



New England Fishery Management Council

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

MEMORANDUM

DATE: November 25, 2020
TO: Groundfish Committee
FROM: Groundfish Plan Development Team
SUBJECT: **Framework 61 – universal sector exemption for redfish, haddock, and pollock**

The Groundfish Plan Development Team (PDT) met via webinar on November 12, 2020, and November 16, 2020, to discuss developing an alternative for a universal sector exemption for redfish, haddock, and pollock, to be included in Framework Adjustment 61 (FW61).

Overview

At their October 27, 2020 meeting, the Council added inclusion of an alternative in FW61 for a universal sector exemption for redfish, haddock, and pollock. The following week on November 4, the Groundfish Committee (Committee) discussed an industry proposal in detail and tasked the PDT with developing a universal sector exemption for redfish only, based on the industry proposal:

To task the Groundfish Plan Development Team with developing an alternative based on the industry proposal for a universal redfish sector exemption (consulting with Mr. Hank Soule and Mr. Dave Leveille) and conduct analysis on that alternative for inclusion in FW61. (Carried 15/0/1)

The PDT discussed the industry proposal and developed draft language for the alternative based on this proposal. The PDT raised several questions and considerations regarding a universal sector exemption for redfish (see *Additional PDT considerations*). The PDT also conducted preliminary analysis to consider in the further development of this alternative.

Draft alternative

4.4 Action 4 – Commercial Fishery Measures for Sectors - Universal Sector Exemption for Redfish

4.4.1 Alternative 1 – No Action

No Action. There would continue to be no universal sector exemption for redfish in the Northeast (NE) Multispecies (Groundfish) fishery management plan (FMP). The Regional

Administrator may exempt sector vessels from any federal fishing regulation implementing the NE Multispecies FMP, except: specific times and areas within the NE Multispecies year-round closure areas; permitting restrictions (e.g., vessel upgrades, etc.); gear restrictions designed to minimize habitat impacts (e.g., roller gear restrictions, etc.); reporting requirements; and accountability measures, in order to allow vessels to fish in accordance with an approved operations plan, provided such exemptions are consistent with the goals and objectives of the FMP. In recent years, sectors have requested through their operations plans an exemption from the currently required 6.5-inch minimum groundfish mesh for trawl vessels to target redfish. Vessels enrolled in sectors that are not granted this exemption, as well as common pool vessels, are not allowed to fish with this exemption.

If the No Action Alternative was selected, sectors would continue to request an exemption through their operations plans to use a smaller mesh size to target redfish. Sector proposals submitted to NMFS could include the elements of the industry proposal described in Alternative 2.

For FY 2020, NMFS granted sectors an exemption to target redfish with 5.5-inch mesh codends, as described below (see FY 2020 Interim Sector Rule; 85 FR 23229; April 27, 2020). Vessels enrolled in sectors with the exemption are allowed to use a 5.5-inch (or larger) codend mesh within the Redfish Exemption Area (Table 1, Map 1) with the stipulations below. Vessels are subject to the at-sea monitoring (ASM) target coverage levels. During the smaller mesh portion of the trip in the Redfish Exemption Area, the allocated groundfish kept needs to be 50% or greater redfish, and on observed trips, no more than 5% of all groundfish (including redfish) may be discarded. See the Final Rule for details (85 FR 23229; April 27, 2020). NMFS monitors these thresholds monthly for each sector.

Stipulations:

- 1) Prior to leaving the dock, vessel operators are required to declare their intent to fish in the Redfish Exemption Area through the Vessel Monitoring System (VMS) by checking the box next to "Redfish Trip" under sector exemptions;
- 2) In Part 1 of the trip, vessel operators may fish with conventional groundfish codends (6.5-inch) in the Gulf of Maine (GOM) and Georges Bank (GB) regulated mesh areas (RMAs), except when fishing with a haddock separator trawl or Ruhle trawl in the GB RMA, where the codend may be 6 inches;
- 3) Vessel operators are allowed to switch to 5.5-inch (or larger) codend for Part 2 of the trip after submitting VMS Multispecies Catch Report indicating that the vessel is switching to smaller mesh. Fishing outside of the Redfish Exemption Area first is optional, but once a vessel switches mesh under Part 2 the vessel cannot fish outside the Redfish Exemption Area. Alternatively, a vessel may choose to immediately transit to the Redfish Exemption Area and begin fishing on Part 2 of the Redfish Exemption Trip;
- 4) Vessel operators must report catch each day from the entire trip (including redfish and non-redfish portions) through the VMS prior to returning to port; and
- 5) Vessel operators must submit a separate Vessel Trip Report to report catch for each codend mesh size for each statistical area where it is fished.

Rationale: Sectors may request exemptions from the regulations implementing the NE Multispecies FMP as part of their operations plans. The annual (or biennial) sector exemption

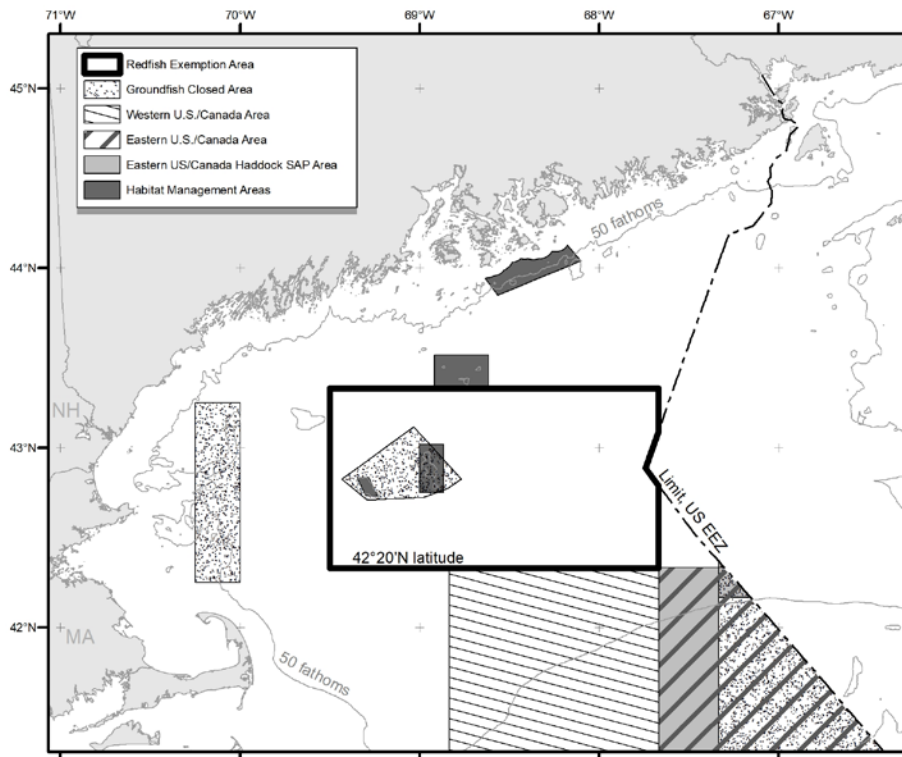
approval process allows NMFS to determine if requested exemptions are appropriate for groundfish sectors in a given fishing year, and/or if they could potentially be modified in response to a management need or opportunity (e.g., changing stock status, or improved catch efficiency). The Redfish Exemption Area approved for FY 2020 is reduced in size compared to the area previously approved under the exemption from FY 2015 to FY 2019. This reduction is intended to address harvest performance issues with the exemption, more specifically to reduce bycatch and potential targeting of other groundfish stocks using smaller mesh, particularly GB cod, white hake, pollock, and haddock. Both GB cod and white hake are overfished and in rebuilding plans.

Table 1 - Coordinates for the sector redfish exemption area approved for FY 2020.

Point	N. Lat.	W. Long.
A	43°20.00'	69°30.00'
B	43°20.00'	67°40.00'
C*	43°06.23'	67°40.00'
D*	42°53.24'	67°44.55'
E*	42°47.17'	67°40.00'
F	42°20.00'	67°40.00'
G	42°20.00'	69°30.00'
A	43°20.00'	69°30.00'

*Approximate points corresponding to the intersections of 67°40' W. longitude and the U.S.-Canada Maritime Boundary, and the area's eastern boundary following the U.S.-Canada Maritime Boundary.

Map 1 - Map of the sector redfish exemption area approved for FY 2020.



4.4.2 Alternative 2 – Add a universal sector exemption for redfish

Alternative 2 would add a universal sector exemption to the NE Multispecies FMP that would allow commercial trawl vessels enrolled in sectors to fish using a 5.5-inch (or larger) mesh codend within the defined Redfish Exemption Area (Table 2, Map 2) with the stipulations below. Approval through the annual (or biennial) sector operations plan approval process would not be necessary.

The Redfish Exemption Area would include a seasonal cod closure that would be closed in February and March due to potential catch of GOM cod, and an additional seasonal closure that would be closed in September through December to reduce bycatch of other groundfish stocks (mainly pollock) (Table 3 and Table 4, Map 2). Vessels would be subject to the ASM target coverage levels. During the smaller mesh portion of the trip in the Redfish Exemption Area, the allocated groundfish kept on Part 2 of the trip needs to be 50% or greater redfish landings, and on observed trips, no more than 5% of all groundfish (including redfish) may be discarded. Options for performance standards and accountability measures, in addition to the performance standards already required under the current approved sector exemption, are described below. Sectors may continue to request other exemptions related to redfish or mesh size.

Stipulations:

- 1) Prior to leaving the dock, vessel operators would be required to declare their intent to fish in the Redfish Exemption Area through the VMS by checking the box next to "Redfish Trip" under sector exemptions;
- 2) In Part 1 of the trip, vessel operators could fish with conventional groundfish codends (6.5-inch) in the GOM and GB RMAs, except when fishing with a haddock separator trawl or Ruhle trawl in the GB RMA, where the codend may be 6 inches;
- 3) Vessel operators would be allowed to switch to 5.5-inch (or larger) codends for Part 2 of the trip after submitting VMS Multispecies Catch Report indicating that that the vessel is switching to smaller mesh. Fishing outside of the Redfish Exemption Area first is optional, but once a vessel switches mesh under Part 2 the vessel cannot fish outside the Redfish Exemption Area. Alternatively, a vessel may choose to immediately transit to the Redfish Exemption Area and begin fishing on Part 2 of the Redfish Exemption Trip;
- 4) Vessel operators would report catch each day from the entire trip (including redfish and non-redfish portions) through the VMS prior to returning to port; and
- 5) Vessel operators would submit a separate Vessel Trip Report to report catch for each codend mesh size for each statistical area where it is fished.

Differences between Alternative 2 and the exemption granted in the FY 2020 Interim Sector Rule (Status Quo):

1. Alternative 2 would incorporate this exemption into the FMP, so that sectors would no longer need to request the exemption through their operations plans (though they could still do so for other exemptions including exemptions related to redfish or mesh size).
2. Alternative 2 would approve this exemption until changed through future Council action, rather than through FY 2020.

3. Area differences between Alternative 2 and the FY 2020 Interim Sector Rule, including seasonal closure areas (described in Table 2 and Map 2).
4. Modifications to thresholds and implementation of performance standards and accountability measures for the exemption in Alternative 2.
5. NMFS may place a sector on probation or revoke a sector's authorization to use this universal exemption through modification of the sector's approved operations plan if that sector fails to meet the performance requirements (see Performance Standards/Accountability Measures below).

Rationale: Under Alternative 2, sectors would no longer need to request a redfish exemption through their operations plans, reducing administrative burden of the exemption request process and potentially adding consistency and predictability for fishing operations. All sectors vessels would be automatically eligible to participate in the universal exemption. The mesh size would allow greater retention of redfish than the current minimum mesh size in the FMP. Studies of the REDNET project showed that vessels could selectively target redfish with minimal bycatch (Pol & He 2014). The intent is to not to supersede or allow fishing under this exemption in any existing or future closed areas within the Redfish Exemption Area boundary. Alternative 2 would increase the size of the Redfish Exemption Area from that specified under the FY 2020 Interim Sector Rule, to restore some areas previously included in the footprint of the redfish area (FY 2015 – FY 2019) for vessels participating in the exemption program. Vessels would not be able to use the exemption in Statistical Reporting Area 131 (Cod Closure) in February and March, due to the presence of GOM cod and the potential for bycatch of this stock. Additionally, vessels would not be able to use the exemption in Seasonal Closure II in September through December, to reduce bycatch of other groundfish stocks, especially pollock.

Table 2 - Coordinates for the sector redfish exemption area under Alternative 2.

Point	N. Lat.	W. Long.
A	43°00'	69°55'
B	43°00'	69°30'
C	43°20'	69°30'
D	43°20'	(US EEZ longitude)
E	42°53.24'	67°44.55'
F	42°20'	(US EEZ longitude)
G	42°20'	67°40'
H	42°00'	67°40'
I	42°00'	69°37'
J	42°20'	69°55'
A	43°00'	69°55'

^aThe intersection of 42°00' N. latitude and the U.S.-Canada Maritime Boundary. Longitude is approximate.

Table 3 - Coordinates for the sector redfish exemption area cod closure under Alternative 2.

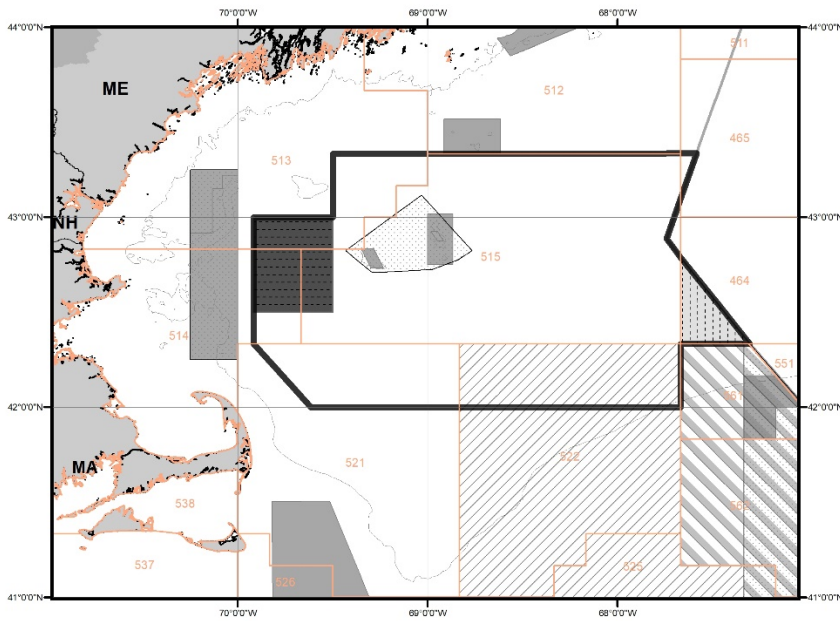
Point	N. Lat.	W. Long.
A	43°00'	69°55'
B	43°00'	69°30'
K	42°30'	69°30'
L	42°30'	69°55'
A	43°00'	69°55'

Table 4 - Coordinates for the sector redfish exemption area seasonal closure II under Alternative 2.

Point	N. Lat.	W. Long.
M	42°47.17'	67°40'
F	42°20'	(US EEZ longitude)
G	42°20'	67°40'
M	42°47.17'	67°40'
M	42°47.17'	67°40'

Map 2 - Map of the sector redfish exemption area under Alternative 2.

Draft Industry - Proposed Redfish Exemption Area



Legend

- Redfish Exemption Area
- Redfish Exemption Area Cod Closure
- Redfish Exemption Area Seasonal Closure II
- Eastern U.S./Canada Management Area
- Western U.S./Canada Management Area
- 50 fathom Bathymetry
- Groundfish Closure Areas
- Habitat Management Areas
- Exclusive Economic Zone (EEZ) (200 nmi)
- Statistical Areas

Drafted 11/24/2020

Performance Standards/Accountability Measures - *The Council may select one or both of these options: Option A or Option B.*

If necessary, the Regional Administrator will place a sector on probation, or revoke a sector's authorization to use this universal exemption within the fishing year, through the operations plan approval process or modification of an approved 2-year operations plan.

Option A - Performance Standards for Monthly Redfish Landings Threshold and Groundfish Discards

The current exemption, as approved by NMFS, requires that at least 50% of the monthly cumulative total groundfish kept on Part 2 of those trips declaring the redfish exemption and targeting redfish during Part 2 of the trip should be redfish. For observed trips (NEFOP/ASM/EM) declaring the redfish exemption and fishing a smaller than 6.5-inch mesh codend during Part 2 of the trip, total groundfish discards (including redfish) may not exceed 5% of all kept fish during Part 2 of the trip. GARFO will monitor these thresholds using available data and make compliance determinations. For any month GARFO determines that the sector is not meeting either of these two thresholds, the sector will be notified, and the sector is expected to modify fishing behavior in order to meet both thresholds.

This option would set additional performance standards for the monthly redfish landings threshold of 50% and the monthly groundfish discards of 5%, such that a sector may not fail to meet either monthly threshold for (a) four or more months per fishing year, or (b) three consecutive months. If either limit is breached, the sector will have its use of the redfish exemption program revoked for the remainder of that fishing year (year 1). Additionally, the sector will be placed on a 'probationary' status for the following fishing year (year 2). For example, a sector could fail to meet the monthly threshold in October, December, and January and would not have its use of the exemption revoked. But, if the sector failed to meet the monthly threshold in September, October, and November, its use of the exemption would then be revoked.

In the following fishing year, if the sector again fails to meet either monthly threshold for (a) four or more months of a fishing year or (b) three consecutive months in a fishing year, the sector will have its use of the redfish exemption program revoked for the remainder of that fishing year (year 2), and have its use of the exemption revoked for the following fishing year (year 3). Otherwise, the sector's probationary period would expire at the end of the following year (year 2).

Rationale: This option would help ensure vessels are targeting redfish by requiring sectors to achieve the 50% monthly redfish landings threshold and not fall below this threshold too often, and to not exceed 5% groundfish discards. Missed thresholds are expected to occur at times when redfish occasionally/seasonally scatter, and the sector is to address the issue. This option is intended to improve performance of the exemption.

Option B – Annual Redfish Landings Threshold

Sectors would be required to achieve a mandatory annual exempted redfish landings composition threshold of 55% (a sector's total annual landed pounds of groundfish landed on Part 2 of redfish exemption trips must comprise at least 55% redfish annually). If a sector fails to meet this threshold (in year 1), it is placed on 'probationary' status for the following fishing year (year 2).

In the following 'probationary' fishing year (year 2), if the sector again fails to meet this annual threshold, the sector will have its use of the redfish exemption revoked for the following fishing year (year 3). If in the following 'probationary' fishing year (year 2), the sector meets the annual threshold, it will no longer be in probationary status in the subsequent year.

Rationale: This option would help ensure vessels are targeting redfish, while not setting the performance standard too high for new entrants.

Additional PDT considerations

In developing the draft alternative based on the industry proposal, the PDT identified several questions and considerations regarding a universal sector exemption for redfish. A number of these questions are related to administrative aspects of a universal exemption, specifically, regarding the performance standards and accountability measures. The PDT raises additional concerns to consider as well:

- *Universal sector exemption and performance standards/thresholds* – Do performance standards complicate a universal exemption? Can a sector tell a member not to use a universal exemption if that member is performing poorly? What mechanism can GARFO use to tell a sector not to use a universal exemption if it fails to meet the performance threshold, and does GARFO have the authority to do this? No existing universal exemptions have any thresholds or provisions for eliminating participation by a sector.
- *Can sectors manage or constrain a sector member's use of a "universal" exemption?* Do all sectors want their members to have the option to do this kind of fishing automatically? What is the implication of required responses to thresholds as opposed to GARFO discretion (to date, NMFS has never withdrawn this exemption from a sector, despite issues with thresholds)?
- *In setting thresholds for monitoring (if included), what are the goals and objectives of the thresholds?* What metrics should the thresholds be measured against. Number of months out of compliance still plausible under proposed thresholds - what is the impact of a more flexible threshold?
- *Timing of monitoring catch for compliance with thresholds* – GARFO typically has a 2-3 week lag in determining whether a sector has fallen out of compliance with the thresholds for any particular month. Alternatively, the intent may be to have sectors report to GARFO when they are out of compliance, as they may be able to do so in more real-time. What are the monitoring expectations, who is responsible for monitoring, and if industry then what is mechanism for enforcement if the exemption is "universal"?

- *If sectors are to report to GARFO when they are out of compliance with the thresholds, should there be a requirement for sectors to submit null reports?* Otherwise there might be a risk that sectors forget to or otherwise fail to report. But this would potentially create more administrative burden for sectors in having to submit additional reports.
- *Process for placing a sector on ‘probationary’ status or revoking use of exemption –* Does this require rulemaking or other APA notice to change a sector’s ops plan?
- *Does approval for a “universal” exemption imply higher standards need to be met for approval?* Should the area be smaller and more focused on where we are confident redfish catch will be “cleanest”? Some of the areas included in the industry proposed exemption area that are restored from the previous exemption area (FY 2015 – FY 2019) are expected to be less efficient for redfish catch and may have issues with meeting the thresholds. Should the annual redfish landings threshold be higher than 55%?
- *Redfish is currently not overfished, with overfishing not occurring.* However, if the stock status changes, a universal exemption not subject to agency review would not allow the exemption to be updated or removed as part of the annual operations rulemaking.
- *If GB portions are approved, what are the impacts of the overlap between the GB haddock separator universal exemption and this exemption?* There are potential economic incentives to use less selective gear - does this undermine the intent of the GB haddock separator universal exemption? How do we analyze overlap?
- *Impact of vessels changing sectors to avoid penalties or moving into sectors with or without issues meeting the thresholds.* The performance standards are applied at the sector level, but there could be complications of how to apply this if vessels using the exemption switch sectors.
- *Enforceability,* especially for seasonal areas, areas where targeting of non-redfish stocks is possible, stock area reporting, etc.
- *Exemption declaration –* Should there be any consideration for additional penalties for failing to declare or potentially different requirements? Declaration issues have made it challenging to determine exemption trips and have created limitations for analysis of exemption activity. Perhaps, vessels that fail to properly declare prior to departing the dock would be prohibited from using the exemption on that trip and use of sub-legal mesh on that trip would be subject to penalty?
- *Split trips –* If the flexibility to fish part of the trip using standard 6.5-inch mesh and then switch into use of the exemption will be codified into the FMP, there are some concerns with this regarding compliance monitoring on how well the exemption is working, as split trips make trip analysis challenging. It also increases the uncertainty for determination of potential changes in selectivity due to the exemption. Additionally, there may be OLE concerns about splitting trips.

GARFO staff on the PDT reported out that after discussion with General Counsel, GARFO believes the implementing regulations should stipulate the thresholds, how the thresholds are monitored, what happens when the thresholds are not met, and how the corrective action is taken. This is very broadly addressed in the draft alternative text above, but would be expressed in detail in any implementing regulations.

Preliminary Analysis of the Industry Proposal

Approach:

A pool of redfish exemption trips was constructed by pulling all sector fishing trip data from GARFO's Data Matching and Identification System (DMIS) database between fishing years 2015 and 2019 and filtering subtrips based on matching information from Vessel Trip Reports (VTRs). From FY2015 to FY2019 the redfish exemption was unchanged (it was changed for FY 2020) in terms of performance measures or area so it provides a good baseline of fishing activity that could occur under the industry proposal, the FY2020 area, or another similar area. Subtrips were identified as redfish exemption trips based on whether they reported fishing in all statistical areas overlapping the FY 2015 to FY2019 exemption area (here referred to as the 'FY2019 area', Figure 1), used between 5.5 inch but less than 6.5 inch mesh, and were not haddock separator exemption trips (fishing on Georges Bank with 6" mesh). Reported fishing location was also obtained from VTRs and used to associate reported landed catch volumes with redfish exemption trips and whether they fell in either the FY 2019 redfish exemption area, the FY 2020 exemption area, or the area proposed by the fishing industry for consideration in FW 61 (Figure 1). It should be noted that reported fishing location is an indicator of where fishing activity occurred, but is not a fine scale measure and may not capture all spatial fishing effort, therefore spatial results finer than the statistical area should be interpreted with some caution.

To allow for non-confidential visualizations of the data, data were aggregated across fishing years and reported fishing locations were binned into 10-minute squares. Figure 1 shows all locations where at least 3 permits reported catch across FY2015-FY2019. All tables and figures which examine landings and revenue in the industry proposed seasonal closure area (in SA 464) do not include trips that occurred between the months of September and December, to simulate what landings and revenue would have been if there had been a closure (see Industry proposal for more details). The GOM cod seasonal closure proposed by industry had already been in place during the baseline period and did not need to be simulated.

Results:

On average, around 65% of total ex-vessel revenue from the FY2019 redfish exemption area came from subtrips that reported fishing in the FY2020 area (Table 1). The industry's proposal would represent an increase relative to the FY2020 area, reinstate a portion of the GOM cod closure seasonal area, and create a new seasonal area in statistical area 464. This change would encapsulate roughly 87% of the total ex-vessel revenue obtained on redfish exemption trips that recorded fishing within the bounds of the proposed area and not during the proposed seasonal closure (Table 1). In the current and future fishing years, changes in ex-vessel revenue and net benefits stemming from an area change will depend on if and how effort shifts.

Increasing the exemption area per the industry's proposal, while potentially increasing opportunities for harvesting redfish, may increase the likelihood of catching non-redfish stocks and not achieving monthly (50%) and annual (55%) catch thresholds. Several areas bordering and outside of the FY2020 area have total redfish catch ratios less than 55%, and a few have less than 40% redfish across all five years (Figure 1). In particular, in two statistical areas in the industry proposal, 464 and 521, over 50% of subtrips did not meet the 50% redfish threshold (Figure 2). By contrast, in the FY2020 exemption area, over 75% of subtrips in 515 exceeded

50% redfish catch. In all other statistical areas at least 50% of trips met or exceeded the 50% threshold (median redfish catch ratio >0.5, Table 2).

Several stocks contribute to variations in redfish catch ratios across the previous, current, and proposed exemption areas, most notably haddock (Figures 3-4) and pollock (Figure 5). Pollock is caught in relatively high proportions (up to 60% of total landings) in area 464, even after simulating the seasonal closure in the last four months of the year. Western Georges Bank haddock is caught in relatively high volumes in 521, and to a lesser extent in 522 (30%-40% of total landings). Gulf of Maine haddock catch ratios range from 15% to 20% on the border of 521 and 515 as well as in the western areas of the proposed exemption area in 515 and 514.

Other stocks may not be landed in relatively large volumes compared to redfish, but due to otherwise high utilization or stock status, may warrant catch to be minimized by medium mesh gear in order to reduce risks of overfishing. Stocks with relative hot spots falling in the industry proposal area include white hake, and both Gulf of Maine cod and western Georges Bank cod (Figures 6-8).

Future Work/Additional Analysis:

The preliminary analysis described here is not an extensive evaluation of the industry proposal, due to time constraints. The PDT noted that additional analysis could be helpful to more fully understand potential impacts and tradeoffs associated with changing the redfish exemption area, in particular:

- Observer data and/or VMS data might allow for analysis at a finer spatial resolution as well as an evaluation of discards. Finer scale data may better identify redfish and non-redfish catch hotspots.
- Observer length information may also evaluation of possible selectivity shifts when fishing with <6.5” mesh. Selectivity changes have important implications for stock assessment and the risk of overfishing, and thus how important it is to reduce non-redfish catch.

The PDT also notes that such additional analyses might be both time and data-limited, since roughly 20% of the 1,100 identified redfish exemption trips have carried an observer over the FY2015-FY2019 period.

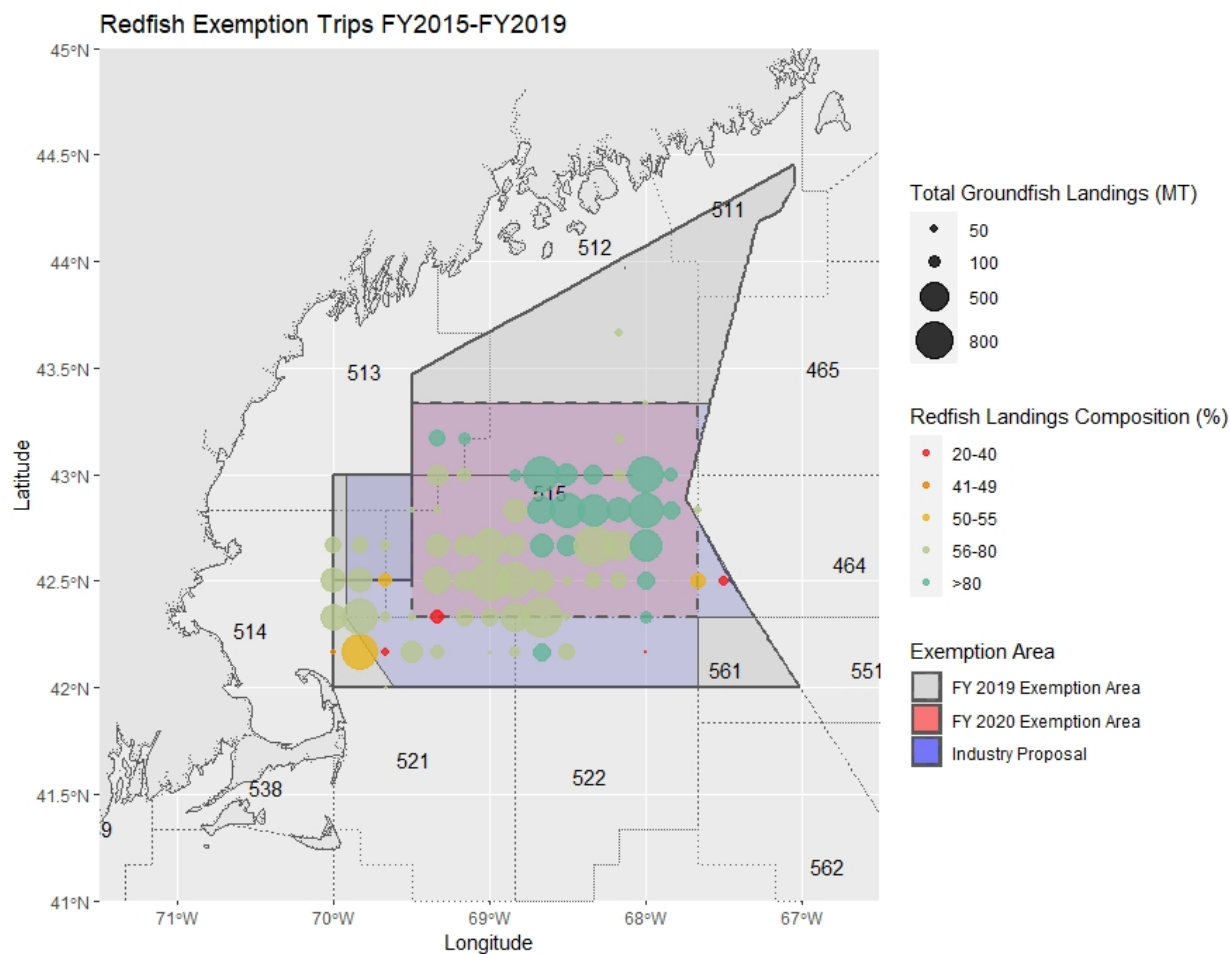


Figure 1: Total landed catch and proportion of redfish on sector trips reporting using medium mesh ($\geq 5.5'' < 6.5''$) between fishing years 2015 and 2019. Does not include haddock separator trips using 6'' mesh on Georges Bank. FY 2019, 2020, and proposed exemption areas are shown. Each data point represents a different 10-minute square.

Table 1: Number of trips, vessels, total landed pounds and ex-vessel revenue on exemption trips. Total pounds and revenue includes non-groundfish and halibut landings and revenue. Does not include trips between September and December in the industry proposed seasonal closure area in 464.

Area	FY	Trips	Vessels	Total Redfish Live Pounds (millions)	Total Landed Live Pounds (millions)	Total Redfish Ex-Vessel Revenue (millions of \$2020)	Total Ex-Vessel Revenue (millions of \$2020)
FY2019	2015	182	24	6.81	8.38	4.23	6.10
	2016	208	24	5.73	7.78	3.59	6.03
	2017	211	18	7.47	10.83	4.17	7.24
	2018	243	17	9.21	13.45	4.69	8.22
	2019	225	19	8.33	11.80	4.44	7.65
Average		214	20	7.51	10.45	4.22	7.05
FY2020	2015	151	23	5.75	6.78	3.56	4.76
	2016	130	22	3.50	4.23	2.18	3.04
	2017	167	17	6.04	7.96	3.40	5.10
	2018	173	15	5.91	8.30	3.12	4.98
	2019	172	17	6.10	7.97	3.34	5.06
Average		159	19	5.46	7.05	3.12	4.59
Industry Proposal	2015	177	23	6.65	8.11	4.13	5.87
	2016	197	24	5.23	6.66	3.28	4.97
	2017	205	18	6.90	9.78	3.87	6.51
	2018	216	17	7.73	11.13	4.00	6.79
	2019	208	18	7.40	10.11	3.99	6.48
Average		201	20	6.78	9.16	3.85	6.13

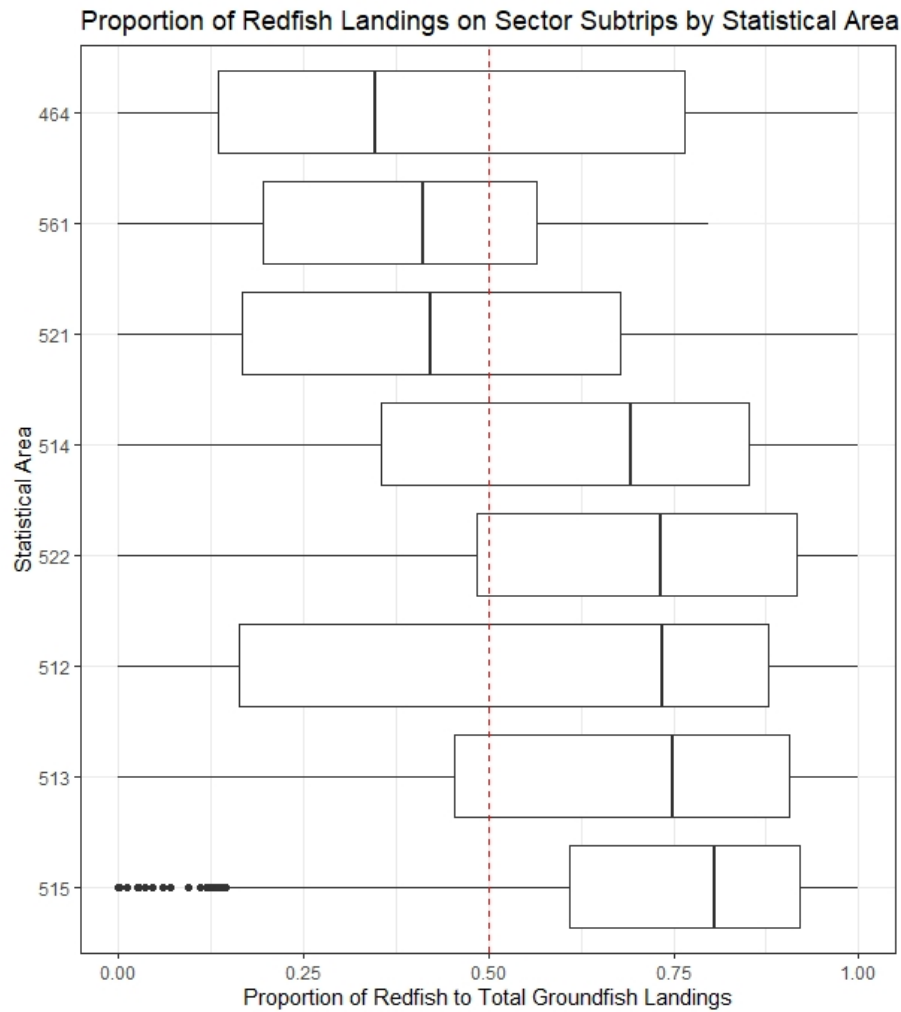


Figure 2: The distribution of redfish catch ratios (redfish reported live pounds to total allocated groundfish pounds) on all redfish exemption subtrips between FY2015 and FY2019 by statistical area. Each box represents the interquartile ranges (25th percentile to the 75th percentile) or the range of ratios that encompass 50% of trips. The solid vertical line in each box represents the median, where 50% of values lie above and below. The horizontal lines on each end of the box represent the tails of the distribution and each represent where the lowest 25% and highest 25% of values fall (left and right of the box, respectively). Any dots represent outliers (extreme values). The dashed vertical line represents the monthly redfish catch ratio threshold, when the median is less than the threshold it means that 50% of subtrips in that statistical area had less than 50% redfish landings. Statistical areas represent the portions of each area from the FY19 exemption area.

Table 2: Total number of redfish exemption trips, vessels, sectors, ex-vessel revenue (millions of \$2020) and landed live pounds (millions) by VTR statistical area (SA, FY2015-FY2019). Revenue and landings represent all allocated groundfish stocks. The median proportion of redfish to all other groundfish landings on all subtrips in an area is shown, as well as the 25th and 75th percentile.

SA	Vessels	Sectors	Trips	Ex-vessel Revenue (millions of \$2020)	Total Redfish Landed (millions of lbs)	Total GF Landed (millions of lbs)	Redfish Landings Ratio (subtrip)		
							25th percentile	Median	75th percentile
464	11	3	32	0.37	0.25	0.49	0.13	0.35	0.76
512	11	4	13	0.30	0.30	0.45	0.16	0.74	0.88
513	13	3	73	1.23	1.29	1.84	0.46	0.75	0.91
514	18	3	262	2.85	3.05	4.44	0.36	0.69	0.85
515	33	4	778	21.34	26.52	33.42	0.61	0.81	0.92
521	20	4	314	3.54	2.22	4.32	0.17	0.42	0.68
522	16	5	161	2.81	3.15	4.09	0.48	0.73	0.92
561	3	2	10	0.20	0.16	0.30	0.20	0.41	0.57

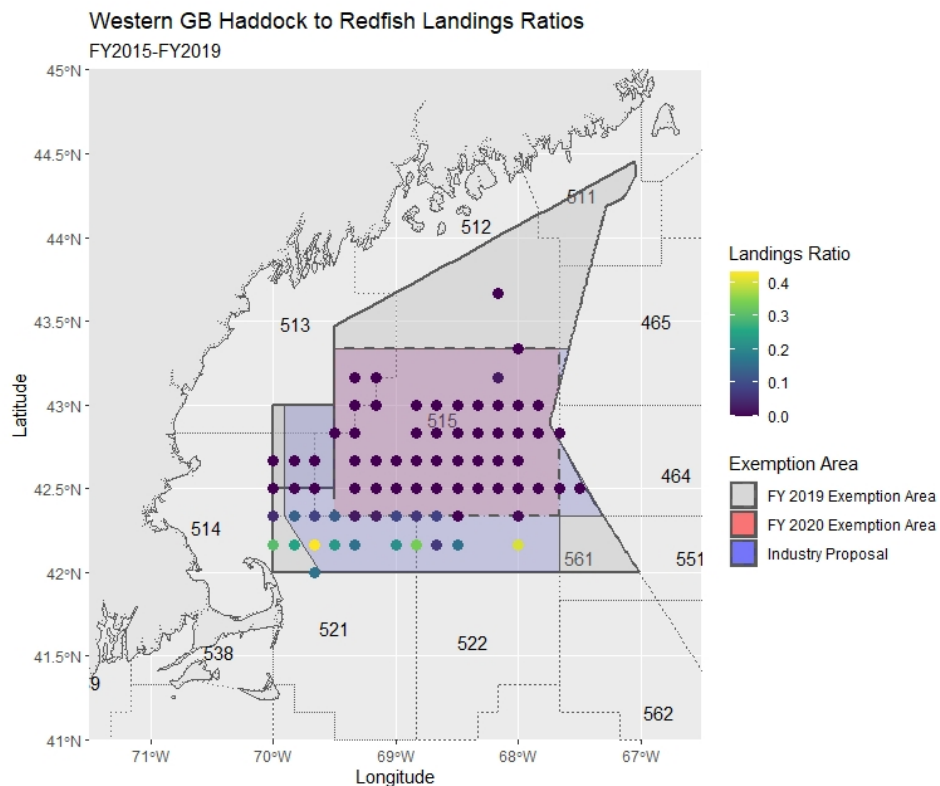


Figure 3: Map of western Georges Bank haddock catch to all other allocated groundfish landings in 10-minute squares across previous, current, and proposed redfish exemption areas (FY2015-FY2019). Lighter areas indicate higher landings ratios.

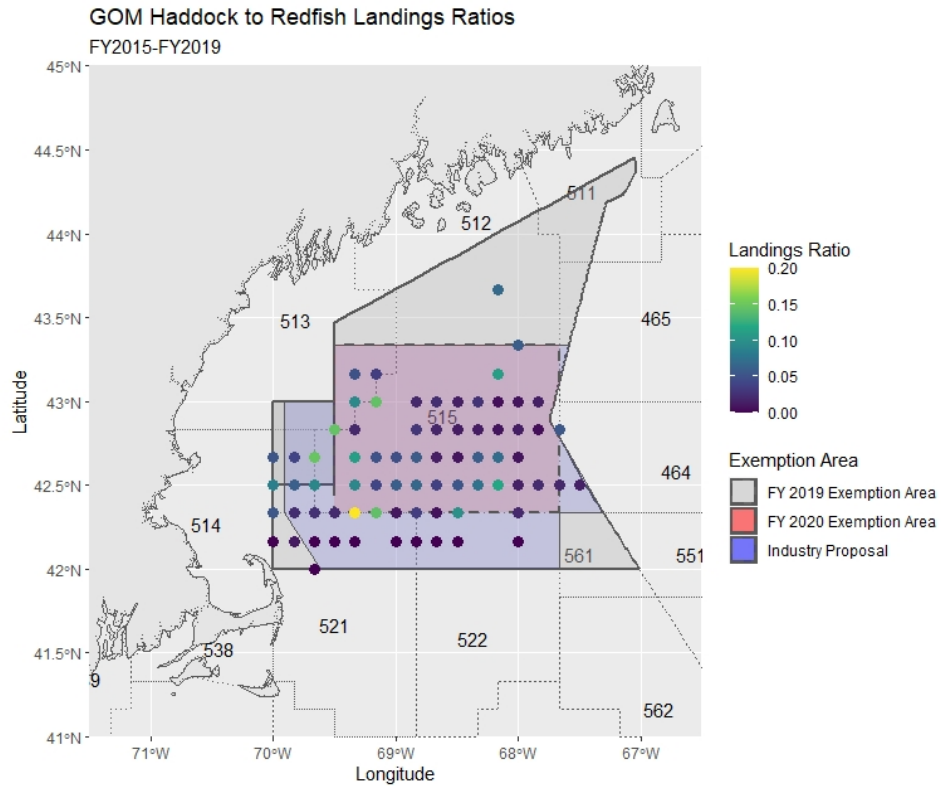


Figure 4: Map of Gulf of Maine haddock landings to all other allocated groundfish landings in 10-minute squares across previous, current, and proposed redfish exemption areas (FY2015-FY2019). Lighter areas indicate higher landings ratios.

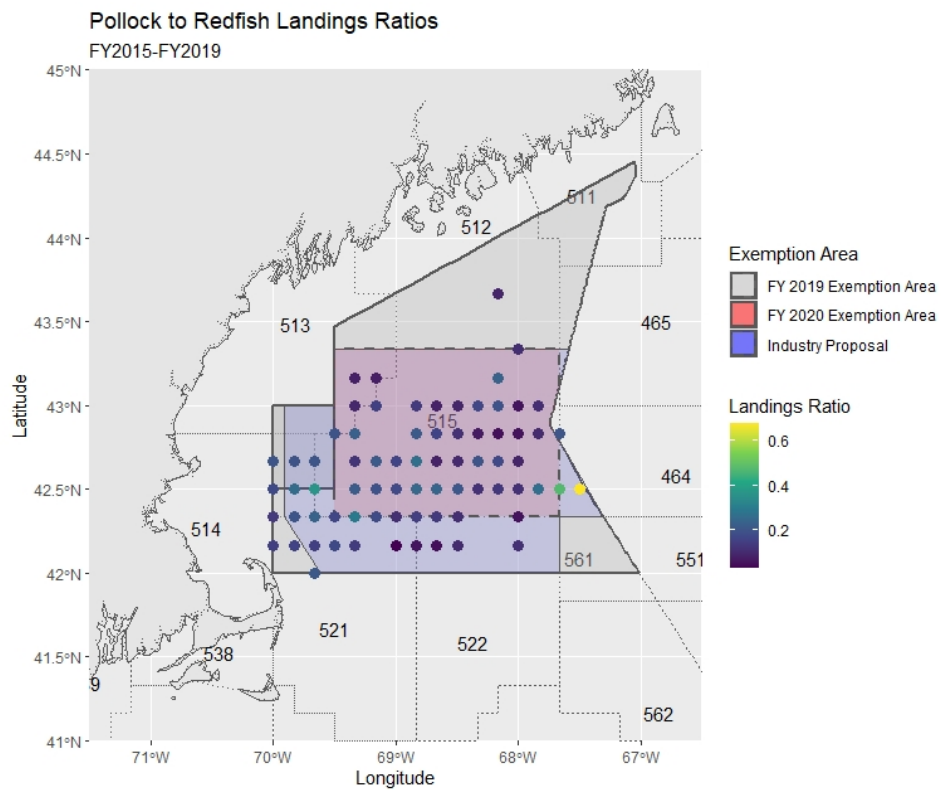


Figure 5: Map of pollock landings to all other allocated groundfish landings in 10-minute squares across previous, current, and proposed redfish exemption areas (FY2015-FY2019). Lighter areas indicate higher landings ratios.

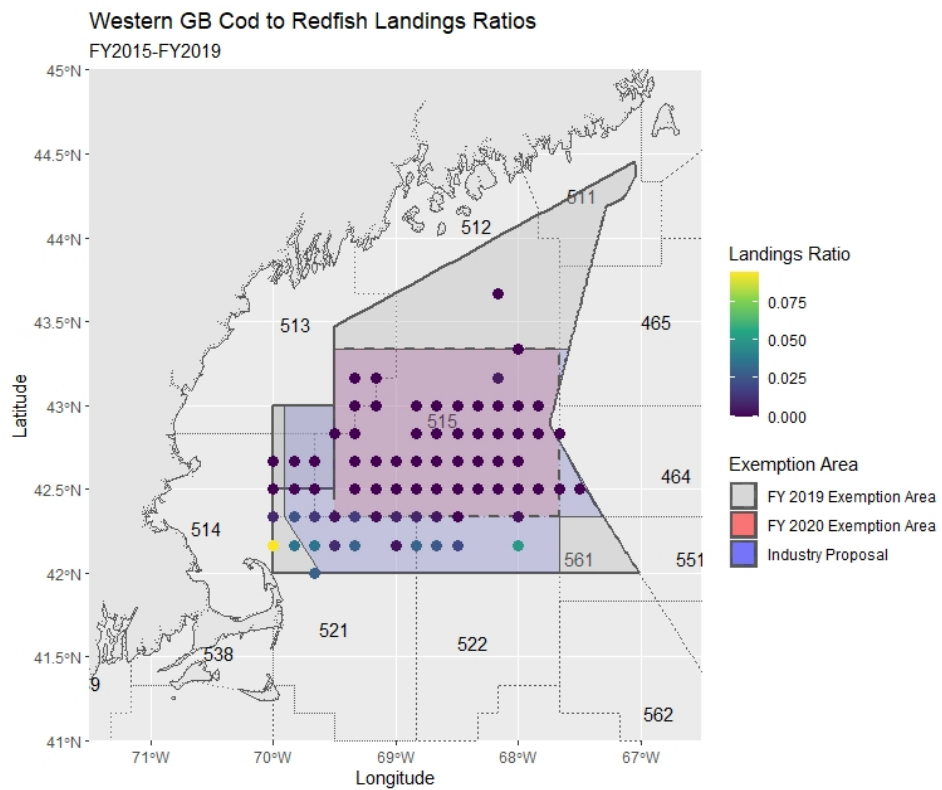


Figure 6: Map of western Georges Bank cod landings to all other allocated groundfish landings in 10-minute squares across previous, current, and proposed redfish exemption areas (FY2015-FY2019). Lighter areas indicate higher landings ratios.

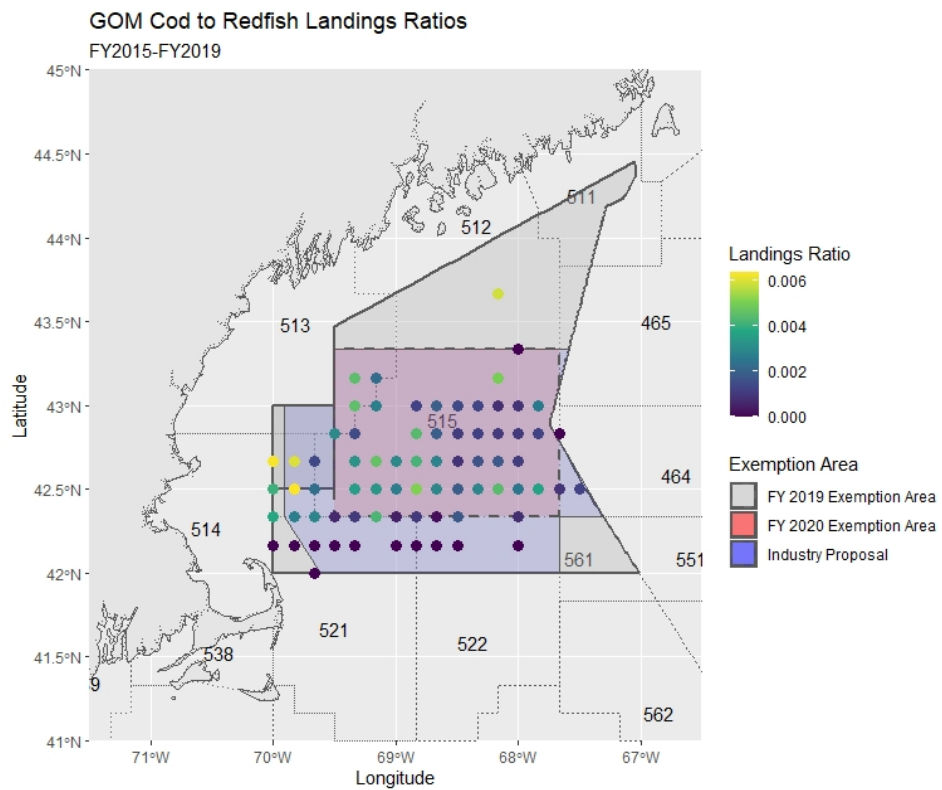


Figure 7: Map of Gulf of Maine cod landings to all other allocated groundfish landings in 10-minute squares across previous, current, and proposed redfish exemption areas (FY2015-FY2019). Lighter areas indicate higher landings ratios.

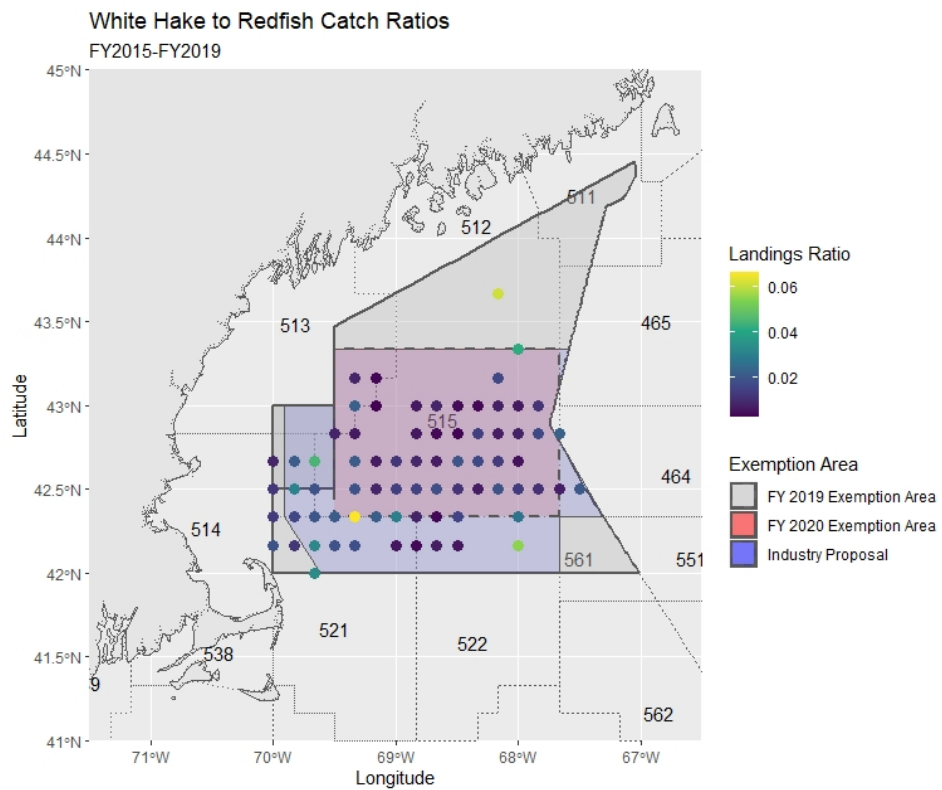


Figure 8: Map of white hake landings to all other allocated groundfish landings in 10-minute squares across previous, current, and proposed redfish exemption areas (FY2015-FY2019). Lighter areas indicate higher landings ratios.