We think, *How do I stay alive?*

I held my documents out in front of

TRAVIS GRISSOM

me, placed the other hand on the steering wheel. I tried to look at his car in my rearview and side mirrors, but the cruiser's spotlight reflecting off them was blinding. Then the silhouette of his uniformed body approaching, his hand reaching for his sidearm, a flicker of movement, the flashlight raised, and soon nothing. I couldn't see anything except the bright-hot light in my face. But I knew, without a doubt, that he had drawn his weapon.

I WAS TAUGHT to fear the police.

In Puerto Rico, in el Caserío Padre Rivera, the government housing projects where I spent my childhood, the police were part of our everyday reality. We were a community that was over-policed, under constant surveillance. To them we were dangerous. Born into poverty, most of us Black and brown, we needed to be controlled, to be kept in line.

We learned to avoid them, and when we saw them, to hold our loved ones close. We learned that our bodies, our homes, our spaces did not belong to us, but to them.

I grew up hearing stories about los camarones, freezing, hiding, running running running when I saw them pull up ready to storm the building next door.

I grew up hearing about Rey el Chino, a close friend of my father's who'd been killed by los camarones when I was a baby. According to our neighbors, the cops took him as the whole block gathered outside, beat him as the crowd watched helplessly, as they called for them to stop. Then, los camarones shot him twice in the groin and tossed him in the back of the cruiser, where he eventually bled out.

Everyone talked about it. Everyone knew. A few years later, in 1984, Pedro Conga, who'd grown up in our neighborhood and later became a salsa bandleader with international acclaim, released a single called "Rey el Chino." The song opened with two shots.

I DON'T REMEMBER what I said to the cop that night in Miami. He asked if I lived in the neighborhood. I thought of my partner, alone in the small apartment we share in Montréal, our second home. He asked where I was coming from, where I was going. How to explain that I was a writer, that I'd just come from reading from my book to a crowd of strangers. Would he believe me? I thought I would piss my pants. I held it, hard. I thought of my mother in her bed, asleep by now, the message in my voice mail when I didn't answer earlier because I'd been running late to the event.

Whatever I said, he believed, because he said good night, walked back to his car and drove away. Left me sitting there, breathing, shaking.

I am a Black Puerto Rican woman with a white mother, with light skin, and more often than not, people don't read me as Black. Miami is a city made up of mostly white Latinxs, and the truth is, when he looked at me, this white cop did not see a Black woman, so he did not consider me dangerous. If he'd read me as Black, he might have read my Blackness as a threat. Maybe I wouldn't have made it home. Maybe my trembling hands, my inability to control my own body would have been enough for him to see me as someone to fear, someone to be kept in line. But that night, I wasn't shot by the police. I got to walk away. Shaken, yes, but alive.

I am the Black daughter of a white woman, which means that in my family tree there are colonizers as well as colonized people, and I carry this violence in my body. I see it in the mirror every day.

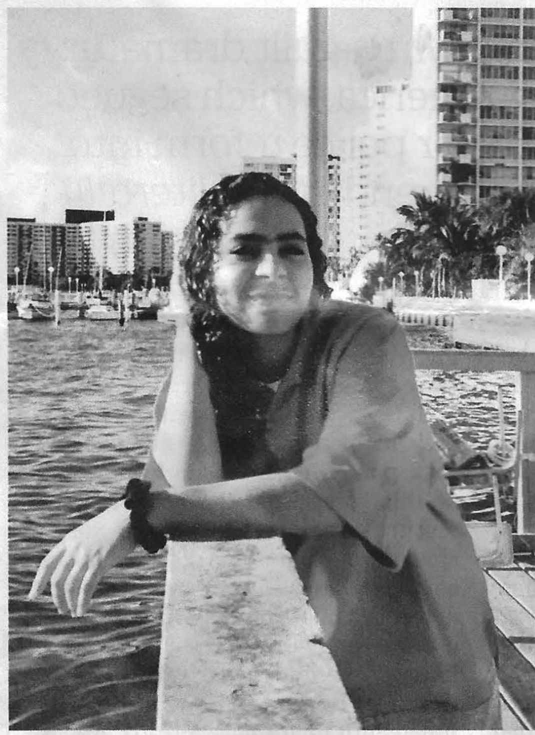
I AM THE BLACK DAUGHTER OF A WHITE WOMAN, WHICH MEANS THAT IN MY FAMILY TREE THERE ARE COLONIZERS AS WELL AS COLONIZED PEOPLE, AND I CARRY THIS VIOLENCE IN MY BODY. I SEE IT IN THE MIRROR EVERY DAY

IN THE U.S., whether or not people read me as Black, I'm a racialized person: I'm Latina; my first language is Spanish; I have an accent. I'm also a gay woman with a white transmasculine fiancé. We spend part of the year in Canada because my partner is not an American citizen, and we've been navigating the complicated, expensive and exhausting system of U.S. immigration. During this pandemic, with the closing of borders, travel bans and the Trump Administration's immigration proclamations, it's only gotten worse: I haven't seen my partner since March 14. We have no idea when we'll see each other again.

Every day, the intersections of our identities as an interracial queer couple make living anywhere, moving in certain spaces, feel like a kind of negotiation. Montréal is very queer, so it feels relatively safe to be openly gay there, to hold my partner's hand in public. They don't have to worry about who they might encounter in a public restroom, because almost everywhere we go, we are surrounded by liberal, queer, genderqueer and transgender people. But in almost all of these queer safe spaces in Montréal, I am always the only person of color. In Miami, spending time in predominantly Latinx spaces often means having to deal with homophobia, transphobia and anti-Black racism.

Being openly gay with a trans partner, I've learned that simple things like using a public restroom, or just existing, can be terrifying. When we're traveling together in the U.S., stopping at roadside gas stations on the interstate, even trying to get a hotel room, is often scary. Going through airport security checkpoints, where TSA agents almost always misgender my partner then flag them for a pat-down, is exhausting. Trying on clothes in department stores or finding queer-friendly barbers and doctors sometimes seem like impossible tasks.

My partner must always consider how they move, and for every single space they enter, if they will be safe. Often, walking down the street together or holding hands on the Metrorail in Miami, we're met with strangers staring, random people making hateful and transphobic comments. More than once, my partner has been attacked in public changing rooms—once violently beaten by a group of teenage girls, and another time by a group of women demanding to see their genitals. We're always thinking about who is watching, who is waiting outside that bathroom stall. I'm always thinking about what might happen on the days when they go out alone. What if I'm not there one day? Or what if I am there, but that is not enough?



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The author, at 14, in Miami Beach

MY FAMILY CAME to Miami from Puerto Rico chasing the promise of a better life. My father believed he could take us out of our home in el caserío, work to lift his family from poverty. He believed that his children would go to school, that we would have health insurance, live happily. He believed that we'd be safe.

The truth is, some of us have always been in crisis. Some of us have never felt safe. Some of us have always been navigating systems of power and oppression in our homes, in our workplaces, in our schools, so we were not surprised by the last presidential election, because while some of America woke up to reality in November 2016, or even just last month, the rest of us have been waking up in this America since we were born or arrived here.

Over the course of the past few months, some of us have felt more targeted than ever. While the world watches, more and more videos of Black people being murdered are shared on social media, countless stories of protesters teargassed, shot, beaten, missing, dying in police custody, found hanging from trees, and the cops who killed Breonna Taylor still haven't been arrested. While the world watches, a famous author with millions of social-media followers writes a transphobic statement to defend transphobic tweets, transgender health protections are reversed by the Trump Administration, Black trans women are brutally murdered one after another, and there's still no justice for Tony McDade, for Riah Milton, for Dominique Fells, for Nina Pop, for Layleen Polanco, for Zoe Spears. Sometimes this feels like too much to bear.

ON JUNE 15, I sat in my living room talking to my partner on video. We talked while I waited for the Supreme Court decision on Title VII of the Civil Rights Act, which protects workers from discrimination on the basis of sex. Shortly after 10 a.m., I saw the news: the Supreme Court had ruled that firing someone for being gay or trans was a violation of Title VII. I burst into tears, leaning back on the sofa, overwhelmed, completely shocked. It felt strange to get good news. It was a relief.

We have always been in crisis. But while the nationwide protests, led by Black women and Black LGBTQ people, are fueled by the fight for Black liberation, more people have been energized to protest all types of oppression. A growing number of Americans are becoming aware of their own roles in systemic racism, how they've been complicit, how they've benefited from systems of oppression and how they can be allies in the fight for Black liberation and LGBTQ rights. Three days after the Supreme Court's Title VII decision, the court ruled that DACA recipients can continue to live and work in the U.S. without being deported.

The movement continues to rise, moving from the streets into classrooms, boardrooms, courtrooms, human-resources departments, publishing, media, film, television, retail, food and service. America is changing. The world is watching. And Election Day is coming.

Díaz is the author of the memoir Ordinary Girls

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ARTICLE

Catch shares drive fleet consolidation and increased targeting but not spatial effort concentration nor changes in location choice in a multispecies trawl fishery

Peter T. Kuriyama, Daniel S. Holland, Lewis A.K. Barnett, Trevor A. Branch, Robert L. Hicks, and Kurt E. Schnier

Abstract: Catch share systems are generally expected to increase economic rents in fisheries by increasing harvest efficiency, reducing capital costs through consolidation, and increasing the value of landed catch. However, these benefits may have costs, as consolidation and the potential for associated change in spatial distribution in landings can hinder social objectives such as maintaining access for fishery-dependent communities and small owner-operators. Achievement of such fishery management objectives are determined by changes in fisher behavior, which may be complex and difficult to predict. Predicting fisher behavior is particularly challenging in multispecies fisheries, in which the mix of species is a determinant of where and when fishing effort and landings occur. We evaluate changes in overall fishing effort, species targeting, and determinants of fishing location choice in response to catch shares in the US West Coast Groundfish Trawl Fishery. We found reductions in total fishing effort, increased targeting of some species, and no evidence of spatial effort concentration. Key determinants of location choice (distance, expected revenue, and recently fished locations) were similar among time periods, but after catch shares there was more avoidance of areas that lacked recent fishing activity or associated information with which to develop expectations of catch and bycatch. Additionally, location choice remained constant with up to 100-fold financial penalties on bycatch species.

Résumé : Il est généralement attendu des systèmes de partage de prises qu'ils accroissent les rentes dans les pêches en rehaussant l'efficacité de la récolte et la valeur des prises débarquées et en réduisant les coûts d'investissement du fait de la consolidation. Ces avantages pourraient avoir des coûts, puisque la consolidation et le potentiel de changements associés de la répartition spatiale des débarquements pourraient nuire à l'atteinte d'objectifs sociaux comme le maintien de l'accès pour les collectivités dépendant des pêches et les petits propriétaires exploitants. L'atteinte de tels objectifs de gestion des pêches est déterminée par des changements des comportements des pêcheurs, qui peuvent être complexes et difficiles à prédire. La prédiction des comportements des pêcheurs est particulièrement difficile pour les pêches multiespèces, pour lesquelles le mélange d'espèces est un déterminant du lieu et du moment de l'effort de pêche et des débarquements. Nous évaluons les changements de l'effort de pêche global, du ciblage d'espèces et des déterminants du choix du lieu de pêche en réponse au partage de prises dans la pêche aux poissons démersaux au chalut de la côte ouest des États-Unis. Nous relevons des réductions de l'effort de pêche total, un ciblage plus intense de certaines espèces et aucun indice de concentration de l'effort dans l'espace. Les déterminants clés du choix du lieu (distance, recettes prévues et lieux ayant déjà été visés par la pêche) sont semblables pour différentes périodes, mais après la mise en place du partage des prises, il y a un évitement accru de secteurs pour lesquels il n'y a pas d'activité de pêche récente ou d'information associée permettant de faire des prédictions quant aux prises et aux prises accessoires. En outre, le choix du lieu demeure constant même au vu de pénalités financières 100 fois plus grandes associées aux espèces de prises accessoires. [Traduit par la Rédaction]

Introduction

Catch share programs address the common fisheries problems of overcapitalization and the race to fish, which often ensues when fleet-wide catch quotas or season length is limited to control overexploitation. In turn, fishers have incentive to outcompete others, which typically results in increases in exploitation. Catch shares limit catch of individuals and introduce incentives to maximize the value of their individual quota. Lease or sale of individual quota can further increase efficiency by redistributing harvest and landings to more profitable vessels and areas. As a result of the incentives they create and the excess capacity that often exists when they are introduced, catch shares commonly produce several intended fishery-wide economic changes. Catch shares slow

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the rent-dissipating race to fish (Birkenbach et al. 2017), allowing fishers to time landings to fetch higher prices in the market (Scheld and Anderson 2014). Consolidation and removal of excess capacity is often a stated goal of catch share programs (Brinson and Thunberg 2016), and fleet sizes do indeed typically decrease under catch shares as quota is consolidated on fewer vessels (Branch 2009; Thunberg and Correia 2015). Some proportion of the fleet is likely to decide that they would rather sell or lease their individual quotas and focus on another fishery or line of work. Catch shares provide a mechanism for compensation as fishers exit; thus, fleet size often declines. Economic efficiency increases as fewer boats catch similar amounts of fish (Arnason 1996; Annala 1996; Grafton 1996*b*; Brinson and Thunberg 2016).

While consolidation associated with catch share implementation can increase economic efficiency, it can also conflict with social goals such as maintaining fishery access for small owner-operators and fishery-dependent communities that may depend on access to a portfolio of fisheries (Fuller et al. 2017). Fishers often become less diversified under catch shares, which can increase financial risk (Holland et al. 2017). Furthermore, individuals can be excluded from fisheries through initial allocations and redistribution of catch limits, and high individual quota prices may result in individual quotas and landings becoming consolidated in fewer communities, sometimes excluding smaller remote communities (Copes 1986; Eythórsson 2000; Himes-Cornell and Hoelting 2015; Bodwitch 2017). Given potential trade-offs between economic and social outcomes, understanding how catch shares affect the industrial structure and the spatial distribution of catch and landings is an important policy concern.

Fishers' responses to management can be unpredictable and result in unintended outcomes (Branch et al. 2006; Hilborn 2007; Fulton et al. 2010), and for multispecies fisheries, responses to catch shares may be more complex and less predictable than for single-species fisheries. The complexities arise as multispecies fisheries manage productive species along with species that are long-lived, slow-growing, and late to mature. These less productive species can experience overfishing with relatively low fishing mortality rates; thus, their effective management can require adoption of very small individual quotas that may constrain fishers' abilities to utilize individual quotas of more productive target species (Holland and Jannot 2012; Ono et al. 2013). Fishers may hoard individual quota of the constraining species if they are uncertain whether they can obtain sufficient quota to cover incidental catch of low-quota species (Holland 2016; Kuriyama et al. 2016; Pacific Fishery Management Council 2017). This may limit quota availability until the end of a season, leading to underutilization of target and nontarget species (Kuriyama et al. 2016). Catch shares provide a natural set of incentives to avoid or target particular species, especially in fisheries where discard mortality is counted against individual quotas. In effect, catch shares require fishers to consider the risks associated with bycatch prior to nets entering the water, and as a result effort should shift to areas with low expected catch rates of low-quota species (Poos et al. 2010; Batsleer et al. 2013, 2016). This shift in risk may additionally alter behavioral decisions, and understanding this response is critical for improving management performance.

We focus analysis on the US West Coast Groundfish Fishery, which transitioned from trip limits to catch shares in 2011 after a history characterized by overfishing and overcapitalization. At the transition point, catches had declined to low levels and the fishery was declared a Federal Disaster in 2000, spurring additional harvest restrictions and the disbursement of federal funds to aid fishers. A congressionally authorized vessel buyback program led to the purchase of 91 vessels (Federal Register Vol. 70, No. 133/Wednesday, July 13, 2005/Rules and Regulation), about one-third of the limited entry groundfish trawl fleet, yet overfishing continued, partly because trip limits (bimonthly cumulative limits for individual species or species groups) provided only a coarse tool to limit fishing mortality. One of the issues with trip limits was that fishers were allowed to discard fish when they hit the trip limit for that species, while continuing to fish for other species. The inevitable reductions in trip limit amounts to reduce overfishing merely had the unintended consequence of increasing discarding (as predicted by Pikitch et al. (1988)) and ultimately failed to halt overfishing of some stocks (Bellman and Heery 2013). In 2011, managers implemented catch shares as an individual fishing quota program for the bottom trawl component of the fishery and a mixture of individual fishing quotas and cooperatives for the Pacific whiting (*Merluccius productus*).

In the US West Coast Groundfish Fishery, managers implemented catch shares with the goals of increasing net economic benefits, creating individual economic stability, providing for full utilization of trawl sector allocation, all while considering environmental impacts and achieving individual accountability of catch and bycatch (Pacific Fishery Management Council and NMFS 2010). Catch shares likely increased net economic benefits for some and may have improved individual economic stability, but have not led to full utilization of catch limits in the trawl sector allocation (Kuriyama et al. 2016; Pacific Fishery Management Council 2017), although one positive benefit has been that decreases in number of tows and tow hours have reduced encounters with living habitat such as corals (Barnett et al. 2017). In addition, communities with the lowest quota allocations experienced improvements in standard of living, and communities with the highest quota allocations experienced improvements in job satisfaction (Russell et al. 2016).

Although catch shares have led to many improvements, they have also introduced a new element of risk — a defining characteristic of this multispecies fishery. Managers set quota allocations of rebuilding rockfishes at a very small proportion of target species quota, which when combined with allocations being based largely on historical catches, led to many fishers receiving very small individual quotas of some species. For example, in the first year of the individual fishing quota program, roughly 65% of participants were allocated 5 kg or less of yelloweye rockfish (*Sebastes ruberrimus*) individual quota for the entire year, which could be exceeded by capturing a single large individual (Kuriyama et al. 2016). While the quota was broadly distributed, catch of these species tends to be infrequent, uncertain, and concentrated (Holland and Jannot 2012). An unlucky tow could exhaust or exceed a fisher's individual quota for some rockfish species and force them to stop fishing unless they can find additional quota amounts on the market. Consequently, we refer to these species as "constraining" species despite the fact that their fleet-wide catches have remained below fleetwide catch limits. These constraining species have likely limited fishers' abilities to fully catch available quotas for other species (Kuriyama et al. 2016) and inhibited the effectiveness of quota markets (Holland 2016). The shifts in risk are likely to be similar to those experienced in European multispecies trawl fisheries with a discard ban (Sardà et al. 2013). Understanding the impacts of catch shares on fisher behavior can better predict outcomes and improve management to increase the likelihood of achieving a mix of economic and social objectives.

Catch shares have changed two main aspects of the fishery: fishers now have individual quotas, and discarding, which was previously allowed, is now prohibited. These changes have likely increased the risks associated with fishing, and we hypothesize that this will consolidate the fleet, concentrate fishing effort in well-known areas, increase targeting of valuable species, and make fishing location behaviors more risk-averse. Decreases in fleet size are well documented in other fisheries in the transition to catch shares, and a pre-implementation study of the US West Coast Groundfish Fishery catch share program predicted the number of vessels would decline by 50%–65% under the program (Lian et al. 2009). Under catch shares, fishers have higher individual accountability, and at-sea observers record both discards and landings on all trips, which both count against quotas. We hypothesize that overall fishing effort will decline and concentrate in specific areas of the coast with low expected bycatch probabilities. Spatial shifts towards areas with low expected catches of bycatch species have occurred in other multispecies trawl fisheries (Branch and Hilborn 2008; Poos et al. 2010; Batsleer et al. 2013, 2016), and fishers now have much stronger incentives to avoid bycatch. Fishers are commonly risk-averse (van Putten et al. 2011; Girardin et al. 2017), and we expect this risk aversion to strengthen under catch shares. Fishers will likely alter their location choices, giving more weight to prior experience and recent catches.

In this paper, we use a complementary set of approaches to investigate fisher responses in multispecies fisheries: whether and how they target or avoid particular species, and when and where they fish. We evaluate changes in targeting intensity and avoidance of particular species and evaluate changes in the magnitude and geographic distribution of effort at the individual and aggregate level. Finally, we develop a fine-scale location choice model to explore the drivers of spatial location choice behavior given complex bathymetry and associated patterns of species density distributions.

Methods

Data processing

For most of our analyses, we combined two data sources: logbook data (2007–2010) and at-sea observer data (2007–2014). Both data sources contained, for each tow, latitude, longitude, and depth that nets entered and exited the water. Catch compositions were reported for individual species, although the logbook data did not include discard amounts, while observer data did. Observers monitored roughly 20% of trips prior to 2011, after which observer coverage increased to 100% (Pacific Fishery Management Council and NMFS 2010; NMFS 2012). There was temporal overlap between the logbook and at-sea observer data for a fraction of tows from 2007 to 2010, and as a result we preferentially use data from the observer data in this period. We only prioritized records that we could match between the two data sources. Observer records likely have more precise catch records and thus were preferable to logbook records.

We categorized species as targets, constraining species, and nontarget groundfish based on the methods in Kuriyama et al. (2016). In short, target species were identified through conversations with assessment scientists and members of the seafood industry. We considered any species that was overfished and had a rebuilding plan at any point from 2007 to 2014 to be a constraining species. Nontarget groundfish were the remaining species that were designated annual total allowable catch amounts. Target species were Dover sole (*Microstomus pacificus*), lingcod (*Ophiodon elongatus*), longspine thornyhead (*Sebastolobus altivelis*), petrale sole (*Eopsetta jordani*), sablefish (*Anopoploma fimbria*), and shortspine thornyhead (*Sebastolobus alascanus*). Constraining species were bocaccio (*Sebastes paucispinis*), cowcod (*Sebastes levis*), canary rockfish (*Sebastes pinniger*), darkblotched rockfish (*Sebastes crameri*), Pacific ocean perch (*Sebastes alutus*), and yelloweye rockfish. As noted above, while catches of these species have in fact remained well below fleetwide quotas, we refer to them as constraining species because of the relatively low quotas set for them and the widespread concern that they could be constraining at the individual vessel level (Holland and Jannot 2012). Nontarget groundfish species included arrowtooth flounder (*Atheresthes stomias*), bank rockfish (*Sebastes rufus*), chilipepper rockfish (*Sebastes goodei*), English sole (*Parophrys vetulus*), greenspotted rockfish (*Sebastes chlorostictus*), greenstriped rockfish (*Sebastes elongatus*), longnose skate (*Beringraja rhina*), vermilion rockfish (*Sebastes miniatus*), widow rockfish (*Sebastes entomelas*), and yellowtail rockfish (*Sebastes flavidus*).

Changes in spatial effort

We evaluated fishery-wide changes in numbers of vessels and numbers of tows. Additionally, we evaluated port-specific changes in numbers of vessels for Astoria, Newport, Charleston, Eureka, Fort Bragg, Brookings, and Crescent City. We outline the selection and grouping of port groups later in this paper. We calculated averages for before (2007–2010) and after (2011–2014) catch shares and quantified the shift between periods.

To test the hypothesis that fishing effort declined and became increasingly concentrated, we quantified spatial autocorrelation with the Moran's *I*. We divided the coast into grid cells based on longitude and latitude (0.5° by 0.5°) and summed the number of tows in each cell in the years before (2007–2010) and after (2011–2014) catch shares. We assigned tows to cells based on the midpoint between start and end tow locations. We used the following equation:

$$(1)\qquad I = \frac{N}{W}\frac{\sum_i \sum_j \mathbf{w}_{ij}(x_i - \bar{x})(x_j - \bar{x})}{\sum_i (x_i - \bar{x})^2}$$

where N is the number of grid cells indexed by i longitude and j latitude; x is the number of tows per grid cell; $\bar{x}$ is the mean of x; $\mathbf{w}_{ij}$ is a matrix of spatial distances with zeroes on the diagonal; and W is the sum of all $\mathbf{w}_{ij}$ (Moran 1950). We calculated two Moran's I values, one for tows before and one for tows after catch shares in 2011. We used the difference in these values ($I_{\text{after}} - I_{\text{before}}$) as a test statistic, where a positive value would suggest that spatial effort has become more concentrated. To quantify statistical significance, we randomized the years associated with each tow and calculated the same test statistic with temporally shuffled tows (1000 iterations). To control for effects that may arise from changes in fleet size, we ran the analysis with tow records from all vessels and for only vessels that remained in the fishery after catch shares. Additionally, we evaluated changes in effort concentration at the port level, using only vessels that remained in the fishery after catch shares.

Changes in targeting

We used the delta plot method developed by Gillis et al. (2008) to quantify changes in targeting behavior before and after catch shares. This required computing two values for each species: the proportion of tows with zero catch and the skew of catch distribution for tows with nonzero catch. Skew was calculated from $\log_{10}$-transformed catch amounts:

$$(2)\qquad \frac{n\sum_{i=1}^{n}(x_i - \bar{x})^3}{(n-1)(n-2)s^3}$$

where n is the number of tows, x is the catch in tow i, and s is the standard deviation of x. The $\log_{10}$ transformations are commonly used in fisheries analysis, and thus used with this calculation (Gillis et al. 2008). For species that are targeted, we expect there to be more tows with higher catches and fewer tows with lower catches compared with a normal distribution, and thus target species will have negative skew values (left-skew distributions) and a low proportion of zero tows, while species that are avoided will have positive skew values and a high proportion of zero tows (Gillis et al. 2008). The test statistic here is the difference in skew and difference in proportion of zero tows calculated before (2007–2010) and after (2011–2014) catch share implementation. Specifically, we calculated skews after – skews before and proportion of zeroes after – proportion of zeroes before catch shares. Again, we randomized the years (1000 iterations) associated with each tow and calculated differences in skew and proportion of zero values to compare the test statistic with a null distribution.

Table 1. Example data input to random utility model based on schematic shown in Fig. 1.

Point	Date	Individual habit	Missing data	Revenue (US$)	Distance (km)	First tow	Fished tow
1	1 March 2012	1	0	400	3	1	True
1*a*	1 March 2012	0	1	0	5	1	False
1*b*	1 March 2012	1	0	100	1	1	False
2	2 March 2012	0	0	350	2	0	True
2*a*	2 March 2012	1	0	200	3	0	False
2*b*	2 March 2012	0	0	75	7	0	False

Factors that affect fishing location choices

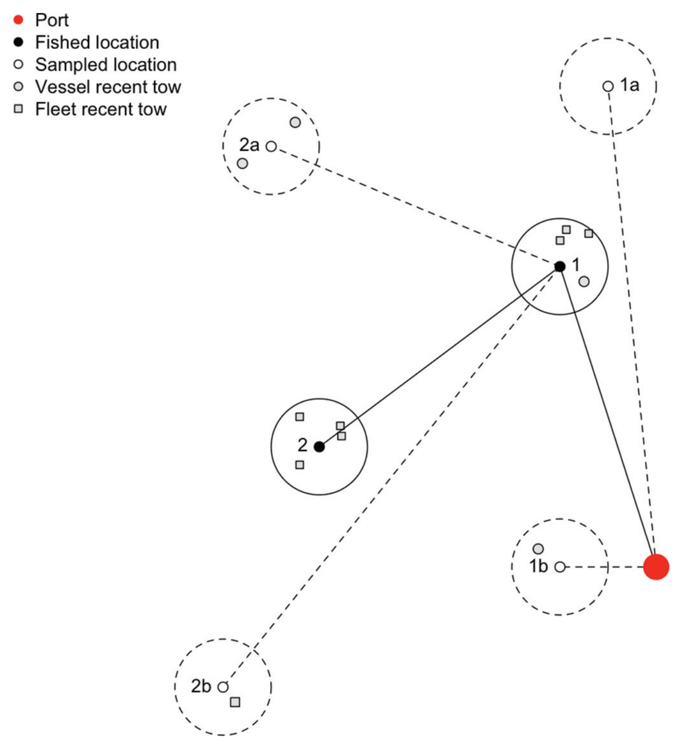
We used random utility modeling to evaluate whether fishers changed how they chose fishing locations before and after catch share implementation. Random utility models assume that individuals have a set of options (in this case fishing locations) and will choose the option that maximizes their utility, defined here to be a linear function of distances, revenue expectations, individual habits, and fleet activity. Further details are included in the next section. Random utility models have been used to study fleet dynamics primarily in data-rich fisheries in North America, Europe, and Australia (van Putten et al. 2011; Girardin et al. 2017). Here, we apply a random utility model based on a novel point-based method of defining choice sets and expected utility associated with them. The method originated in unpublished simulation and empirical work by R. Hicks, K. Schnier, and D. Holland in 2014 (available upon request via Dan Holland; dan.holland@noaa.gov) and results in improved modeling choices in environments with fine-scale heterogeneity.

In our random utility model, choice sets characterize the range of possible specific fishing locations. Data availability and fishery characteristics can dictate the method of generating choice sets. The traditional approach is to divide the coast into discrete areas, each representing a possible fishing location (Hicks and Schnier 2008, 2010). The traditional approach can capture large-scale shifts in fishing effort but may not capture fine-scale changes that occur within discrete areas. The US west coast has locations with steep and complicated bathymetry where small changes in distance can correspond to large changes in depth, which in turn affects species composition given interspecific differences in depth distribution. We generate choice sets using a method that captures fine-scale features based on past fleet-wide fishing locations. This method takes advantage of high-resolution fisheries logbook and observer data and allows for fishing locations to be characterized by recent (e.g., within the past 30 days) and nearby (e.g., within 5 km) fishing locations. Based on the unpublished 2014 work, models with fine-scale, point-based choice sets had higher predictive abilities than models estimated using choice sets based on discrete areas. The specification of 30 days and 5 km radius had the best model fits, although we ran models with combinations of 14 days and 8 km. Inference based on coefficient signs and significances did not change with different radius values.

Choice set specification

We generated choice sets by sampling 50 past tow locations for each fished tow location in the data set. Each of the sampled tow locations represented possible alternative fishing locations drawn for a set of all observed fishing locations chosen by the port group. To have sufficient fishing history, we used 2009 as the first year of analysis allowing locations to be sampled from 2007 and 2008. We generated choice sets separately for the top six ports in the fishery: Astoria, Oregon; Newport, Oregon; Charleston, Oregon; Brookings, Oregon, and Crescent City, California, combined; Eureka, California; and Fort Bragg, California. These six port groups account for 75% of the total landings in the fishery. Vessels were assigned to port groups based on the vessel's most common port of return. Tow locations were sampled in proportion to the effort observed by depth intervals. Each tow was assigned to a depth bin

Fig. 1. The random utility model requires specification of choice sets to compare observed fishing locations with a sample of alternative possible locations. This choice set schematic shows an example choice set for Vessel A, including two empirical fished locations (solid black circles; 1 and 2) from a single trip and two sampled locations for each fished location (open circles; 1*a*, 1*b*, 2*a*, and 2*b*). Sampled locations are drawn from all tows within the fleet between 2007 and the dates for tows 1 and 2. In some cases, Vessel A fished within the spatiotemporal radius (large circles; 5 km and 30 days prior to dates for tows 1 and 2) around each location, and these values (gray circles) are used to characterize individual habit. Additionally, other vessels in the fleet fish within the spatiotemporal radius of locations, and these values (gray squares) are used to characterize missing data and revenue coefficients. The lines show distances to fished locations (solid lines) and sampled locations (dashed lines). Also shown is port location (red circle, lower right). [Colour online.]



based on the average recorded depth between start and end tow locations. Depth bins were originally in 50 fathom increments (1 fathom = 1.829 m), but we report them in metres (0–91, 91–183, 183–274, 274–366, 366–549, 549–914, and 914–1280 m).

Choice sets require specification of characteristics (like distance, expected revenues, and habits) for all of the alternative locations — the one chosen as well as the sample of previous alternative locations. We describe the choice set specification process with a schematic (Fig. 1) and show example data (Table 1) used in the random utility model. In the schematic, tow 1 occurred on

1 May 2012, and tow 2 occurred on 2 May 2012 for Vessel A. Both tows were consecutive in a single fishing trip, and two alternative locations were sampled for each fished tow. Location samples were drawn from prior fished tows, in this case tows that occurred between 1 January 2007 (i.e., point 1*a* in Fig. 1) and 1 or 2 May 2012 (e.g., point 1*b* in Fig. 1), from all vessels in the fleet. The spatiotemporal radius characterizes the recent fleet activity, defined to be 5 km and 30 days prior to the tow date. Note that the sampled locations associated with each fished tow can be from a wide time period (roughly 5 years in this example), and the radius is applied to both fished and sampled locations. We also explored using a larger radius but model fits degraded. All fished tows that occurred within the spatiotemporal radius (e.g., within 5 km of the location and between 1 April and 1 May 2012) are indicated by gray symbols. Individual habit variables had a value of 1 if Vessel A fished within the spatiotemporal radius within the past 30 days (gray circles in Fig. 1). Missing data variables, in contrast, take a value of 1 if no vessels fished within the spatiotemporal radius in the past 30 days, and thus there are no data to construct revenue expectations (gray squares in Fig. 1). A negative coefficient on the missing data variable therefore demonstrates avoidance of areas not recently fished by the fleet. Similarly, the expected revenue variable is calculated from tows that occurred within the spatiotemporal radius. Distances for the first tow were based on the distance from port (unlabeled red point in Fig. 1, lower right side), while for later tows this is the distance from the previous tow. Additional variables in the random utility model data specify whether the tow was the first of a trip and if a tow was fished or sampled, allowing us to estimate separate coefficients for the first versus later tows. Thus, the set of predictor variables is individual habit, missing data, revenue, distance, and dummy variables for first tow or later tow.

We considered the three primary factors in location choices to be revenues, distances, and habits. Net revenues for catch in each tow were calculated with the following equation:

$$r_{\mathrm{net}} = r - c \tag{3}$$

where r_{net} is net revenue, r is the total revenue summed across species, and c is the quota costs summed across species. We calculated revenues as the monthly ex-vessel prices for species at each port without any time lags. The benefit of these price data is that they capture temporal market conditions. For annual quota pound prices (equivalent to quota share lease prices), we used the species-specific 4-year average quota costs presented in Holland (2016). Tows that occurred prior to 2011 had no quota costs, as catch shares were not in place, and the net revenue values were equal to total revenue.

We calculated distances for first tows in each trip as the distance from port to start location and distance for later tows on each trip as the distance from the previous tow's end location to the prospective tow's start location. We used the spherical law of cosines (great circle distance) for calculating distances in kilometres. Expected revenues (REV) were calculated with an arithmetic mean of revenue per tow for all tows within the spatiotemporal radius. Missing data (Dmiss) variables were 1 if there were no records within the spatiotemporal radius and 0 if there were. Individual habit variables (Dhab) had a value of 1 if an individual vessel had records within the spatiotemporal radius and a value of 0 if not. Prior year individual habit variable (Dhab_1) were handled the same way, except that the temporal filter was the past 30 days of the previous year. Fishers may have a tendency to return to the same locations at particular times of year, and we quantify this tendency with inclusion of this prior year coefficient. There also is a variable indicating whether the empirical tow is the first ($D_0 = 1$) or later ($D_1 = 1$) tow of a trip. Here, distance was a proxy for fuel and labor costs, as both are expected to increase linearly as boats travel further from port.

All of this information was incorporated into a linear expected utility function and estimated with a standard conditional logit model:

$$\begin{aligned} V_{ijt} = {} & \beta_{\mathrm{dist1}} D_1 \mathrm{DIST}_{ijt} + \beta_{\mathrm{dist0}} D_0 \mathrm{DIST}_{ijt} + \beta_{\mathrm{rev1}} D_1 \mathrm{REV}_{ijt} \\ & + \beta_{\mathrm{rev0}} D_0 \mathrm{REV}_{ijt} + \beta_{\mathrm{miss}} \mathrm{Dmiss}_{ijt} + \beta_{\mathrm{hab}} \mathrm{Dhab}_{ijt} + \beta_{\mathrm{hab1}} \mathrm{Dhab}_{1\_ijt} + \varepsilon_{ijt} \end{aligned} \tag{4}$$

where V_{ijt} is utility for individual i at location j in time period t, and ε_{ijt} are the factors that affect location choices and are unaccounted for explicitly with variables.

Target and constraining species quotas can differ by orders of magnitude, and the consequences of exceeding individual quotas for constraining species can be high even if the probability is low. Thus, net revenue calculations that deduct quota costs may not fully account for the risk that fishers perceive. Risk may have many components: the risk of exceeding individual quotas, the risk that additional quota for specific species might not be available on the quota market, and the risk that an individual will be unable to fish. To account for these higher perceived risks associated with obtaining quota for constraining species, we ran models with net revenue calculated using quota prices for constraining species assumed to be 5, 10, 50, and 100 times actual prices. Under these scenarios, areas associated with constraining species can have low or even negative expected revenue values. If these models with higher quota cost multipliers had improved model fits, this would provide some indirect evidence for risk avoidance.

Performance metrics

We quantify parameter precision with confidence intervals for each port by year. For the distance to revenue ratios, we calculated parameter ratio precision using the Krinsky–Robb method (Krinsky and Robb 1986). We identified significant changes both year to year and in response to catch shares from these confidence intervals.

We quantified model fits with two predictive metrics and one distance-based metric. The predictive metrics were based on the calculated probabilities of each choice (the location actually chosen and 49 randomly sampled tows) in the choice set. The "correct tow" metric, calculated for each choice, is the proportion of choices in which the location actually chosen also had the highest estimated probability of being chosen. The "correct area" metric is the proportion of choices in which the locations with the highest estimated choice probability was within 5 km of the location actually chosen. The distance metric is the average distances between the location with the highest estimated choice probability and the location actually chosen.

Analyses were conducted in the statistical programming language R (R Core Team 2017). The packages "dplyr" (Wickham et al. 2017), "lubridate" (Grolemund and Wickham 2011), "doParallel" (Revolution Analytics and Weston 2015), and "mlogit" (Croissant 2013) were essential for data processing and model fitting.

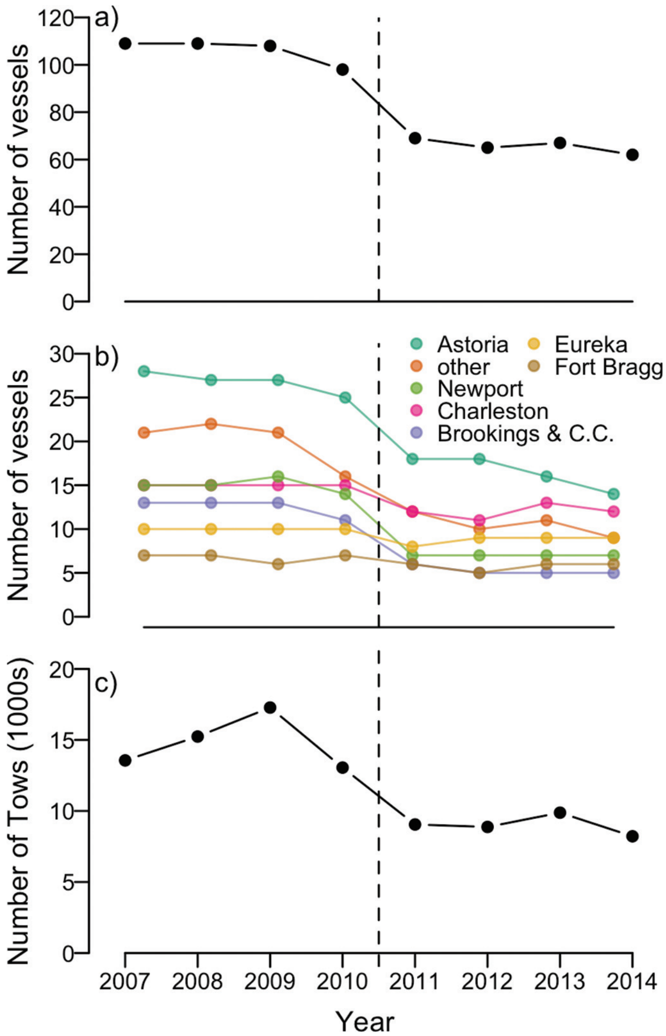
Results

Changes in spatial effort

After catch shares, the fleet consolidated and fishing effort generally declined throughout the region. The number of vessels declined 38% from a mean of 106 vessels before to a mean of 66 vessels after catch shares (Fig. 2*a*). Newport and Astoria had declines in average fleet size of 53% and 38%, respectively (Fig. 2*b*). Declines in the "other" group occurred in Bellingham Bay, San Francisco, Half Moon Bay, and Westport. The mean number of tows declined by about 39% from 14 783 in 2007–2010 to 9005 in 2011–2014 (Fig. 2*c*).

Contrary to our expectations, there was no evidence that fishing became more spatially concentrated across the entire fishery after catch shares. For tows from all vessels, the opposite effect

Fig. 2. Trends in the total number of vessels (*a*), number of vessels in each port-associated fleet (*b*), and total number of tows (*c*) for 2007–2014. The dashed vertical line divides the years prior to (2007–2010) and after (2011–2014) catch share implementation. [Colour online.]



was found, with spatial autocorrelation actually declining significantly (difference in Moran's *I* values of −0.018, $p < 0.05$) indicating that effort was less patchily distributed. For tows from only the vessels remaining in the fishery after catch shares, there was no significant change in spatial autocorrelation (difference in Moran's *I* of 0.003, $p = 0.62$).

There was no evidence of spatial concentration at the port level for vessels that remained in the fishery after catch shares. Newport (difference in Moran's *I* of −0.065), Charleston (−0.045), Eureka (−0.040), and Brookings and Crescent City (−0.118) all had statistically significant declines in Moran's *I* values, suggesting that the footprint of spatial fishing effort expanded after catch shares. Astoria and Fort Bragg had statistically insignificant changes in Moran's *I*.

Changes in targeting

Delta plots showed increased targeting after individual transferable quotass as evidenced by 14 of 23 species having significant decreases in skew values (Fig. 3). Increased targeting was most notable among target species; five of six target species had decreases in skew values and were caught in more than 50% of tows before and after catch shares (Figs. 3*a*–3*b*). The biggest targeting increases were for Dover sole, thornyheads, and sablefish (the "DTS" complex), which are typically targeted together, and there was also increased targeting of some constraining rockfish species.

Factors that affect fishing location choices

Location choice before catch shares (2009–2010) was largely similar to location choice after catch shares (2011–2014); coefficients for distance, revenue, and individual habitat were significant with consistent signs throughout 2009–2014 (Table 2; Fig. 4). Fishers generally fished in locations relatively close to their home port on the first tow of a trip and closer to their previous tow location for subsequent tows. Evidence for this behavior is that coefficients for first-tow distance were always negative and were significant in 30 out of 36 port–year combinations in 2008–2014 (Table 2; Fig. 4). Similarly, the coefficients for later tow distance were significant and negative in all years and all ports (Table 2; Fig. 4). These negative distance coefficients indicate that longer distances resulted in lower utility values, which is reasonable as distance is a strong proxy for costs of fuel and the lost opportunity costs of time spent steaming instead of fishing. Distance coefficients for first tows are smaller than that for later tows, indicating that vessels are willing to steam further for the first tow than from one tow to the next.

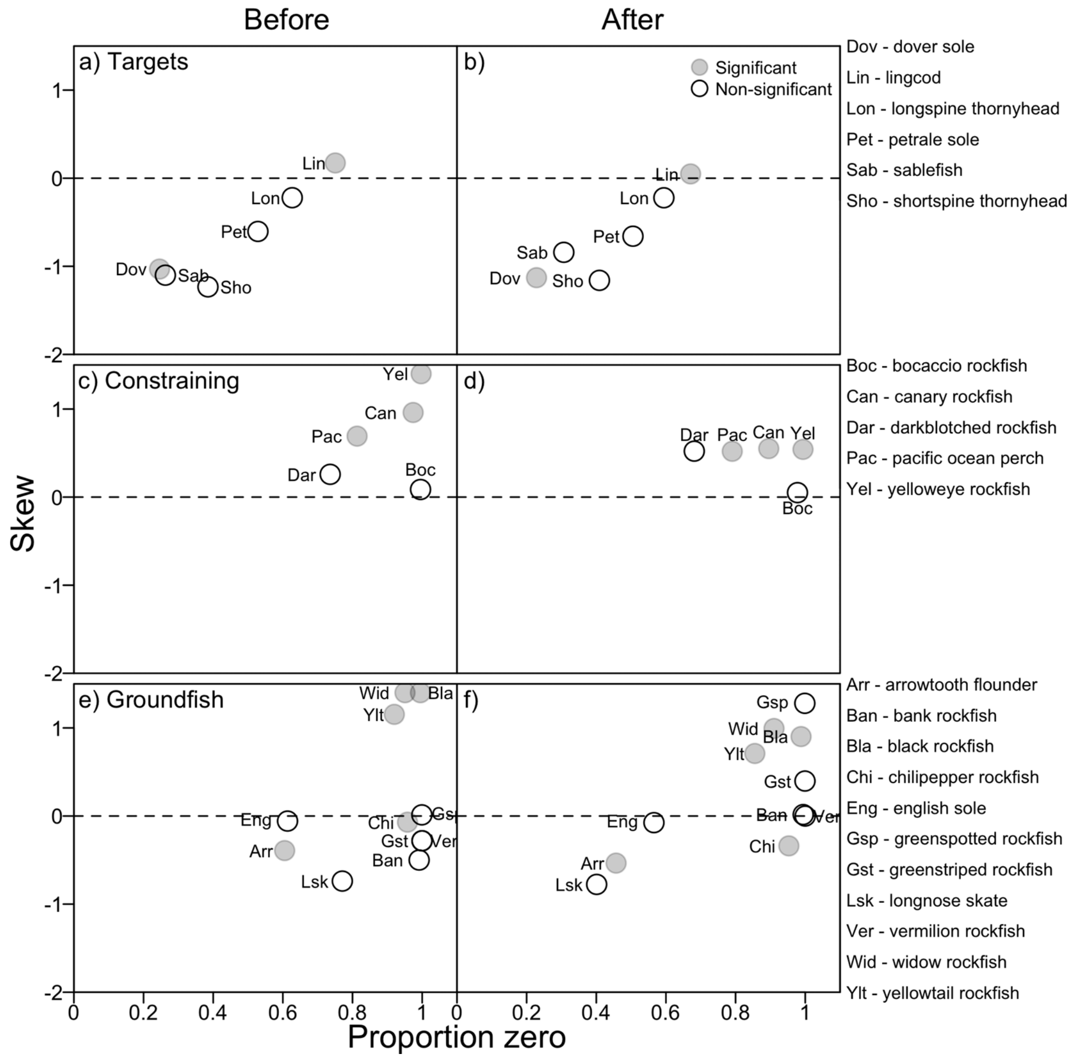
Fishers generally fished in locations with higher expected revenues. Coefficients for first tow revenue and later tow revenue were always positive and were significant in most ports in most years (Table 2; Fig. 5). Individual habit strongly influenced fishers' location choices; they tended to fish in the same locations that they had fished in the previous 30 days of the tow date and in the corresponding 30-day period from the previous year, as evidenced by positive and significant coefficients for individual habits in all years and all ports (Table 2; Fig. 5). Positive revenue coefficients indicate that higher revenues resulted in higher expected utilities.

Only Astoria, Newport, and Eureka showed evidence of significantly different fishing behaviors after catch shares. Astoria had the most consistent shift in distance to revenue ratios for later tows (Fig. 6*a*). The more negative ratios after catch shares suggest that fishers were less willing to travel long distances after the first tow. Newport and Eureka had significant shifts from 2010 to 2011 (Figs. 6*b* and 6*e*). In Newport, 2010 seems to be a distinct year (Fig. 6*b*), whereas in Eureka, 2011 and 2014 had distinct distance to revenue trade-offs (Fig. 6*e*). Note that the scale of revenue parameters was extremely small, resulting in very large uncertainties for some year–port combinations (e.g., Fig. 6*c* — Charleston 2013).

Positive coefficients for the variable for no observed tows (missing tows; D_{miss}) from which to calculate expected revenue suggest that fishers in the two largest ports, Astoria and Newport, shifted location choice after catch shares. In 2010, the year before catch shares, all these D_{miss} coefficients were positive and significant, indicating that individual fishers were willing to fish in locations that the fleet had not fished in the past 30 days (Table 2). After catch shares in 2011, Astoria D_{miss} coefficients were negative and significant in 2011 and 2013–2014 (Table 2), and Newport D_{miss} coefficients were not significant, negative in 2011 and 2014, and positive in 2012 and 2013 (Table 2). In the other ports, coefficients were mostly positive and significant, suggesting that behavior remained consistent after catch shares (Table 2). Sensitivity tests on these results showed that coefficient significance was consistent when model runs were performed with a broader spatial radius of 8 km instead of 5 km and narrower temporal window using information from the prior 14 days instead of 30 days. So while a spatiotemporal radius of 5 km and 30 days had the best fit, inference based on model results was similar with different configurations.

Predictive ability at the port level was highest for Astoria and lowest for Brookings and Crescent City. On average, models accu-

Fig. 3. Delta plots from observer data showing the relation between proportion of tows with zero fish and the skewness of the distribution of $\log_{10}$ catch amounts for target species (*a*–*b*), constraining species (*c*–*d*), and other groundfish (*e*–*f*). A skew above zero indicates species with fewer large catches than expected, while a skew below zero indicates more large catches than expected. The left column is years before catch shares (2007–2010), and the right column is years after catch shares (2011–2014). Gray shading indicates species with significant ($p < 0.05$) decreases in skew values after catch shares were implemented. No species had significant increases in skew or significant increases or decreases in the proportion of tows with zero values.



rately predicted 42% of tows and 48% of areas for Astoria, while for Brookings and Crescent City, models predicted a mean of 18% of tows and 27% of areas (Table 3).

Contrary to our expectation, models that calculated expected revenue using inflated quota prices for constraining species did not improve model performance. Increasing quota prices by factors of 5, 10, 50, and 100 decreased significance in the first and later tow revenue coefficients across ports and years (refer to online Supplemental Material[1], Tables S1–S4). Additionally, predictive metrics were nearly identical across ports, years, and quota price multipliers (Supplemental Material[1], Tables S5–S8). This empirical result is consistent with a previous ecosystem simulation model of the US West Coast Groundfish Fishery that found that increasing quota prices to $50·kg^{-1}$ did not noticeably impact fleet dynamics because expected catch of the constraining species was still very low, making expected quota cost low as well (Kaplan et al. 2014).

Discussion

Catch shares did not result in concentration of spatial effort, strong avoidance, nor drastic shifts in location choice in the US West Coast Groundfish Fishery. There may have been more evidence of change if the fishery had transitioned from open access or more derby-like management to catch shares, but overall many of the characteristics we evaluated remained constant. Notably, the model fit for the location choice model was not improved by assuming higher quota costs for constraining species as a proxy for risk. This result may suggest that fishers accounted for bycatch risk in the years before and after catch shares.

Fishing effort and fleet size declined after catch shares were implemented in the US West Coast Groundfish Fishery, which is consistent with responses to catch share policies in Canada (Crowley and Palsson 1992; Grafton 1995), New Zealand (Grafton 1996*b*), and Alaska, USA (Abbott et al. 2010). Nearly all the ports

[1]Supplementary data are available with the article through the journal Web site at http://nrcresearchpress.com/doi/suppl/10.1139/cjfas-2019-0005.

Table 2. Table of random utility model coefficients.

Fleet	Coefficient	2009	2010	2011	2012	2013	2014
Astoria	First tow distance	−0.009***	−0.010***	−0.006***	−0.004***	−0.002*	0.000*
	Later tow distance	−0.045***	−0.054***	−0.064***	−0.059***	−0.058***	−0.057***
	First tow revenue	0.033***	0.026***	0.019***	0.027***	0.016***	0.011*
	Later tow revenue	0.020***	0.015***	0.011***	0.009***	0.011***	0.009***
	Missing data	0.294***	0.358***	−0.147	−0.225*	−0.207*	−0.211*
	Individual habit	2.094***	2.093***	2.059***	2.200***	2.051***	2.447***
	Individual habit last year	0.119*	0.450***	0.230***	0.275***	0.530***	0.433***
Newport	First tow distance	−0.019***	−0.006*	−0.011	−0.005	−0.005	−0.029***
	Later tow distance	−0.054***	−0.049***	−0.060***	−0.052***	−0.054***	−0.052***
	First tow revenue	0.012***	0.024***	0.023***	0.002	0.017***	0.016***
	Later tow revenue	0.008***	0.020***	0.007	0.006	0.009***	0.005*
	Missing data	0.192*	0.583***	0.032	0.096	0.124	−0.126
	Individual habit	1.647***	1.693***	1.574***	1.507***	1.224***	1.111***
	Individual habit last year	0.249*	0.195*	0.427*	0.510*	0.346*	0.223
Charleston	First tow distance	−0.008*	−0.004	−0.014*	−0.021***	−0.003	−0.014*
	Later tow distance	−0.054***	−0.048***	−0.052***	−0.044***	−0.048***	−0.046***
	First tow revenue	0.009*	0.015***	0.017***	0.016***	0.017***	0.010*
	Later tow revenue	0.005*	0.009***	0.009***	0.005	0.000	0.005
	Missing data	0.200	0.739***	0.507***	0.388*	0.153	−0.178
	Individual habit	1.912***	2.251***	2.169***	2.201***	2.081***	1.790***
	Individual habit last year	0.261***	0.662***	0.348***	0.645***	0.790***	0.732***
Brookings and Crescent City	First tow distance	−0.011***	−0.014***	−0.028***	−0.013*	−0.015*	−0.029***
	Later tow distance	−0.037***	−0.035***	−0.039***	−0.028***	−0.028***	−0.036***
	First tow revenue	0.010*	0.009*	0.013***	0.014*	0.020***	0.005
	Later tow revenue	0.009***	0.008*	0.014***	0.021***	0.017***	0.007***
	Missing data	0.460*	0.451*	0.302	0.506	1.020***	0.727*
	Individual habit	1.307***	1.574***	1.252***	1.538***	1.883***	2.017***
	Individual habit last year	0.197	0.370***	0.074	−0.124	0.178	0.355*
Eureka	First tow distance	−0.007*	−0.013***	−0.012***	−0.019***	−0.013***	−0.012***
	Later tow distance	−0.056***	−0.054***	−0.052***	−0.051***	−0.047***	−0.058***
	First tow revenue	0.023***	0.027***	0.016***	0.018***	0.014***	0.009*
	Later tow revenue	0.023***	0.023***	0.011***	0.018***	0.021***	0.014***
	Missing data	0.950***	1.199***	0.574***	0.867***	1.004***	0.957***
	Individual habit	2.011***	2.082***	2.070***	1.933***	2.548***	2.438***
	Individual habit last year	0.256*	0.239*	0.291*	0.333*	0.142	0.376***
Fort Bragg	First tow distance	−0.017***	−0.010***	−0.011*	−0.016***	−0.006*	−0.015***
	Later tow distance	−0.045***	−0.045***	−0.052***	−0.050***	−0.053***	−0.056***
	First tow revenue	0.027***	0.016*	0.009*	0.014*	0.025***	0.003
	Later tow revenue	0.012***	0.011***	0.005*	0.007*	0.011***	0.004*
	Missing data	0.197	0.338*	0.198	0.221	0.799***	−0.063
	Individual habit	1.011***	1.137***	1.711***	1.635***	1.968***	1.441***
	Individual habit last year	0.189*	−0.075	0.309*	0.307*	0.418***	0.403***

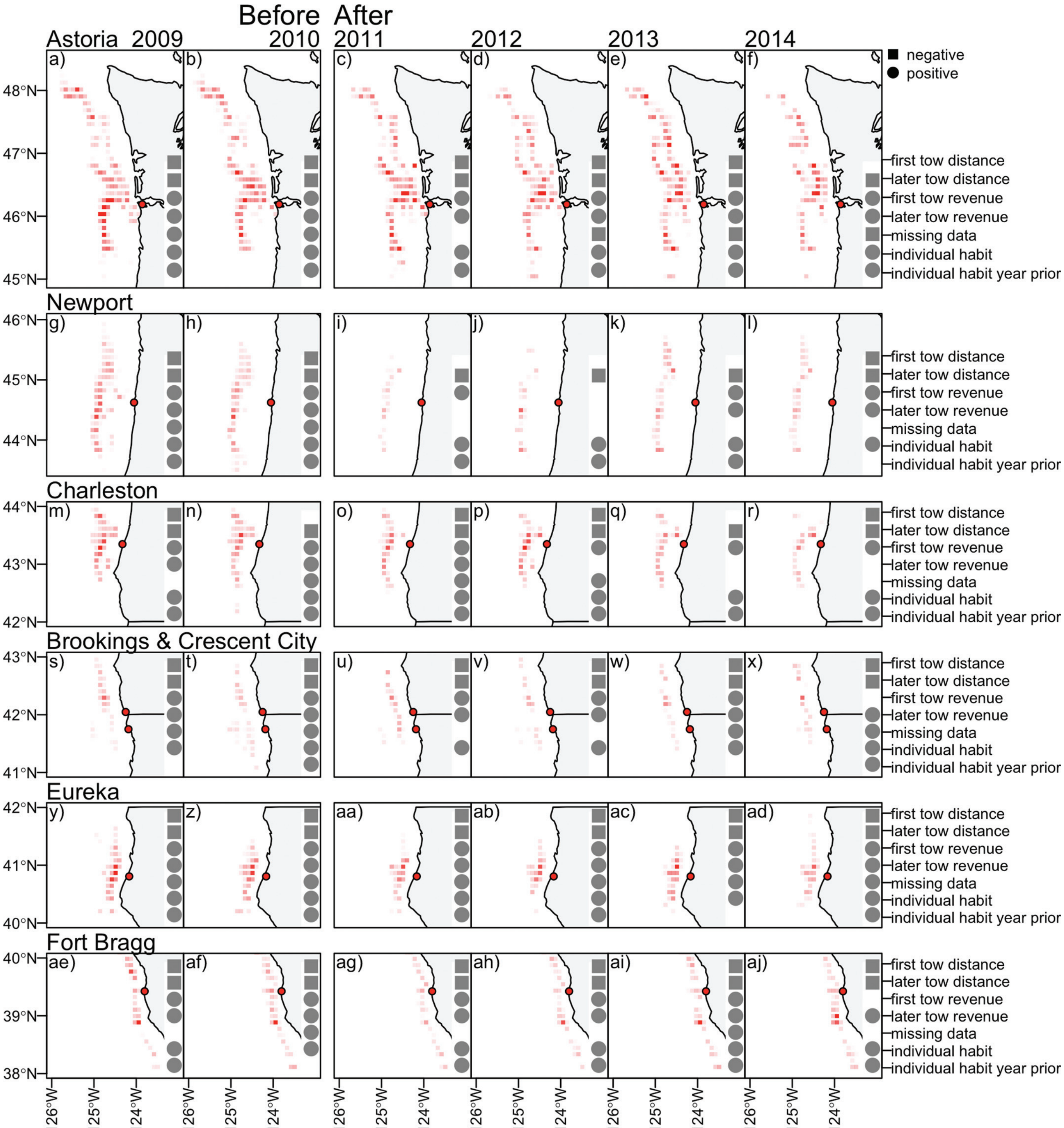
Note: Coefficients were significant with *p* values less than 0.05 (*) and 0.001 (***).

experienced declines in fleet size, and Astoria and Newport experienced the largest declines in terms of numbers of vessels. Some smaller ports maintained comparatively little change in fleet sizes. In all these cases, the theory of catch shares accurately predicts that fleet sizes and effort will decline as fishers consider their opportunity costs and decide to exit the fishery (Grafton 1996*a*). However, some design aspects of catch share programs may limit the magnitude of declines. Managers in the US Northeast, for example, gave fishers the option to volunteer to join a catch share program or remain in open access. About half of the permits joined the catch shares program, but fishers were allowed to move between catch shares and open access. In this case, the number of permits did not decline, although in the sectors, catches consolidated on fewer vessels (Holland et al. 2013).

We found that effort in the US West Coast Groundfish Fishery did not concentrate after catch shares, suggesting that fishers adopted different behavioral strategies to increase their targeting abilities. There is evidence of behavioral adjustments like fishing at different times of day, with different gear, and with shorter tows in this fishery (Miller and Deacon 2017). These adjustments likely explain the increase in targeting without evidence of spatial effort concentration. Shifts in fishing effort are often responses to concomitant factors like changes in local fish abundance (Ames 2004; Morato et al. 2006), gear bans (Bellman et al. 2005), local bycatch events (Dunn et al. 2014; Abbott et al. 2015), spatial closures (Hutton et al. 2004), or even religious events (Poos and Rijnsdorp 2007). Fishers are highly adaptable, and behavioral adjustments such as altering fishing times or changing gear are seen after catch share implementation in fisheries in Alaska (Abbott et al. 2015), southeast Australia (Baelde 2001), and the North Sea (Mortensen et al. 2018).

We found evidence of increased targeting of the high-value species after catch shares, particularly for the DTS complex after catch shares were implemented. Surprisingly we also found moderate evidence of increased targeting for some constraining rockfish species, which may be due to a combination of their increasing biomass and overlap in their distribution with target species on the outer continental shelf and upper slope. Darkblotched rockfish and Pacific ocean perch, for which our results suggested increased targeting, may be taken incidentally while targeting the DTS complex. However, these species were not found to be associated at the finer spatial scales sampled by scien-

Fig. 4. Number of tows in each 10 km × 10 km grid cell for vessels in each port group (rows) and year (columns). Significance and signs for coefficients are shown in the right of each panel. Nonsignificance (no point) and significance (solid; $p < 0.05$) are shown for positive (circle) and negative (square) coefficients. Each grid shown is filtered to contain at least three tows from at least three vessels. [Colour online.]



tific trawl surveys (Thorson and Barnett 2017). Despite this, total catches for all constraining rockfishes remained well below total quotas (Kuriyama et al. 2016). For constraining species, average catch rates and the frequency of large catches in a single tow did decline after implementation of catch shares (Pacific Fishery Management Council 2017). Thus, fishers may have been successful at avoiding dense concentrations of these species, but frequent incidental catch may be unavoidable due to some similarity in depth and latitudinal distribution with target species. Our results also find increased targeting of widow rockfish. Widow rockfish was a potentially constraining species at one time, but has since been rebuilt, and quotas were dramatically increased soon after implementation of catch shares. Avoidance would no longer have been a concern, and some fishers began targeting widow rockfish with midwater trawl gear (though this analysis was restricted to bottom trawl gear). Considering all evidence, catch shares have

Fig. 5. Estimates for each coefficient through time. Estimates (points) with 95% confidence intervals (tails) are arranged by port (colour). Significant values ($p < 0.05$) are indicated with solid points, while nonsignificant values have open points. Vertical dashed gray lines indicate the year of catch share implementation (2011), and horizontal dashed gray lines indicate zero values. If viewing in grayscale, points for each year are slightly offset for each year (Astoria furthest left, Fort Bragg furthest right). [Colour online.]

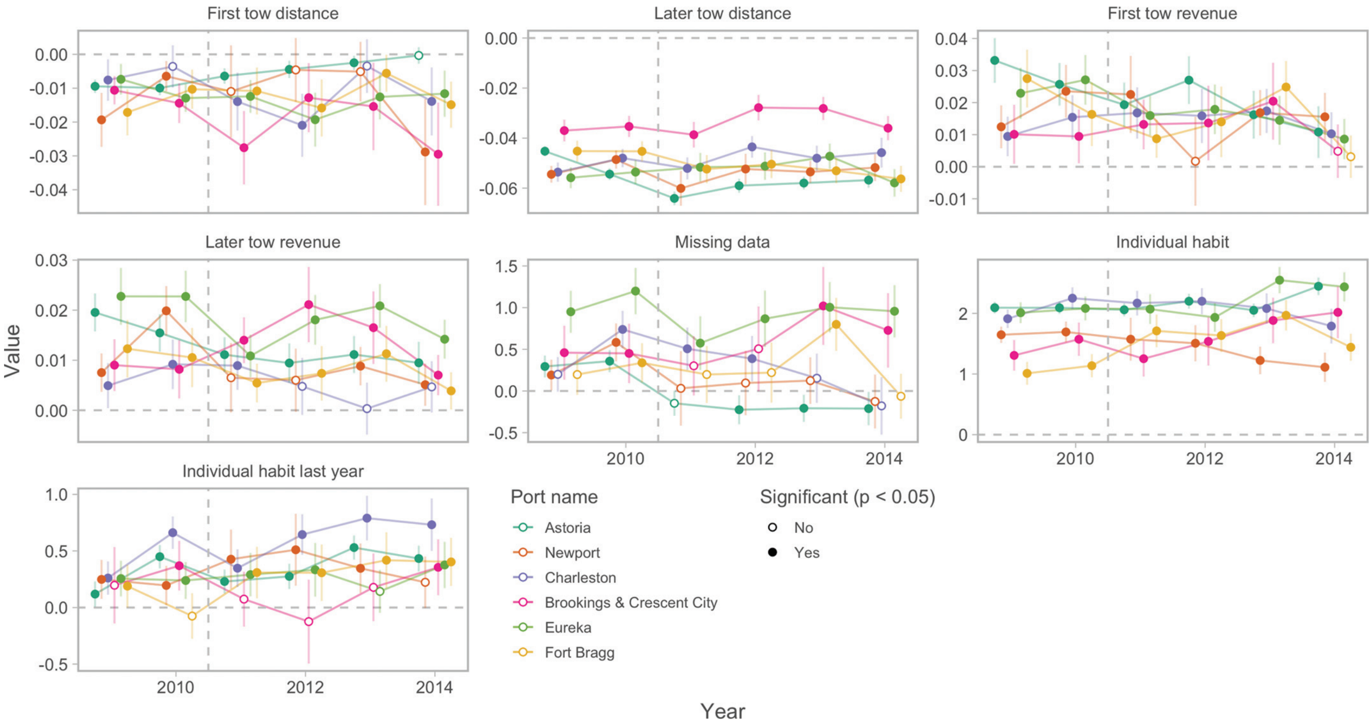


Fig. 6. Ratios of distance to expected revenue coefficients for first tow (circles) and later tows (triangles) before and after catch shares (implemented in 2011; gray vertical line) with 95% confidence intervals (tails). More negative ratios suggest fishers are less willing to travel further from their port or previous tow location, and there is no consistent trend among year and fleet.

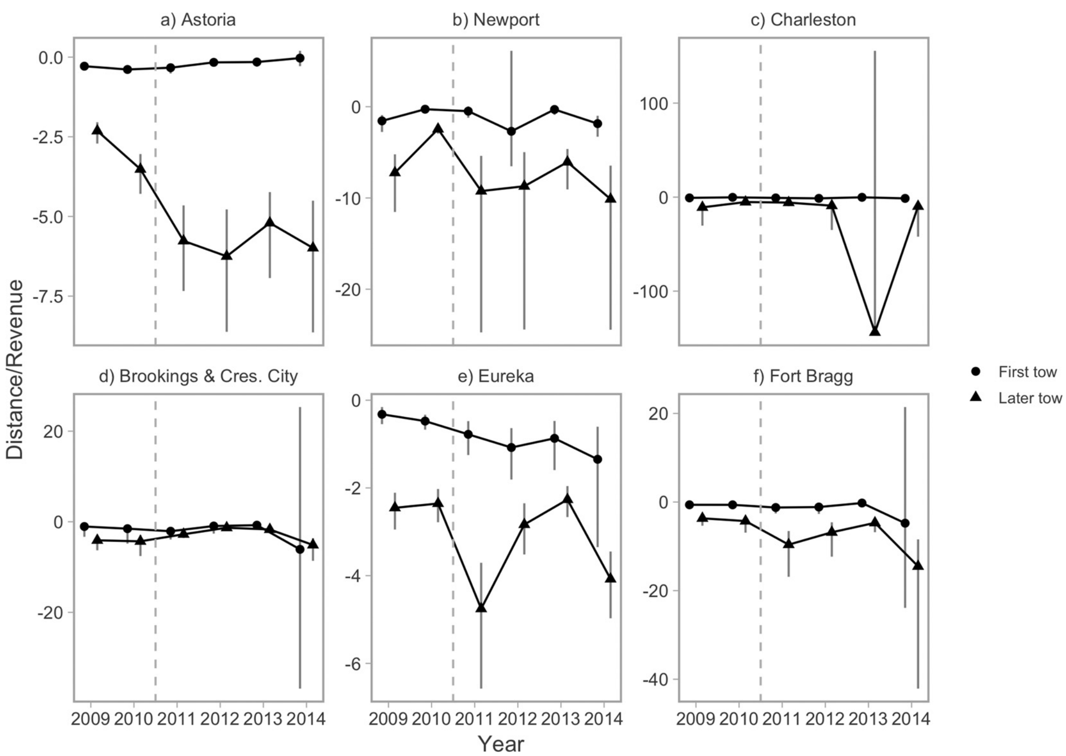


Table 3. Predictive metrics by port and year.

Port	2009	2010	2011	2012	2013	2014
Correct tow (%)						
Astoria	38	39	43	43	41	46
Newport	24	23	26	19	21	19
Charleston	26	27	24	19	21	18
Brookings and Crescent City	20	21	18	17	16	18
Eureka	21	21	25	21	23	25
Fort Bragg	14	15	24	26	23	21
Correct area (%)						
Astoria	39	40	44	56	53	57
Newport	29	24	28	39	36	38
Charleston	33	29	26	38	42	44
Brookings and Crescent City	27	23	20	29	31	32
Eureka	29	25	29	41	40	44
Fort Bragg	22	18	25	44	41	39
Distance (km)						
Astoria	84	78	65	16	17	15
Newport	56	78	61	20	19	19
Charleston	32	45	45	17	17	16
Brookings and Crescent City	129	163	134	27	26	23
Eureka	36	62	58	17	16	15
Fort Bragg	52	67	62	19	19	19

Note: Correct tow is the percentage of correctly predicted tows, correct area is the percentage of correctly predicted areas, and distance is the distance between predicted and empirical tows.

led to increased targeting efficiency while having mixed influence on avoidance; thus, it does not appear that the risk of incidental catch of constraining species is a primary driver of fisher behavior.

Multispecies catch share fisheries are complex, and policies will likely need to be adapted to improve ecological, social, and economic outcomes. Risk pools are one example of adaptation in the US West Coast Groundfish Fishery. Many fishers joined risk pools to ameliorate the risk of exceeding quotas of constraining species. Members of the risk pools share their quota and coordinate fishing effort to minimize chances that catches are limited by constraining species. Risk pools may have facilitated avoidance and higher utilization of target species (Kauer et al. 2018). Fishers that joined risk pools have greater access to quota to cover incidental catch of constraining species, but they also agreed to abide by contractually binding rules intended to reduce risk of large catches of these species (Holland and Jannot 2012). Additional innovations may include consideration of multispecies interactions when setting total allowable catches (Ulrich et al. 2011), allowing species conversions (Woods et al. 2015*a*, 2015*b*, 2016), and identification of spatiotemporal species complexes (Dolder et al. 2018).

Consistent with previous analyses, we found that fishers tend to fish in areas that (*i*) they have fished before, (*ii*) have higher expected revenues, and (*iii*) are closer to previous tow or port locations to reduce steam time and associated cost. Previous random utility models also found choice probabilities increased with higher expected revenue and decreased with distance (Holland and Sutinen 2000; Haynie et al. 2009; Abbott and Wilen 2011), and habit is a significant predictor in roughly 75% of reviewed fleet dynamics studies (Girardin et al. 2017). The relative importance of revenue and distance in determining location choice remained relatively constant before and after catch shares for most fleets.

Given that our fleetwide spatial analysis indicated a relative increase of effort closer to shore with catch shares, we might have expected to see the ratio of the absolute value of the distance over expected revenue coefficients to increase, indicating a stronger reluctance to travel further. However, we did not see consistent changes in this ratio after catch shares, indicating that the change in spatial effort was more likely caused by changes in spatial distribution of quota or changes in habit rather than short-term profit considerations of individual fishers.

Before catch shares, fishers were likely to fish in areas without recent activity as evidenced by positive and significant missing data (D_{miss}) variables. Negative and insignificant parameters for the missing data variables after catch shares for some fleets suggest fishers for these fleets were more likely to avoid areas not recently fished relative to before catch shares. However, results varied by fleet and year. Fishers in Astoria tended to avoid areas not recently fished, whereas fishers in Brookings, Crescent City, and Eureka were still more likely to fish in areas where others had not recently fished. This difference may be related to the spatial extent of fishing grounds. Larger ports like Astoria and Newport have large spatial footprints of fishing effort, whereas smaller ports like Brookings and Crescent City may have better defined fishing grounds. Skippers in the larger ports may be less familiar with the broad fishing grounds and rely on recent catch information gathered from others.

Fishers in the US West Coast Groundfish Fishery may not account for incidental catch of constraining species on monetary terms. Model performance was essentially unchanged when increasing quota costs up to 100-fold. Rebuilding plans in the US West Coast Groundfish Fishery have been in place since 2000, and fishers may have adopted strategies to avoid constraining species in the years prior to the study period. Fishers appear to have sufficiently avoided these species as catch rates and large catch incidents for constraining rockfish species declined after catch shares. With landings well below catch limits and a series of years with good conditions for recruitment, stocks of nearly all of the constraining species have been rebuilt.

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We have received 9 of the following letter to date, we will make future comments available when we receive them.

AMENDMENT 23 IS OFF COURSE! START OVER!

Monitoring is important to the successful management of **ALL** fisheries but it must not come at the cost of decimating the iconic groundfish fishery!

COVID-19 has shown me how critical it is for my local community to have a reliable locally harvested source of healthy protein. As a New England resident, I am lucky to have access to the seafood sustainably caught by the small independent groundfish fleet. In its own words, Amendment 23 will force fishermen out of business and provide a windfall "to more efficient vessels with lower operating costs and higher profits."

A diverse groundfish fleet is critical to the continuation of this iconic fishery and as currently written Amendment 23 will decimate the fleet until only a few large corporations remain. Amendment 23 fails to strike the necessary balance needed to preserve our local fishing community. Be Fair! Start Over!

From: Phil Lynch
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