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MAURA HEALEY, Governor | KIMBERLEY DRISCOLL, Lt. Governor | REBECCA TEPPER, Secretary | RONALD S. AMIDON, Commissioner | DANIEL J. MCKIERNAN, Director

MEMORANDUM

TO: Marine Fisheries Advisory Commission (MFAC)

FROM: Daniel J. McKiernan, Director

DATE: February 8, 2023

SUBJECT: **Proposal to Adjust Commercial Summer Flounder Limits for 2023**

Proposal

Given recent fishery performance, and that the 2023 commercial summer flounder quota will remain elevated at 1.36 million pounds, I am proposing several potential adjustments to the management of the commercial fishery beginning in 2023. These proposals are informed by public comment received at an industry scoping meeting on December 13, 2023. These proposals focus on increasing access to the quota and enhancing the efficiency of the fishery to the benefit of its remaining participants.

1. Adjust the so-called landing window, so that vessels may offload summer flounder from 6AM to 10PM, rather than 6AM to 8PM.
2. For summertime Period II fishery (April 23–September 30), either:
    a. adopt a weekly aggregate pilot program for trawlers exempting them from daily limits in favor of a weekly limit, or.
    b. increase the trip limit for trawlers from 500 pounds to 800 pounds with a scheduled increase to 1,000 pounds on September 1 (rather than 800 pounds) if more than 20% of the quota remains
3. Adjust the bycatch allowance provision for the small mesh squid fishery. Rather than setting at 100-pound limit for summer flounder when fishing for small mesh or when in possession of more than 250 pounds of squid, have this limit only apply when fishing with small mesh.
4. For the fall Period II fishery (October 1–December 31), increase the trip limit from 3,000 pounds when more than 5% quota remains and 800 pounds otherwise to 10,000 pounds when more than 5% of the quota remains and 1.000 pounds otherwise.
5. For Period I (January 1 – April 22), increase the regulatorily set limit from 3,000 pounds to 10,000 pounds.

The above-described potential adjustments to trip limits by season are depicted in Table 1.

Background

Massachusetts' annual summer flounder quota has been rising since its all-time low in 2017 (Table 2). In recent years (2021 and 2022), the growth in the quota has been substantial in response to increases to the coastwide quota as based on the results of the most recent stock assessments[1] and a change in how the

[1] For example, the 2021 stock assessment (used to set 2022 specifications) demonstrates summer flounder are not overfished and overfishing is not occurring. Spawning stock biomass was estimated to be 86% of the target and trending upwards, while fishing mortality was estimated to be 19% below the threshold.

coastwide quota is allocated among the states resulting in a heightened share for Massachusetts[2]. For 2022, Massachusetts quota was set at 1.39 million pounds—the highest level it has been in more than a decade—and for 2023, the quota will remain similarly elevated at about 1.36 million pounds.

Table 1. Proposed Changes to Trip Limits by Season

Period	Quota Allocation	Season	Trip Limit*	Size Limit
Period I	30%	January 1 – April 22	**10,000 pounds** ~~**3,000 pounds**~~ 100 pounds once 30% of quota taken	14”
Period II	70%	April 23 – August 31*	**800 pounds** ~~**500 pounds**~~	14”
		September 1 – September 30	**1,000 pounds** ~~**800 pounds**~~ **if >20% quota;** **800 pounds** ~~**500 pounds**~~ **if <20% quota**	
		October 1 – December 31	**10,000 pounds** ~~**3,000 pounds**~~ **if >5% quota;** **1,000 pounds** ~~**800 pounds**~~ **if <5% quota**	
		Small-mesh squid fishery allowance	100 pounds if fishing with small mesh ~~**or in possession of > 250 pounds of squid**~~.	

* DMF, with the approval of the MFAC may make temporary in-season adjustments to trip limits based on anticipated fishery performance and quota utilization. For instance, for the October 1 – December 31 season in 2022 and Period I in 2023, DMF increased the trip limit to 10,000 pounds.

Table 2. Massachusetts Annual Quota and Landings (2017 – 2023)

Year	Quota (lb)*	Landings (lb)	Percent Utilized
2017	389,573	419,714	108%
2018	413,361	427,167	103%
2019	741,532	551,267	74%
2020	795,584	700,390	88%
2021	1,025,159	679,914	66%
2022	1,391,379	872,386	63%
2023	1,358,834	65,320**	5% (YTD)

* Quotas are adjusted by transfers.
** Landings for 2023 current as February 2, 2023

DMF held a series of industry meetings over the past few years to discuss how to adjust the state’s summer flounder management program in response to this increased quota availability. A product of these industry meetings was a series of regulatory amendments enacted this past May to liberalize the commercial summer flounder limits[3]. While these regulatory amendments did enhance landings in 2022 compared to recent years (Table 2; Figure 1), we underutilized the annual quota by more than 35%

[2] Beginning in 2021, when the coastwide quota exceeds 9.55 mlb, all additional quota above this level is allocated in equal shares of 12.375% to all states (except ME, NH, and DE which share 1% of the additional quota). Quota up to 9.55 mlb is allocated under the historic shares based on 1980-1989 landings. Massachusetts’ historic baseline quota share is 6.82%. Based on the size of the coastwide quota, the state’s quota share was effectively increased to roughly 8.1% for 2021 and 8.9% for 2022–2023.

[3] https://www.mass.gov/doc/042922-new-regulations-affecting-commercial-summer-flounder/download

(~500,000 pounds). We would expect similar performance and quota utilization in 2023 under status quo management. To address this expected underutilization, DMF held an industry scoping meeting on December 13, 2022 at SMAST East to hear from constituents on what potential changes should be considered moving forward. The meeting was well attended with commercial fishers and seafood dealers providing DMF with input on the management of the fishery. Several competing ideas were discussed.

There exists a segment of commercial fishers who wanted to retain status quo regulations for 2023, allow the fishery to likely underperform the quota again, and then revisit management next winter with the benefit of an updated stock assessment. They expressed concerns that substantial changes to the summertime limits could negatively impact the viability of the inshore dayboat fishery by increasing fishing effort in Vineyard and Nantucket Sounds and reducing local availability, which would disproportionately impact small boat fishers who cannot lawfully or safely access federal waters. Further, they argued it was short-sighted to make sweeping management changes this year when the available quota could be reduced in 2024 in response to the stock assessment. There exists a sentiment that the current stock assessment exaggerates stock abundance producing inflated quotas and this may be corrected with the benefit of a new assessment.

However, this was not the prevailing sentiment. Both dealers and commercial fishers supported DMF efforts to make the summertime fishery more effective, efficient, and profitable. This included accommodating higher trip limits earlier in the season when the price is strong; expanding or eliminating the landing window to allow for more flexibility to offload boats given seasonal summertime day length, the availability of trucks and traffic on Cape Cod during the summer; and adopting a weekly aggregate program to increase the fleet's efficiency. These comments strongly influenced the development of DMF's public hearing proposal.

The dealer sector also strongly advocated for the state to utilize the available quota and these sentiments are echoed in the attached letters from Red's Best regarding the importance of utilizing available quotas to the state's seafood production sector.

There were also other requests from industry that are not included in this public hearing proposal. Some commercial fishers supported lifting the prohibition on night fishing. Proponents argued this would allow them to fish harder for summer flounder to utilize the quota and to better access scup and horseshoe crabs, which are purportedly caught in greater quantities during pre-dawn tows. Others supported dropping the minimum mesh size for the summer flounder trawl fishery from 6.5" in the cod end to 5.5" in the cod end. This is the minimum net mesh size for summer flounder established by the interstate and federal fishery management plans and adopting a smaller net mesh size could increase access to legal sized summer flounder.

I do not support accommodating night fishing at this time. Night fishing was historically prohibited to prevent gear conflicts with fixed gear and aid in fisheries enforcement. These remain management concerns. There is fish pot and whelk pot fishing effort occurring in Nantucket and Vineyard Sounds during the summer and early fall period and allowing night fishing would expose these fisheries to potential gear conflicts. It could also incentivize unlawful fishing in closed areas. I think the marginal benefit potentially provided by lifting the night closures is far outweighed by the potential challenges related to gear conflicts, enforcement, and compliance.

I also do not support accommodating the requested net size reduction at this time. This is a mixed trawl fishery that catches summer flounder along with horseshoe crabs, black sea bass, whelks, and scup. Reducing the net mesh size will likely alter the catch composition and resulting bycatch and discard rates. Of specific concern is how such a change may potentially impact juvenile horseshoe crabs and the black sea bass fishery. Unfortunately, I do not have the staff resources to further investigate this question at this

time. Moreover, the recreational fishery has expressed continuous concern regarding the minimum size disparity between the commercial fishery (14") and the recreational fishery (16.5") and how this negatively impacts recreational fishing opportunities in inshore waters. Lowering the minimum mesh size would increase the opportunity for the commercial fishery to harvest these smaller grade fish which the recreational fishery does not have access to. Lastly, for 2023, the MAFMC intends to review and revise minimum mesh size regulations and exemptions for summer flounder, scup, and black sea bass. This effort may help further inform discussion at the state level.

Overview of Public Hearing Proposals

Landing Window

Historically, DMF restricted the offloading of summer flounder between 8PM and 6AM. This was done as a measure to facilitate enhanced enforcement, as there was concern that the trip limits were being exceeded by vessels landing under the cover of darkness. With higher trip limits, the incentive to bring in non-conforming quantities of fish is lower. In fact, DMF is willing to set trip limits at whatever level the fishery participants feel is appropriate for that season, so. Accordingly, exceeding summer flounder trip limits should not be an enforcement challenge reducing the enforcement need for such a strict landing window.

During the public scoping meeting in December, DMF heard from dealers and commercial fishers regarding how the landing window has become inconvenient and makes operations less efficient, particularly during the summertime period. Given the economics of the inshore summer flounder fishery in recent years, fewer dealers are sending fewer trucks to Cape Cod to pick up catch. With the summertime congestion on the Cape, it becomes difficult for dealers to service the various ports from Woods Hole to Chatham where vessels may be landing. Having to offload vessels by 8PM creates a time crunch for dealers and fishermen alike. As a result of this, commercial fishers may have to wrap up their day early to meet the truck at the dock. This is time they could spend actively fishing, particularly given the summertime night fishing prohibition does not go into effect until ½ hour after sunset, which frequently occurs after 8PM from late-April through late-August.

For these reasons, I am taking comment on adjusting the landing window. My current preference would be to delay the start of the landing prohibition by two hours until 10PM. However, I am open to hearing from industry and law enforcement on the potential to further liberalize it.

Weekly Aggregate Pilot Program for Trawlers

The concept of a weekly aggregate program has been discussed over the past several years. While Rhode Island adopted such a program back in 2019, I have been hesitant to do so in Massachusetts. My opinion on this has evolved over the past several years given the underutilization of the quota, the attrition in the inshore trawl fishery, and the advancement of electronic vessel tracking and reporting technology. With diminished participation and ample available quota, I think it is critical to consider management options that provide the remaining fleet with opportunities to efficiently access available quota. A weekly aggregate pilot program may provide this opportunity.

Fortunately, Rhode Island has led the way to investigate this concept and we can learn from their experience (see attached RI DEM Assessment Report). Staff and I met with our colleagues at RI DEM on January 12, 2023 to discuss how they manage their program and how they view its overall impact. While Rhode Island's summer flounder fishery functions differently than ours, their industry and managers alike generally viewed their aggregate program favorably. Much was learned from this conversation to help inform the development of a potential pilot program here.

Using Rhode Island as a model, DMF has developed the parameters for a potential program in Massachusetts in 2023. They are as follows:

1. The pilot program would be limited to commercial fishers using trawl gear. This is the sector of the fishery that is the most interested and most likely to benefit from such a program. Commercial hook and liners are not frequently utilizing their daily trip limit of 300 pounds and are unlikely to make multiple day trips to target summer flounder. Fisheries using other gear types that may encounter summer flounder (e.g., gillnets) are occurring exclusively in federal waters and may be satisfied with current trip limits, as they have not requested additional access to the quota.
2. The pilot program may exclude any vessels who are participating in a pilot program in other states. Effectively, such a restriction would prevent vessels who participate in Rhode Island's pilot program to also participate in Massachusetts' pilot program. This may also alleviate concerns expressed about opportunistic fishing effort moving into Massachusetts state waters.
3. Trawlers participating in the biomedical trawl fishery for horseshoe crabs would be restricted from participating in the weekly aggregate program. The priorities of these vessels should be to timely meet biomedical processing demand and handle the horseshoe crabs to maximize survivability. DMF currently allows them to retain and sell lawfully harvested catch obtained during this fishing activity in order to incentivize participation in the biomedical trawl fishery. However, allowing participation in the weekly aggregate program could shift priorities away from the biomedical fishery and may contribute to increased horseshoe crab mortality.
4. Vessels would only be able to opt into the program once per calendar year. Therefore, if a vessel opted in and then opted out, they would not be able to opt in again later in the season. This will ease the administrative burden of the program and will help ensure compliance with the rule excluding participation in another state's pilot program.
5. Participating vessels would be required to submit daily electronic trip reports prior to landing and have a DMF-approved electronic tracking device onboard the vessel. This is consistent with the requirements of Rhode Island's program. These requirements are necessary to aid in enforcement of the weekly aggregate limits, spatial closures, and night fishing prohibitions. It will also provide DMF with the high-resolution data to better understand where fishing effort in the aggregate program is occurring. DMF is considering not authorizing VMS as a viable tracking device because these data are not readily available to the agency and instead require all participating vessels be outfitted with the electronic trackers being required in the federal lobster trap fishery.
6. The pilot program would begin on June 1. This would give DMF ample lead time to administer the program, including: developing the implementing Letter of Authorization and Statement of Permit Conditions; enrolling perspective permit holders; and ensuring participating permit holders have access to electronic reporting and vessel tracking requirements.
7. The pilot program would apply only to the retention of summer flounder and black sea bass. Scup already has a regulatorily set weekly aggregate limit of 10,000 pounds for trawlers. Other commonly caught species (e.g., horseshoe crabs and whelk) would remain subject to daily landing limits. For whelk, the current limit is 1,000 pounds of channeled and knobbed whelk; for horseshoe crabs the limit is currently 300 crabs for permitted trawlers and 75 crabs for non-permitted trawlers, but trip limits in the horseshoe crab bait fishery are subject to change this year.
8. For both summer flounder and black sea bass the weekly aggregate limit would be five-times the current daily limit (i.e., 2,500 pounds of summer flounder per week and 500 pounds of black sea bass per week). While the fishery is open seven-days per week, most vessels are not participating at that frequency given weather, maintenance, and days off. This would allow participating vessels to better choose their fishing days and more effectively retain at least what they would expect to catch over the course of a normal work week. Moreover, it may encourage participation from vessels who have left the fishery in recent years to pursue other fishing opportunities by

making it more economically viable for them to spend a day or two per week targeting summer flounder.

Increasing Summertime Trip Limits

While a weekly aggregate pilot program is DMF's preferred management approach, I will also take comment on a series of trip limit increases that may be in play should DMF determine not to move forward with a pilot program.

For the initial Period II season, I would propose increasing the trip limits from 500 pounds to 800 pounds for trawlers. This proposal is being made consistent with advice from the seafood dealer sector to open our fishery with high trip limits to take advantage of market conditions. Price per pound is generally elevated during the spring and early summer period (Figure 2), as overall supply is low with many states not having a directed fishery at this time of year. This would encourage vessels to fish for summer flounder to start the season and making those trips more profitable. In turn, this may encourage vessels to stay on the south Cape participating in this fishery into the summer.

During September, I am proposing to increase the trip limit from 800 pounds to 1,000 pounds should more than 20% of the quota remain on August 31. While the market for summer flounder tends to be softer during the early-fall (Figure 2), this may make trips more profitable for the vessels who remain in the fishery. Similar to the existing rule, should less than 20% of the quota remain on August 31, then the trip limit would stay at its summertime level. Here the trip limit may be 800 pounds rather than 500 pounds should the April 23 – August 31 trip limit be increased.

Small Mesh Bycatch Allowance

The interstate and federal fishery management plans establish a 100-pound summer flounder bycatch limit when fishing with net mesh less than 5.5". Our current state regulations go a step further and implement this 100-pound limit on any vessel possessing more than 250 pounds of squid. The thinking was that any vessel possessing more than 250 pounds of squid was likely using small mesh and adopting this threshold would prevent non-compliance by eliminating the opportunity to unlawfully target summer flounder with small mesh.

During this past fishing season, DMF received calls from offshore trawlers indicating that the rule restricted their ability to fish with both large and small mesh to target summer flounder and squid during the same trip. Additionally, if the vessel were permitted in another state (e.g., Rhode Island) they would land their catch there, as other states did not have this additional restriction. To better accommodate the offshore fleet, and to better match the management of the trawl fishery in neighboring states, I am proposing to refine this bycatch rule so it only applies to the use of small mesh.

Increasing Fall Trip Limits

I am proposing to increase the October 1–December 31 trip limit from 3,000 pounds to 10,000 pounds should more than 5% of the quota remain on September 30. This is consistent with the in-season adjustment taken by the MFAC in 2022. Recall, the rationale here was to accommodate larger trip limits as the fishery moves offshore and to set trip limits at levels similar to Mid-Atlantic states to encourage vessels to land their fish in Massachusetts ports. Similar to the existing rule, should less than 5% of the quota remain on September 30, then the trip limit will stay at its September level. In this case the trip limit may be 1,000 pounds rather than 800 pounds should the trip limit for September be increased. This will allow landings to trickle in throughout the remainder of the year.

Increasing Period I Trip Limits

I am proposing to increase the Period I trip limit from 3,000 pounds to 10,000 pounds. This is consistent with the in-season adjustment made by the MFAC for the current season. While this will not impact

commercial fishing this year (2023), it would be the regulatory baseline for future years. Recall, the rationale here is to accommodate the offshore trip fishery. Landings during this period will remain capped at 30% of the overall quota. Should the 30% allocation be reached, the trip limit will be reduced to 100 pounds in order to preserve quota for the summertime fishery.

Attachments
September 1, 2022 Letter from Red's Best on Quota Utilization
December 15, 2022 Letter from Red's Best on Summer Flounder Management
December 13, 2022 Industry Scoping Meeting Presentation
RI DEM Assessment of Summer Flounder and Black Sea Bass Pilot Aggregate Management Programs

Figure 1. Annual Running Total of Summer Flounder Landings (2017–2022)

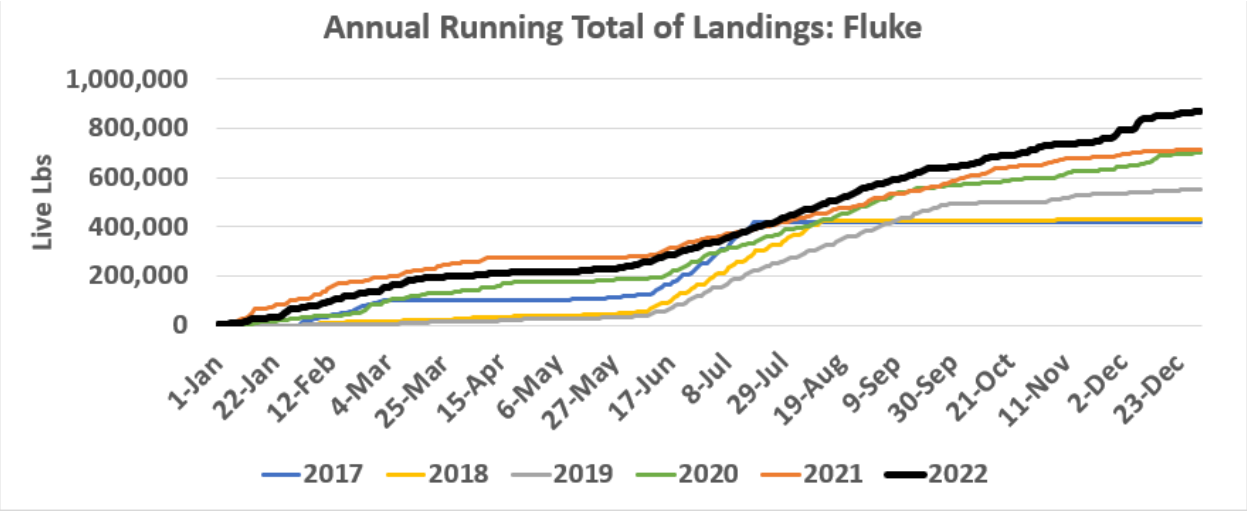
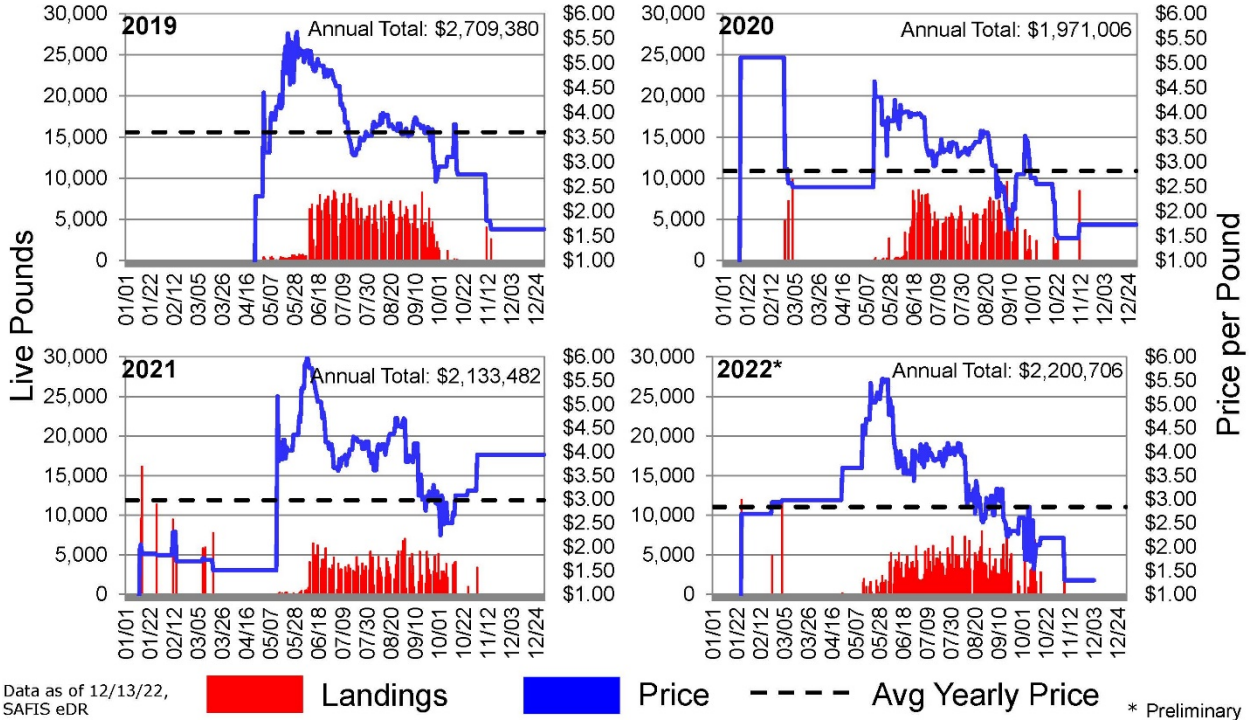


Figure 2. Daily Landings and Average Prices (2019 – 2022)



WildFish LLC, 37 Boston Fish Pier, Boston, MA 02210
tel: 617 830 1672 fax: 857 496 1155
www.redsbest.com

RE: Quota Utilization / Permit Access

September 1, 2022

Hello,

I am writing this letter to strongly encourage the DMF to do everything in their power to harvest the entirety of the Massachusetts fish quotas every year.

In my opinion a big reason we are under harvesting our quotas is because of the difficulty of obtaining permits. We have overcorrected in our attempt to limit entrants in these fisheries. We are now faced with a situation where the fleet is aging out and young people are unable to get in.

I am confident the goal was not to make permits inaccessible (expensive) but rather to limit fishery entrants in order to harvest the quotas in a reasonable amount of time. We are now unable to harvest some very valuable fisheries and it is costing the State millions of dollars every year.

There are certainly solutions to this problem but we need to act fast because the pool of potential new fishermen is disappearing fast.

The underharvesting of quotas is a major problem across many fisheries in the United States and we need to start taking aggressive actions to fix this problem before it is too late and there is nobody left to do the work.

Best regards,

Jared Auerbach, CEO

WildFish LLC, 37 Boston Fish Pier, Boston, MA 02210
tel: 617 830 1672 fax: 857 496 1155
www.redsbest.com

December 15, 2022

RE: Massachusetts Commercial Fluke Fishery

To whom it may concern,

This letter is in support of a weekly aggregate landing limit for fluke in Massachusetts from May 1 - October 1.

We think this limit should be 10,500 per week, 1,500 lbs per day. Regardless of the numbers, we should remove the daily landing restrictions and make sure we catch the full quotas.

We feel that the State has an obligation to make rules that enable fishermen to harvest the entirety of the fluke quota. This has not happened for a number of years.

The only way we can see this getting accomplished is to remove the unnecessary restrictions that fishermen have. We would also like to point out that these unnecessary restrictions cause unnecessary harm to the environment.

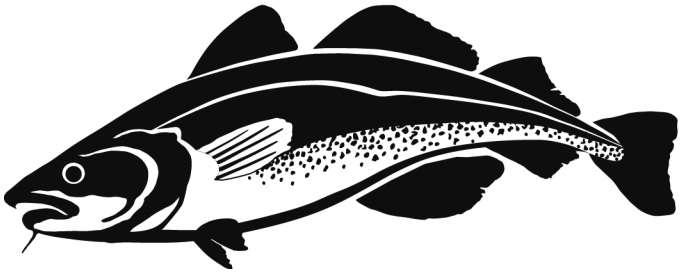
Thank you very much for all of your hard work in regulating our local oceans in a sustainable way. We appreciate all that you do.

Sincerely,

Jared Auerbach, CEO

Public Meeting:
Summer Flounder Management
December 13, 2022

MarineFisheries
Commonwealth of Massachusetts

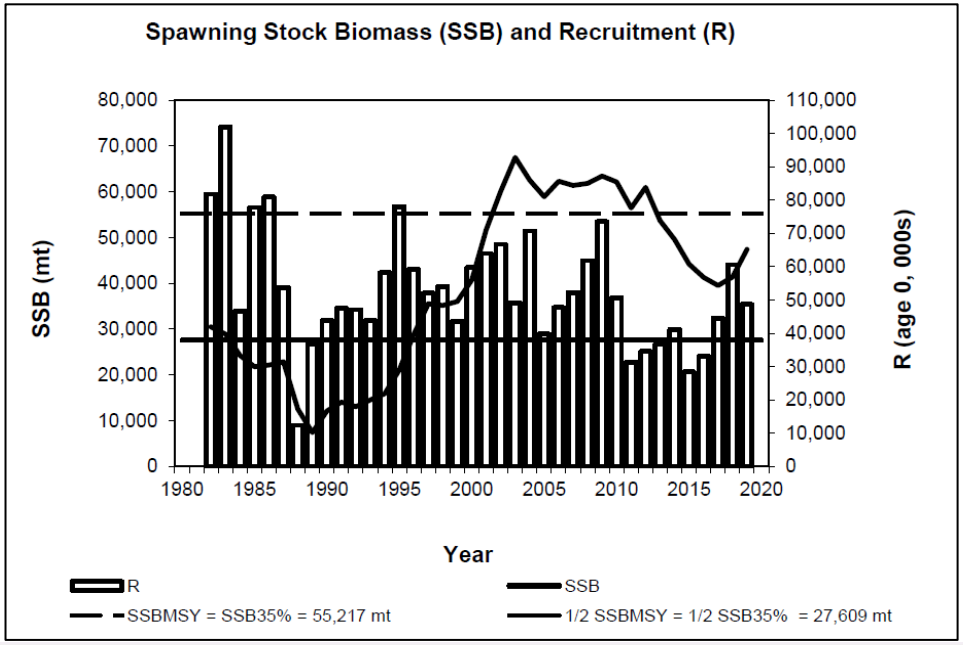


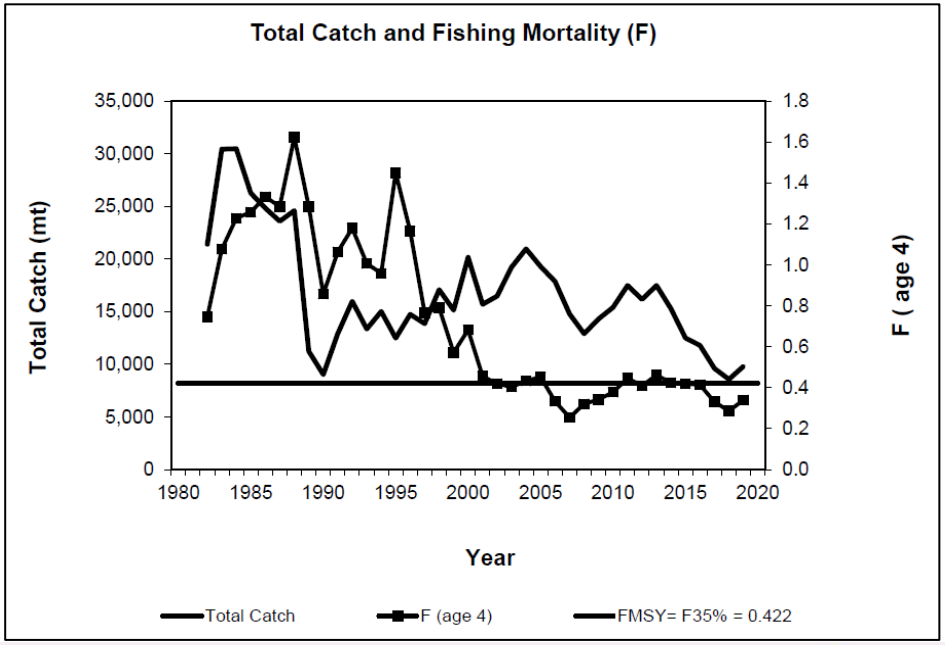
Agenda

1. Summer Flounder Stock Status
2. Summary of Recent Management Changes
3. Review of Recent Performance
4. Discuss Potential Management Solutions

Summer Flounder Stock Status

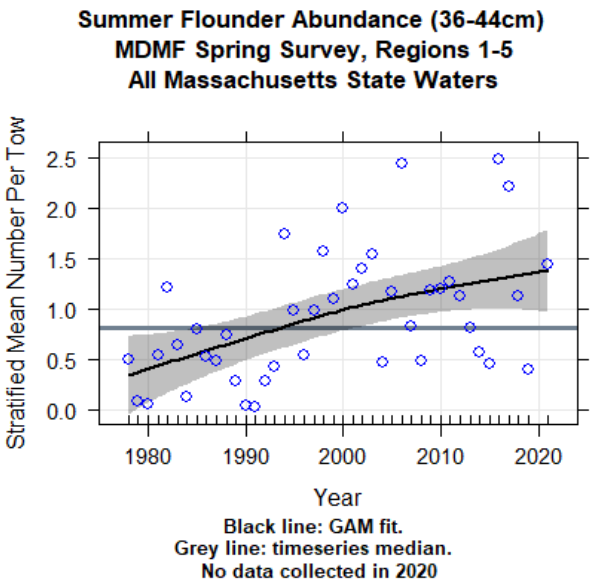
- Source: 2021 Management Track Assessment (data through 2019)
- Not overfished. SSB_{2019} = 47,397 MT, or 86% of biomass target. Note recent upward trend.
- Recruitment: below average 2011-2017 caused recent decline in SSB (driver of pattern unknown); 2018 year class above average, 2019 below average but above 2011-2017.
- Not experiencing overfishing. F_{2019} = 0.34, 81% of threshold.
- Northward & eastward shift in spatial distribution over last four decades.



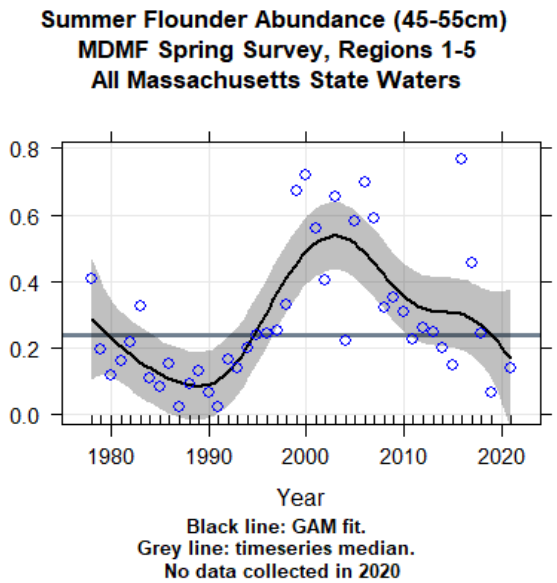


Spring Trawl Survey Abundance by Market Grade

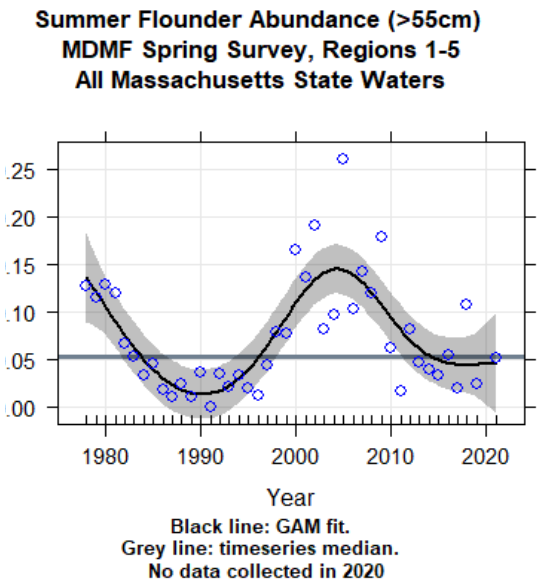
Market Grade: Medium



Market Grade: Large



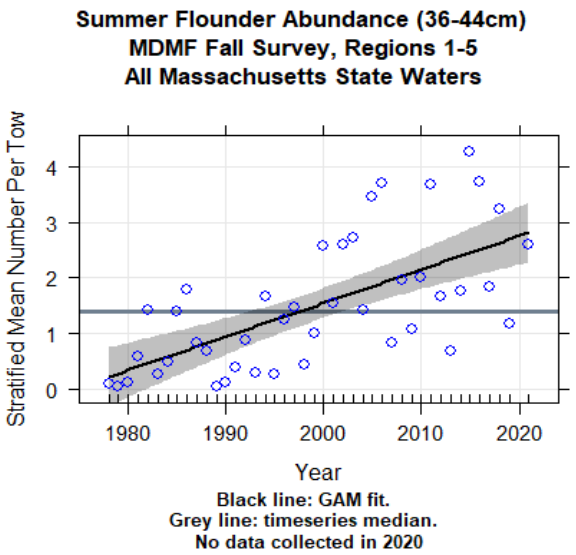
Market Grade: Jumbo



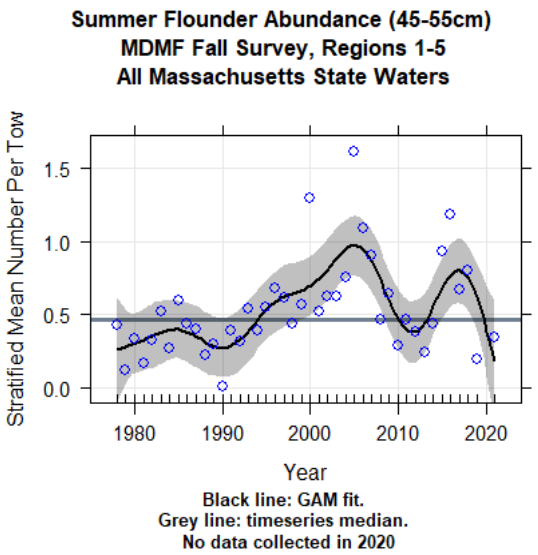
- Trawl survey occurs in May.
- Observed increase in abundance of medium market grade fish.
- Abundance of large and jumbo market grade fish now below time-series mean. Substantial decrease from time-series high in early 00s.
- Expectation is this survey would catch those fish moving into inshore summertime fishery.

Fall Trawl Survey Abundance by Market Grade

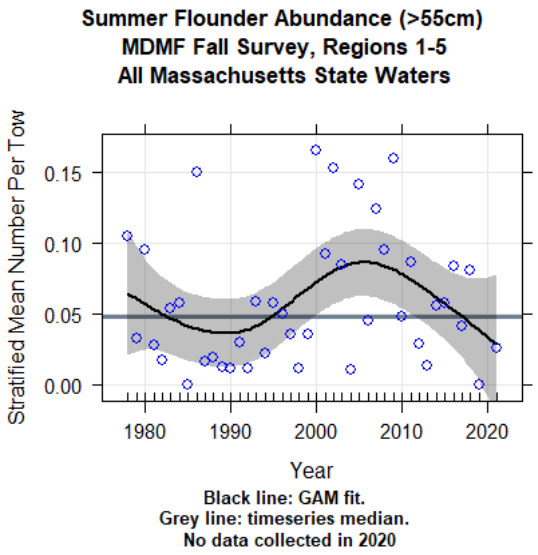
Market Grade: Medium



Market Grade: Large



Market Grade: Jumbo



- Fall trawl survey occurs in September.
- Similar but less pronounced trends than in the spring regarding abundance by market grade.
- Seasonal migration tends to be occurring during the time the fall trawl survey occurs.

Summer Flounder Quota & Utilization

- MA commercial quota expected to be set at 1.36 million pounds for 2023, similar to 2022 quota (1.39 mlbs)
- Quota has steadily increased since all-time low in 2017 with large increases in 2021 (28%) and in 2022 (37%).
- Quota increases occurring coastwide due to stock status. Additionally, MA's quota share increased in 2022 under a new quota allocation approach.
- Quota has been under utilized since 2019.

Year	Quota (lb)*	Landings (lb)	Percent Utilized
2017	389,573	419,714	108%
2018	413,361	427,167	103%
2019	741,532	551,267	74%
2020	795,584	700,390	88%
2021	1,025,159	679,914	66.3%
2022	1,391,379	774,474**	55.6%**
2023	1,360,000^	TBD	TBD

* Quota as adjusted by transfers; ** as of December 13, 2022; ^ approximate anticipated quota.

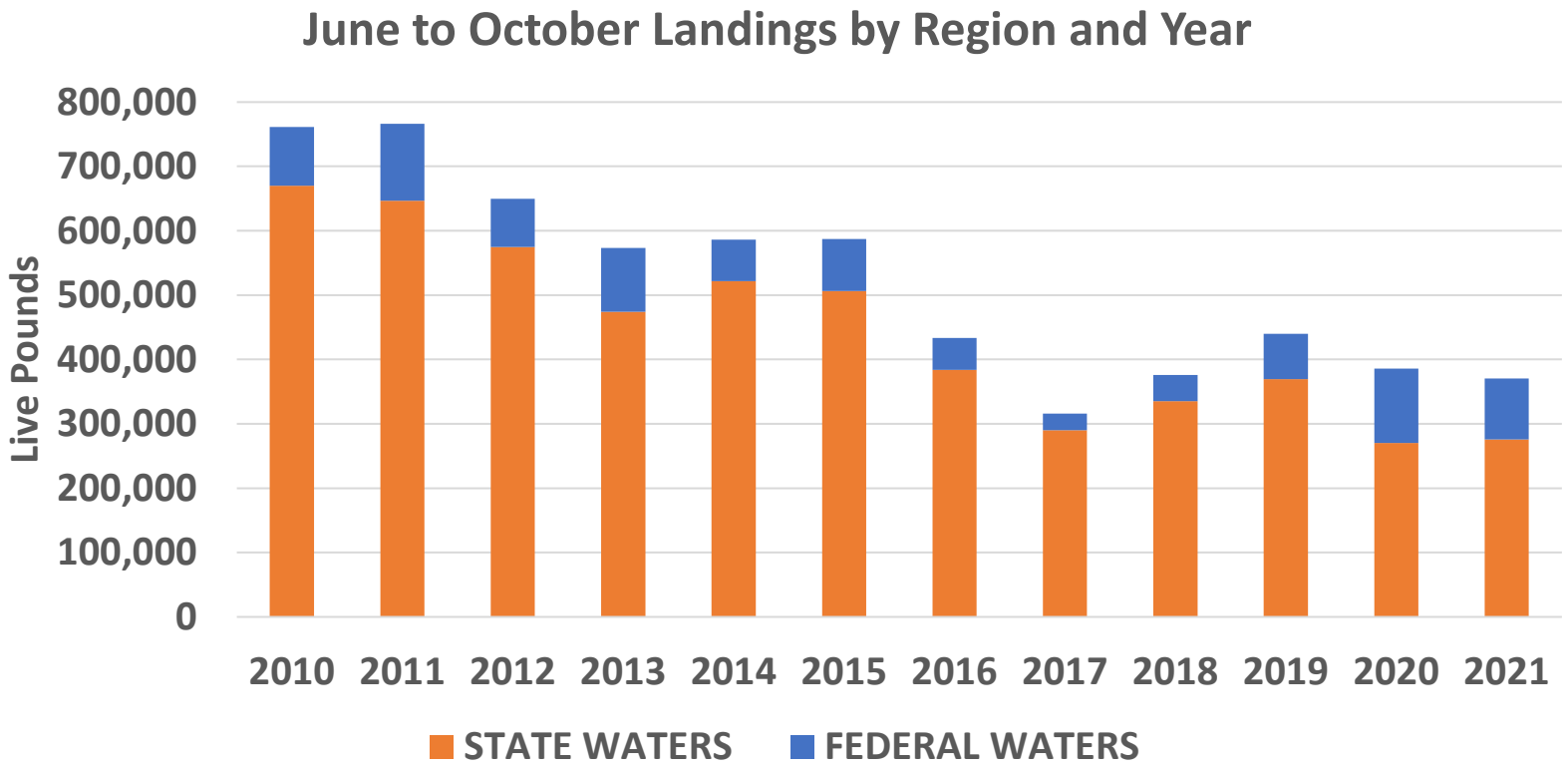
2022 Regulatory Changes

Period	Allocation	Season	Open Days	Trip Limits	Min. Size
Period I	30%	Jan 1–Apr 22	Sun – Sat	~~1,000 lb, reduced to 100 lb at 25% quota use (all gear)~~ **3,000 lb, reduced to 100 lb at 30% quota use (all gear)** **Multi-state possession limit program**	14"
Period II	70%	~~Apr 23–Jun 9~~	~~Sun – Sat~~	~~100 lb (nets), 0 lb (hooks)~~	14"
		~~Jun 10–Oct 31~~ **Apr 23–Aug 31**	~~Sun – Thu~~ **Sun–Sat**	~~400 lb (nets), 250 lb (hooks)~~ **500 lb (nets)*, 300 lb (hooks)**	
		Sept 1–Sept 30	**Sun–Sat**	**800 lb (all gears) if ≥20% quota remains**	
		~~Nov 1–Dec 31~~ **Oct 1–Dec 31**	Sun – Sat	~~1,000 lb (all gear) if ≥5% quota remains, otherwise 500 lb~~ **3,000 lb if ≥ 5% quota remains; 800 pounds if ≤ 5% of quota remains** **Multi-state possession limit program**	

* 100-lb limit applies if more than 250 lb of squid in possession or if fishing with small mesh.

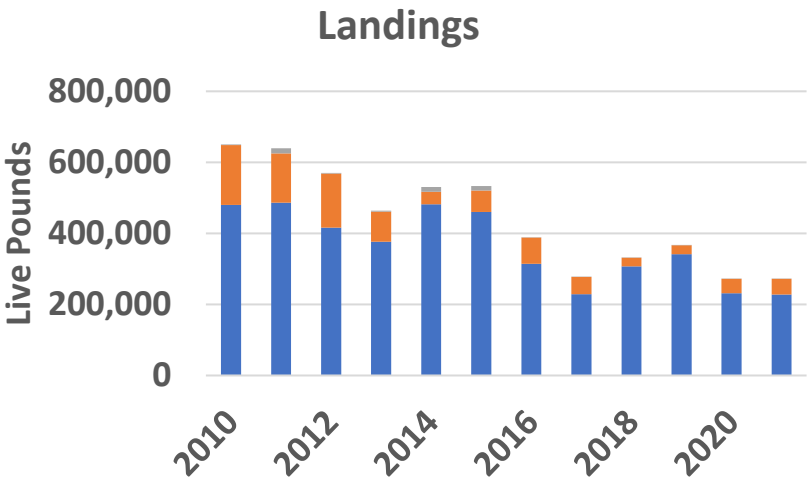
- October 1 – December 31 trip limit increased to 10,000 pounds by in-season adjustment.
- DMF considering in-season adjustment to maintain 10,000 pound trip limit for 2023 P1.

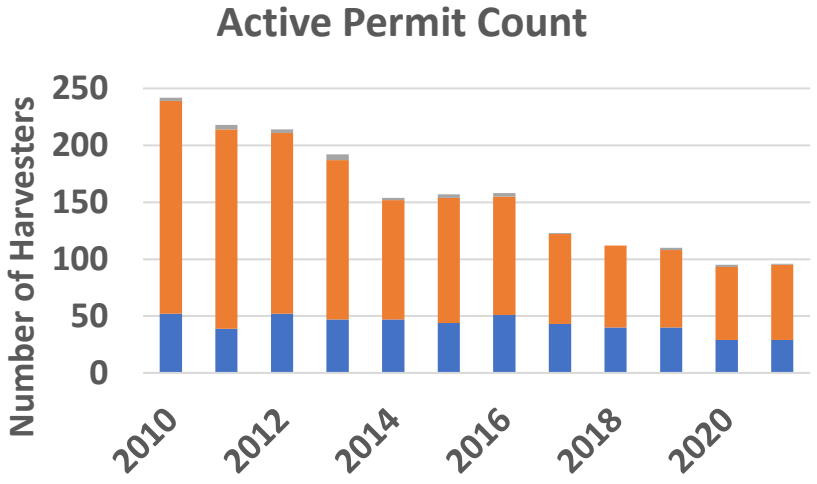
Commercial Summertime Landing Trends by Year and Distance from Shore

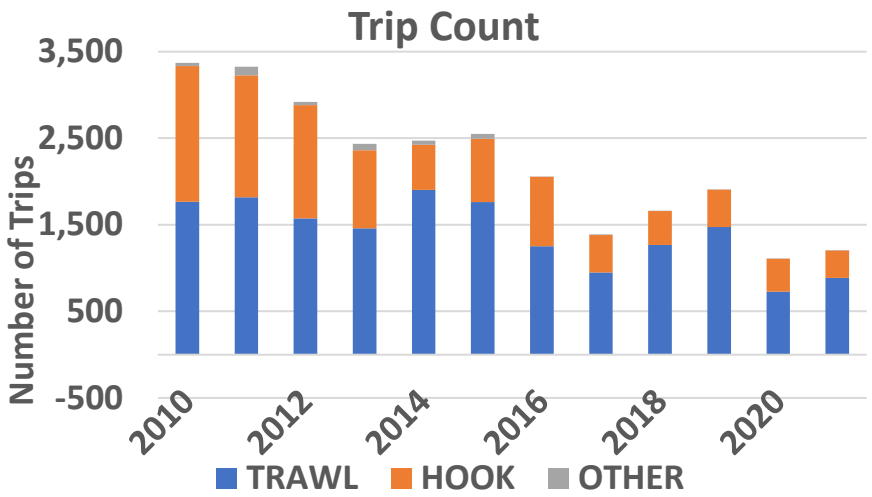


Data as of 12/13/22, SAFIS eTRIPS & federal VTRs

Commercial Summertime Landings, Participation and Trip Count by Gear Type

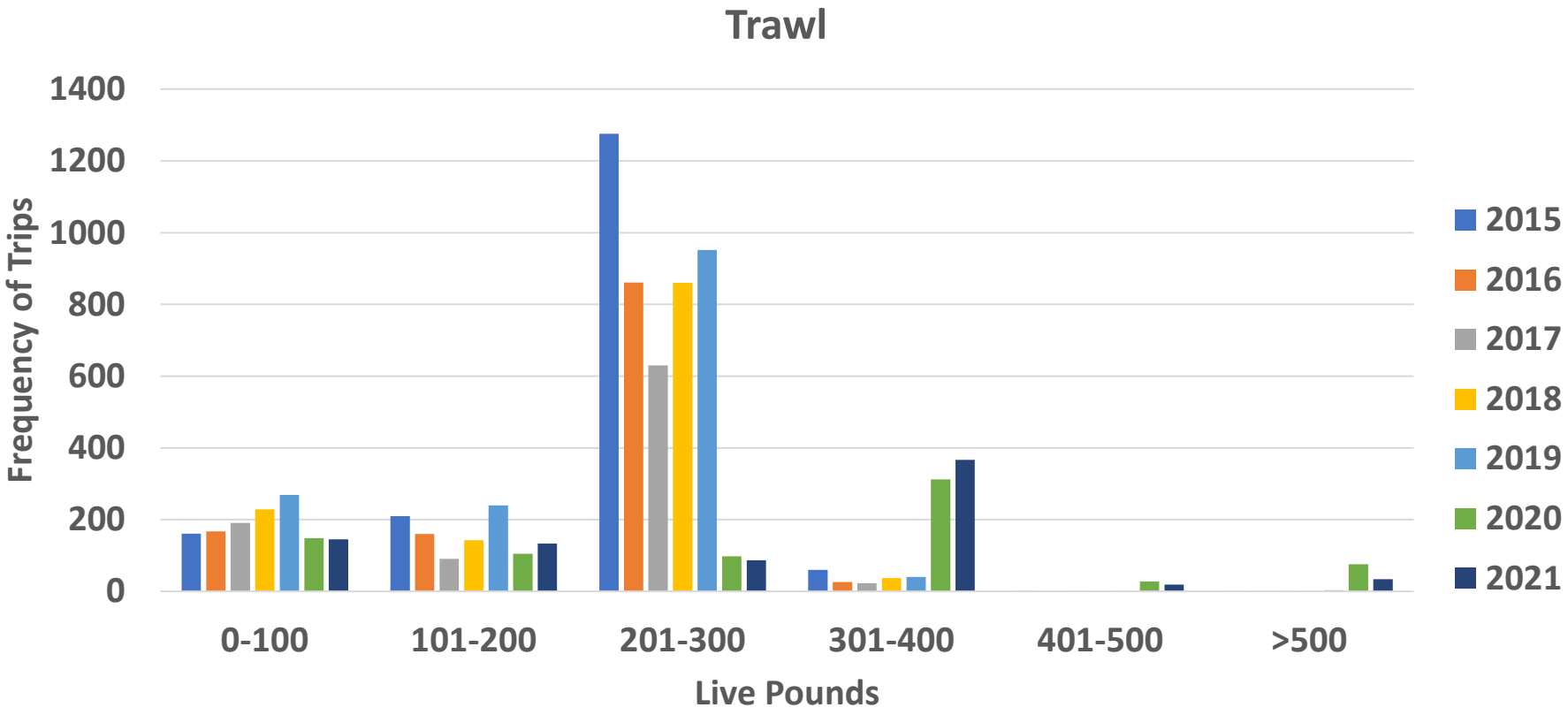






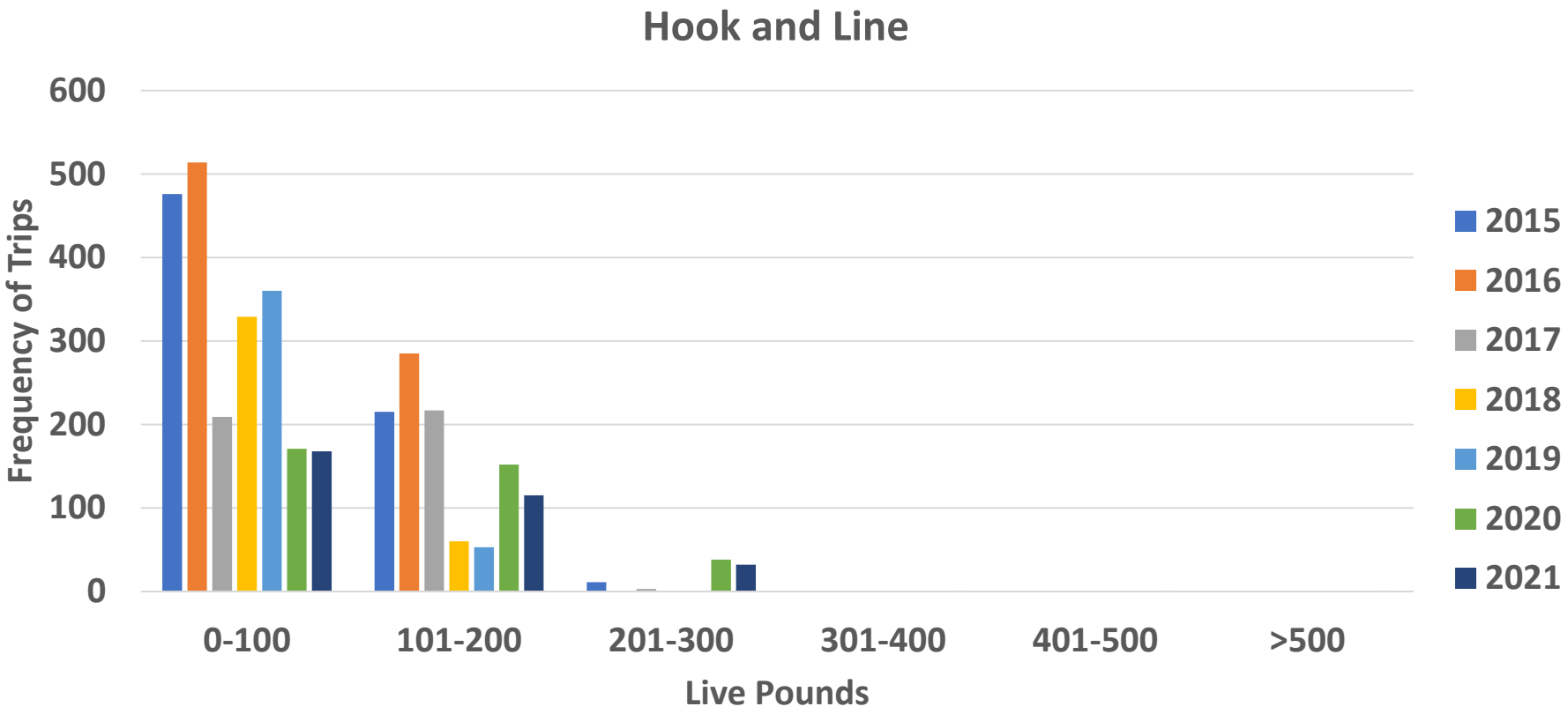
Data as of 12/13/22, SAFIS eTRIPS & federal VTRs

Frequency of Summertime Landings for Trawl



Data as of 12/13/22, SAFIS
eTRIPS & federal VTRs

Frequency of Summertime Landings for Hooks



Data as of 12/13/22, SAFIS
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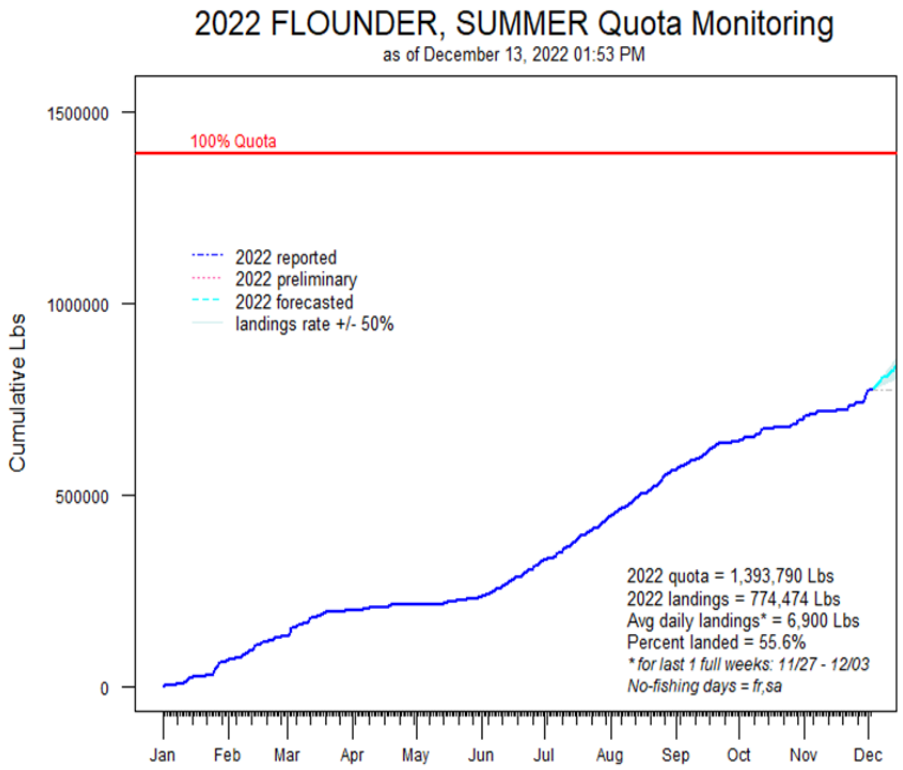
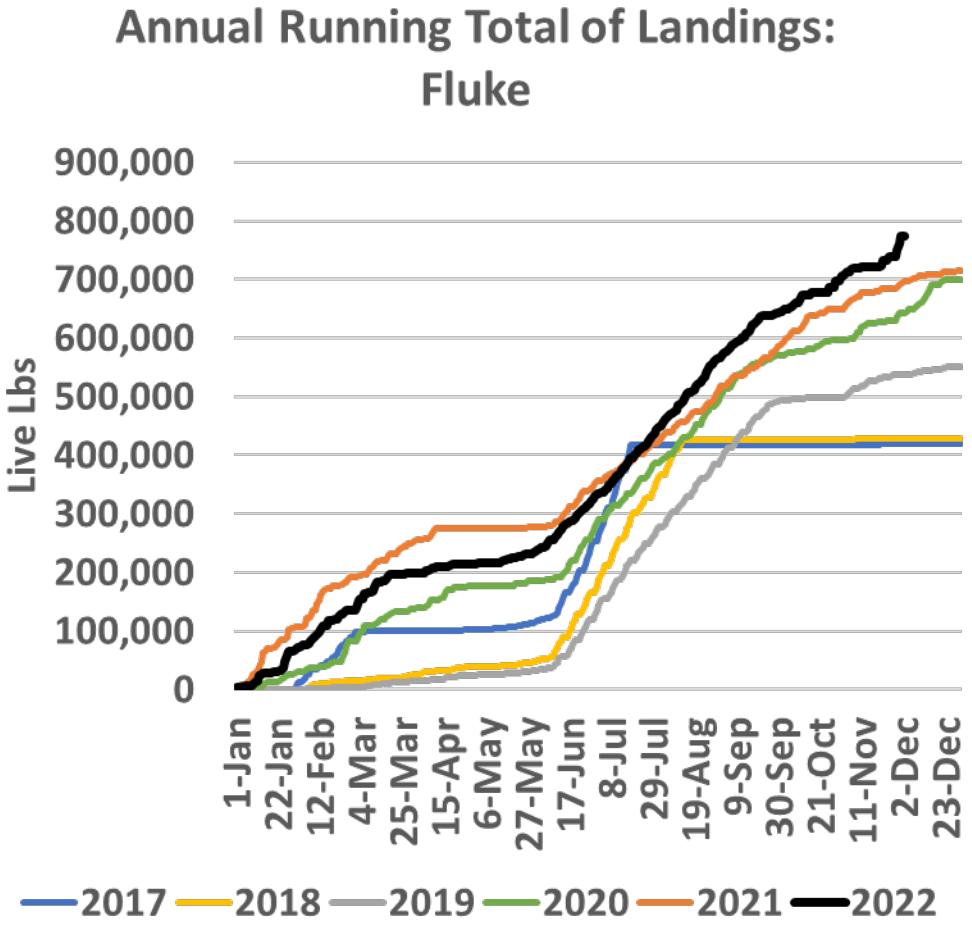
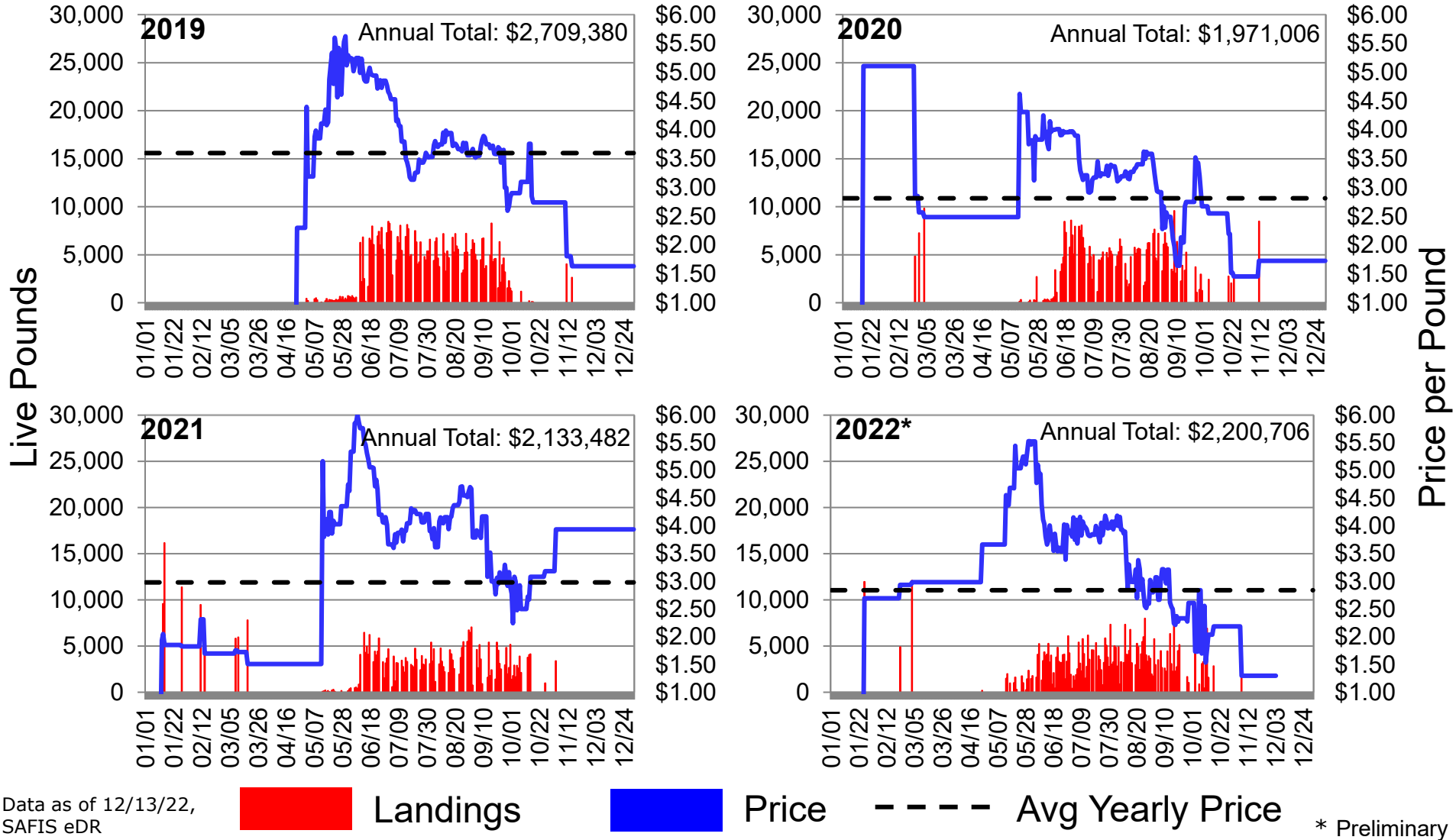
2022 Quota Monitoring





Data as of 12/13/22,
SAFIS eDR

Daily Landings and Avg Prices

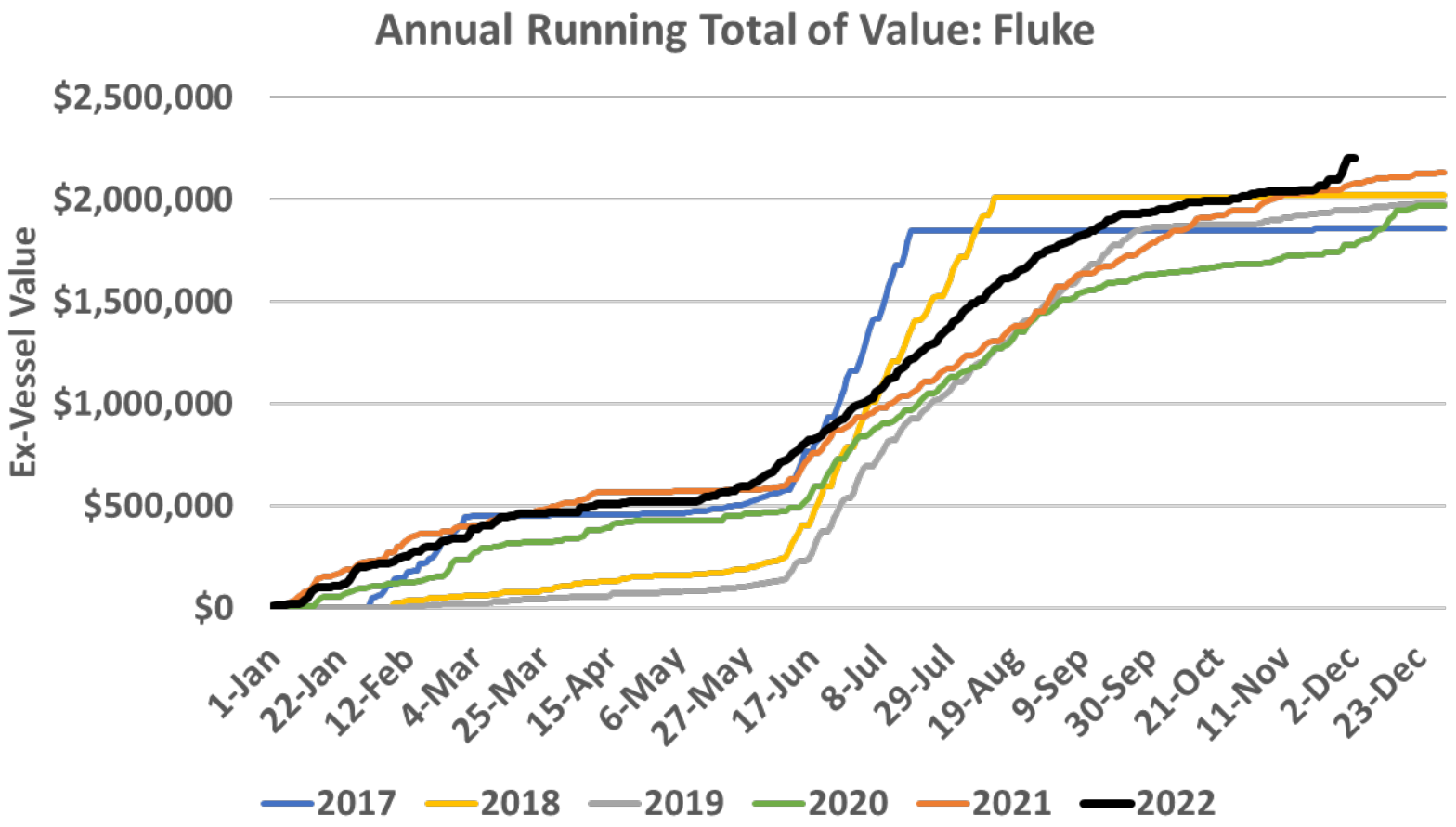


Data as of 12/13/22, SAFIS eDR

Landings Price Avg Yearly Price

* Preliminary

Fluke Ex-Vessel Value Trends



Data as of 12/13/22,
SAFIS eDR

Mesh Sizes by Species Under FMP

Summer Flounder FMP
5.5-inch diamond or 6.0-inch square applied throughout the body, extension(s), and codend portion of the net, except as required in a TED extension
Bycatch allowance for smaller mesh: <100 lb May 1 - October 31, and <200 lb November 1 - April 30

Scup FMP
5.0-inch diamond mesh, applied throughout the codend for at least 75 continuous meshes forward of the terminus of the net
Bycatch allowance for smaller mesh: <1,000 lb October 1 - April 14; <2,000 lb April 15 - June 15; and <200 lb June 16 - September 30

Black Sea Bass FMO
4.5-inch diamond mesh applied throughout the codend for at least 75 continuous meshes forward of the terminus of the net
Bycatch allowance for smaller mesh: <500 lb January 1 through March 31, and <100 lb April 1 - December 31

MA Current Rule: 6.5-inch in cod end and 6-inch throughout year-round in state waters, with exceptions for seasonal small mesh exempted fisheries (e.g., squid).

Potential Management Changes

Options for Change

- Period quota allocation splits?
- Amending trip limits?
- Retention of summer flounder when possessing squid?
- Mesh sizes?
- Permitting and transferability?
- RI-style weekly aggregate limit (pilot program)?
- What else may work?

Questions?

Assessment of the Rhode Island Summer Flounder and Black Sea Bass Pilot Aggregate Management Programs

June 2022

Julia Livermore

Introduction

For years, discussions on aggregate landings programs have garnered interest from the summer flounder, or fluke (*Paralichthys dentatus*), and black sea bass (*Centropristis striata*) commercial fisheries in Rhode Island. The weekly aggregate landing model has been used for fluke during a winter sub-period (January through April) since the 1990s, scup have been managed using a weekly aggregate limit for many years, and a weekly or bi-weekly aggregate landing approach has been used for bluefish since 2015. The commercial quotas for fluke and black sea bass have traditionally been managed through season-specific quotas, changes in possession limits throughout the year, and in some cases closures during certain days of the week. Both fluke and black sea bass are targeted by a large proportion of the commercial fleet (particularly in summer) due to their high demand and relatively high prices at dealers. As such, the daily possession limit of both species is generally low with state quota allocations also contributing to low limits. Given the variability of fish stocks, low quotas, and subsequently low possession limits, combined with rising fuel prices, vessel maintenance costs, safety at-sea concerns, and global pandemics, fisheries managers are striving to provide more flexible fishing programs to the fishing industry.

It is hypothesized that an aggregate program would allow fishermen more flexibility in fishing practices through the utilization of a weekly possession limit instead of a daily limit. Such a program could potentially decrease costs to the fishermen by decreasing days at sea (reduced fuel and vessel maintenance costs) while also increasing safety as fishermen could pick which days are the best in terms of weather. Aggregate programs could also decrease regulatory discards, and thus, discard mortality in some fisheries, especially at times when possession limits are low by reducing the total number of fishing trips. A reduction in number of fishing trips could mean less time and area for mobile gears to be in contact with the bottom resulting in a potential benefit to the related habitat. Aggregate possession limits could also reduce illegal fishing behavior by increasing flexibility and therefore reducing the incentive to harvest over the daily limit.

However, there have been stated concerns from the commercial industry in RI that aggregate programs may: 1) favor individual businesses depending on how they operate; 2) increase catch rates, which can lead to quicker quota consumption and result in shorter fishing seasons due to early closures; 3) cause an increase in fish landed and variability in timing of landings that will oversaturate the market and drive prices down; and 4) lead to an increase in illegal fishing activity due to the potential difficulties in accountability and enforceability. Ideas on how such an aggregate program would impact the function of these fisheries and what the potential mechanisms should be to manage and enforce the program are largely untested.

At the recommendation of certain commercial fishing industry representatives and to address these concerns, the Rhode Island Department of Environmental Management (RIDEM) Division of Marine Fisheries (DMF) brought forth a proposal for a pilot fluke and black sea bass aggregate program in the fall of 2018 to the Rhode Island Marine Fisheries Council (RIMFC), which was passed and implemented in 2019. The goal of the Pilot Aggregate Program was to collect data for assessing the viability of an aggregate program for fluke and black sea bass from May 1 to December 31, where participants would be held to a weekly aggregate limit (daily possession limit times the number of days open) in lieu of a daily limit. With the support of the 2019 Pilot Aggregate Program fishing participants, the program was extended through the 2021 fishing year in hopes of better understanding interannual variability

associated with the program that is imperative to understand before any form of the program can be formally adopted. Increasing the number of participants using each respective gear type was also essential to capture variability among harvesters.

While this pilot aggregate program was specific to the RI fishing industry, other states could adopt similar flexible management opportunities, depending on RI findings. Understanding how fishing businesses respond to aggregate programs may provide justification for other states or regional fisheries to take aggregate program approaches to management for species with small quotas. Fluke and black sea bass are both highly sought-after species coast-wide, with complicated management structures; pilot aggregate program evaluation may help to improve fishing flexibility, while maintaining healthy fish populations.

Harvest and effort data collection (via dealer reporting and state logbooks or federal vessel trip reports) occurred during the pilot aggregate program and all aggregate participants were also required to install a Vessel Monitoring System (VMS) onboard for real-time vessel location monitoring. However, no data collection on the economic and safety components of the program took place initially, limiting state managers' ability to assess program performance in terms of socioeconomic impact. Collection of these data is necessary to determine whether this pilot aggregate program resulted in improved economic efficiency and safety, as intended. Discerning the human behavioral response in terms of changes to fishing activity and business operations is pivotal to understanding what drives changes in harvest. This information is necessary to make informed recommendations about management options that will achieve desired positive impacts for harvesters, specifically stable and predictable harvest to maximize quota utilization within subperiods.

This report presents results from a mixed-methods (qualitative and quantitative) study aimed at addressing this data gap by offering a strategy to collect business information (fuel, bait, ice, grocery, and labor costs, number of days fished, etc.) and perspectives on the program directly from fishermen participating in the program coupled with analysis of landings data for comparison.

Methods

Interviews

To collect participant business information, semi-structured interviews were conducted with pilot aggregate program participants with funding from a grant through the Atlantic Coastal Cooperative Statistics Program (Award Number: NA21NMF4740471). Prior to contacting potential interviewees, a semi-structured interview instrument was developed and approved by the University of Rhode Island's Institutional Review Board, which reviews all research projects involving human subjects to ensure that subjects are not placed at undue risk and that they are ensured informed consent to their voluntary participation. Interview questions focused on perceptions of impacts (i.e., changes to number of trips targeting fluke or black sea bass or costs associated with fuel and bait, whether the program affected the number of discards), behavioral intentions (i.e., changes to number of days at sea or other business decisions), and attitudes towards the program (e.g., positive or negative, what could be done to improve the program).

Sampling efforts attempted to reach all pilot aggregate program participants. This is an example of purposive sampling, which is a common practice for studying individuals of a particular demographic (Bernard and Ryan 2010). Data collection was focused exclusively on participants of the aggregate

programs to allow for assessment of changes to their businesses since joining the program. For the actual pilot aggregate program, starting in 2019, 12 participants were chosen by lottery to represent multiple gear types within the pilot aggregate programs; three otter trawl fishermen, one lobster pot fisherman, three gillnet fishermen, one rod and reel fisherman, three multi-gear fishermen, and one fish pot fisherman. Three participants per gear type were sought in year one, but limited applications for lobster pot, fish pot, and rod and reel participants were received (one apiece). This pool was expanded in 2020 to an additional 18 participants. Three new participants for each gear type were sought in 2020, but not all types met this goal; participants were selected by lottery when more than three applications were received within a gear type. This pilot aggregate program participant pool represented both state-only and federally permitted vessels. New participants brought the totals by gear type to:

- 6 otter trawl
- 6 gillnet
- 2 lobster pot
- 5 fish pot
- 5 rod and reel
- 6 multi-gear (participants whose fishing history was not comprised of over 80% of a single gear type)

Actively fishing pilot aggregate program participants represented between 2.1 % and 6.5% of fishers harvesting summer flounder, and between 2.3% and 6.4% of all RI fishers landing black sea bass across the three years of the pilot program. All 30 program participants were contacted via email (provided when applying for the pilot aggregate program) on October 20th, 2021 requesting to set up an interview. Four program participants responded via email to set up an interview. Based on gear types of those that responded to the email solicitation, an additional 14 participants were given phone calls between October 27th, 2021 and February 24th, 2022 soliciting for interviews. These 14 individuals were selected to address other gear types that did not have as much interview coverage. At least three participants from each gear grouping needed to be interviewed for that gear type to be discussed in reporting, per data confidentiality requirements (ACCSP Rule of Three). Ultimately, a total of 14 program participants were interviewed, representing 47% of the program, as well as one dealer, for a total of 15 interviews conducted. DMF offered embroidered baseball caps to interviewees as a thank you for their willingness to provide information about their experience in the pilot aggregate program.

While a relatively small sample size, 15 interviews represents an acceptable sample size in qualitative data collection. Further, Crouch and McKenzie (2006) recommend that studies not exceed 20 participants to build and maintain trust with participants and allows for optimal open exchange of information. Guest et al. (2006) suggest that data “saturation” (when additional participants do not provide additional insights) occurs around 12 participants in homogeneous groups. Nevertheless, one goal of sampling in qualitative analysis is to ensure that sampling has included a broad set of interests. Given the use of purposive sampling of pilot aggregate program participants only, it is reasonable to assume that this study reached saturation at 12 or more interviews, as a 40% positive interview response rate should achieve an acceptable sample size to determine overall program efficiency for all gear types combined.

Since the COVID-19 pandemic was still ongoing at the time of interviewing, interviews were done either in-person or over the phone, depending on the participant’s preference. Interviews occurred between

October 25th, 2021 and March 7th, 2022 and ranged from ten minutes to one hour and six minutes (mean ± SD = 35.13 ± 16.8). All interviews were recorded and transcribed for reporting accuracy, after confirming that the participant was comfortable with the discussion being recorded and providing either written or verbal consent to the interview.

Data Analysis

Of the fishers interviewed, interviewees represented five different gear types: fish pot (3), rod and reel (4), gillnet (3), otter trawl (3), and use of multi-gear types (1). Based on the Rule of Three, fish pot, rod and reel, gillnet, and otter trawl can be discussed in isolation, while multi-gear cannot. Interviewees had between 12 and 50+ years of work experience in the fishing industry.

Interview recordings were transcribed using Temi transcription services (www.temi.com), and manual correction. Transcriptions were then coded in NVivo software (QSR International 2022) for qualitative analysis. NVivo coding allowed for data to be categorized and synthesized by topic area.

Dealer reports from the Standard Atlantic Fisheries Information System (SAFIS) were acquired, along with state logbooks and vessel trip reports from the Atlantic Coastal Cooperative Statistics Program (ACCSP) Data Warehouse, for all fishing activity resulting in fluke and black sea bass landings between 2014 and 2021. These data were analyzed in R statistical software (R Core Team 2022).

Results

All 15 interviewees expressed positive views of the program. In discussing overall thoughts on the program, the following topics were noted as direct benefits (Figure 1):

- Savings on fuel
- Improved safety
- Opportunity to reduce regulatory discards
- Flexibility to target other species certain days
- Ability to make up lost fishing days
- Better for the environment
- Flexibility to spend more time with family
- Improvements to mental health (reduction in stress)
- Ability to coordinate with dealers on when demand for fish would be highest
- Increased fishing efficiency

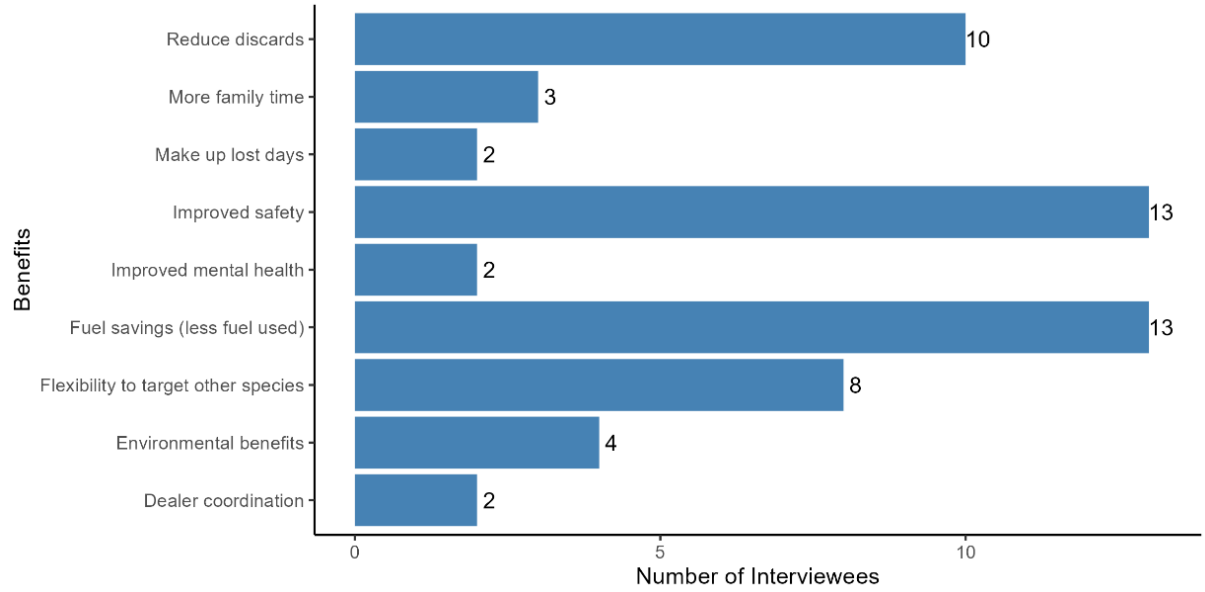


Figure 1. Number of interviewees that noted each respective benefit

The only negative attitude expressed about the program was a concern from one individual that the aggregate landings approach could lead to a reduction in availability of fluke by harvesting the quota more quickly.

The following topic areas were asked about directly within the interviews and summaries of interviewee responses are summarized below.

Safety

Most interviewees (13/15) indicated that the program improved safety. Rationales included the ability to pick fishing days based on weather rather than necessity to catch a daily limit (noted by ten individuals), less time on the water overall (fewer days or shorter days), taking time when needed to make vessel repairs correctly due to reduced pressure to catch a daily limit, and a general ability to avoid risks without losing money.

However, the two remaining individuals said the program had no effect on their safety, primarily because they either fish inshore or are already avoiding bad weather days.

Expenses

Five individuals (one third of participants interviewed) described the pilot aggregate program as either a cost saving or profit increasing program. Based on interviewee responses, savings appeared to be driven primarily by a reduction in the number of trips or overall time at sea, resulting in lower fuel expenses.

Trips

Interview Responses

A slight majority of program participants interviewed (8/15) explained that they took fewer trips during their time in the program. Additionally, two others noted that while they still took the same number of trips, they took fewer to specifically target fluke and black sea bass.

Of those that indicated they had taken fewer trips during their time in the pilot aggregate program, six provided detailed explanations of how the reduction occurred. Those descriptions are as follows:

- For sea bass specifically, one person took 50% fewer trips during the program.
- For the sea bass season, one person went from 21 trips prior the program down to 10 trips (52% reduction).
- One person fished 90-100 days per year prior to the program and during the program fished 75 or fewer days a year (17-25% reduction).
- One person fished 5-7 days a week during the fishing season in years prior and then only fished 2 days a week while in the pilot aggregate program (60-71% reduction).
- One person fished all 7 days a week before being in the pilot aggregate program and then reduced to only 1-1.5 days a week during the pilot (79-86% reduction).
- One person took 90-100 (day) trips per year before the pilot and closer to the mid-seventies during the pilot aggregate program (they described a 15-20% reduction overall).

One of these six also noted that their catch of black sea bass increased while in the program, along with a reduction in the number of trips taken, resulting in a 200% increase in profits during the program relative to prior.

Two interviewees said they took the same number of trips, but their days were shorter and they may have set less gear in the water. Another participant explained that they fished the same number of trips, but kept more fish that would have become discards on trips prior to being in the program. One individual noted that they did not think they had reduced their number of trips during the program, but might do so if fish are not around in large numbers, as individual day trips for a 50-pound limit of black sea bass may not be enough to justify a trip. Finally, one participant also noted that to truly reduce the number of trips, there would need to be aggregate landings allowances for more species.

Fisheries Dependent Data Analysis

Analysis of vessel trip reports in conjunction with landings for all aggregate participants suggests there were reductions in the number of trips by fishers participating in the pilot aggregate program across multiple gear types (Figure 2). For fish pot, most captains had fewer trips in 2020 and 2021 than the 2014-2018 median. Most gillnet and rod and reel fishermen had fewer trips than the 2014-2018 median in all three aggregate years (2019, 2020, and 2021). Lobster pot captains overall had fewer trips during the aggregate time period, but had an equal number of captains harvesting above and below the median in 2020. Trawlers had a similar pattern, where most captains had fewer trips than the median in 2019 and 2022, but an equal number of captains harvesting above and below the median in 2020. Most multi-gear captains had fewer trips than the median in 2019 and 2022, but a larger number of captains with more trips than the median in 2020. Overall, there is a reduction in the number of trips during the pilot aggregate program for aggregate captains relative to their 2014-2018 activity.

It is worth noting that 2020 was an anomalous year for all fishing activity due to the COVID-19 pandemic. While overall pounds landed in Rhode Island of black sea bass and summer flounder increased from 2019 to 2020 (39% and 2%, respectively), the value associated with those landings decreased between the two years (12% and 16%, respectively). Therefore, the low price of ex-vessel landings during the pandemic may have affected harvester behavior.

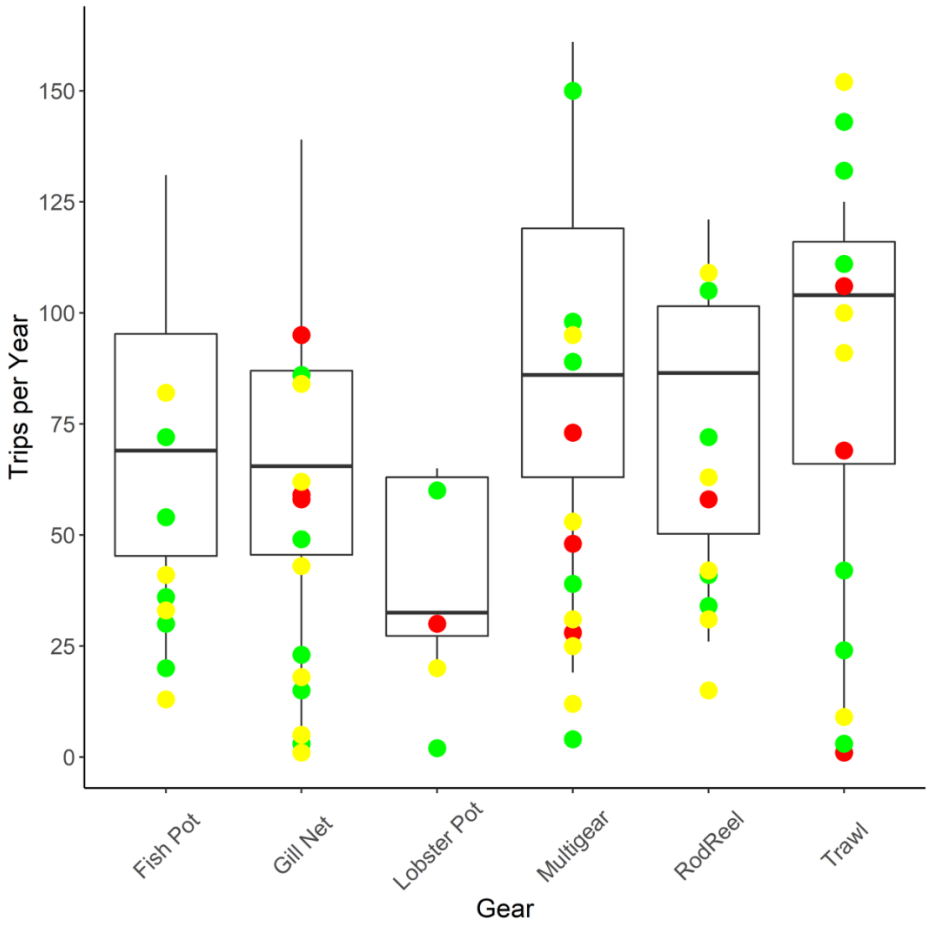


Figure 2. Trips per year for all pilot aggregate program participants by gear type (not just those interviewed). Box plots represent number of annual trips from 2014-2018 and dots represent number of trips during pilot aggregate program participation. Dot color corresponds to pilot aggregate program year, where red is 2019, green is 2020, and yellow is 2021. Figure and analysis conducted by Richard Balouskus, Principal Biologist, RIDEM DMF.

Fuel

A reduction in fuel usage was noted by 13 individuals. For most gear types this resulted from a reduction in the number of trips, but for some gillnetters, their days on the water were shorter because they were able to set fewer nets while still hitting their weekly target catch. One person noted no change in fuel usage, while another was unsure because they targeted other species more as a result of the program, so parsing out fuel usage to target fluke and black sea bass alone was not possible.

Bait

For gear types that use bait (i.e., fish pots and rod and reel), five participants stated that they thought the pilot aggregate program resulted in savings on bait costs. Two others suggested there was no effect on bait expenses, while another two discussed challenges in determining whether changes in bait costs were associated with the pilot aggregate program. Bait prices were noted to be increasing during the program period, and two discussed how they switched from using clam bellies as bait to squid gurry in an effort to save money. However, this had nothing to do with the pilot aggregate program.

Labor

Participants generally thought that labor costs did not change due to the pilot aggregate programs. Only one individual suggested a reduction in labor costs, while seven others stated that they did not observe any changes in paying for crew associated with the program. The majority of interviewees noted that they worked alone or with family members, so there was no change to crew expenses during the program versus prior years.

Wear and Tear

Six interviewees indicated that the program likely resulted in a reduction in wear and tear on either the vessel and/or fishing gear. Of these six, three stated that these reductions were limited in scope and hard to parse out. The other three noted specific situations including replacing gear less frequently because it spent less time in the water, gear not needing to be modified as much to target different species, or a reduction in vessel maintenance time and costs.

An additional two individuals believed that the program had no effect on costs or time associated with vessel or gear maintenance.

Discards

One of the key topic areas discussed by participants related to the program's impact on discarded fish. Of the 15 individuals interviewed, ten (two thirds of those interviewed) stated that they thought the program reduces regulatory discards. Two others suggested that the program may reduce discards, one of which stated that there was no change to their discard numbers, but for other gear types it is likely to reduce them. One additional interviewee stated that they had the same number of dead fish, but got to keep fish that would have been discards previously because they fished the same number of days as before. Only one individual thought that there was no change to discards due to the program.

A key point expressed by multiple individuals was that the program's effect on discards may be different by gear type. For example, it was noted that controlling discards with gillnets can be challenging, but this program does allow for more fish to be kept that traditionally may have been discarded. However, another perspective was that if you hit your target catch more efficiently each week, you may fish less for aggregate species, resulting in fewer discards.

Changes in Catch

Interview Responses

For some gillnetters, the program allowed them to reach their weekly possession limits (equaling more than they would catch fishing on daily limits) because they could catch a large enough amount to make fishing worthwhile.

For fish potters, one noted that their catch of black sea bass increased even while the number of trips decreased because they were able to keep more fish on a single trip.

Two individuals also suggested that catch (and profits) were higher because the pilot aggregate program prevented them from having "lost" fishing days. Being able to land in aggregate allowed them to make up for "lost" days, where historically, if they had not fished, that access to the daily possession limit was eliminated.

Fisheries Dependent Data Analysis

Landings data were analyzed to evaluate the difference in catch of black sea bass and fluke of participants in the pilot aggregate program relative to those harvesting under daily possession limits. The number of aggregate participants landing black sea bass in each year differed (Table 1); not all eligible participants landed black sea bass in 2020 and 2021.

Table 1. Number of aggregate and non-aggregate participants fishing in each of the three program years. The number of total aggregate program participants in 2019 was 12 and was increased to 30 in 2020 and 2021.

Species	Year	Aggregate	Non-Aggregate	% Aggregate
Black Sea Bass	2019	12	515	2.3%
Black Sea Bass	2020	29	452	6.4%
Black Sea Bass	2021	25	448	5.6%
Summer Flounder	2019	10	473	2.1%
Summer Flounder	2020	25	384	6.5%
Summer Flounder	2021	21	404	5.2%

In all three pilot years, aggregate participants landed more pounds of black sea bass each week than non-aggregate harvesters on average (Figure 3). Distributions of average weekly catch differed statistically between the two across the three years (Kolmogorov–Smirnov test p-value < 0.001).

Aggregate participant numbers landing summer flounder also differed each year (Table 1); in all three years, not all eligible participants landed summer flounder. Similar to black sea bass landings, aggregate participants generally landed more pounds weekly of summer flounder than non-aggregate harvesters on average in 2019, 2020, and 2021 (Figure 4). Average weekly catch distributions also differed between aggregate and non-aggregate harvesters (Kolmogorov–Smirnov test p-value < 0.001).

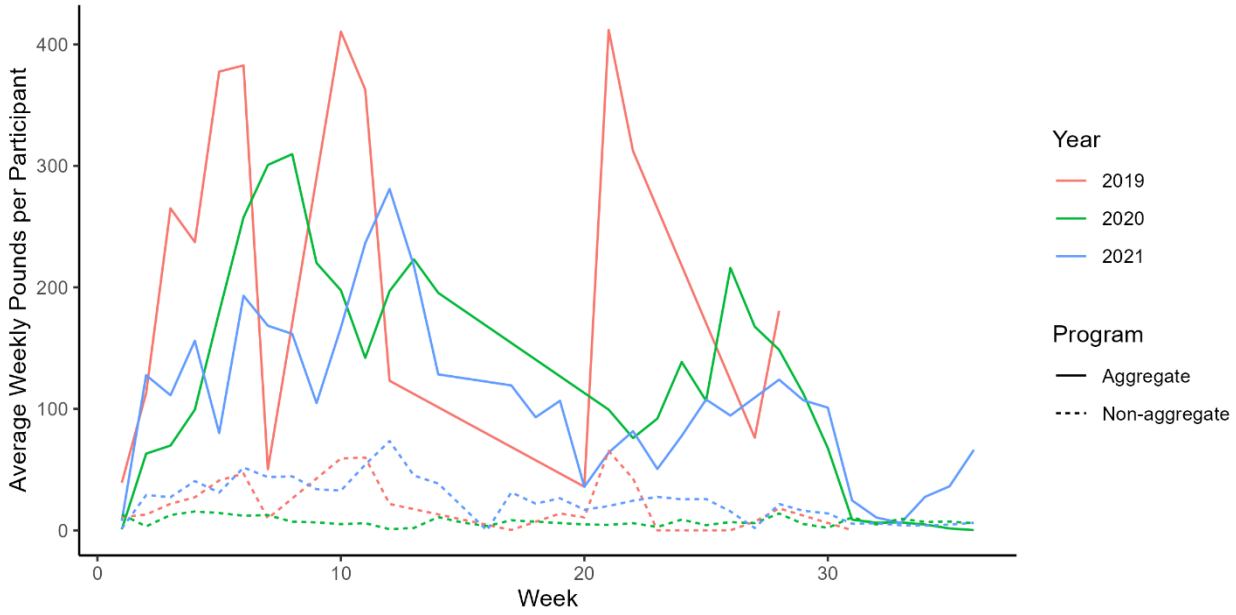


Figure 3. Average weekly pounds of black sea bass landings from 2019-2021 separated by aggregate versus non-aggregate participants. The aggregate landings period was only in effect from May – December each year. Only weeks during the aggregate period are included in this plot. Black sea bass harvest was closed in December of 2019 due to reaching the state's quota allocation.

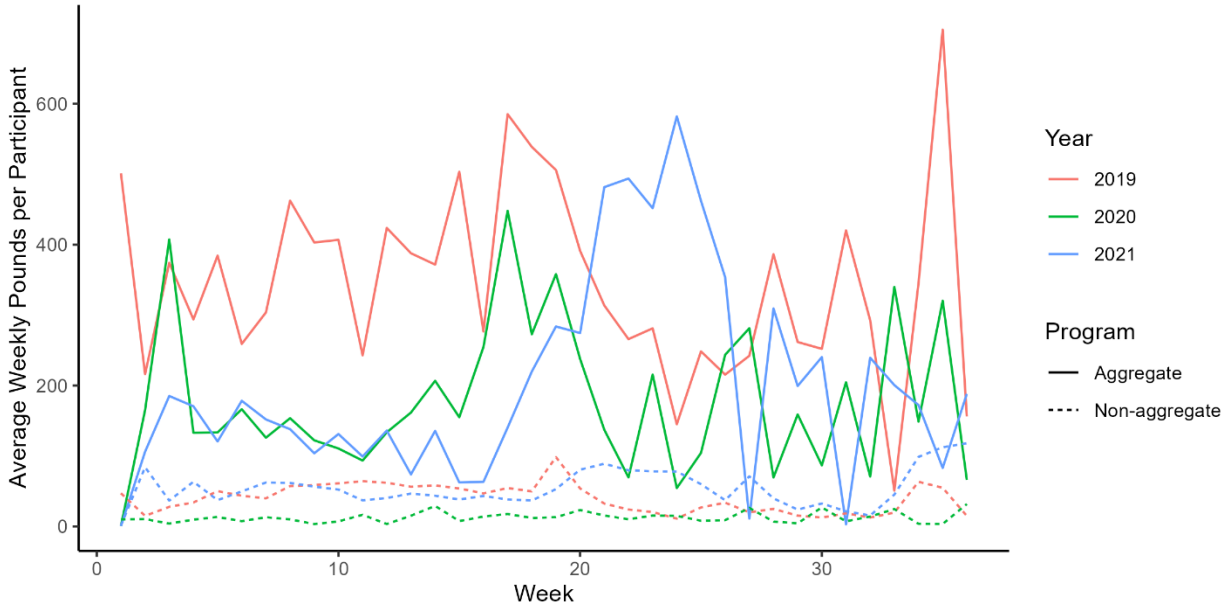


Figure 4. Average weekly pounds of summer flounder landings from 2019-2021 separated by aggregate versus non-aggregate participants. The aggregate landings period was only in effect from May – December each year. Only weeks during the aggregate period are included in this plot.

Quota Interactions

Interview Responses

It was unclear through the pilot program whether black sea bass and summer flounder quotas would be substantially affected by an aggregate landings approach. Eight interviewees noted potential program interactions with quota, but responses were primarily describing concerns with exhausting quota if the entire fleet could land in aggregate. However, others argued that since the total weekly possession limit is no higher for aggregate participants, there should be no effect.

Fisheries Dependent Data Analysis

RIDEM DMF staff conducted simulations extrapolating harvest rates of those within the pilot aggregate program to the entire fleet and found that the quota may be exhausted more quickly; results were presented at a public workshop on January 10th, 2022.

Suggested Program Improvements

Interviewees offered a variety of suggestions on how the program could be improved moving forward. Three individuals suggested that other species, or all species, should be allowed to be landed in aggregate; tautog and striped bass were the most frequently suggested additional species.

Two interviewees noted concerns with the vessel monitoring system (VMS) requirements and suggested that the VMS requirement should be eliminated, or communication on why it is necessary be improved. One such comment was about technical challenges with these systems and the other comment was a preference to not have vessel location tracking, unless absolutely necessary for enforcement purposes.

Two interviewees suggested that no changes be made to the program, only that it be extended temporally. One individual suggested opening the program up to all RI commercial harvesters while others explicitly argued against that approach and advised the DMF to only expand the pilot aggregate program to collect more data on catch variability among program participants.

Finally, for those interviewees concerned with aggregate programs causing the quota to be exhausted too quickly, two suggestions were offered: 1) one individual recommended allowing a weekly aggregate limit, but having a daily limit built in, where this daily limit is larger than the non-aggregate daily possession limit, and 2) another individual suggested having the aggregate weekly limit be a function of fewer days than total days open (e.g., 6 days x the daily possession limit instead of 7 days).

Conclusion

Perceptions of Program from Fishing Industry Perspective

Based on the interviews conducted in 2021 and 2022, participant perceptions of the pilot aggregate program were overwhelmingly positive, with some neutral comments (i.e., no changes or improvements relative to past fishing activity), and one negative comment (a concern about potential impacts to the summer flounder quota). All interviewees expressed a desire to stay in the program, depending on its future format, but most noted that they simply wanted to see the program continue in some form. One interviewee suggested that the number of days per week to determine the aggregate limit could be modified if aggregate landings were found to accelerate quota depletion. However, another noted explicitly that if the number of days were reduced, they would leave the program and chose to fish daily possession limits instead to maximize their catch. This tradeoff was ultimately discussed by the RIMFC.

Perceptions of Program from Management Perspective

From the perspective of the DMF, the pilot aggregate program was successful in garnering interest from the fishery to participate and allowing for tracking of landings data for comparison to non-aggregate activity and tracking impacts to the state quota. The pilot also enabled successful integration of VMS tracking and enhanced data collection into a new management program. Based on the interviews, the program was also successful in achieving a variety of program targets: 1) reducing regulatory discards, 2) increasing flexibility for commercial harvesters in terms of how they conduct their fishing activity, which may enable adaptability in light of changing ocean and market conditions, and 3) creating conditions where fishermen may be able to harvest more efficiently and save money or increase profits.

As previously noted, one of the drivers for the fishing industry to recommend an aggregate landings approach for high-value, low possession limit species was to reduce the incentive to harvest over the daily possession limit. The DMF agreed that an aggregate landings approach could potentially reduce perverse incentives created by small daily possession limits and the VMS requirement could further limit illegal activity. Whether this pilot aggregate program succeeded in changing incentives remains to be evaluated directly, but the RIDEM Division of Law Enforcement (DLE) used pilot program participants' VMS to monitor their fishing activity throughout the program. Law enforcement approached the pilot aggregate program with some trepidation due to concerns over a lessened ability to readily identify non-compliance in trip limits and a need to ensure accountability on the part of the fishermen. With the inclusion of a VMS requirement, these concerns for identifying non-compliance were lessened. DLE has recommended that all future aggregate programs make VMS mandatory. The DLE still has concerns with the prolonged administrative procedure to sanction permits for documented violations and recommends that consideration be given to immediate permit sanctions upon documentation of said violation; a similar process is employed in other jurisdictions and future programs could explore the feasibility of additional enforcement measures.

Future Directions

In early 2022, the RIMFC discussed the fate of the pilot aggregate program and evaluated three potential options: 1) eliminate the program, 2) implement the program indefinitely in some capacity, or 3) continue the pilot program with some modifications to test for additional uncertainties. Ultimately, on March 7th, 2022, the RIMFC voted to extend the pilot aggregate program another year (through 2022), and to expand the number of participants to 58, with no restrictions by gear type. They also modified the program to using five days instead of seven to determine the aggregate limit for black sea bass. This will allow for an additional year of data collection to help address questions that remain unanswered. For example, the expanded pilot aggregate program should help to provide additional data on the rate of quota depletion, given the uncertainty around the simulations and the speculative answers from program participants.

However, some questions remain untested. For example, future research should seek to quantify the change in discards associated with an aggregate landings program. This could include fisheries observers onboard commercial vessels to collect information on the number of black sea bass and summer flounder discarded, as well as information on size, sex, and maturity of discarded fish.

Further, analysis on the variability in catch between aggregate and non-aggregate participants across program years is necessary to better understand potential drivers. This should include incorporation of year class effects for both black sea bass and fluke to determine whether differences may be attributed

to the program or external influences. Additional modeling incorporating market factors (e.g., COVID-19) should also be conducted, as well as more detailed characterization of program participants versus the larger fishing fleet targeting fluke and black sea bass. Questions also remain on how representative the pilot aggregate program participants are of the Rhode Island fluke and black sea bass fisheries.

DMF staff intend to conduct more detailed data analyses on these topics following an additional year of data collection to include the 2022 fishing year with more aggregate participants. These results will be compiled into a manuscript for publication upon completion.

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