Summer Flounder – Black Sea Bass

Pilot Aggregate Program Summary: 2019-2022

April 2023 Update

Presented to the Rhode Island Marine Fishery Council

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Executive Summary

This report summarizes the Rhode Island Division of Marine Fisheries analyses of the summer flounder and black sea bass pilot aggregate landing program that ran in the summer and fall from 2019-2022. The major goals and concerns related to the pilot program are outlined and addressed throughout this report. Numerous assessment metrics as well as the methods used to analyze each metric are presented. Significant areas of interest regarding the aggregate program included fishing effort (days at sea), catch rates and their relationship with quota utilization, market impacts, and how the summer flounder exemption certificate may relate to the aggregate program in future years.

The overall number of permitted participants in the pilot program increased from 2019 through 2022. While participating in the pilot program, individual harvesters tended to fish total fewer days compared to the years prior to the pilot program. These fewer days at sea may be correlated with increased safety, reduced fuel costs, and improved vessel maintenance. Total available quota is a primary factor for overall fishery performance, including early closures. This was true in years with and without the pilot program operational. No year of the pilot program indicated outliers in the relationship between total available quota and closed days compared with pre-pilot program years. However, quota simulation modeling indicates that if participation were high in a statewide aggregate program, fleetwide catch rates may increase and potentially lead to more closed days. A complimentary report detailing structured interviews with program participants found that "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." The final section of this report overviews the summer flounder exemption certificate and its relationship with the pilot program. Across three years of the pilot program, vessels that held a summer flounder exemption certificate fished more total trips with higher fluke landings and a higher percentage of their trips with higher fluke landings than those vessels without an exemption certificate. If the summer flounder exemption certificate requirement had not been exempted for the pilot program, numerous trips would have resulted in a higher percentage of regulatory discards.

1. Overview

For years, discussions on aggregate 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 model has been used for fluke during a winter sub-period (January through April) since the 1990s, for black sea bass during a winter sub-period (January through April) since 2016, scup have been managed using a weekly aggregate limit for many years, and a weekly or bi-weekly aggregate 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 RI 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 dictating 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 provide fishermen with greater flexibility in fishing practices through the utilization of a weekly possession limit instead of a daily limit. Such a program could potentially decrease operating costs and increase safety by reducing the number of days at sea. 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 deployment of mobile gears resulting in less impacts to bottom habitat. Finally, improved operating flexibility could also reduce over harvest that can result from daily limits.

However, there have been stated concerns from the commercial industry in RI that aggregate programs may: 1) favor select businesses depending on how they operate; 2) increase catch rates, which can lead to quicker quota consumption resulting in shorter fishing seasons; 3) affect variability in timing of landings that could affect market prices; and 4) lead to an increase in illegal fishing activity due to the potential difficulties in accountability and enforceability. How such an aggregate program may affect fishing and dealer behavior, and the mechanisms to manage and enforce the program are largely untested.

At the recommendation of 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 (hereafter 'pilot program') to the Rhode Island Marine Fisheries Council (RIMFC) in the fall of 2018, which resulted in the adoption of the pilot aggregate program via a new rule in January 2019. The goal of the pilot program was to collect data to assess the effects of aggregate possession limits on harvest rates for fluke and black sea bass from May 1 to December 31.

2. Program Assessment

This report addresses the major goals and concerns related to the pilot program as available data allows. While some of the goals and potential issues of a weekly possession limit can be quantifiably measured through commercial fisheries reporting data, other aspects such as regulatory discards, generalized fishing practices, undetected illicit fishing, and economics can only be assessed qualitatively at this time. Major goals and concerns of an aggregate program addressed in this report include:

- Days at Sea – Days at sea, which is correlated with safety, fuel cost, and vessel maintenance is quantitively measured by total number of trips taken by aggregate vessels before and during the program (Section 3). This metric is also qualitatively assessed through structured interviews with participants (Section 5).
- Catch Rates – Catch rates and its relationship with quota utilization are assessed quantitively in Sections 4.1 and 4.2. Additionally, theoretical quota utilization simulation modeling is presented in Section 4.3.
- Regulatory Discards – Discards are assessed qualitatively through structured interviews with participants (Section 5). Because discards are an optional reporting metric, data are sparse and considered generally inaccurate fleetwide, therefore precluding quantitative assessment.

- Market Impacts – In particular, price of fish is considered an important metric for assessment of an aggregate program. No detailed economic model was used to assess impacts of aggregate fishing trips on market price for fluke and black sea. Market impacts are addressed qualitatively through structured interviews with participants (Section 5). Additional information is available within that report from dealer perceptions of the aggregate program.
- Illegal Fishing Activity – Enforcement issues are not discussed as part of this RI DMF report. It is noted that the RI DEM Division of Law Enforcement has continually expressed support for this program and their ability to effectively enforce rules related to the program at various workshops, public hearings, and council meetings. This support is bolstered by the program requirements for active vessel monitoring system (VMS) devices and electronic reporting prior to each landing event.
- Summer Flounder Exemption Certificate – The summer flounder exemption certificate is a unique issue to RI with regards to a weekly aggregate program for that species. The implications of either requiring or excluding the necessity of a summer flounder exemption certificate to land more than 200 lbs. per day is discussed in Section 6. The requirement for a summer flounder exemption certificate to land more than 200 lbs. per trip was excluded for pilot program participants.

3. Participation

When the pilot program was initiated in 2019, the DMF deemed it important to include a range of different commercial fishing gear types to determine how gear types used impacted fishing behavior and catch rates. Gear types included: trawl, gill net, fish pot, rod and reel, lobster pot, and 'multigear'. In 2019 the program was open to three vessels per gear type, which was doubled to six vessels per gear type for 2020 and 2021, and then eliminated in 2022 in an attempt to increase total participation. In 2022 participation was increased to 53 vessels which accommodated every vessel that applied to the pilot program (59 vessels were permitted, but only 53 of those participated). Not every vessel issued a permit participated in the program in any given year.

It should be noted that as RI does not issue 'gear specific' commercial fishing licenses. As such, limiting access to an aggregate program by fishing gear type would likely be considered to be both discriminatory and regulatorily infeasible.

Table 1. Total number of participants in the pilot program by year. More permits may have been issued in a given year, but some vessels may not have participated in the aggregate program while permitted (opt-out).

Year	Number of Participants
2019	12
2020	30
2021	30
2022	53

3.1 Fishing Trips

Fishing effort, measured in fishing trips per program year (May 1- December 31), by permit holders varied widely throughout the term of the pilot program. Data shows that some participants increased fishing effort, while others reduced their total days at sea. There are numerous interactive variables that may concurrently effect fishing effort including, but not limited to, fish price, fuel price, weekly limits, vessel condition, harvester health, weather, operational changes, and other work and family conflicts. Because of all these complicating factors, generalized information about trips by year is presented, but all other caveats should be considered when viewing this data.

Figures 1-4. Total number of trips taken by pilot program participants before (2014-2018) and during the pilot program. Because pilot program participation varied annually, each respective pilot year is considered individually. In other words, the 2019 figure compares the total number of trips taken by year of only those fishermen who were participants in 2019. Likewise, the 2020 figure compares the total number of trips taken by year of only those fishermen who were participants in 2020, and excludes data from 2019 because during that year, some 2020 participants fished in the pilot program, while others were not yet permitted in the program. Across all years, the median trips per participant were lower in pilot years than in years prior to the pilot program.

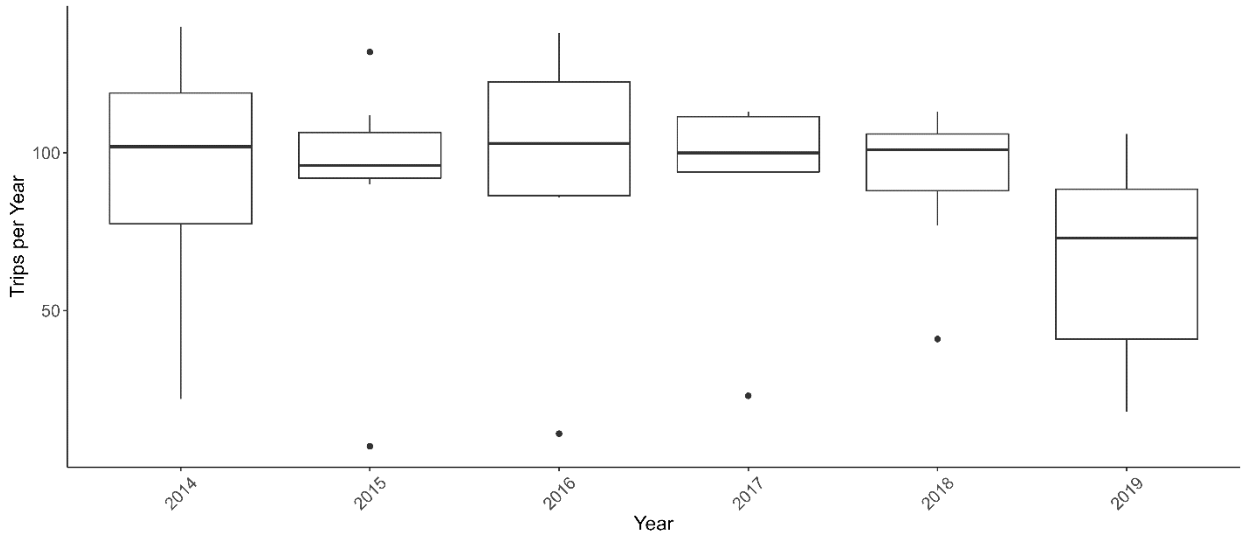

Figure 1. Boxplot of fishing trips by year of 2019 aggregate program participants.

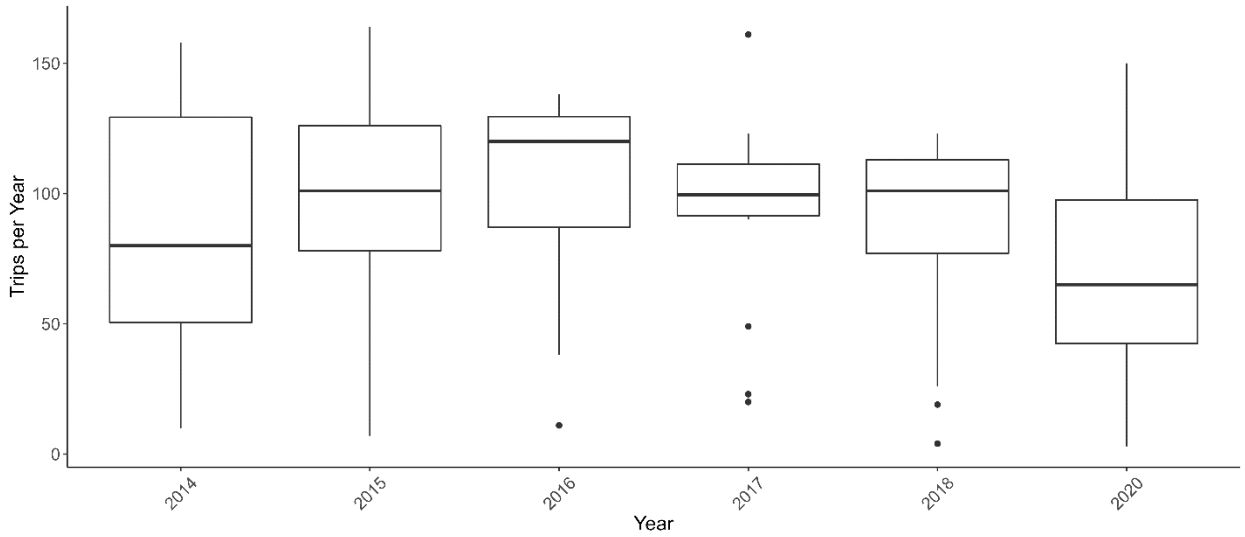

Figure 2. Boxplot of fishing trips by year of 2020 aggregate program participants.

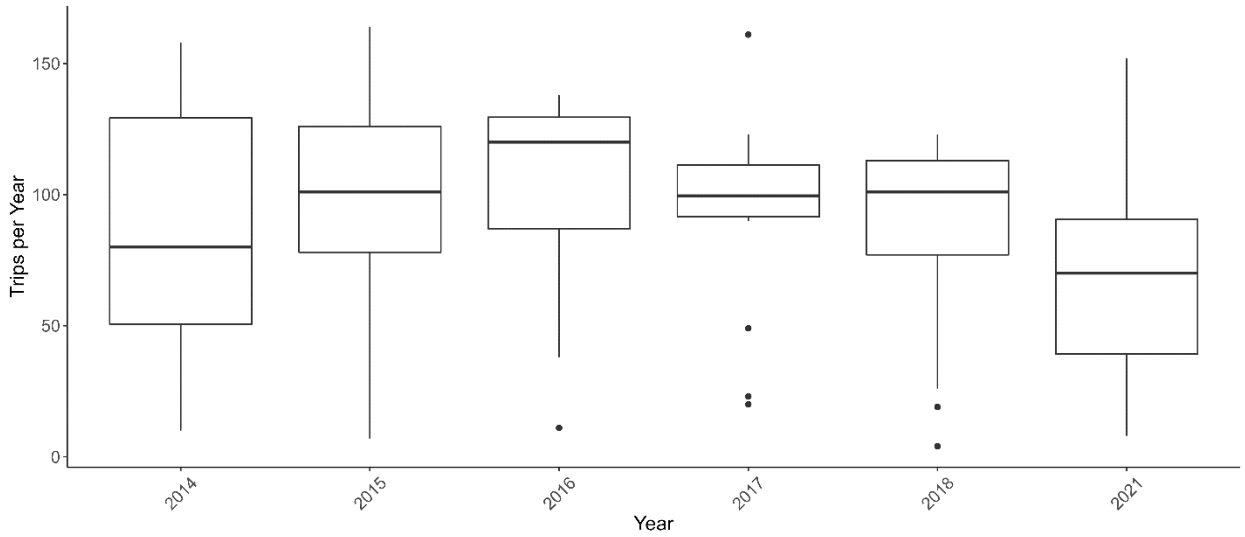

Figure 3. Boxplot of fishing trips by year of 2021 aggregate program participants.

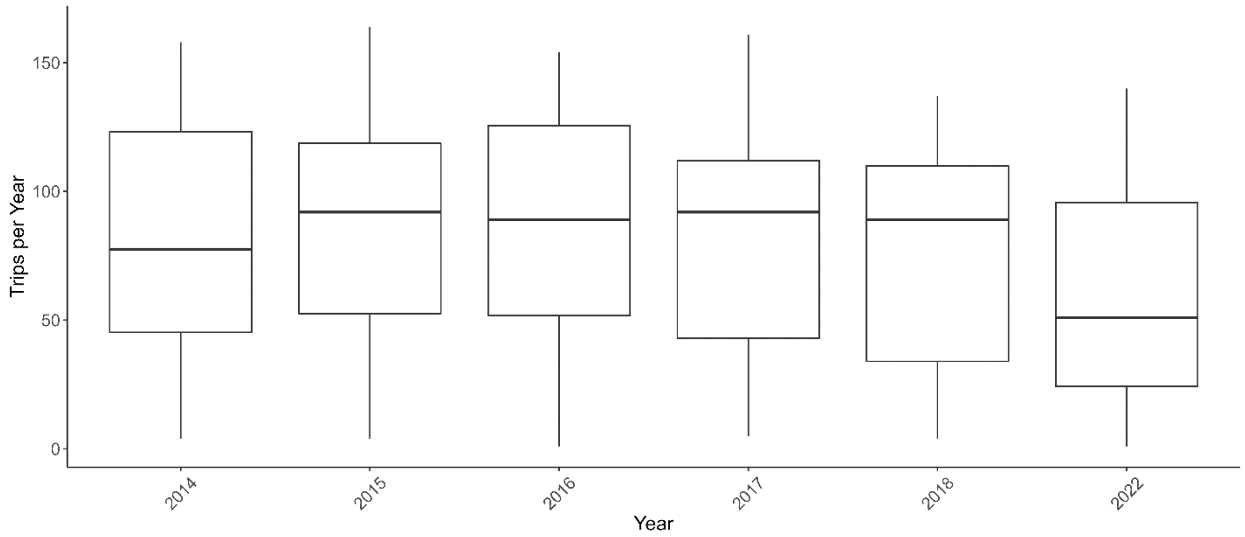

Figure 4. Boxplot of fishing trips by year of 2022 aggregate program participants.

4. Quota Utilization

Total available subperiod allocations vary based on the annual state apportioned quota available through the Atlantic States Marine Fisheries Commission allotted to RI, as well as the percentage of that total allocation assigned to each subperiod through the regulatory process. To assess the pilot program's potential impact on RI quota and catch rates for fluke and black sea, several data streams were analyzed. Section 4.1 outlines fleetwide quota utilization in the years preceding and during the pilot program. Section 4.2 overviews gear type specific catch rates from 2019-2021 for pilot program

participants. Section 4.3 includes results from a quota utilization simulation that was run using results from the first few years of the program (2019-2021).

4.1 Fleetwide Quota Utilization

Total available quota is a primary factor for overall fishery performance, including early closures. This was true in years with and without the pilot program.

A table and plot are provided for fluke and black sea bass respectively, illustrating the relationship between final subperiod allocation and total closed days within a subperiod. Tables are conditionally formatted to highlight gradients of high to low allocations and few to many closed days respectively.

Table 2. Fluke final subperiod allocations and total closed days by year and subperiod. Final subperiod allocations are formatted in a red-green scale with relatively high pound allocations in green and low pound allocations in red. Total closed days are formatted with relatively few closed days in green and many days in red.

Year	Subperiod	Final Period Allocation (lbs)	Did it close early?	Total Closed Days
2014	May 1 - Sept 15	578466	No	0
2014	Sept 16 - Dec 31	181820	Yes	6
2015	May 1 - Sept 15	615801	No	0
2015	Sept 16 - Dec 31	211844	No	0
2016	May 1 - Sept 15	444227	No	0
2016	Sept 16 - Dec 31	172467	No	0
2017	May 1 - Sept 15	315379	Yes	30
2017	Sept 16 - Dec 31	76963	Yes	48
2018	May 1 - Sept 15	370131	No	0
2018	Sept 16 - Dec 31	184299	Yes	3
2019	May 1 - Sept 15	662688	No	0
2019	Sept 16 - Dec 31	298193	No	0
2020	May 1 - Sept 15	736281	No	0
2020	Sept 16 - Dec 31	432547	No	0
2021	May 1 - Sept 15	682418	No	0
2021	Sept 16 - Dec 31	471103	No	0
2022	May 1 - Sept 15	847835	No	0
2022	Sept 16 - Dec 31	570163	No	0

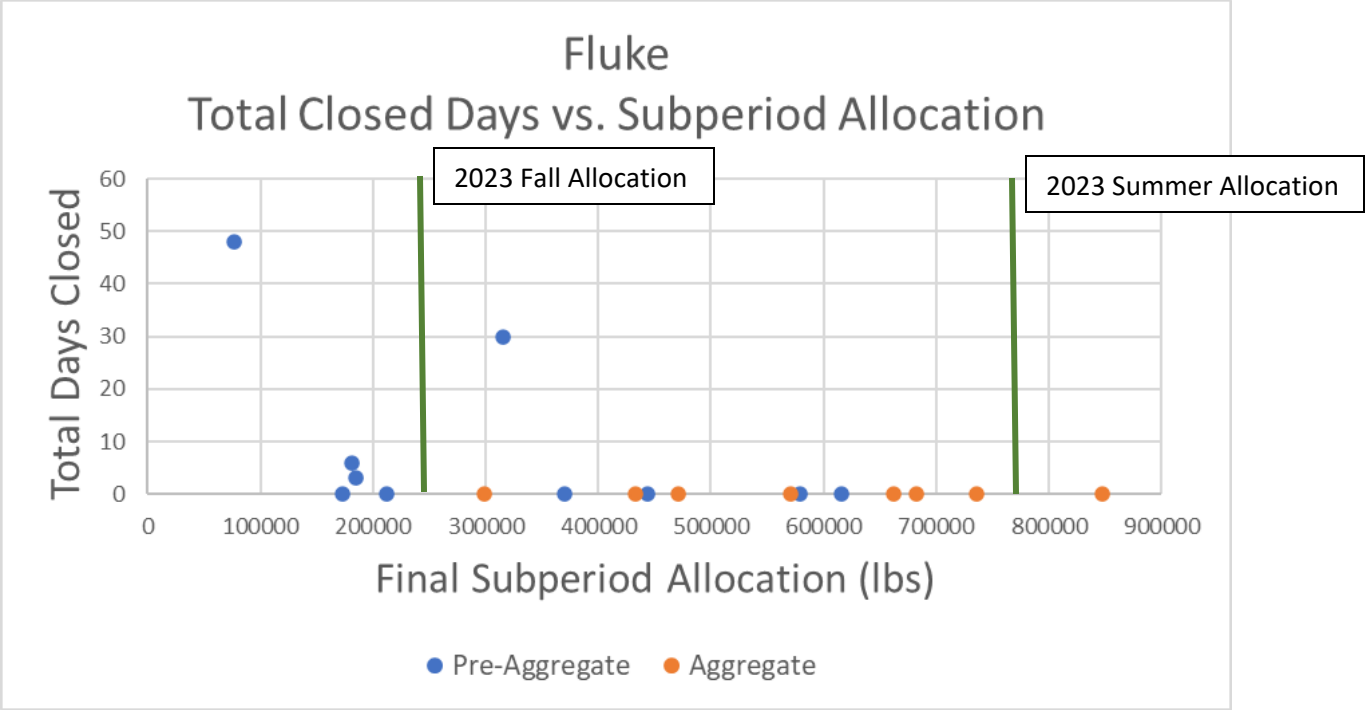

Figure 5. Relationship for fluke between final subperiod allocation and total days closed, 2014-2022. Years prior to the pilot program are blue and years during the program are orange. 2023 subperiod allocations are vertical green lines.

Table 3. Black sea bass final subperiod allocations and total closed days by year and subperiod. Final subperiod allocations are formatted in a red-green scale with relatively high pound allocations in green and low pound allocations in red. Total closed days are formatted with relatively few closed days in green and many days in red.

Year	Subperiod	Final Period Allocation (lbs)	Did it close early?	Total Days Closed
2014	May 1- Jun 30	58920	Yes	28
2014	July 1 - July 31	46433	Yes	18
2014	Sept. 1 - Oct. 31	42508	Yes	37
2014	Nov 1 - Dec 31	16731	Yes	49
2015	May 1- Jun 30	61294	Yes	30
2015	July 1 - July 31	42647	Yes	24
2015	Sept. 1 - Oct. 31	46322	Yes	38
2015	Nov 1 - Dec 31	19673	Yes	53
2016	May 1- Jun 30	75514	Yes	31
2016	July 1 - July 31	58547	Yes	22
2016	Sept. 15 - Oct. 31	52458	Yes	35
2016	Nov 1 - Dec 31	26170	Yes	52
2017	May 1- Jun 30	113611	Yes	25
2017	July 1 - July 31	90739	Yes	15
2017	Sept. 15 - Oct. 31	95395	Yes	19
2017	Nov 1 - Dec 31	87404	No	0
2018	May 1- Jun 30	102105	Yes	14
2018	July 1 - July 31	79879	Yes	14
2018	Sept. 15 - Oct. 31	73104	Yes	29
2018	Nov 1 - Dec 31	41062	No	0
2019	May 1- Jun 30	93750	Yes	20
2019	July 1 - July 31	66471	Yes	16
2019	Sept. 15 - Oct. 31	72489	Yes	34
2019	Nov 1 - Dec 31	14371	Yes	51
2020	May 1- Jun 30	178098	No	0
2020	July 1 - July 31	127776	No	0
2020	Sept. 15 - Oct. 31	139559	No	0
2020	Nov 1 - Dec 31	126818	No	0
2021	May 1- Jun 30	155198	Yes	3
2021	July 1 - July 31	129912	No	0
2021	Sept. 15 - Oct. 31	61501	No	0
2021	Nov 1 - Dec 31	55475	No	0
2022	May 1- Jun 30	208222	No	0
2022	July 1 - Aug 15	218270	No	0
2022	Aug 16 - Sept 15	105056	No	0
2022	Sept 16 - Oct 15	109475	No	0
2022	Oct 16 - Dec 31	153641	No	0

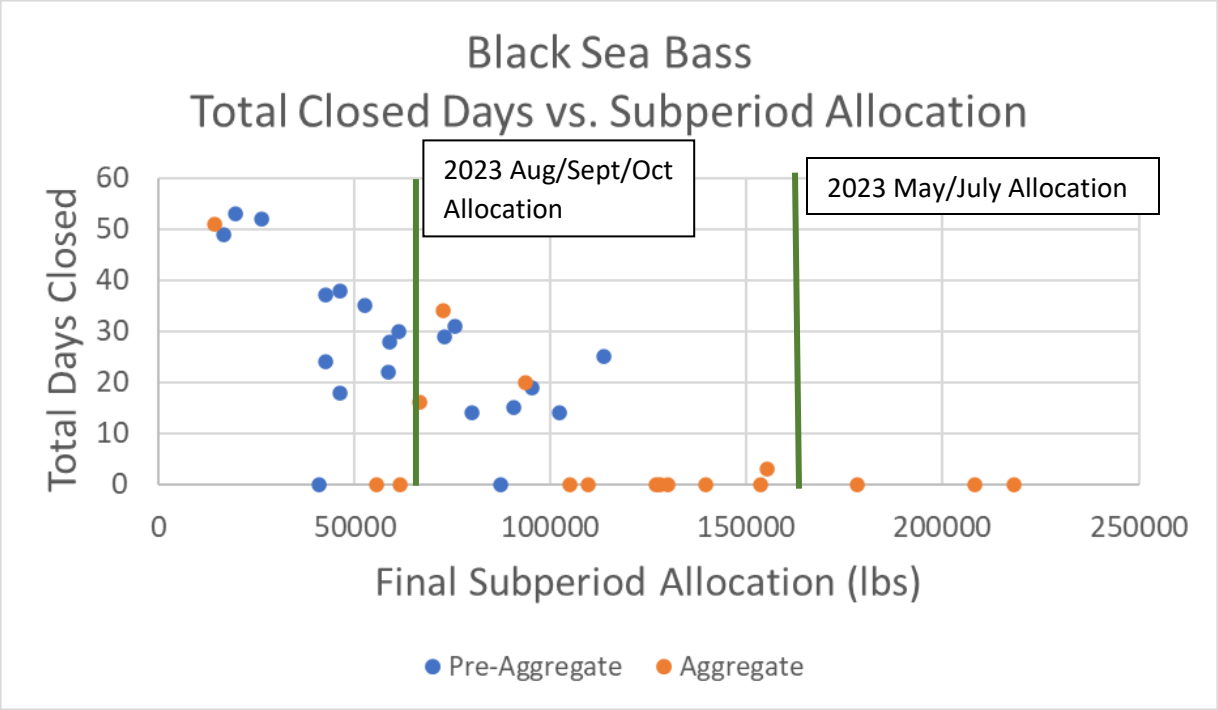

Figure 6. Relationship for black sea bass between final subperiod allocation and total days closed, 2014-2022. Years prior to the pilot program are blue and years during the program are orange. 2023 subperiod allocations are vertical green lines.

4.2 Pilot Program Gear Type Catch Rates

There was high variability in participation of harvesters in the pilot program; some utilized the program more extensively than others. When examining catch rates, increases in fluke catch were primarily attributable to trawlers (Figure 7). Captains utilizing other gear types generally remained within the range of total annual fluke catch they had landed before participating in the pilot program. Data for both the Section 4.2 gear type catch rate analysis and Section 4.3 quota simulation modeling has not been updated with 2022 data. An initial analysis of the 2022 pilot program catch data indicated it would not change our inferences about either gear type specific catch rates or quota simulation projections.

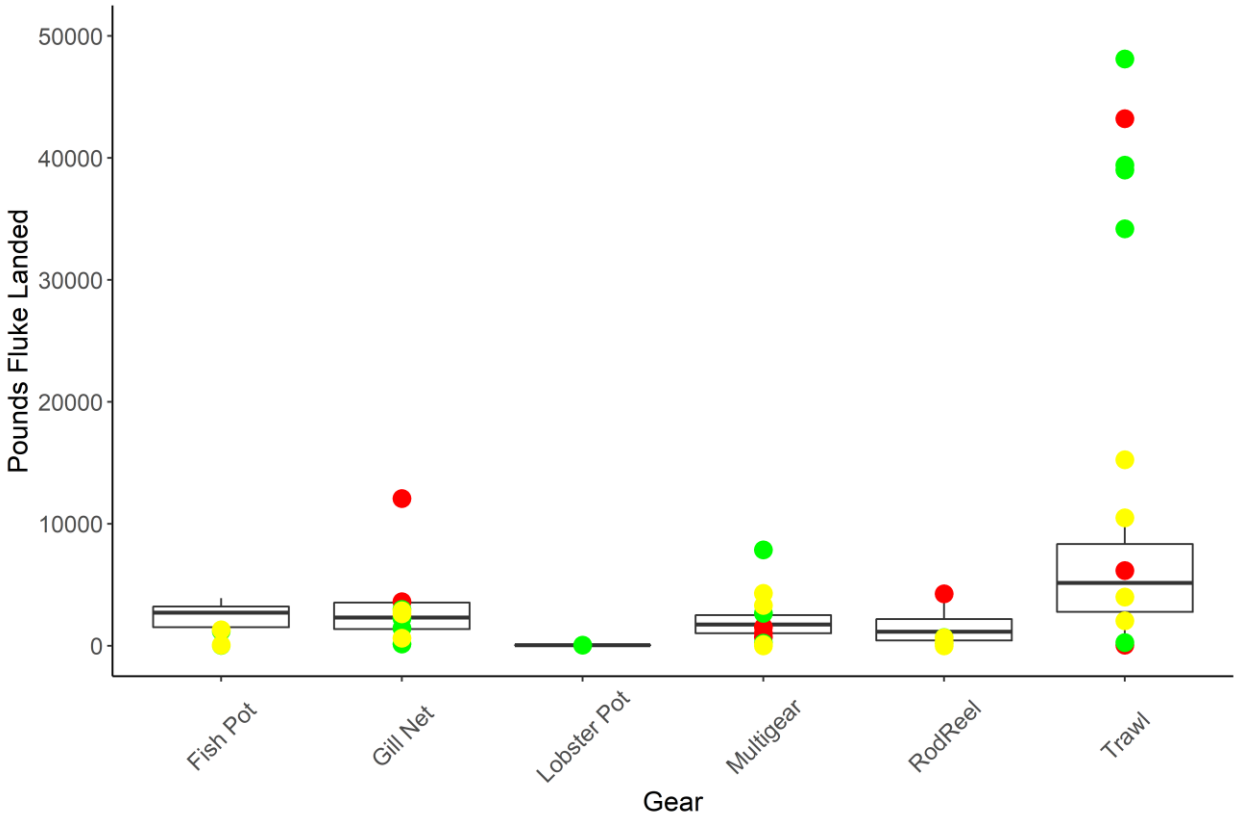

Figure 7. Historic and pilot program fluke landings (pounds) of pilot program participants. Box and whisker plots represent summarized catch (May-December) from 2014-2018 for all participants by respective gear type. Dots represent catch from 2019 (red), 2020 (green), and 2021 (yellow) for each respective captain. Note that 2021 data are partial year catch through August 2021. Dots above the box and whisker plots show catch above historic rates.

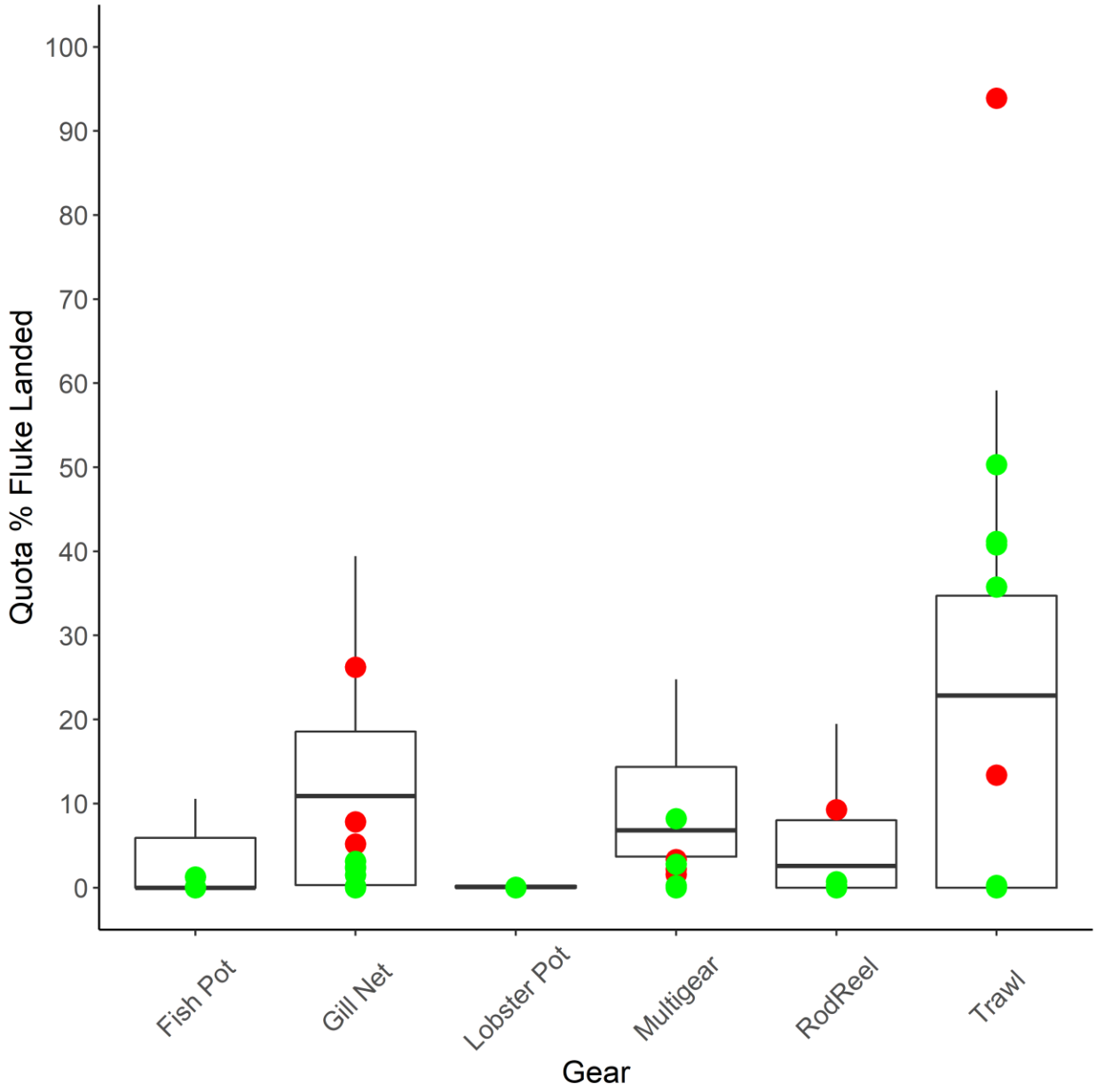

Figure 8. Historic and pilot program fluke landings (% of total available quota harvested) of pilot program participants. Box and whisker plots represent summarized catch (May-December) from 2014-2018 for all participants by respective gear type. Dots represent catch from 2019 (red) and 2020 (green) for each respective captain. Dots above the box and whisker plots show catch above historic rates.

However, increases in black sea bass catch were found across all gear types.

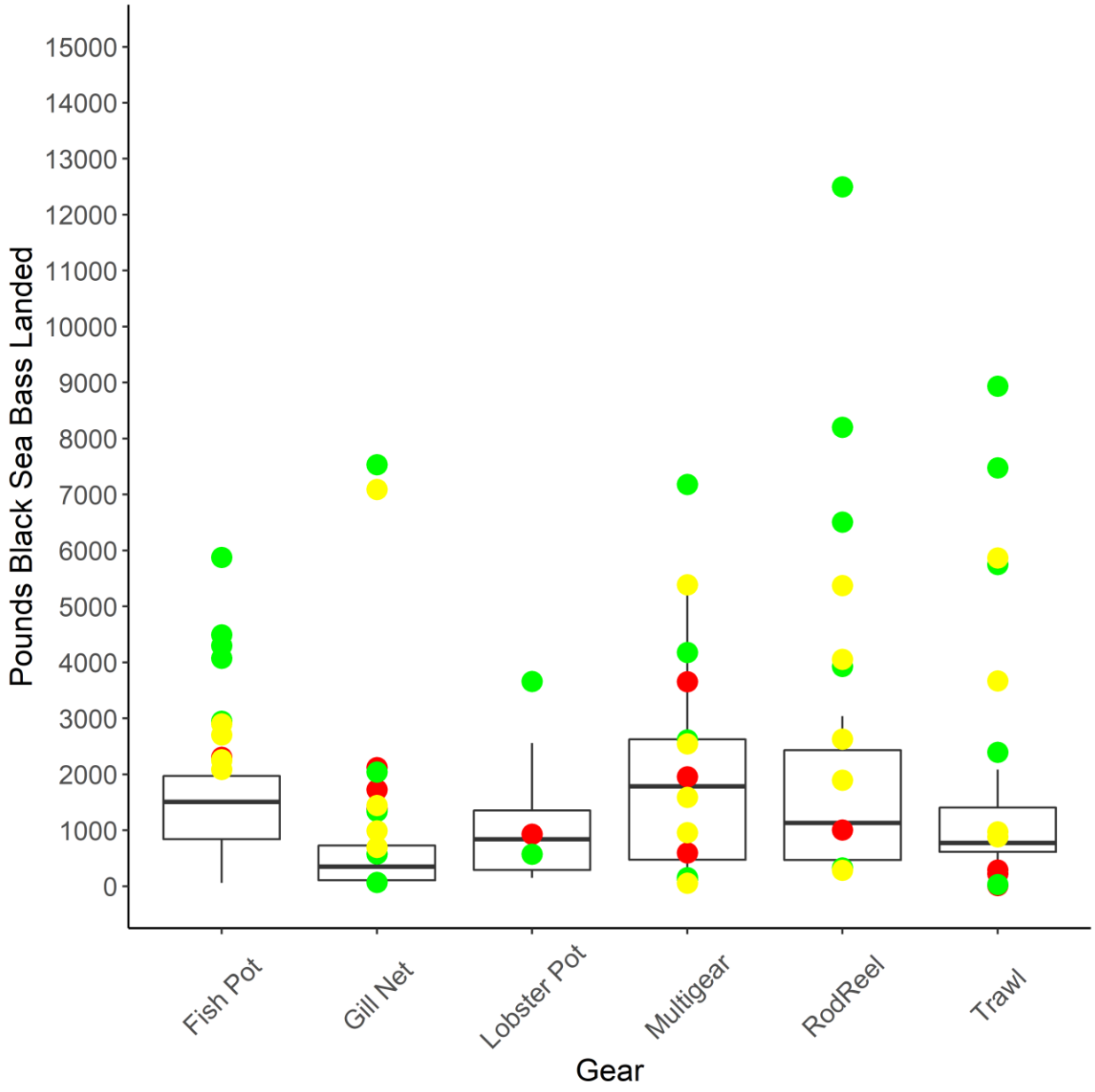

Figure 9. Historic and pilot program black sea bass landings (pounds) of pilot program participants. Box and whisker plots represent summarized catch (May-December) from 2014-2018 for all participants by respective gear type. Dots represent catch from 2019 (red), 2020 (green), and 2021 (yellow) for each respective captain. Note that 2021 data are partial year catch through August 2021. Dots above the box and whisker plots show catch above historic rates.

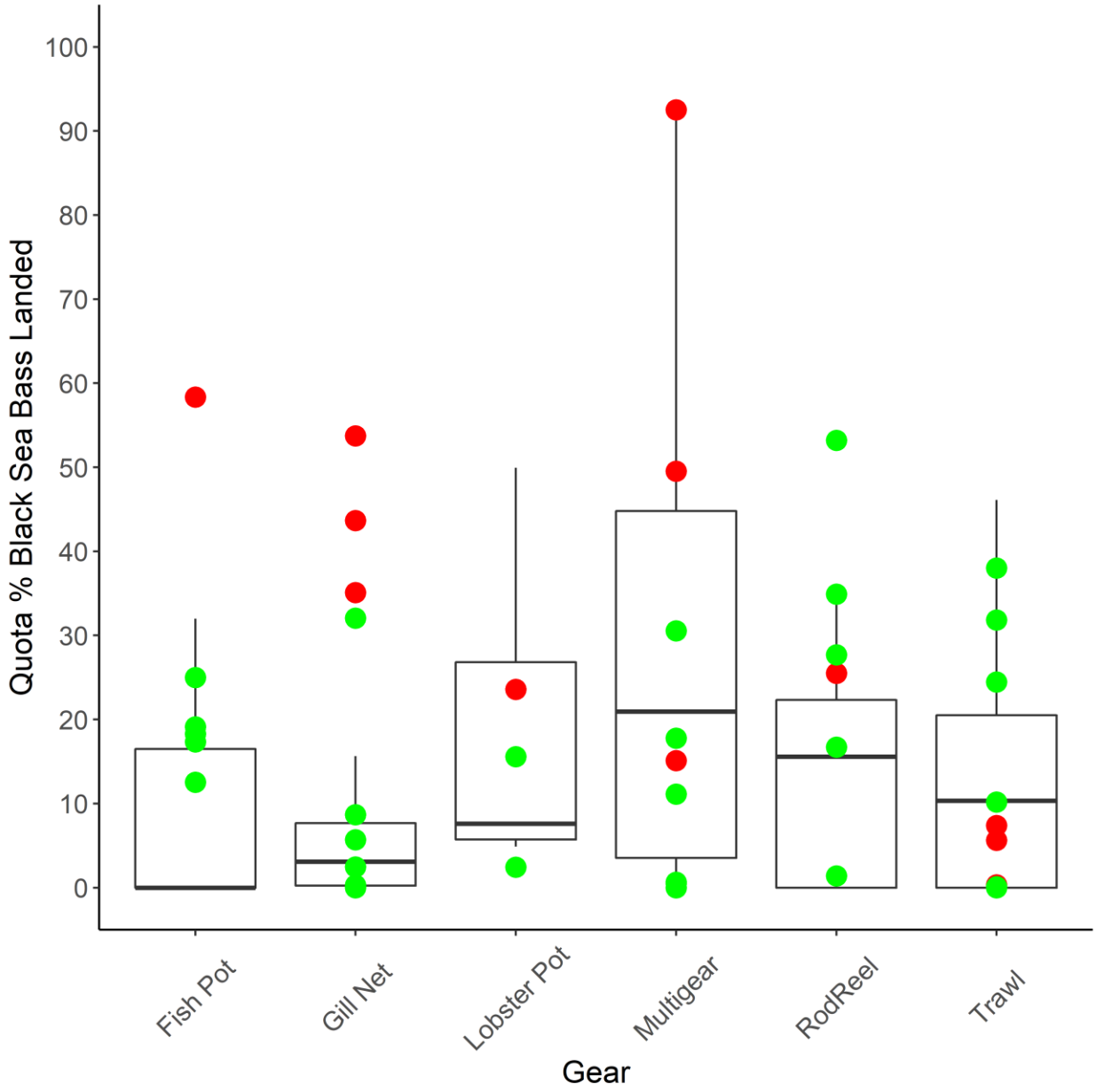

Figure 10. Historic and pilot program black sea bass landings (% of total available quota harvested) of pilot program participants. Box and whisker plots represent summarized catch (May-December) from 2014-2018 for all participants by respective gear type. Dots represent catch from 2019 (red) and 2020 (green) for each respective captain. Dots above the box and whisker plots show catch above historic rates.

4.3 Quota Tracking Simulation

4.3.1 Overview

Quota tracking simulations were run to compare historic catch rates of summer flounder and black sea bass to projected catch rates under a weekly aggregate possession limit. Data used for simulations presented in this report include two years of RI fleet data (May-December 2019 and 2020) and two and a half years of aggregate landings (May-December 2019 and 2020; May-August 2021). One hundred unique simulations were run for each scenario. The mean catch (weight) of each respective species for each week was calculated. The following simulations were run to cover a range of potential management scenarios for both summer flounder and black sea bass:

- Whole fleet fishing weekly aggregate from May 1 – December 31
- Whole fleet fishing weekly aggregate + 3 standard deviations of simulation mean catch weight (e.g., whole fleet-high effort year)
- Whole fleet fishing weekly aggregate – 3 standard deviations of simulation mean catch weight (e.g., whole fleet-low effort year)
- 50% of fleet fishing weekly aggregate (e.g., captains must choose between opting into summer or fall season [fluke], other 50% adheres to daily limits)
- Whole fleet fishing weekly aggregate *except* current winter aggregate captains (e.g., forced to choose between opting in to winter or summer/fall – all winter aggregate captains choose to stay in winter season)
- 50% of fleet fishing weekly aggregate *except* current winter aggregate captains (e.g., captains must choose between opting into summer or fall season [fluke] but current winter aggregate captains opt to stay in winter season and do not fish aggregate during summer/fall)
- Whole fleet fishing weekly aggregate *except* trawlers (trawlers adhere to daily limits)
- Whole fleet fishing aggregate at 75% historic quota limit
- Whole fleet fishing aggregate at 50% historic quota limit
- Whole fleet fishing aggregate at 25% historic quota limit
- Whole fleet fishing aggregate for first two weeks of allocation period, then reverting to daily limits after those two weeks

Given the relatively few number of participants in the pilot program from 2019 through 2021 (~30), uncertainties due to COVID related market issues, and changes in fleet composition over time, all results carry high uncertainty. Results from these simulations indicate that simulations produce 'worst case scenarios' for catch. Pilot program participant landing data from 2022, when participation was highest, indicated that the simulation models presented here generate much higher catch rates than would actually occur.

4.3.2 Methods

At the broadest level, simulations were run by replacing historic reported catch from the entire RI fishing fleet with a random catch from the pilot program fishing fleet. Catch is matched by species, gear type, and season. Gear types are generalized into five categories: trawl, rod and reel, gillnet, fish pots, and lobster pots. While multi-gear participants were included in the pilot program, their individual catch is treated gear specifically for modeling purposes. Seasons are broken down into summer (May-September) and fall (October-December). As an example, for an individual captain, the total fluke catch

from a week of trips from May 2014 caught in an otter trawl would be replaced, randomly, with a week of total fluke catch from an aggregate captain from 2019, 2020, or 2021 who fished with an otter trawl during the summer months. Likewise, a historic weekly catch of black sea bass by a captain from October 2017 in a fish pot would be replaced with a weekly catch of black sea bass from an aggregate captain from 2019, 2020, or 2021 who fished with fish pots during fall months. These replacement catches are randomly selected from the matching pool and may be higher or lower than the original historic catch. If the replacement catch exceeds the historic weekly limit that it is replacing, that value is reduced to match the historic weekly limit. This is done to adjust for historic fishing regulations. To provide an upper limit estimate for catch, summer flounder exemption certificate daily limits are used for all captains simulated, even those who did not have exemption certificates historically.

4.3.3 Results

Fishing rates (pounds of catch per trip) and total catch increased under nearly all[*] full quota scenarios for both species under all simulation scenarios compared. Comparing simulation scenarios, the whole fleet fishing with a weekly aggregate limit at a high rate resulted in the greatest catch rate while the 25% quota and 50% of the fleet with no winter I aggregate program captains scenario resulted in the lowest catch among simulations and therefore the longest open allocation periods (seasons). Effectively all aggregate scenarios resulted in earlier closures, for each respective species, than occurred historically.

The simulation model is more effective at forecasting fluke than black sea bass. Because calculations are done on weekly catch, and the catch rate compared to available quota is so high for black sea bass it is often difficult to infer where weekly closures would have occurred.

[*]- a single fluke scenario resulted in slightly reduced catch rate compared with historic catch

Fluke

The following tables show the number of days fluke was closed for each subperiod and compares it with the projected number of days that the fishery would have been closed under each respective simulation scenario. Results are broken down by allocation period and year. Within each summary table green indicates fewer closed days while red indicate more closed days.

Fluke Summer Simulations -

Table 4. Historic and simulated days closed for summer flounder for the summer season from 2014-2020. Scenarios with a greater number of closed days within an allocation are highlighted in red, while those with fewer closed days are highlighted in green.

Year	Time Period	Final Period Allocation (lbs)	Did it close early?	Total Days Closed	25% Quota	50% Fleet + No Wint Agg	Whole Fleet No Trawlers	50% Quota	2 Week Start Agg	No Wint Agg	50% Fleet	-3SD Whole Fleet	75% Quota	Mean Whole Fleet	+3SD Whole Fleet
2014	May 1 - Sept 15	578466	No	0	0	16	37	9	37	51	51	44	44	58	65
2015	May 1 - Sept 15	615801	No	0	0	0	0	0	3	17	31	24	31	52	59
2016	May 1 - Sept 15	444227	No	0	0	0	0	0	0	5	5	5	0	19	33
2017	May 1 - Sept 15	315379	Yes	30	30	30	30	30	30	30	30	30	30	41	55
2018	May 1 - Sept 15	370131	No	0	0	0	0	0	0	0	0	0	0	14	21
2019	May 1 - Sept 15	662688	No	0	0	0	0	0	0	0	0	0	0	29	36
2020	May 1 - Sept 15	736281	No	0	0	0	0	0	0	0	0	0	3	17	31

Fluke Fall Simulations -

Table 5. Historic and simulated days closed for summer flounder for the fall season from 2014-2020. Scenarios with a greater number of closed days within an allocation are highlighted in red, while those with fewer closed days are highlighted in green.

Year	Time Period	Final Period Allocation (lbs)	Did it close early?	Total Days Closed	25% Quota	50% Fleet + No Wint Agg	Whole Fleet No Trawlers	50% Quota	2 Week Start Agg	No Wint Agg	50% Fleet	-3SD Whole Fleet	75% Quota	Mean Whole Fleet	+3SD Whole Fleet
2014	Sept 16 - Dec 31	181820	Yes	6	6	25	39	32	67	60	67	74	67	81	81
2015	Sept 16 - Dec 31	211844	No	0	0	0	0	40	33	40	54	75	61	75	82
2016	Sept 16 - Dec 31	172467	No	0	0	0	7	28	14	35	49	56	56	70	77
2017	Sept 16 - Dec 31	76963	Yes	48	48	48	50	57	64	71	71	78	71	78	85
2018	Sept 16 - Dec 31	184299	Yes	3	3	3	3	30	23	30	51	58	58	65	72
2019	Sept 16 - Dec 31	298193	No	0	0	0	0	17	0	3	24	24	38	45	59
2020	Sept 16 - Dec 31	432547	No	0	0	0	0	0	0	0	5	0	12	26	40

Table 6. Summary of days closed for fluke (summer and fall seasons combined) across all scenarios, 2014-2020. The 'mean annual days closed' column shows an average of how many days the fishery is closed under different simulations. The 'percent of historic' column shows how many days the fishery remained open for each simulation compared with what actually happened in a given allotment period. Table is sorted ascending by mean total days closed.

Scenario	Mean Annual Days Closed	Percent of Historic
Historic	6	
25% Quota	6	100
50% Fleet + No Winter Agg	9	98
Whole Fleet No Trawlers	12	95
50% Quota	17	90
2 Week Start Agg	19	89
No Winter Agg	24	84
50% Fleet	31	78
-3SD Whole Fleet (Low Effort)	33	77
75% Quota	34	76
Mean Whole Fleet	48	64
+3SD Whole Fleet (High Effort)	57	56

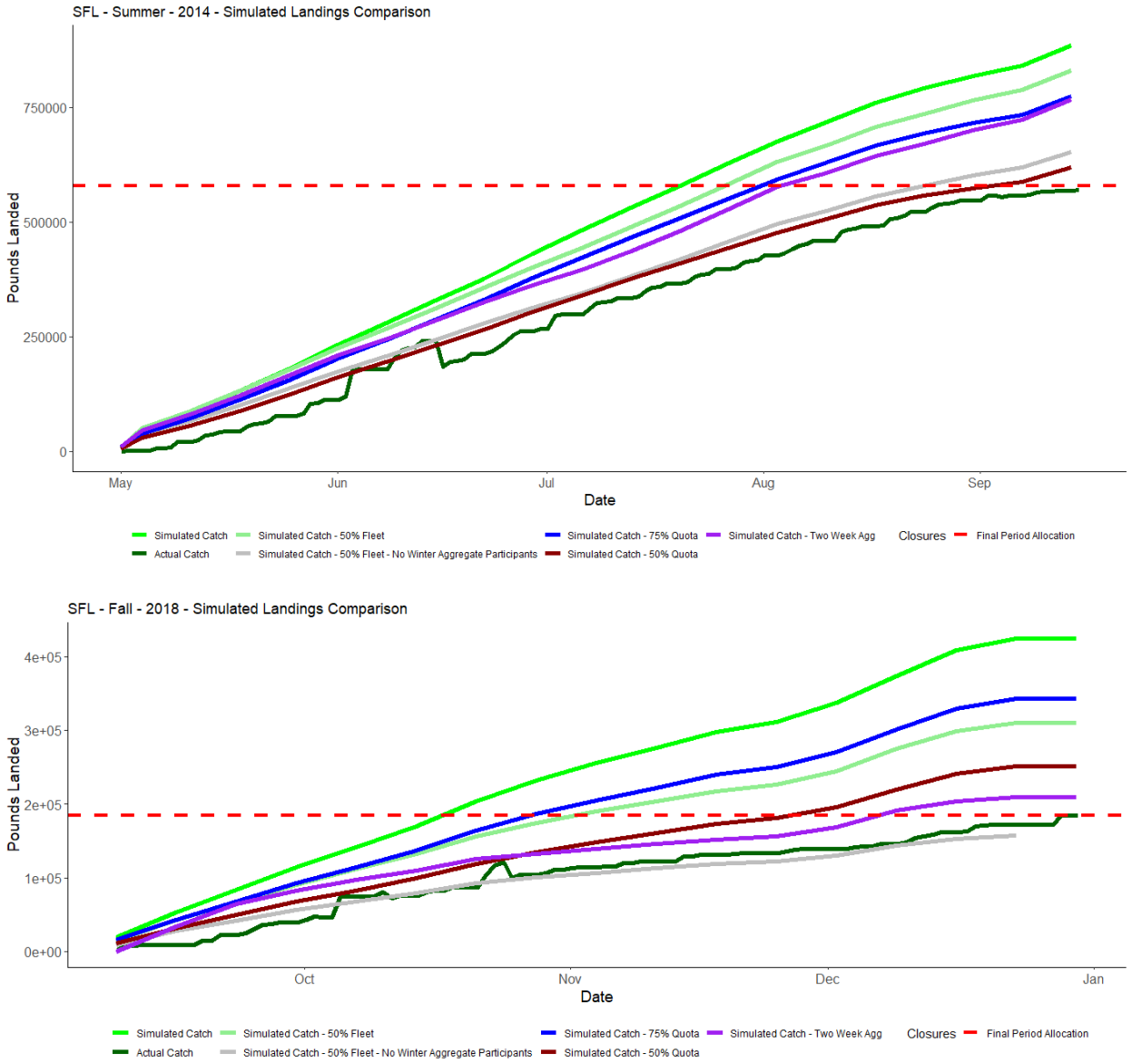

Figure 11. Example quota tracking plots for fluke displaying the true historic catch (dark green) and various simulation results. For simulations, each line represents the mean of 100 unique simulation runs. The horizontal red dashed line shows the final period allocation. The top plot shows data for the summer season in 2014. The bottom plot shows the fall season for 2018.

Black Sea Bass

Black Sea Bass May Simulations -

Table 7. Historic and simulated days open for black sea bass in the month of May from 2014-2020. Scenarios with a greater number of open days within an allocation are highlighted in green, while those with fewer open days are highlighted in red.

Year	Time Period	Final Period Allocation (lbs)	Did it close early?	Total Days Closed	25% Quota	50% Quota	50% Fleet + No Wint Agg Days Open	2 Week Start Agg	50% Fleet Days Open	-3SD Whole Fleet Days Open	75% Quota	Whole Fleet No Trawlers	No Wint Agg Days Open	Mean Whole Fleet Days Open	+3SD Whole Fleet Days Open
2014	May 1- Jun 30	58920	Yes	28	28	40	40	40	40	40	40	40	40	47	47
2015		61294	Yes	30	33	33	40	40	40	40	40	40	40	47	47
2016		75514	Yes	31	31	33	33	33	40	40	40	40	40	40	40
2017		113611	Yes	25	26	26	33	26	33	40	33	40	33	40	40
2018		102105	Yes	14	19	26	33	26	33	33	33	40	33	40	40
2019		93750	Yes	20	20	33	33	33	40	40	40	40	40	40	40
2020		178098	No	0	0	12	12	12	19	19	19	19	19	26	26

Black Sea Bass July Simulations -

Table 8. Historic and simulated days open for black sea bass in the month of July from 2014-2020. Scenarios with a greater number of open days within an allocation are highlighted in green, while those with fewer open days are highlighted in red.

Year	Time Period	Final Period Allocation (lbs)	Did it close early?	Total Days Closed	25% Quota	50% Quota	50% Fleet + No Wint Agg Days Open	2 Week Start Agg	50% Fleet Days Open	-3SD Whole Fleet Days Open	75% Quota	Whole Fleet No Trawlers	No Wint Agg Days Open	Mean Whole Fleet Days Open	+3SD Whole Fleet Days Open
2014	July 1 - July 31	46433	Yes	18	18	25	25	25	25	25	25	25	25	25	25
2015		42647	Yes	24	25	25	25	25	25	25	25	25	25	25	25
2016		58547	Yes	22	25	25	25	25	25	25	25	25	25	25	25
2017		90739	Yes	15	15	18	25	25	25	25	25	25	25	25	25
2018		79879	Yes	14	14	18	25	25	25	25	25	25	25	25	25
2019		66471	Yes	16	16	25	25	25	25	25	25	25	25	25	25
2020		127776	No	0	0	18	18	18	18	18	18	18	18	18	25

Black Sea Bass September Simulations -

Table 9. Historic and simulated days open for black sea bass in the month of September from 2014-2020. Scenarios with a greater number of open days within an allocation are highlighted in green, while those with fewer open days are highlighted in red.

Year	Time Period	Final Period Allocation (lbs)	Did it close early?	Total Days was actually open	25% Quota	50% Quota	50% Fleet + No Wint Agg Days Open	2 Week Start Agg	50% Fleet Days Open	-3SD Whole Fleet Days Open	75% Quota	Whole Fleet No Trawlers	No Wint Agg Days Open	Mean Whole Fleet Days Open	+3SD Whole Fleet Days Open
2014	Sept. 1 - Oct. 31	42508	Yes	37	37	40	40	40	40	40	40	40	40	40	40
2015		46322	Yes	38	40	40	40	40	40	40	40	40	40	40	40
2016		52458	Yes	35	35	33	40	40	40	40	40	40	40	40	40
2017		95395	Yes	19	19	19	19	19	19	19	19	26	26	26	33
2018		73104	Yes	29	29	29	33	40	40	40	40	40	40	40	40
2019		72489	Yes	34	34	34	40	40	40	40	40	40	40	40	40
2020		139559	No	0	0	12	12	12	19	19	19	19	19	19	26

Black Sea Bass November Simulations -

Table 10. Historic and simulated days open for black sea bass in the month of November from 2014-2020. Scenarios with a greater number of open days within an allocation are highlighted in green, while those with fewer open days are highlighted in red.

Year	Time Period	Final Period Allocation (lbs)	Did it close early?	Total Days was actually open	25% Quota	50% Quota	50% Fleet + No Wint Agg Days Open	2 Week Start Agg	50% Fleet Days Open	-3SD Whole Fleet Days Open	75% Quota	Whole Fleet No Trawlers	No Wint Agg Days Open	Mean Whole Fleet Days Open	+3SD Whole Fleet Days Open
2014	Nov 1 - Dec 31	16731	Yes	49	49	54	54	54	54	54	54	54	54	54	54
2015		19673	Yes	53	53	53	54	54	54	54	54	54	54	54	54
2016		26170	Yes	52	52	52	54	54	54	54	54	54	54	54	54
2017		87404	No	0	0	0	0	0	0	0	0	0	19	19	33
2018		41062	No	0	0	26	19	47	26	26	40	40	40	47	47
2019		14371	Yes	51	51	54	54	54	54	54	54	54	54	54	54
2020		126818	No	0	0	0	0	0	0	0	0	12	26	19	40

Table 11. Summary of total days open for black sea bass (May, July, September, November seasons combined) across all scenarios, 2014-2020. Table is sorted descending by total days open.

Scenario	Mean Days Closed per Year	Percent of Historic
Historic	23	
25% Quota	23	98
50% Quota	29	80
50% Fleet + No Winter Agg	30	74
2 Week Start Agg	31	71
50% Fleet	32	68
-3SD Whole Fleet (Low Effort)	32	67
75% Quota	32	66
Whole Fleet No Trawlers	34	62
No Winter Agg	34	59
Mean Whole Fleet	36	55
+3SD Whole Fleet (High Effort)	38	47

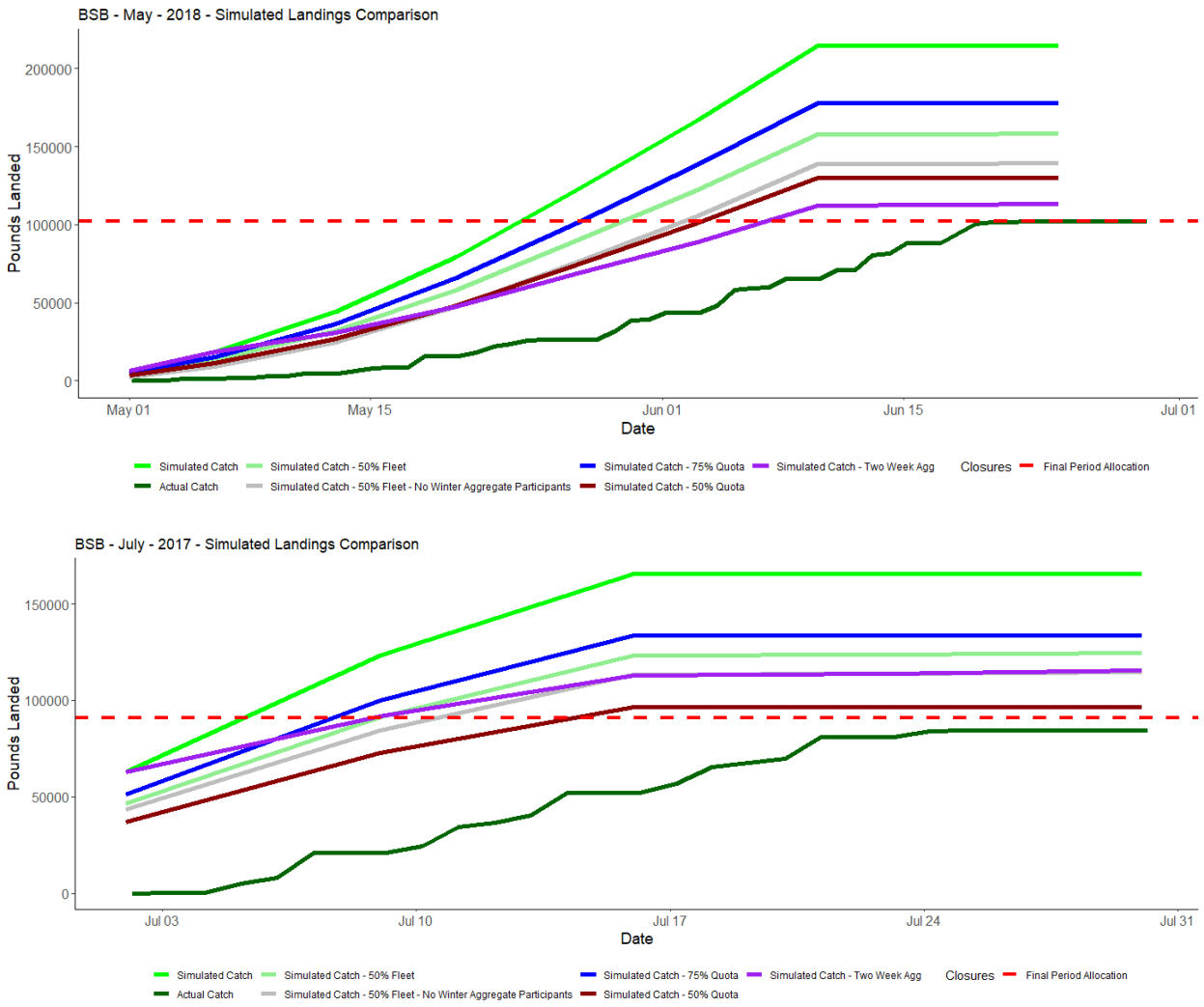

Figure 12. Example quota tracking plots for black sea bass displaying the true historic catch (dark green) and various simulation results. For simulations, each line represents the mean of 100 unique simulation runs. The horizontal red dashed line shows the final period allocation. The top plot shows data for the May allotment period in 2018. The bottom plot shows the allotment period for the month of July in 2017. Simulation runs do not start at zero because the model uses weekly timeframes as opposed to daily.

5. Input From Program Participants

An extensive and systematic assessment of the pilot program was conducted by RI DMF Deputy Chief Julia Livermore for the fishing years 2019-2021. That report is attached to this council packet and can also be found online at: https://dem.ri.gov/sites/g/files/xkgbur861/files/2022-08/Pilot_Aggregate_Report.pdf.

In summary: “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."

The structured interviews also touch upon 'intangibles' related to the pilot program that are not assessed elsewhere in this report. These include topics like flexibility in fishing practices and its relationship to matters like family time, mental health, and overall employment/financial status.

6. Summer Flounder Exemption Certificate

As part of the pilot program, the requirement for the program permitted vessel to hold a summer flounder exemption certificate to land >200lbs of fluke per day was suspended. This exception allowed the Division to determine more accurately the impact a larger scale aggregate program may have on fluke quota, as well as differences in fishing practices between summer flounder exemption certificate holding vessels and those without.

The relationship between the summer flounder exemption certificate and landings of pilot program participants is shown in Tables 12-14. Across the years 2020-2022, summer flounder weekly possession limits were always greater than 700 lbs. Therefore, the regulations allowed for a pilot program participant to harvest up to at least 700 lbs of fluke on their first day of fishing within a week. Across three years of the pilot program, vessels that held a summer flounder exemption certificate fished more total trips with higher fluke landings and a higher percentage of their trips with higher fluke landings than those vessels without an exemption certificate. If the summer flounder exemption certificate requirement had not been exempted for the pilot program, numerous trips would have resulted in a higher percentage of regulatory discards (assuming the same trips were made with or without the fluke exemption certificate exclusion for program participants). In 2020 (Table 12), 43 trips made by vessels not holding the certificate (7% of all their trips) exceeded 200 lbs. In 2021 (Table 13), 62 trips made by vessels not holding the certificate (9% of all their trips) exceeded 200 lbs. In 2022 (Table 14), 127 trips made by vessels not holding the certificate (19% of all their trips) exceeded 200 lbs.

Table 12. Fluke landings by pilot program participants in 2020 delineated by vessels with and without summer flounder exemption certificates. Trips highlighted in orange indicate landings that would have been capped at 200 lbs. if a certificate were required to land >200 lbs.

	2020			
	Fluke Cert		No Fluke Cert	
Pounds Landed	# of Trips	% of Trips	# of Trips	% of Trips
101-200	75	16%	129	20%
201-300	54	12%	24	4%
301-400	17	4%	13	2%
401-500	22	5%	3	<1%
501-600	14	3%	1	<1%
601-700	10	2%	1	<1%
>700	30	7%	1	<1%

Table 13. Fluke landings by pilot program participants in 2021 delineated by vessels with and without summer flounder exemption certificates. Trips highlighted in orange indicate landings that would have been capped at 200 lbs. if a certificate were required to land >200 lbs.

	2021			
	Fluke Cert		No Fluke Cert	
Pounds Landed	# of Trips	% of Trips	# of Trips	% of Trips
101-200	42	8%	87	13%
201-300	33	6%	27	4%
301-400	15	3%	6	1%
401-500	29	6%	29	4%
501-600	8	2%	0	0%
601-700	8	2%	0	0%
>700	31	6%	0	0%

Table 14. Summer flounder landings by pilot program participants in 2022 delineated by vessels with and without summer flounder exemption certificates. Trips highlighted in orange indicate landings that would have been capped at 200 lbs. if a certificate were required to land >200 lbs.

	2022			
	Fluke Cert		No Fluke Cert	
Pounds Landed	# of Trips	% of Trips	# of Trips	% of Trips
101-200	49	11%	70	11%
201-300	54	13%	40	6%
301-400	27	6%	19	3%
401-500	12	3%	17	3%
501-600	10	2%	9	1%
601-700	15	4%	13	2%
>700	52	12%	29	4%