

Analysis of Management Options for the Area 2C and 3A Charter Halibut Fisheries for 2023

A Report to the North Pacific Fishery Management Council

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1.0 Introduction

The International Pacific Halibut Commission (IPHC) approves catch limits for Pacific halibut each year for Regulatory Areas in Alaska. In IPHC Regulatory Areas 2C and 3A, which roughly correspond with Southeast and Southcentral Alaska, these catch limits are allocated between the commercial longline fishery and the sport charter fishery. The allocations are specified in the North Pacific Fishery Management Council's Halibut Catch Sharing Plan (CSP) for Areas 2C and 3A¹. The allocations vary with the magnitude of the overall catch limit, such that the percentage allocated to the charter sector increases slightly as catch limits decrease. The CSP also specifies that "wastage" or release (discard) mortality will count toward each sector's allocation. The CSP further specifies that, effective in 2014, charter harvest accounting will be based on numbers of halibut reported harvested in Alaska Department of Fish and Game (ADF&G) saltwater guide logbooks.

The charter fishery in Areas 2C and 3A is managed under regulations reviewed and recommended each year by the North Pacific Fishery Management Council (Council) and approved and published by the IPHC as annual management measures. As the first step in this process, the Council's Charter Halibut Management Committee met October 21, 2022, to develop alternative management measures for analysis by the ADF&G for the 2023 season. ADF&G staff provided preliminary estimates of charter harvest and release mortality for the 2022 season to committee members prior to the meeting. In Area 2C, electronic reporting of trips using eLogbook became mandatory in 2021; therefore, logbook data for all trips that were submitted prior to October 12, 2022, were used for preliminary estimates. In recent years, no harvest was reported in Area 2C after October 15th. In Area 3A, where use of paper logbooks is still widespread, the preliminary estimates were based on logbook data for trips through August 31, 2022. Estimates will be finalized by fall of 2023 once all logbook data are entered and edited. One notable change in the preliminary estimates for both Regulatory Areas is that the length-weight relationships were updated and now use the IPHC's Area specific estimates (Webster and Stewart 2022).

In Area 2C, the 2022 preliminary reported harvest for the charter fishery was 82,888 halibut with an estimated average net weight of 9.74 lb (King et al. 2022). The Area 2C preliminary estimate of charter removals was 0.843 million pounds (Mlb), including an estimated 0.037 Mlb of release mortality. The preliminary estimate of charter removals was 3% over the 0.820 Mlb allocation. Charter regulations in 2C included a one-fish bag limit and a reverse slot limit allowing for harvest of fish less than or equal to 40 inches or greater than or equal to 80 inches (U40O80).

In Area 3A, an estimated 167,090 halibut were harvested with an average weight of 10.53 lb (King et al. 2022). The preliminary estimate of charter removals for Area 3A was 1.77 Mlb, including 0.013 Mlb of release mortality. The preliminary estimate was 16% under the allocation of 2.11 Mlb. Charter regulations in 3A included a two-fish bag limit of which one fish could be any size and the second must be less than or equal to 28 inches, no harvest of halibut on Wednesdays, no harvest of halibut on two Tuesdays, a limit of one trip per vessel per day, and a limit of one trip per Charter Halibut Permit (CHP) per day.

¹ Catch Sharing Plan regulations are at: <https://www.federalregister.gov/documents/2013/12/12/2013-29598/pacific-halibut-fisheries-catch-sharing-plan-for-guided-sport-and-commercial-fisheries-in-alaska>

The Charter Committee considered the performance of last year's measures, and in light of recent trends in effort, numbers of halibut harvested by charter anglers, average weight of halibut, halibut abundance, and economic considerations, identified the following measures for analysis for 2023:

Area 2C (all options include a one-fish bag limit):

- 1) Reverse slot limit with U35-U50 on the low end and O50-O80 on the high end.
- 2) Reverse slot limit with U35-U50 on the low end and O80 on the high end, analyzed with a day of the week closure starting from the end of the season (after September 15) working to the beginning of the season (before May 15) for each day of the week.
- 3) Reverse slot limit with U35-U50 on the low end and O80 on the high end, analyzed with two day of the week closures (for each combination of days with at least two days between closures) starting from the end of the season (after September 15) working to the beginning of the season (before May 15).
- 4) Annual limits of 2-3 fish, in combination with each of the above options.

Area 3A (all options include, unless otherwise noted, a two-fish bag limit with a maximum size limit on one fish and one fish of any size, one trip per vessel and one trip per CHP per day, and a Wednesday closure all year):

- 1) Maximum size limit of 26 – 32 inches on one fish combined with one or more Tuesday closures from June 01 – August 31 or for the entire season.
- 2) Maximum size limit of 26 – 32 inches on one fish combined with Status quo with all Tuesdays closed and additional days closed on Mondays or Thursdays from June 01 – August 31 or for the entire all season.
- 3) Maximum size limit of 26 – 32 inches on one fish combined with annual limits of 2 – 4 fish, with Wednesdays closed all Tuesdays open.
- 4) Maximum size limit of 26 – 32 inches on one fish combined with annual limits of 2 – 4 fish and one or more Tuesday closures from June 01 – August 31 or for the entire, with Wednesdays closed all season.
- 5) 28-inch size limit on one fish with all days of the week open and a season closure prior to May 16 or June 1 and after July 31.
- 6) Maximum size limit of 26 – 32 inches on one fish combined with one or more Wednesday closures from June 01 – August 31 or for the entire season with all other days open.

This analysis provides information to stakeholders and the Council to assist them in selecting management measures likely to keep total charter removals within their allocations. The allocations will be derived from catch limits determined by the IPHC at their Annual Meeting in January 2023. The charter allocations will not be known when the Council is expected to make its recommendations in December 2022. However, the Council may base recommendations on the charter allocation associated with maintaining the IPHC's reference fishing intensity ($F_{43\%}$) or based on other scenarios for coastwide TCEYs and distributed mortality limits, such as the 2012 allocations. Previously, a distribution procedure was part of the interim management procedure and used to guide decisions on management measures; however, the agreement for the procedure has since expired and an updated distribution has not been established. It is recommended that the Council include contingencies to accommodate adoption of a range of catch limits.

The IPHC's 2022 stock assessment results were made available to the public on November 23rd. Because the interim management procedure has expired, and there are no Regulatory Area TCEYs to use as a reference point for the analyses for the 2C and 3A charter management measures this year. There are several reference points that the Council may wish to consider in making recommendations for 2023. The Coastwide TCEY in 2022 was 41.2 Milb; the 2022 Stock Assessment indicated that a 3-year surplus TCEY for 2023 is estimated to be 43 Milb and a TCEY at the reference fishing intensity ($F_{43\%}$) is

estimated to be 52 Mlb. The driving factor causing the increase in the $F_{43\%}$ reference TCEY from 2022 is an update to the natural mortality estimate and productivity of the stock in one of the four ensemble models used in the IPHC’s Stock Assessment. In addition to the Coastwide TCEY the Council may wish to consider changes in the stock distribution as estimated by the IPHC’s Fishery Independent Setline Survey. In 2021, survey results estimated that 11.9% of the O32 biomass (halibut ≥ 32 -inches) was in Regulatory Area 2C, while in 2022 that increased to 14.3%. In 2021, survey results estimated that 34.2% of the O32 biomass was in Regulatory Area 3A, while in 2022 that decreased to 26.3%. In recent years, distribution procedures have taken into account the distribution of O32 biomass among Regulatory Areas, in addition to other factors such as relative harvest rates, socio-economic considerations, and international agreements when determining Regulatory Area TCEYs.

We have used the 2022 allocations as reference points for the 2023 charter management measures; results presented here are within the context of allocations set for 2022:

IPHC Area	2022 Allocation (Mlb)
2C	0.82
3A	2.11

This analysis projects total charter fishery removals under the current (status quo) charter fishery regulations in each Regulatory Area. As shown below, under current regulations the projected charter removal in 2023 for Area 2C is 0.867 Mlb. The projected removal for Area 3A is 2.023 Mlb.

Area	Projected Status Quo Charter Removals (Mlb)	Status Quo TCEY Difference (Mlb) (2022 Allocation – 2023 Projection)
2C	0.867	-0.047
3A	2.023	0.087

For consistency with analyses reported in recent years, the analyses included in this report generally follow previously reported methods (Webster and Powers 2018, 2019, and 2020, and Webster, Jevons, and Powers 2021). The analyses cover a range of alternatives as proposed by the Charter Halibut Management Committee to allow stakeholders, the Council, and the IPHC to select the desired management measures to meet the charter allocation for each Area. Where applicable, results reference candidate measures that result in projected charter removals within the 2022 allocation.

2.0 General Methods

2.1 Definitions and Basic Calculations

Throughout this analysis, the term “harvest” means the number of halibut killed and landed in the charter fishery. “Yield” is the harvest expressed in units of weight. “Release mortality” refers to halibut that die as a result of stress or injury from being caught and then released and is expressed in units of weight. Finally, “removals” refers to all halibut killed in the sport fishery, including harvest and release mortality, and is measured in units of weight. Weight is based on length data from harvested halibut sampled at ports and the length-weight relationship developed by IPHC (Table 2C.1 and Table 3A.1, Webster and

Stewart 2022). Removals are generally projected from harvest, average weight, and release mortality as follows:

$$\text{Harvest}(\text{no. fish}) = \text{Effort}(\text{angler days}) \times \text{HPUE}(\text{harvest per angler day}),$$

$$\text{Yield}(\text{lb}) = \text{Harvest} \times \text{AverageNetWeight}(\text{lb}), \text{ and}$$

$$\text{Removals}(\text{lb}) = \text{Yield}(\text{lb}) \times r(\text{lb})$$

where r is the release mortality expansion factor. In IPHC Area 2C the release mortality expansion factor is a function of the lower limit of the reverse slot limit and for 2023 is calculated as:

$$r(\text{lb}) = -0.0029 * (\text{Lower Limit of Reverse Slot Limit}) + 1.1805$$

and in IPHC Area 3A the release mortality is calculated using past data as:

$$r(\text{lb}) = 1 + [\text{ReleaseMortality}(\text{lb})/\text{Yield}(\text{lb})]$$

which for 2022 is 1.008, unless otherwise noted.

2.2 Calculations by Subarea

All calculations for Area 2C and Area 3A were done by Subarea and then summed to obtain yield estimates for each Regulatory Area. Analyses were done at the Subarea level because many of the variables analyzed (harvest, effort, average weight, etc.) vary substantially by Subarea.

There are six Subareas in Area 2C and eight Subareas in Area 3A (Table 2C.2 and Table 3A.2, Figure 1). With few exceptions, the Subareas correspond to ADF&G sport fishery management areas as well as the reporting areas used for the ADF&G Statewide Harvest Survey (SWHS, mail survey of sport fishing). The Juneau and Haines/Skagway Areas were combined because the Haines/Skagway Area is not sampled for average weight and harvests are quite small. SWHS Area J is split into three Subareas: Eastern Prince William Sound (EPWS), Western Prince William Sound (WPWS), and the North Gulf Coast (NG). Likewise, Cook Inlet (SWHS Area P) is split into Central Cook Inlet (CCI) and Lower Cook Inlet (LCI) Subareas. These SWHS areas were split into Subareas such that the landings in each Subarea could be matched to estimates of average weight from port sampling. ADF&G obtained length measurements from harvested halibut and interviewed anglers and charter captains in at least one port in each Subarea. In addition, SWHS Area G (Glacier Bay) is divided into the 2C and 3A portions using statistical areas reported during biological sampling and in saltwater guide logbooks.

2.3 Harvest Forecasts

Time series methods are used to forecast effort in Area 2C and harvest per unit effort (HPUE) in both Areas. Effort is measured in angler days; any days when bottomfish hours or bottomfish statistical areas were recorded in the logbook or halibut were harvested are considered days with halibut effort, permitting that day was open to harvest of halibut. Forecasts are inherently uncertain because they rely only on past data, which are not necessarily indicative of future trends. Time series forecasts can't be used in all instances because they assume that the same underlying processes are in place as those that generated the historical data. Therefore, recent regulation changes or social/economic conditions may bias a forecast or render it unsuitable for other regulatory scenarios. Time series methods used in this report include simple and double exponential smoothing models using SAS/ETS^{TM2} software. Simple exponential models have a single parameter representing the level of the estimate and typically fit best to data without a clear trend. Double exponential models have a parameter for level and a parameter for trend, and typically fit best to data with a trend. Both models contain a smoothing weight, the value of which determines how much weight is given to more recent observations. The smoothing weights are optimized to minimize one-step-

² SAS/ETSTM software, Version 9.4, SAS System for Windows, Copyright © (2002-2012), SAS Institute, Inc.

ahead prediction errors over the entire time series. Generally, the stronger the trend and lower the variability, the higher the smoothing weight and the more emphasis is placed on recent observations. Generally, both simple and double exponential models were run for each time series and the forecasts with the smallest AICc value (Akaike Information Criterion, corrected for small sample size) were selected.

For Area 2C, the 2023 harvest forecasts were calculated for each Subarea as the product of the effort and HPUE forecasts. Simple exponential and double exponential forecasts were generated for 2023 effort using logbook data for 2009- 2022 for Subareas B, C, D, and G2C; 2020 was omitted from all Areas due to the impacts of COVID-19 on recreational fishing effort that year. Simple exponential models were used for all areas except for B and D for forecast effort.

In 3A, there were substantial and incremental changes in regulations over recent years that specifically target fishing effort including vessel trip limits, CHP trip limits, closing days to fishing, and annual limits. Therefore, 2022 estimate of effort in 3A was assumed as the status quo effort for 2023. In addition, implementation of the first size limits in Area 3A in 2014 resulted in a marked decline in the proportion of the charter halibut harvest made up of second fish in the bag limit (Figure 4). The largest decreases were in Subareas with the highest average weights (Glacier Bay and Yakutat). In other words, at ports with large halibut available, fewer anglers harvested a second fish, preferring instead to focus on harvesting one large fish. The decrease in retention of a second fish by anglers caused HPUE to decline as well (Figure 4). However, the areawide proportion of second fish retained continued to decline every year through 2019 even though changes in size limits and annual limits were quite minor. In 2020, the proportion of second fish in the harvest increased in all 3A ports and remained high in 2021. Areawide, HPUE was likely impacted by the regulations implemented in response to the COVID-19 pandemic in both 2020 and 2021, therefore, forecasts were generated for HPUE using logbook data for 2009-2019 and 2022 for all Subareas in Area 3A (Table 3A.3, Figure 3).

2.4 Accounting for Release Mortality of Halibut

Under the CSP, the charter halibut allocation includes total removals by the charter sector, including directed harvest and estimated release mortality. In 2018, the IPHC requested that all sizes of discards be included in the directed commercial fishery allocations (prior to 2018 only fish greater than or equal to 26 inches were included). While the CSP is vague with regards to sizes of discards, release mortality of all sizes of halibut were included in projected removals for consistency with the commercial sector and the intent of the IPHC. All sizes of release mortality have been estimated for 2013-2022 for inclusion in the IPHC's annual stock assessment as part of sport fishery removals. Estimation methods are documented in Webster and Buzzee (2020) and in ADF&G's annual reports to the IPHC³.

The numbers and average weight of released fish are expected to vary with the regulations (e.g. types of size limits, bag limits, annual limits). For example, anglers would be expected to release more fish under a one-fish bag limit than a two-fish bag limit as they search for the largest fish possible to retain. The average weight of released fish would be expected to be higher under maximum size limits or reverse slot limits than under a minimum size limit, because more of the released fish would be large. On the other hand, the number of fish released is likely to be higher under a minimum than maximum size limit because smaller fish are relatively more abundant and more likely to be caught. Under reverse slot limits, the amount of release mortality would be expected to vary with the sizes and range of the protected slot. A wide protected slot would likely result in more released fish than a narrow slot, and a higher protected slot would result in a higher average weight of released fish. Under annual limits, both the number of fish and average weight of released fish would likely increase as annual limits are made more restrictive. Seasonal or daily closures will also increase total number of released fish.

³ The ADF&G annual reports to the IPHC are available for download at <https://www.npfmc.org/fisheries-issues/fisheries/halibut-fisheries/halibut-recreation/>

In Area 2C, under reverse slot limits, the ratio of release mortality to charter yield (in pounds) is correlated to the lower bound of the reverse slot limit. Due to the correlation between the lower bound of the slot limit and release mortality, a linear regression model is used for projections. Under status quo regulations, the predicted 2023 ratio of release mortality to harvested halibut is 0.065.

In Area 3A, the ratio of release mortality to charter yield has generally decreased over time, mostly due to a decrease in the number of released fish rather than to changes in the average weight of released fish. The ratio was 0.018 in 2013, and then decreased steadily from 0.022 in 2014 to 0.007 in 2022. For 2023 projections, the 5-year average of 0.008 was applied to yield to account for release mortality under the status quo management measures.

3.0 Area 2C Management Measures

3.1 Status Quo Forecast of the Number of Fish Harvested

Status quo measures for Area 2C include a one-fish bag limit and U40O80 reverse slot size limit. Models of 2023 effort predicted similar effort to 2022 in three of six Subareas (Figure 2). HPUE is predicted to decrease slightly in all ports and be similar to pre-pandemic conditions (Table 3A.15). The 2023 status quo effort forecast for Area 2C is 114,044 angler-days, the weighted average HPUE forecast is 0.71 halibut per angler-day, and the harvest forecast is 80,402 halibut, with a 95% margin of error (± 2 standard errors) of $\pm 3,630$ fish (Table 2C.4). This is a decrease from the preliminary harvest for 2022 of 82,686 halibut.

3.2 Reverse Slot Limit

3.2.1 Approach

Reverse slot size limits have been used to manage the Area 2C charter fishery since 2012. The goal of the reverse slot limit is to control the average weight of the harvest by requiring retained fish to be either below a lower size limit or above an upper size limit. The reverse slot size limit functions mostly as a maximum size limit, while still preserving the opportunity for anglers to retain exceptionally large fish. The charter industry and the Council have recommended reverse slot size limits because they effectively control average weight without severely impacting angler demand under a one-fish bag limit, thus preserving charter revenues in the face of restrictions.

Average weight under reverse slot limits was predicted using the same methods used for 2014-2022. Briefly, this procedure fixes the proportion of harvest above the upper size limit equal to the proportion in 2010, the last year without a size limit. The proportion of harvest below the lower size limit is assigned the remainder. Average weight is then estimated as a weighted mean of the average weight of fish above and below the upper and lower limits in 2010, where the weighting factors are the respective proportions of harvest above and below those limits. All estimates of average weight were adjusted to account for the updated length-weight relationship in all 2C analyses.

Average weights estimated from the fishery in 2019-2022 were compared to the 2010 predicted average weights for the size limits that were in place at the time. The average weights estimated from the fishery included any illegally harvested fish in the protected size slot between the lower and upper size limits (illegal-size fish made up an estimated 0.6% to 1.6% of the Area 2C harvest each year). Errors in predicted average weights ranged from -9.2% to +62.8% for individual Subareas. Predicted average weight errors were highly variable among years and among Subareas. Correction factors were developed for the predicted average weights for each Subarea. The correction factors were based on the average ratio of the predicted and observed average weights from all years and ranged from 0.66 to 1.00 among Subareas.

Total charter removals were projected for 2023 under a range of reverse slot limits with lower limits ranging from 35 to 50 inches and upper limits ranging from 50 to 80 inches. Projections of charter

removals include the correction factors for bias in estimation of average weight as well as an inflation factor for predicted release mortality based on the lower slot limit.

3.2.2 Results

The projected charter removal under the status quo size limit of U40080 is 0.867 Mlb (Table 2C.5). Projections ranged from 0.713 to 1.685 Mlb. Several options for reverse slot limits were below the 2022 allocation of 0.82 Mlb with lower slot limits of 35 – 38 inches and upper limits of 70 to 80 inches. The most liberal combinations of reverse slot limits that were below the 2022 allocation are shaded in Table 2C.5.

3.3 Reverse Slot Limit with Various Annual Limits

3.3.1 Approach

The effects of various annual limits (two to three fish) on harvest in 2C were estimated using charter logbook data that summarized the distribution of annual harvests by individual licensed anglers using 2022 as the base year. Calculations of annual harvests could not be done for youth anglers (under 16 years old for nonresidents and under 18 years old for residents) because they are not required to be licensed, and therefore harvest cannot be assigned to individuals. Youth accounted for 3.8% – 4.7% (average 4.3%) of charter effort in Area 2C during the years 2011-2022 with the lowest proportion in 2008 and 2020. Because the proportion of youth effort was steady and relatively low, we assume that leaving youth anglers out of the calculations did not significantly bias estimates of the effects of implementing annual limits.

For each Subarea, harvests under each proposed annual limit were estimated by truncating the annual harvest of each angler during the base year at the annual limit. For example, if 500 anglers harvested five fish each in the base year (2,500 fish total), then under an annual limit of four fish, that group of 500 anglers would only harvest 2,000 fish. The number of anglers that would be affected by each annual limit was calculated as the number of anglers that harvested more than the annual limit in the base year. In the example above, all 500 anglers harvested more than four fish and would be affected by a four-fish annual limit, but anglers that harvested four or fewer fish would be unaffected. Using this approach, the annual harvest by licensed anglers was calculated over a range of annual limits and the percentage reduction in harvest was calculated by comparison to their total harvest without an annual limit. All calculations were done by Subarea and summed to obtain the harvests under each annual limit in Areas 2C.

Doing the calculations by Subarea slightly underestimates the harvest reductions associated with annual limits because some anglers fish in multiple Subareas within a year. For example, if an individual angler caught four fish in each of two Subareas in the base year, the analysis by Subarea would indicate that a four-fish annual limit would have no effect on that angler's annual harvest in either Subarea. However, the limit would reduce that angler's annual harvest by 50 percent. The degree of underestimation depends on how many anglers fished multiple Subareas in a year. The magnitude of this error was evaluated by comparing the percentage harvest reductions estimated from Subarea and areawide data. For Area 2C, the estimated reductions in harvest based on Subarea data were underestimated by 0.3% for annual limits from two or three fish; therefore, the underestimation caused by anglers fishing multiple Subareas was negligible and may provide a slightly conservative estimate.

Total charter removals were projected for a range of two and three fish annual limits under a range of reverse slot limits with lower limits ranging from 35 to 50 inches and upper limits ranging from 50 to 80 inches. Tables of projected total removals were generated for 2023 harvest forecasts with annual limits. A single level of harvest is associated with each sub-table because it was assumed that the size limits by themselves have no effect on the number of fish harvested. Projections of charter removals include the correction factors for bias in estimation of average weight as well as an inflation factor for predicted release mortality based on the lower slot limit.

3.3.2 Results

The areawide estimated harvest reductions associated with annual limits were about 25.6% under an annual limit of two fish and 6.5% under an annual limit of three fish (Table 2C.5).

If a two-fish annual limit were implemented, a range of reverse slot limits with lower limits of 35 to 49 inches and upper limits of 58 to 80 inches are forecast to constrain the charter harvest to an allocation of 0.82 Milb in 2023 (Table 2C.7a). Forecasts indicate that a range of reverse slot limits with lower limits of 35 to 40 inches and upper limits of 66 to 80 inches combined with a three-fish annual limit would constrain the charter harvest to 0.82 Milb (Table 2C.7bbelow).

3.4 Reverse Slot Limit with Day of the Week Closures

3.4.1 Approach

Harvest was projected with day of the week closures in Area 2C with reverse slot limits ranging from a lower limit of 35 to 50 inches and with the upper limit fixed at 80 inches. The potential effect of closing days on each day of the week with starting dates from May 14th through September 23rd or for the entire year was estimated (Table 2C.8a-g). The analysis relied on complete logbook data for 2019. Generally, speaking, the analysis proceeded by estimating the proportional effect of each day closure in 2019 and applying those to the harvest forecast for 2023. 2019 data were used because it was the most recent year with complete data that was not affected by the COVID-19 pandemic.

The first step was to identify dates that would be closed in 2023 under each possible number of closed days for each day of the week. Once the specific closed dates for each scenario were identified, the corresponding dates for each day of the week was identified from the 2019 data set for analyses. The analysis assumed that the proportion of harvest occurring on each day in 2019 would be eliminated if those days were closed. In other words, the harvest that occurred on those days represented the maximum potential change in harvest if those days were closed. All analyses were done by Subarea to account for differences in the structure of the charter fleet among Subareas. The total annual harvest under each scenario of closed days was compared to the harvest scenario of no closed days (2019) to estimate the proportional change in harvest for 2023.

Options for closing one day for the entire year (Table 2C.9) and a range of dates on a second day of the week were also explored following the above methods (Table 2C.12a-g).

A day of the week closure would be unlikely to achieve the estimated maximum reductions in halibut harvest because of the potential for displaced clients to book on alternate dates. We do not have sufficient information to accurately estimate the effect of a day of the week closure; we can only say that it would reduce halibut harvest by no more than the presented maximum reductions, and that the reduction would likely be less.

3.4.2 Results

Implementation of a daily closure on a single day of the week could be used to bring the projected removals below an allocation of 0.82 Milb (Table 2C.8a-g). In general, Monday closures are projected to result in slightly lower removals than other days of the week. Many options for variable numbers of closure days on each day of the week in concert with reverse slot limits with lower limits ranging from 38 to 44 inches are forecasted to keep removals below 0.82 Milb. A wide range of options are available with closure dates on a second day, depending on which days of the week are selected and the season's size limits (Table 2C.12).

3.5 Reverse Slot Limit with Annual Limits Combined with Day of the Week Closures

3.5.1 Approach

Harvest was projected in Area 2C under reverse slot limits with lower limits of 35 to 50 inches and an upper limit of 80 inches with a combination of annual limits of two or three fish and closed days on each day of the week with starting dates from May 14th through September 23rd or for the entire year, and for one day closed for the entire year and additional closures on a second day. The same protocols were used for this analysis as the analyses for annual limits and day of the week closures, outlined above. Annual limits were applied to harvest estimates prior to day of the week closure reductions because they have a more definitive effect on overall harvest.

These estimates should be considered maximum reductions in harvest relative to annual limits because we do not know how many anglers might rebook on alternate days of the week and still harvest their annual limit.

3.5.2 Results

Implementation of an annual limit combined with a daily closure could be used to bring the projected removals below the 2022 allocation under numerous combinations of reverse slots, closed days, and annual limits. The actual reductions achieved from these management measures will be somewhere between reductions from a reverse slot limit with annual limits alone and the maximum reductions presented in Tables 10a-g, 11a-g, 12 a-g, 13a-g, and 14a-g. For a three fish and two fish annual limit, fewer days would need to be closed to stay within allocations if annual limits were implemented. With three-fish annual limits and one closed day, lower limits of 40 to 46 inches are possible under a 0.82 Mlb allocation, and with two closed days it ranged from 45 to 50. With two-fish annual limits and two closed days, all combinations of lower limits and closed days came under the 2022 allocation, and with one closed day the lower limits ranged from 49-50 inches.

4.0 Area 3A Management Measures

4.1 Status Quo Forecast of the Number of Fish Harvested

The status quo measures for Area 3A included a two-fish bag limit with a maximum size limit of 28 inches on one fish, no retention of halibut on Wednesdays, no retention of halibut on two Tuesdays, and limits of one trip per vessel and one trip per CHP per day. HPUE decreased in all Subareas from 2013 – 2019 which was likely a result of the number of anglers retaining two fish due to size limits on the second fish and to a lesser extent the imposition of annual limits, then increased in all Subareas in 2020 and 2021 likely due to the change of size limits that allowed for harvest of a larger second fish and removal of the annual limit. The larger size limits in 2020 and removal of the annual limits were implemented because of the COVID-19 pandemic and therefore data from those years were not included in the HPUE forecasts. The status quo effort forecast for Area 3A for 2023 is 115,079 angler-days, with a weighted average HPUE of 1.46 halibut per angler-day, and the harvest forecast is 169,046 halibut with a 95% margin of error (± 2 standard errors) of 5,368 fish (Table 3A.3). This is a slight increase from the preliminary harvest estimate for 2022 of 164,382 halibut.

4.2 Forecast of the Average Weight in each Subarea

4.2.1 Approach

Average weight was calculated as a weighted mean of the fish of any size and the fish subject to a maximum size limit. Calculations were done for each Subarea, then aggregated to Area 3A. All data associated with average weight was updated to use the current estimated length-weight relationship for 3A. The average weight for the fish of any size was assumed to be the overall average weight in 2013, the last year without a size limit in Area 3A. The average weight for size-restricted fish was calculated as the average weight of fish less than or equal to the specified size limit in 2013 (28 inches under status quo, size limits from 26 to 32 inches were all evaluated). These average weights were then weighted by the 2023 projected proportions of harvest made up of “first” and “second” fish in an angler’s bag limit. These terms do not refer to the order in which the fish were caught, but rather to whether the fish came from

limits of one or two fish. For example, if an angler kept only one halibut on a trip, the fish was designated a “first” fish. If an angler kept two halibut, one was designated “first” and the other “second.” The proportions of “second” fish in the harvest were forecasted for 2023 from 2010-2019 and 2022 logbook data using the exponentially-weighted time series models described in Section 2.3. Data from 2020 and 2021 were excluded to mimic the methods used to forecast HPUE and because the substantial increase seen in second fish in 2020 and 2021 was likely a result of regulations reflective of pandemic conditions. These forecasted proportions ranged from 43-44% in Cook Inlet down to 4-11% in the Glacier Bay and Yakutat Subareas, with a weighted average of 37% for Area 3A overall (Figure 4).

The average weights predicted using this method for each size limit differed from average weights observed under those size limits in past years. Factors contributing to those differences include changes since 2013 in the size distribution of the population, changes in the sizes of fish anglers are willing to keep given annual limits, and changes in the proportions of first and second fish in the harvest. Therefore, the predicted average weights were corrected, or adjusted to match current average weights. Bias corrections were based on the difference between predicted and estimated (observed) average weights for 2019-2022. Predicted average weights for past years tended to be underestimated for most Subareas, ranging from 40.5% below to 21.8% above observed values across all Subareas and years. Correction factors, based on the average ratio of the predicted and observed average weights, ranged from .90 to 1.31 among Subareas.

4.2.2 Results

The status quo forecast of average weight in 3A is 11.87 lbs. Status quo is based on a two fish bag limit with one fish of any size and a maximum size limit of 28 inches on one fish. This is above the 2022 preliminary average weight estimate of 11.07 lbs. Estimated removals, including yield and release mortality, under status quo regulations is 2.023 Mlb and is below the 2022 allocation of 2.11 Mlb.

4.3 Maximum Size Limit on One Fish Combined with Tuesday closures

4.3.1 Approach

Charter removals were projected under maximum size limits ranging from 26 to 32 inches on the second fish and Tuesday closures from May through August or for the entire season were explored for flexibility in recommending management measures. Projected removals include a 0.8% inflation factor to account for release mortality and a correction for the average weight as described above. These projections incorporate all other status quo measures.

The analysis for Tuesday closures relied on complete logbook data for 2021, the last year in which the fishery was open on all Tuesdays and closed on Wednesdays. The analysis proceeded by estimating the proportional effect of closing Tuesdays in 2021 and applying those proportional effects to the harvest forecast for 2023. The first step was to identify the dates of specific Tuesdays that would be closed in 2023 under each possible number of closed days. A range of 13 Tuesdays closures during the period May 30-August 22, 2023, and all Tuesdays from February – December, 2023 were evaluated (Table 3A.5). Once the specific closed Tuesdays were identified, the corresponding Tuesday to each of those dates was identified from 2021. The analysis assumed the proportions of harvest occurring on each Tuesday in 2021 would be eliminated if those days were closed, respectively. Closing all Tuesdays beyond the May 30 – August 22 period would only reduce harvest another 2.5% (Table 3A.4), reflecting the relatively low levels of harvest in the shoulder seasons.

In past years, this analysis relied on maintaining the proportion of harvest before and after July 31st due to the availability of preliminary logbook data. With mandatory eLogbooks in Southeast Alaska, reliable preliminary logbook data are now available through August 31st in Southcentral due to the associated reduction in data entry demands, so maintaining the proportion of harvest before and after July 31st is no longer essential to analyses. Nevertheless, 3A analyses proceeded by selecting closed days in the same

manner as past years' analyses. The benefit to this practice is that closing days during the peak of the season results in greater reductions to effort and harvest with fewer days closed.

As outlined in the 2C analysis of daily closures, the harvest reductions (relative to all Tuesdays open) under each scenario represent the maximum expected reduction in the number of fish harvested. A day of the week closure would be unlikely to achieve the maximum reduction in halibut harvest because of the potential for displaced anglers to book on alternate dates. We do not have sufficient information to accurately estimate the effect of a day of the week closure; we can only say it would reduce halibut harvest by no more than the presented maximum reductions, and that the reduction would likely be less.

Average weight under each size limit from 26 to 32 inches was calculated as a weighted mean of the fish of any size and the fish subject to a maximum size limit as outlined in section 4.2.1.

4.3.2 Results

Removal estimates for combinations of closed Tuesdays and size limits on one fish ranged from 1.685 Mlb for a 26-inch fish with all Tuesdays closed to 2.219 Mlb for a 32-inch fish with no Tuesdays closed (Table 3A.5). Combinations of size limits and closed days that were below the 2022 allocation of 2.11 Mlb ranged from 28 to 32 inches and zero to five closed Tuesdays.

4.4 Maximum Size Limit on One Fish Combined with Tuesdays closed and Additional Days Closed

4.4.1 Approach

Status quo regulations in Area 3A included a year-round closure of the charter fishery on Wednesdays and two Tuesdays. Charter removals were projected with all Tuesdays closed under maximum size limits ranging from 26 to 32 inches and Monday or Thursday closures ranging from zero to thirteen days or for the entire season. Projected removals include a 0.8% inflation factor to account for release mortality. These projections incorporate all other status quo measures.

The analysis estimated the proportional reduction in halibut harvest with each additional daily closure in 2021 and applied those proportional reductions to the harvest forecast for 2023. 2021 was used as the base year because it was the most recent year with available data with the same or fewer days closed as status quo. Specific dates for closure days in 2023 can be found in Table 3A.6.

Identification of closed Mondays and Thursdays and estimation of the proportional effects followed the same procedures outlined above for closed Tuesdays. Methods for changes in the maximum size limit followed the procedures outlined in section 4.2.1.

4.4.2 Results

The potential reductions in harvest relative to status quo ranged from 13.5% for all Tuesdays and no closed Monday or Thursday to 30.0% to 29.8% for all closed Tuesdays and all closed Mondays or Thursdays, respectively (Table 3A.6a-b). Proportional reductions and projected removals varied slightly and were generally similar between Monday and Thursday closures. For the entire year, Mondays had slightly more savings than Thursdays. Removal estimates with Tuesdays closed and combinations of closed Mondays and size limits on one fish ranged from 1.364 Mlb to 1.838 Mlb (Table 3A.7). Removal estimates with Tuesdays closed and combinations of closed Thursdays and size limits on one fish ranged from 1.368 Mlb to 1.845 Mlb (Table 3A.8). All combinations of size limits and closed days were below the 2022 allocation of 2.11 Mlb.

4.5 Maximum Size Limit on One Fish Combined with Annual Limits

4.5.1 Approach

Combinations of other size limits and annual limits were explored to provide the Council flexibility in recommending management measures. Charter removals were projected under maximum size limits ranging from 26 to 32 inches on the second fish and annual limits of two to four fish. Projected removals

include a 0.8% inflation factor to account for release mortality. These projections incorporate all other status quo measures, including the charter vessel trip limit, permit trip limit, and a Wednesday closure for the entire year; this analysis assumed all Tuesdays were open.

Average weight under each size limit was calculated as described in section 4.2.1.

The effects of various annual limits on harvest were estimated using preliminary charter logbook data that summarized the distribution of annual harvests by individual licensed anglers from 2022. Calculations of annual harvests could not be done for youth anglers because they are not required to be licensed, and therefore harvest cannot be assigned to individuals. Youth accounted for 5.9% of charter effort in Area 3A in 2022. Because the proportion of youth effort was relatively low, we assume that leaving youth anglers out of the calculations did not bias estimates of the effects of implementing annual limits.

For each Subarea, harvests under each proposed annual limit were estimated by truncating the annual harvest of each angler during 2022 at the given annual limit. For example, if 500 anglers harvested four fish each in 2022 (2,000 fish total), then under an annual limit of three fish, that group of 500 anglers would only harvest 1,500 fish. The number of anglers that would be affected by each annual limit was calculated as the number of anglers that harvested more than the given annual limit in 2022. In the example above, all 500 anglers harvested more than three fish and would be affected by a three-fish annual limit, but anglers that harvested three or fewer fish would be unaffected. Using this approach, the annual harvest by licensed anglers was calculated over a range of annual limits and the percentage reduction in harvest was calculated by comparison to their total harvest with no annual limit. All calculations were done by Subarea and summed to obtain the harvests under each annual limit in Area 3A.

Doing the calculations by Subarea slightly underestimates the harvest reductions associated with annual limits because some anglers fish in multiple Subareas within a year. For example, if an individual angler caught two fish in each of two Subareas in the base year, the analysis by Subarea would indicate that a three-fish annual limit would have no effect on that angler's annual harvest in either Subarea. In reality, the limit would cut that angler's annual harvest by 25 percent. The degree of underestimation depends on how many anglers fished multiple Subareas in a year. The magnitude of this error was evaluated by comparing the percentage harvest reductions estimated from Subarea and areawide data. The Subarea method underestimated the reductions in harvest by 3.3 to 0.6 percentage points for annual limits from two to four fish, respectively. The underestimation caused by anglers fishing multiple Subareas was considered negligible. Furthermore, because this underestimated the reduction of harvest, results are considered conservative estimates.

4.5.2 Results

The effects of annual limits varied by Subarea, with the largest effects in the Kodiak (Table 3A.9). Areawide, application of annual limits to the harvest would result in harvest reductions of 3.4% to 15.2% with four to two fish annual limits. With all other status quo measures in effect (and all Tuesdays open), implementing a four-fish annual limit is estimated to reduce the harvest from 173,458 to 167,646 halibut (Table 3A.9).

A 30 inch size limit on the second fish combined with a four-fish annual limit is forecast to constrain removals to below 2022's allocation of 2.11 Mlb; options for larger size limits and more restrictive annual limits are also available (Table 3A.10).

4.6 Maximum Size Limit on One Fish Combined with Annual Limits and Tuesday Closures

4.6.1 Approach

Combinations of other size limits, annual limits, and Tuesday closures were explored to provide the Council flexibility in recommending management measures. Charter removals were projected under maximum size limits ranging from 26 to 32 inches, one to thirteen Tuesday closures or a Tuesday closure

for the entire season and annual limits of two to four fish. Projected removals include a 0.8% inflation factor to account for release mortality. These projections incorporate other status quo measures, including the charter vessel trip limit, permit trip limit, a Wednesday closure for the entire year.

Average weight under each size limit was calculated as described in section 4.2.1. Effects of annual limits were calculated as described in section 4.5.1. These were applied prior to the effect of Tuesday closures as annual limits are expected to have a more definitive effect on harvest. Effects of Tuesday closures were then applied following the methods outlined in section 4.3.1.

4.6.2 Results

Combinations of 30-to-32-inch size limits with a four-fish annual limit and zero to two closed Tuesdays are forecast to constrain removals below the 2022 allocation of 2.11 Mlb; more restrictive annual limits allow for larger size limits with fewer closed days (Table 3A.11a-c).

4.3 Maximum Size Limit on One Fish Combined with Wednesday openings

4.3.1 Approach

Charter removals were projected under maximum size limits ranging from 26 to 32 inches on the second fish and Wednesday openings from June through August or for the entire season were explored for flexibility in recommending management measures. Projected removals include a 0.8% inflation factor to account for release mortality and a correction for the average weight as described above. These projections incorporate all other status quo measures.

The analysis for Wednesday closures relied on complete logbook data for 2014, the last year in which the fishery was open on all days throughout the season. The analysis proceeded by estimating the proportional effect of Wednesdays in 2014 and applying those proportional effects to the harvest forecast for 2023. Methods for identifying closed days followed those outlined in above sections. The analysis assumed the proportions of harvest occurring on each Tuesday in 2014 would be added if those days were opened, respectively.

Average weight under each size limit from 26 to 32 inches was calculated as a weighted mean of the fish of any size and the fish subject to a maximum size limit as outlined in section 4.2.1.

4.3.2 Results

Removal estimates for combinations of opened Wednesdays and size limits on one fish ranged from 1.997 Mlb for a 26-inch fish with all Wednesdays closed to 2.657 Mlb for a 32 inch fish with all Wednesdays open (Table 3A.12). Combinations of size limits and closed days that were below the 2022 allocation of 2.11 Mlb ranged from 26 to 28 inches and 11 to All closed Wednesdays.

4.7 Status Quo with All Days of the Week Open and a Seasonal Closure Prior to May 16 or June 1 and After July 31

4.7.1 Approach

This analysis looked at changing the halibut season for the charter sector in Area 3A from the status quo (February 1 – December 31) to an opening date of either May 16 or June 1 and a closing date of July 31. This management measure would allow for harvest on all days of the week throughout the open season. These projections incorporate all other status quo measures.

Status quo regulations in Area 3A included a year-round closure to retention of halibut by the charter fishery on Wednesdays and two Tuesdays. The analysis for opening all days relied on complete logbook data for 2014, the last year in which the fishery did not have any daily closures. The analysis proceeded by estimating the proportional effect of closed days in 2014 and applying those proportional effects to the harvest forecast for 2023. Estimated harvest for the entire year with all days opened was 204,594 halibut; this was used as the base harvest to estimate seasonal closures.

The analysis then assumed that the proportions of harvest in 2021 occurring before and after the open season dates would be eliminated if those days were closed in 2023. 2021 was used as the base year because it is the most recent year with complete data.

Average weight under each size limit was calculated and corrected as described in section 4.2.1 and a 0.08% release mortality inflation factor was added to estimate removals.

4.9.2 Results

The projected removals associated with all days of the week open from May 16 – July 31 and all other status quo management measures were 1.596 Milb. The projected removals for a season with all days of the week open from June 1 – July 31 were 1.463 Milb (Table 3A.14). The projected removals are below the 2022 allocation.

5.0 Implementation Considerations

5.1 Size Limits

There are no anticipated problems associated with implementation of a reverse slot limit in Area 2C or maximum size limit on the second fish in Area 3A. Size limits have been used successfully in both Regulatory Areas for several years. Maximum size limits and reverse slot limits are implemented for the charter halibut fishery to control the average weight of harvested fish. This type of regulation increases the number of fish released thereby increasing removals associated with release mortality. Not only do these size limits generate additional regulatory (versus voluntary) release of halibut, they also increase the average weight of released fish. The relative impact of size limits, in terms of release mortality and angler satisfaction, is expected to vary by Subarea due to variation in the availability of large fish caught. For example, clients fishing in Subareas where large fish are commonly caught would likely end up releasing relatively more fish above the maximum size limit or in the protected slot, and those fish would likely be larger. Although release mortality is higher under size limits, it is included in the estimates of removals and is accounted for in the charter sector allocation.

5.2 Annual Limits

Annual limits were implemented in Area 3A in 2015 (5 fish) and 2016 – 2019 (4 fish). If annual limits are recommended for the charter fishery in either area, it is crucial for enforcement purposes to ensure that the regulation be accompanied by a recording requirement like that implemented in past years. Specifically, immediately upon retaining a halibut, charter anglers must record, in ink, the date, location (IPHC area), and species (halibut) on their harvest record. Enforcement of the annual limit consists of checking anglers with halibut to make sure the harvest is recorded. It is expected that Guided Angler Fish (GAF) taken under the CSP would be exempt from the recording requirement as these harvests accrue toward the IFQ fishery allocation.

Halibut harvest accounting by individual anglers would be implemented through ADF&G charter logbooks as was done in past years. Logbooks require reporting the number of halibut kept and released by individual anglers, as well as the angler's name and fishing license/ID number. No number can be recorded for youth anglers as they are not required to be licensed. Under the CSP, all anglers (including youth) are required to certify in the logbook that the reported number of halibut kept and released is correct.

Another concern with annual limits is that compliance may be low among youth anglers. Youth anglers are not required to be licensed but are still required to complete a harvest record upon harvesting halibut. Although enforcement in the field would be no different for youth anglers, their annual harvests cannot be evaluated post-season using logbook data. However, youth anglers comprised only 4.0% of angler-days in Area 2C and 5.9% of angler-days in Area 3A in 2022, so harvest by youth anglers beyond the annual limit is unlikely to be substantial.

5.3 Daily Closures

As mentioned earlier, the primary issue with daily closures is that the effect cannot be accurately predicted or evaluated. Daily closures are expected to reduce effort, and therefore their effect is confounded with any factors that affect effort (e.g., trip limits, economic trends). This analysis could only estimate the maximum potential change in halibut harvest but cannot predict possible changes in angler behavior, such as anglers booking alternate days. Closure of days during the peak season (June through August) may be more effective than closure of a day or two here and there. With each additional day closed, there would be fewer days available to rebook and fewer charters available to take the displaced anglers. The effectiveness of day of the week closures in Area 2C is expected to be similar to those seen in Area 3A. However, differences in business models and angler behavior between the Areas may impact the effectiveness of this management measure.

Another impact of daily closures is the potential increase in the harvest of other species such as salmon, rockfishes, sablefish, and lingcod. Some charter businesses are able to book anglers to catch other species, particularly salmon. Increases in harvest may intensify conservation concerns for these stocks.

5.4 Seasonal Closures

The projections of charter removals under a shorter season are sensitive to the proportion of fish harvested during the proposed open and closed season in past years. Data from 2021 were used in this analysis, but the possibility that 2021 data are not representative of what may happen in 2023 should also be considered. If implemented, one consideration is that this measure could cause a shift in the distribution of effort and harvest into the open season. As with daily closures, the effect cannot be accurately predicted or evaluated. A shorter season is expected to reduce effort. This analysis could only estimate the maximum potential reduction in halibut harvest but cannot predict possible changes in angler behavior, such as anglers booking alternate days. With a shorter season, there would likely be less available space to rebook on alternate dates or with alternate businesses.

As with daily closures, another impact of a shorter season is the potential increase in the harvest of other species such as salmon, rockfishes, sablefish, Pacific cod, and lingcod. Some charter businesses are able to book anglers to catch other species, particularly salmon. Increases in harvest may intensify conservation concerns for these stocks.

6.0 References

- Marrinan, S. and M. Fey. 2017. Charter Halibut Permit Latency Discussion Paper. Unpublished discussion paper presented to the North Pacific Fishery Management Council in December 2017. <https://npfmc.legistar.com/LegislationDetail.aspx?ID=3205273&GUID=24B349B0-A8E5-4671-B5FB-8C43284E1922>
- Stewart, I., A. Hicks, R. Webster, D. Wilson., and B. Hutniczak. 2021. Summary of the data, stock assessment, and harvest decisions table for the Pacific halibut (*Hippoglossus stenolepis*) at the end of 2021. Report for the 2021 Interim Meeting of the International Pacific Halibut Commission, November 30- December 1, 2021, IPHC-2021-IM097-10 Rev_1.
- Webster, R. and I. Stewart. 2022. Revision of the IPHC length-weight relationship. Report for the 2022 Annual Meeting of the International Pacific Halibut Commission, January 25 – January 28, 2022. IPHC-2022-AM098_INF07.
- Webster, S., M. Jaenicke, D. Tersteeg, M. Ford, and M. Schuster. 2021. Letter from ADF&G to IPHC reporting final 2020 and preliminary 2021 sport halibut harvest estimates, Oct 25, 2021.
- Webster, S. and R. Powers 2018. Analysis of management options for the Area 2C and 3A charter halibut fisheries for 2019: A report to the North Pacific Fishery Management Council, December 2018. Alaska Department of Fish and Game. Unpublished. https://www.npfmc.org/wp-content/PDFdocuments/halibut/Charter/2018/2019_Mgt_Analysis.pdf
- Webster, S. and R. Powers 2019. Analysis of management options for the Area 2C and 3A charter halibut fisheries for 2020: A report to the North Pacific Fishery Management Council, December 2019. Alaska Department of Fish and Game. Unpublished. <http://meetings.npfmc.org/CommentReview/DownloadFile?p=13fa6dae-9093-4fba-b15a-57224c8277f8.pdf&fileName=Analysis%20of%20Charter%20Mgmt%20Options%20C%203A%20for%202020.pdf>
- Webster, S., and B. Buzzee. 2020. Estimation and projection of statewide sport halibut harvest. Alaska Department of Fish and Game, Division of Sport Fish, Regional Operational Plan ROP.SF.4A.2020.04, Anchorage. <https://www.adfg.alaska.gov/FedAidPDFs/ROP.SF.4A.2020.04.pdf>
- Webster, S. and R. Powers 2020. Supplemental analysis of management options for the 3A charter halibut fisheries for 2020: A report to the North Pacific Fishery Management Council, January 2020. Alaska Department of Fish and Game. Unpublished. <https://meetings.npfmc.org/CommentReview/DownloadFile?p=24da17e2-6181-415e-85c2-674888755867.pdf&fileName=C1%20Supplemental%20Analyses%20of%20Charter%20Mgmt%20Options%20for%203A%202020.pdf>
- Webster, S. and R. Powers 2020. Analysis of management options for the Area 2C and 3A charter halibut fisheries for 2021: A report to the North Pacific Fishery Management Council, December 2020. Alaska Department of Fish and Game. Unpublished. <https://meetings.npfmc.org/CommentReview/DownloadFile?p=24f83f52-b5fd-4b3e-b6b1-53a925ce2c74.pdf&fileName=Analysis%20of%20Charter%20Mgmt%20Options%20C%203A%20for%202021.pdf>
- Webster, S., B. Jevons and R. Powers 2021. Analysis of management options for the Area 2C and 3A charter halibut fisheries for 2022: A report to the North Pacific Fishery Management Council, December 2020. Alaska Department of Fish and Game. Unpublished. <https://meetings.npfmc.org/CommentReview/DownloadFile?p=ea129c39-34b5-4fef-840f-2c194bb67ea8.pdf&fileName=C1%20Analysis%20of%20Charter%20Mgmt%20Options%20for%202022.pdf>

Analysis of Management Options for the Area 2C Charter Halibut Fisheries for 2023

Table 2C.1. Estimated average net weight (headed and gutted) of Pacific halibut by length for Area 2C. Estimates are based on the current International Pacific Halibut Commission length-weight relationships⁴.

Length (in)	Net Weight (lb)	Length (in)	Net Weight (lb)	Length (in)	Net Weight (lb)	Length (in)	Net Weight (lb)
22.5	3.4	40.0	21.2	57.5	67.7	75.0	158.2
23.0	3.6	40.5	22.1	58.0	69.6	75.5	161.6
23.5	3.9	41.0	23.0	58.5	71.5	76.0	165.0
24.0	4.1	41.5	23.9	59.0	73.5	76.5	168.5
24.5	4.4	42.0	24.8	59.5	75.5	77.0	172.1
25.0	4.7	42.5	25.8	60.0	77.5	77.5	175.7
25.5	5.0	43.0	26.7	60.5	79.6	78.0	179.3
26.0	5.4	43.5	27.7	61.0	81.7	78.5	183.0
26.5	5.7	44.0	28.8	61.5	83.9	79.0	186.8
27.0	6.0	44.5	29.8	62.0	86.1	79.5	190.6
27.5	6.4	45.0	30.9	62.5	88.3	80.0	194.4
28.0	6.8	45.5	32.0	63.0	90.6	80.5	198.3
28.5	7.2	46.0	33.2	63.5	92.9	81.0	202.3
29.0	7.6	46.5	34.3	64.0	95.3	81.5	206.3
29.5	8.0	47.0	35.5	64.5	97.7	82.0	210.4
30.0	8.5	47.5	36.8	65.0	100.1	82.5	214.5
30.5	8.9	48.0	38.0	65.5	102.6	83.0	218.7
31.0	9.4	48.5	39.3	66.0	105.1	83.5	222.9
31.5	9.9	49.0	40.6	66.5	107.7	84.0	227.2
32.0	10.4	49.5	41.9	67.0	110.3	84.5	231.6
32.5	10.9	50.0	43.3	67.5	113.0	85.0	236.0
33.0	11.5	50.5	44.7	68.0	115.7	85.5	240.5
33.5	12.0	51.0	46.1	68.5	118.4	86.0	245.0
34.0	12.6	51.5	47.6	69.0	121.2	86.5	249.6
34.5	13.2	52.0	49.1	69.5	124.0	87.0	254.2
35.0	13.9	52.5	50.6	70.0	126.9	87.5	258.9
35.5	14.5	53.0	52.2	70.5	129.8	88.0	263.7
36.0	15.2	53.5	53.8	71.0	132.8	88.5	268.5
36.5	15.8	54.0	55.4	71.5	135.8	89.0	273.4
37.0	16.5	54.5	57.0	72.0	138.9	89.5	278.3
37.5	17.3	55.0	58.7	72.5	142.0	90.0	283.3
38.0	18.0	55.5	60.4	73.0	145.1	90.5	288.4
38.5	18.8	56.0	62.2	73.5	148.3	91.0	293.5
39.0	19.6	56.5	64.0	74.0	151.6	91.5	298.7
39.5	20.4	57.0	65.8	74.5	154.9	92.0	303.9

⁴ IPHC length-weight relationships for IPHC Area 2C are $NetWt(lb) = 8.198 \times 10^{-6} ForkLength(cm)^{3.20}$ from iphc-2022-lwt-2cimperial.pdf.

Table 2C.2: Subareas of IPHC Areas 2C, ports where ADF&G halibut sampling occurs, and Subarea abbreviations used in tables and figures in this report.

IPHC Area	Subarea	Ports with Sampling and Angler Interviews	Abbreviations
2C	Ketchikan	Ketchikan	Ketch, A
	Prince of Wales Island	Craig, Klawock	PWalesI, PWI, B
	Petersburg/Wrangell	Petersburg, Wrangell	Pburg, C
	Sitka	Sitka	D
	Juneau, Haines, Skagway	Juneau	Jun, E, EF
	Glacier Bay (2C portion)	Gustavus, Elfin Cove	GlacB, GlacB-2C, G2C

Table 2C.3: Charter logbook effort, harvest per unit effort, and harvest of halibut in IPHC Area 2C, 2013 - 2022. Preliminary numbers for 2022 (in italics) are based on logbook data for charter trips entered as of November 7, 2022.

Year	Subarea						Total 2C
	Ketch	PWI	Pburg	Sitka	Jun	GlacB-2C	
Effort (angler-days)*							
2013	13,582	20,180	3,029	24,470	9,288	11,206	81,755
2014	14,680	21,491	2,839	28,638	10,375	12,390	90,413
2015	16,685	21,931	3,071	31,113	11,391	10,613	94,804
2016	16,595	23,440	3,373	31,093	12,069	9,694	96,264
2017	18,678	25,466	3,133	33,481	13,729	9,786	104,273
2018	21,661	25,708	3,538	32,394	13,993	11,396	108,690
2019	20,998	24,412	3,194	33,057	14,674	10,414	106,749
2020	4,521	12,644	1,934	16,605	4,089	5,133	44,926
2021	13,536	26,082	3,303	33,689	12,112	12,618	101,340
2022	<i>20,892</i>	<i>28,435</i>	<i>3,265</i>	<i>36,771</i>	<i>12,777</i>	<i>12,783</i>	<i>114,923</i>
Halibut Harvest per Angler-Day (HPUE)							
2013	0.494	0.833	0.696	0.706	0.698	0.792	0.713
2014	0.486	0.801	0.729	0.761	0.678	0.789	0.719
2015	0.465	0.744	0.691	0.759	0.675	0.768	0.693
2016	0.507	0.725	0.621	0.789	0.633	0.667	0.687
2017	0.460	0.753	0.630	0.777	0.592	0.692	0.677
2018	0.440	0.729	0.606	0.751	0.572	0.637	0.644
2019	0.439	0.742	0.523	0.766	0.615	0.699	0.661
2020	0.776	0.771	0.768	0.834	0.854	0.783	0.804
2021	0.674	0.794	0.668	0.806	0.718	0.786	0.768
2022	<i>0.481</i>	<i>0.795</i>	<i>0.614</i>	<i>0.809</i>	<i>0.691</i>	<i>0.738</i>	<i>0.719</i>
Harvest (number of halibut)							
2013	6,711	16,810	2,107	17,265	6,487	8,880	58,260
2014	7,138	17,214	2,071	21,798	7,034	9,781	65,036
2015	7,762	16,322	2,121	23,611	7,687	8,153	65,656
2016	8,414	16,999	2,095	24,528	7,642	6,469	66,147
2017	8,590	19,173	1,975	26,018	8,123	6,769	70,648
2018	9,530	18,731	2,143	24,327	7,998	7,255	69,984
2019	9,217	18,105	1,672	25,306	9,020	7,280	70,600
2020	3,507	9,750	1,485	13,848	3,490	4,020	36,100
2021	9,125	20,706	2,206	27,155	8,692	9,919	77,803
2022	<i>10,049</i>	<i>22,613</i>	<i>2,005</i>	<i>29,747</i>	<i>8,835</i>	<i>9,437</i>	<i>82,686</i>

*Effort is defined as angler-days with recorded bottomfish hours or harvest of at least one halibut.

Table 2C.4. Forecasts of effort, halibut harvest per unit effort (HPUE), and harvest (numbers of halibut) for Area 2C in 2023 under status quo regulations, with associated standard errors. Status quo regulations include a one-fish bag limit and U40O80 reverse slot size limit.

Subarea	Effort (angler-days)	Std Error	HPUE	Std Error	Harvest (no. halibut)	Std Error
Ketch	19,084	3,075	0.465	0.043	8,875	1,639
PWI	28,939	1,524	0.760	0.040	21,997	1,645
Pburg	3,149	364	0.597	0.047	1,881	263
Sitka	37,428	1,772	0.795	0.048	29,745	2,278
Jun	12,776	1,209	0.691	0.045	8,834	1,015
GlacB-2C	12,667	1,363	0.716	0.059	9,070	1,223
Area 2C	114,044	4,286	0.705	*	80,402	3,630

*This SE cannot be calculated because unlike effort and harvest, HPUE is not expected to additive across subareas.

Table 2C.5. Projected charter removals (Mlb) for Area 2C in 2023 under reverse slot limits ranging from U35O50 to U50O80 with a 1-fish bag limit. Shaded cells represent projections for the most liberal combinations that do not exceed the 2022 allocation of 0.82 Mlb. All values in the table include corrections for errors in estimation of average weight and inflation factors for release mortality.

Harvest = 80,402

Lower Limit (in)	Upper Length Limit (in)															
	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
35	1.385	1.295	1.225	1.145	1.086	1.034	0.963	0.894	0.854	0.825	0.795	0.773	0.745	0.728	0.726	0.713
36	1.418	1.330	1.261	1.182	1.124	1.073	1.003	0.935	0.895	0.866	0.836	0.814	0.786	0.770	0.768	0.755
37	1.436	1.350	1.282	1.203	1.146	1.095	1.026	0.958	0.919	0.890	0.860	0.838	0.811	0.794	0.792	0.779
38	1.465	1.380	1.313	1.236	1.179	1.130	1.061	0.994	0.955	0.926	0.896	0.875	0.848	0.831	0.829	0.816
39	1.486	1.402	1.336	1.260	1.204	1.155	1.086	1.020	0.981	0.953	0.923	0.902	0.875	0.858	0.856	0.844
40	1.502	1.420	1.355	1.280	1.224	1.176	1.108	1.042	1.004	0.975	0.946	0.925	0.898	0.882	0.880	0.867
41	1.522	1.442	1.378	1.303	1.248	1.200	1.134	1.068	1.030	1.002	0.973	0.952	0.925	0.909	0.907	0.895
42	1.535	1.456	1.393	1.319	1.265	1.217	1.151	1.086	1.048	1.021	0.992	0.971	0.944	0.928	0.926	0.914
43	1.550	1.471	1.409	1.337	1.283	1.236	1.170	1.106	1.068	1.041	1.012	0.992	0.965	0.949	0.947	0.935
44	1.571	1.495	1.433	1.362	1.309	1.262	1.197	1.134	1.096	1.069	1.041	1.020	0.994	0.978	0.976	0.964
45	1.595	1.520	1.460	1.390	1.337	1.291	1.227	1.164	1.127	1.100	1.072	1.052	1.025	1.010	1.008	0.995
46	1.610	1.536	1.477	1.408	1.356	1.311	1.247	1.185	1.148	1.121	1.093	1.073	1.047	1.031	1.029	1.017
47	1.630	1.558	1.500	1.432	1.381	1.336	1.273	1.211	1.175	1.148	1.121	1.101	1.075	1.059	1.057	1.045
48	1.644	1.573	1.516	1.448	1.398	1.353	1.291	1.230	1.193	1.167	1.139	1.119	1.094	1.078	1.076	1.064
49	1.669	1.600	1.544	1.477	1.428	1.384	1.322	1.262	1.226	1.199	1.172	1.153	1.127	1.111	1.110	1.098
50	1.685	1.618	1.562	1.497	1.448	1.405	1.343	1.284	1.248	1.222	1.195	1.176	1.150	1.135	1.133	1.121

Table 2C.6. Estimated effects of annual limits of two to three halibut on Area 2C charter anglers and projected harvest for 2023. Effects were estimated using 2022 logbook data from licensed anglers. The percent of affected anglers is the portion of individual anglers that harvested more than the specified annual limit in 2022.

Annual Limit	Subarea						
	Ketch	PWI	Pburg	Sitka	Jun	GlacB	Area 2C
Estimated percent of anglers affected by the annual limit:							
2	13.6%	57.8%	25.5%	49.2%	34.5%	46.3%	42.4%
3	2.2%	10.8%	9.1%	10.1%	20.1%	21.9%	11.2%
Estimated percent change in harvest relative to no annual limit:							
2	-11.1%	-28.3%	-19.2%	-25.7%	-28.9%	-31.0%	-25.6%
3	-2.0%	-5.5%	-5.9%	-5.3%	-12.5%	-12.0%	-6.5%
Projected harvest (number of halibut):							
2	7,891	15,777	1,520	22,106	6,277	6,259	59,830
3	8,694	20,782	1,770	28,178	7,733	7,978	75,136
No Limit	8,875	21,997	1,881	29,745	8,834	9,070	80,402

Table 2C.7. Projected charter removals (Mlb) for Area 2C in 2023 under reverse slot limits ranging from U35O50 to U50O80 with a 1-fish bag limit combined with **annual limits ranging from three to two fish**. Shaded cells represent projections for the most liberal upper and lower size limits that do not exceed the 2022 allocation of 0.82 Mlb. All values in the table include corrections for errors in estimation of average weight and inflation factors for release mortality.

A. 3-fish annual limit, harvest = 75,136

Lower Limit (in)	Upper Length Limit (in)															
	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
35	1.292	1.208	1.142	1.067	1.012	0.965	0.899	0.834	0.797	0.770	0.742	0.722	0.695	0.680	0.678	0.666
36	1.323	1.241	1.176	1.102	1.048	1.001	0.936	0.872	0.835	0.808	0.781	0.760	0.734	0.719	0.717	0.705
37	1.340	1.259	1.195	1.122	1.069	1.022	0.957	0.894	0.857	0.830	0.803	0.783	0.757	0.742	0.740	0.728
38	1.367	1.287	1.225	1.153	1.100	1.054	0.990	0.927	0.890	0.864	0.837	0.817	0.792	0.776	0.775	0.763
39	1.386	1.308	1.246	1.175	1.123	1.077	1.014	0.952	0.915	0.889	0.862	0.843	0.817	0.802	0.800	0.788
40	1.402	1.325	1.264	1.194	1.142	1.097	1.034	0.972	0.936	0.910	0.884	0.864	0.839	0.824	0.822	0.810
41	1.420	1.345	1.285	1.216	1.165	1.120	1.057	0.997	0.961	0.935	0.909	0.889	0.864	0.849	0.847	0.836
42	1.432	1.358	1.299	1.230	1.180	1.136	1.074	1.014	0.978	0.952	0.926	0.907	0.882	0.867	0.865	0.854
43	1.446	1.373	1.314	1.246	1.197	1.153	1.091	1.032	0.996	0.971	0.945	0.926	0.901	0.886	0.884	0.873
44	1.466	1.395	1.337	1.270	1.221	1.178	1.117	1.058	1.023	0.997	0.972	0.953	0.928	0.913	0.911	0.900
45	1.489	1.419	1.362	1.296	1.248	1.205	1.145	1.086	1.051	1.026	1.001	0.982	0.957	0.943	0.941	0.930
46	1.503	1.434	1.378	1.313	1.265	1.223	1.163	1.105	1.071	1.046	1.021	1.002	0.977	0.963	0.961	0.950
47	1.522	1.454	1.400	1.336	1.288	1.247	1.188	1.130	1.096	1.071	1.046	1.028	1.003	0.989	0.987	0.976
48	1.535	1.468	1.415	1.351	1.304	1.263	1.204	1.147	1.113	1.089	1.064	1.045	1.021	1.007	1.005	0.994
49	1.558	1.493	1.441	1.378	1.332	1.291	1.233	1.177	1.143	1.119	1.095	1.076	1.052	1.038	1.036	1.025
50	1.573	1.510	1.458	1.396	1.351	1.311	1.253	1.198	1.164	1.140	1.116	1.097	1.074	1.059	1.058	1.047

b. 2-fish annual limit, harvest = 59,830

Lower Limit (in)	Upper Length Limit (in)															
	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
35	1.025	0.958	0.905	0.846	0.803	0.765	0.713	0.662	0.632	0.610	0.589	0.573	0.552	0.540	0.538	0.529
36	1.050	0.984	0.933	0.874	0.832	0.795	0.743	0.692	0.662	0.641	0.620	0.604	0.583	0.571	0.570	0.561
37	1.064	0.999	0.948	0.890	0.848	0.811	0.760	0.709	0.680	0.659	0.638	0.622	0.601	0.590	0.588	0.579
38	1.085	1.022	0.972	0.915	0.873	0.837	0.786	0.736	0.707	0.686	0.665	0.650	0.629	0.617	0.616	0.607
39	1.101	1.038	0.989	0.933	0.892	0.856	0.805	0.756	0.727	0.706	0.685	0.670	0.649	0.638	0.636	0.627
40	1.114	1.052	1.003	0.948	0.907	0.872	0.822	0.773	0.744	0.723	0.703	0.687	0.667	0.655	0.654	0.645
41	1.129	1.068	1.021	0.965	0.925	0.890	0.841	0.792	0.764	0.743	0.723	0.708	0.687	0.676	0.675	0.666
42	1.138	1.079	1.032	0.977	0.938	0.903	0.854	0.806	0.778	0.757	0.737	0.722	0.702	0.690	0.689	0.680
43	1.149	1.090	1.044	0.990	0.951	0.917	0.868	0.820	0.792	0.772	0.752	0.737	0.717	0.705	0.704	0.695
44	1.166	1.108	1.062	1.009	0.971	0.937	0.888	0.841	0.814	0.794	0.773	0.758	0.739	0.727	0.726	0.717
45	1.183	1.127	1.082	1.030	0.992	0.958	0.911	0.864	0.837	0.817	0.797	0.782	0.762	0.751	0.750	0.741
46	1.195	1.140	1.095	1.044	1.006	0.973	0.926	0.879	0.852	0.832	0.813	0.798	0.778	0.767	0.766	0.757
47	1.210	1.156	1.113	1.062	1.025	0.992	0.945	0.900	0.873	0.853	0.833	0.819	0.799	0.788	0.787	0.778
48	1.221	1.168	1.125	1.074	1.038	1.005	0.959	0.913	0.887	0.867	0.848	0.833	0.814	0.803	0.801	0.793
49	1.239	1.187	1.145	1.096	1.060	1.028	0.982	0.937	0.910	0.891	0.872	0.857	0.838	0.827	0.826	0.817
50	1.251	1.200	1.159	1.110	1.075	1.043	0.998	0.953	0.927	0.908	0.889	0.874	0.855	0.844	0.843	0.835

Table 2C.8. Projected charter removals (Mlb) for Area 2C in 2022 under reverse slot limits with lower limits of the protected slot ranging from 35 to 50 inches and an upper limit of 80 inches with **days closed throughout the season**. Shaded cells represent projections for the most liberal upper and lower size limits that do not exceed the 2022 allocation of 0.82 Mlb. All values in the table include corrections for errors in estimation of average weight and inflation factors for release mortality

a. Sunday closures

		Sunday Closures																				
		None	Starting Sept 17	Starting Sept 10	Starting Sept 03	Starting Aug 27	Starting Aug 20	Starting Aug 13	Starting Aug 6	Starting July 30	Starting July 23	Starting July 16	Starting July 9	Starting July 2	Starting June 25	Starting June 18	Starting June 11	Starting June 4	Starting May 28	Starting May 21	Starting May 14	All Year
	Harvest	80,402	80,333	80,093	79,608	78,896	78,510	77,460	76,512	75,647	74,762	73,733	72,873	72,105	71,374	70,776	70,343	70,084	69,807	69,659	69,615	69,613
Lower Limit (in)	35	0.713	0.712	0.710	0.706	0.700	0.697	0.688	0.679	0.672	0.664	0.655	0.648	0.641	0.634	0.629	0.625	0.623	0.620	0.619	0.619	0.619
	36	0.755	0.754	0.752	0.747	0.741	0.737	0.728	0.719	0.711	0.703	0.693	0.685	0.678	0.672	0.666	0.662	0.659	0.657	0.655	0.655	0.655
	37	0.779	0.779	0.776	0.772	0.765	0.761	0.751	0.742	0.734	0.726	0.716	0.708	0.701	0.694	0.688	0.684	0.681	0.678	0.677	0.676	0.676
	38	0.816	0.816	0.813	0.809	0.802	0.798	0.787	0.778	0.769	0.760	0.750	0.742	0.734	0.727	0.721	0.716	0.714	0.711	0.709	0.709	0.709
	39	0.844	0.843	0.841	0.836	0.828	0.824	0.814	0.804	0.795	0.786	0.775	0.767	0.759	0.751	0.745	0.740	0.737	0.734	0.733	0.732	0.732
	40	0.867	0.866	0.864	0.859	0.851	0.847	0.836	0.826	0.817	0.808	0.797	0.788	0.780	0.772	0.766	0.761	0.758	0.755	0.753	0.753	0.753
	41	0.895	0.894	0.891	0.886	0.878	0.874	0.863	0.852	0.843	0.833	0.822	0.813	0.805	0.797	0.790	0.785	0.782	0.779	0.777	0.777	0.777
	42	0.914	0.913	0.911	0.905	0.897	0.893	0.881	0.871	0.861	0.851	0.840	0.831	0.822	0.814	0.808	0.802	0.799	0.796	0.794	0.794	0.794
	43	0.935	0.934	0.931	0.926	0.918	0.913	0.901	0.890	0.881	0.871	0.859	0.850	0.841	0.833	0.826	0.821	0.818	0.814	0.812	0.812	0.812
	44	0.964	0.963	0.960	0.954	0.946	0.942	0.929	0.918	0.908	0.898	0.886	0.876	0.867	0.859	0.852	0.846	0.843	0.840	0.838	0.837	0.837
	45	0.995	0.995	0.992	0.986	0.977	0.973	0.960	0.948	0.938	0.928	0.915	0.905	0.896	0.887	0.880	0.875	0.871	0.867	0.865	0.865	0.865
	46	1.017	1.016	1.013	1.007	0.998	0.994	0.981	0.969	0.959	0.948	0.935	0.925	0.916	0.907	0.899	0.894	0.890	0.886	0.884	0.884	0.884
	47	1.045	1.044	1.041	1.035	1.026	1.021	1.008	0.996	0.985	0.974	0.961	0.951	0.941	0.932	0.924	0.918	0.915	0.911	0.909	0.908	0.908
	48	1.064	1.063	1.060	1.054	1.045	1.040	1.026	1.014	1.003	0.992	0.979	0.968	0.958	0.949	0.941	0.935	0.932	0.928	0.925	0.925	0.925
	49	1.098	1.097	1.093	1.087	1.078	1.073	1.059	1.046	1.035	1.023	1.010	0.999	0.989	0.979	0.971	0.965	0.961	0.957	0.955	0.954	0.954
50	1.121	1.120	1.117	1.110	1.101	1.096	1.082	1.069	1.057	1.045	1.031	1.020	1.010	1.000	0.992	0.986	0.982	0.978	0.976	0.975	0.975	

Table 2C.8. (continued)

b. Monday closures

		Monday Closures																					
		None	Starting Sept 18	Starting Sept 11	Starting Sept 4	Starting Aug 28	Starting Aug 21	Starting Aug 14	Starting Aug 7	Starting July 31	Starting July 24	Starting July 17	Starting July 10	Starting July 3	Starting June 26	Starting June 19	Starting June 12	Starting June 5	Starting May 29	Starting May 22	Starting May 15	All Year	
	Harvest	80,402	80,378	80,148	79,730	79,167	78,193	77,040	75,964	74,835	73,736	72,602	71,604	70,883	69,959	69,296	68,889	68,534	68,248	68,081	68,052	68,035	
Lower Limit (in)	35	0.713	0.713	0.711	0.707	0.702	0.694	0.684	0.674	0.664	0.654	0.644	0.636	0.629	0.621	0.615	0.611	0.608	0.606	0.604	0.604	0.604	
	36	0.755	0.754	0.752	0.748	0.743	0.734	0.723	0.713	0.703	0.693	0.682	0.673	0.666	0.657	0.651	0.647	0.644	0.641	0.639	0.639	0.639	
	37	0.779	0.779	0.777	0.773	0.767	0.758	0.747	0.737	0.726	0.715	0.705	0.695	0.688	0.679	0.672	0.668	0.665	0.662	0.660	0.660	0.660	
	38	0.816	0.816	0.814	0.810	0.804	0.794	0.783	0.772	0.760	0.749	0.738	0.728	0.721	0.711	0.705	0.700	0.696	0.693	0.692	0.691	0.691	
	39	0.844	0.843	0.841	0.837	0.831	0.821	0.809	0.797	0.786	0.774	0.763	0.752	0.745	0.735	0.728	0.724	0.720	0.717	0.715	0.714	0.714	
	40	0.867	0.867	0.864	0.860	0.854	0.843	0.831	0.820	0.808	0.796	0.784	0.774	0.766	0.756	0.748	0.744	0.740	0.737	0.735	0.734	0.734	
	41	0.895	0.894	0.892	0.887	0.881	0.870	0.857	0.846	0.833	0.821	0.809	0.798	0.790	0.780	0.772	0.768	0.763	0.760	0.758	0.758	0.757	
	42	0.914	0.914	0.911	0.906	0.900	0.889	0.876	0.864	0.851	0.839	0.827	0.816	0.807	0.797	0.789	0.784	0.780	0.777	0.774	0.774	0.774	
	43	0.935	0.934	0.931	0.927	0.920	0.909	0.896	0.884	0.871	0.858	0.845	0.834	0.826	0.815	0.807	0.802	0.798	0.794	0.792	0.792	0.792	
	44	0.964	0.963	0.960	0.956	0.949	0.937	0.924	0.911	0.898	0.885	0.872	0.860	0.852	0.841	0.832	0.827	0.822	0.819	0.817	0.816	0.816	
	45	0.995	0.995	0.992	0.987	0.980	0.968	0.954	0.941	0.927	0.914	0.901	0.889	0.880	0.868	0.860	0.854	0.850	0.846	0.844	0.843	0.843	
	46	1.017	1.016	1.013	1.008	1.001	0.989	0.975	0.961	0.947	0.934	0.920	0.908	0.899	0.887	0.878	0.873	0.868	0.864	0.862	0.861	0.861	
	47	1.045	1.044	1.041	1.036	1.029	1.016	1.002	0.988	0.973	0.959	0.946	0.933	0.924	0.912	0.903	0.897	0.892	0.888	0.886	0.885	0.885	
	48	1.064	1.064	1.061	1.055	1.048	1.035	1.020	1.006	0.991	0.977	0.963	0.950	0.941	0.929	0.919	0.914	0.908	0.904	0.902	0.901	0.901	
	49	1.098	1.097	1.094	1.089	1.081	1.068	1.052	1.038	1.023	1.008	0.993	0.980	0.970	0.958	0.948	0.942	0.937	0.933	0.930	0.930	0.930	
	50	1.121	1.121	1.117	1.112	1.104	1.090	1.075	1.060	1.045	1.030	1.015	1.001	0.991	0.979	0.969	0.963	0.957	0.953	0.950	0.950	0.950	

c. Tuesday closures

		Tuesday Closures																				
		None	Starting Sept 19	Starting Sept 12	Starting Sept 5	Starting Aug 29	Starting Aug 22	Starting Aug 15	Starting Aug 8	Starting Aug 1	Starting July 25	Starting July 18	Starting July 11	Starting July 4	Starting June 27	Starting June 20	Starting June 13	Starting June 6	Starting May 30	Starting May 23	Starting May 16	All Year
	Harvest	80,402	80,362	80,129	79,702	79,078	78,393	77,325	76,211	75,077	74,088	73,169	72,125	71,405	70,492	69,867	69,635	69,316	69,115	69,041	69,005	69,000
Lower Limit (in)	35	0.713	0.713	0.711	0.707	0.701	0.695	0.686	0.676	0.666	0.657	0.649	0.639	0.633	0.625	0.619	0.617	0.614	0.612	0.612	0.611	0.611
	36	0.755	0.754	0.752	0.748	0.742	0.736	0.726	0.715	0.704	0.695	0.686	0.677	0.670	0.662	0.656	0.653	0.650	0.648	0.647	0.647	0.647
	37	0.779	0.779	0.777	0.773	0.767	0.760	0.749	0.739	0.727	0.718	0.709	0.699	0.692	0.683	0.677	0.675	0.671	0.669	0.669	0.668	0.668
	38	0.816	0.816	0.814	0.809	0.803	0.796	0.785	0.774	0.762	0.752	0.743	0.732	0.725	0.716	0.709	0.707	0.703	0.701	0.700	0.700	0.700
	39	0.844	0.843	0.841	0.836	0.830	0.822	0.811	0.800	0.787	0.777	0.767	0.756	0.749	0.740	0.733	0.730	0.727	0.724	0.724	0.723	0.723
	40	0.867	0.867	0.864	0.860	0.853	0.845	0.834	0.822	0.809	0.798	0.789	0.777	0.770	0.760	0.753	0.751	0.747	0.745	0.744	0.743	0.743
	41	0.895	0.894	0.892	0.887	0.880	0.872	0.860	0.848	0.835	0.824	0.814	0.802	0.794	0.784	0.777	0.774	0.770	0.768	0.767	0.767	0.767
	42	0.914	0.913	0.911	0.906	0.899	0.891	0.878	0.866	0.853	0.841	0.831	0.819	0.811	0.801	0.794	0.791	0.787	0.784	0.784	0.783	0.783
	43	0.935	0.934	0.931	0.926	0.919	0.911	0.898	0.885	0.872	0.860	0.850	0.838	0.829	0.819	0.812	0.809	0.805	0.802	0.801	0.801	0.801
	44	0.964	0.963	0.960	0.955	0.948	0.939	0.926	0.913	0.899	0.887	0.876	0.864	0.855	0.845	0.837	0.834	0.830	0.827	0.826	0.826	0.826
	45	0.995	0.995	0.992	0.987	0.979	0.970	0.957	0.943	0.929	0.916	0.905	0.892	0.884	0.872	0.865	0.861	0.857	0.854	0.853	0.853	0.853
	46	1.017	1.016	1.013	1.008	1.000	0.991	0.977	0.963	0.948	0.936	0.925	0.911	0.903	0.891	0.883	0.880	0.875	0.873	0.872	0.871	0.871
	47	1.045	1.044	1.041	1.036	1.027	1.018	1.004	0.990	0.975	0.962	0.950	0.937	0.927	0.916	0.907	0.904	0.899	0.897	0.896	0.895	0.895
	48	1.064	1.064	1.061	1.055	1.046	1.037	1.023	1.008	0.993	0.979	0.968	0.954	0.944	0.933	0.924	0.921	0.916	0.913	0.912	0.912	0.912
	49	1.098	1.097	1.094	1.088	1.079	1.069	1.055	1.040	1.024	1.010	0.998	0.984	0.974	0.962	0.953	0.950	0.945	0.942	0.941	0.940	0.940
	50	1.121	1.121	1.117	1.111	1.102	1.092	1.077	1.062	1.046	1.032	1.019	1.005	0.995	0.982	0.973	0.970	0.965	0.962	0.961	0.960	0.960

Table 2C.8. (continued)

d. Wednesday closures

		Wednesday Closures																				
	Harvest	None	Starting Sept 20	Starting Sept 13	Starting Sept 6	Starting Aug 30	Starting Aug 23	Starting Aug 16	Starting Aug 9	Starting Aug 2	Starting July 26	Starting July 19	Starting July 12	Starting July 5	Starting June 28	Starting June 21	Starting June 14	Starting June 7	Starting May 31	Starting May 24	Starting May 17	All Year
				80,402	80,366	80,176	79,803	79,172	78,519	77,504	76,555	75,451	74,664	73,708	72,667	71,887	71,000	70,248	69,788	69,421	69,158	68,987
Lower Limit (in)	35	0.713	0.713	0.711	0.708	0.702	0.696	0.687	0.679	0.669	0.662	0.653	0.644	0.637	0.629	0.622	0.618	0.615	0.612	0.611	0.611	0.610
	36	0.755	0.754	0.752	0.749	0.743	0.737	0.727	0.718	0.708	0.700	0.691	0.682	0.674	0.666	0.659	0.654	0.651	0.648	0.646	0.646	0.646
	37	0.779	0.779	0.777	0.773	0.767	0.761	0.751	0.742	0.731	0.723	0.714	0.704	0.696	0.688	0.680	0.676	0.672	0.669	0.667	0.667	0.667
	38	0.816	0.816	0.814	0.810	0.804	0.797	0.787	0.777	0.766	0.758	0.748	0.737	0.730	0.720	0.713	0.708	0.704	0.701	0.699	0.699	0.699
	39	0.844	0.843	0.841	0.837	0.831	0.824	0.813	0.803	0.791	0.783	0.773	0.762	0.754	0.745	0.737	0.731	0.727	0.724	0.722	0.722	0.722
	40	0.867	0.867	0.865	0.860	0.854	0.846	0.836	0.825	0.813	0.804	0.794	0.783	0.775	0.765	0.757	0.752	0.747	0.744	0.742	0.742	0.742
	41	0.895	0.894	0.892	0.888	0.881	0.873	0.862	0.851	0.839	0.830	0.819	0.808	0.799	0.789	0.781	0.775	0.771	0.768	0.766	0.765	0.765
	42	0.914	0.914	0.911	0.907	0.900	0.892	0.880	0.870	0.857	0.848	0.837	0.825	0.816	0.806	0.797	0.792	0.787	0.784	0.782	0.782	0.782
	43	0.935	0.934	0.932	0.927	0.920	0.912	0.900	0.889	0.876	0.867	0.856	0.843	0.835	0.824	0.815	0.809	0.805	0.802	0.799	0.799	0.799
	44	0.964	0.963	0.961	0.956	0.948	0.940	0.928	0.917	0.903	0.894	0.882	0.870	0.861	0.850	0.841	0.835	0.830	0.827	0.824	0.824	0.824
	45	0.995	0.995	0.992	0.988	0.980	0.971	0.959	0.947	0.933	0.923	0.911	0.898	0.889	0.878	0.868	0.862	0.857	0.854	0.851	0.851	0.851
	46	1.017	1.016	1.014	1.009	1.001	0.992	0.980	0.967	0.953	0.943	0.931	0.918	0.908	0.897	0.887	0.881	0.876	0.872	0.870	0.869	0.869
	47	1.045	1.044	1.042	1.037	1.028	1.019	1.007	0.994	0.979	0.969	0.956	0.943	0.933	0.922	0.912	0.905	0.900	0.896	0.894	0.893	0.893
	48	1.064	1.064	1.061	1.056	1.047	1.038	1.025	1.012	0.997	0.987	0.974	0.960	0.950	0.939	0.928	0.922	0.916	0.912	0.910	0.910	0.910
	49	1.098	1.097	1.094	1.089	1.080	1.071	1.057	1.044	1.029	1.018	1.005	0.990	0.980	0.968	0.957	0.950	0.945	0.941	0.938	0.938	0.938
	50	1.121	1.121	1.117	1.112	1.103	1.094	1.080	1.066	1.050	1.039	1.026	1.011	1.001	0.988	0.978	0.970	0.965	0.961	0.958	0.958	0.958

e. Thursday closures

		Thursday Closures																				
	Harvest	None	Starting Sept 21	Starting Sept 14	Starting Sept 7	Starting Aug 31	Starting Aug 24	Starting Aug 17	Starting Aug 10	Starting Aug 3	Starting July 27	Starting July 20	Starting July 13	Starting July 6	Starting June 29	Starting June 22	Starting June 15	Starting June 8	Starting Jun 1	Starting May 25	Starting May 18	All Year
				80,402	80,339	80,189	79,812	79,173	78,588	77,538	76,474	75,431	74,541	73,725	72,695	71,921	71,160	70,272	69,641	69,306	69,032	68,878
Lower Limit (in)	35	0.713	0.713	0.711	0.708	0.702	0.697	0.688	0.678	0.669	0.661	0.654	0.645	0.639	0.632	0.624	0.618	0.615	0.613	0.611	0.611	0.610
	36	0.755	0.754	0.753	0.749	0.743	0.738	0.728	0.718	0.708	0.700	0.692	0.683	0.676	0.669	0.660	0.654	0.651	0.648	0.647	0.646	0.646
	37	0.779	0.779	0.777	0.774	0.767	0.762	0.752	0.741	0.732	0.723	0.715	0.705	0.698	0.691	0.682	0.676	0.672	0.669	0.668	0.667	0.667
	38	0.816	0.816	0.814	0.810	0.804	0.798	0.787	0.777	0.766	0.757	0.749	0.739	0.731	0.723	0.714	0.708	0.704	0.701	0.700	0.699	0.699
	39	0.844	0.843	0.841	0.838	0.831	0.825	0.814	0.803	0.792	0.782	0.774	0.763	0.755	0.748	0.738	0.731	0.728	0.725	0.723	0.722	0.722
	40	0.867	0.867	0.865	0.861	0.854	0.847	0.836	0.825	0.814	0.804	0.795	0.784	0.776	0.768	0.759	0.752	0.748	0.745	0.743	0.742	0.742
	41	0.895	0.894	0.892	0.888	0.881	0.874	0.863	0.851	0.840	0.829	0.820	0.809	0.801	0.793	0.783	0.775	0.771	0.768	0.766	0.765	0.765
	42	0.914	0.913	0.911	0.907	0.900	0.893	0.881	0.869	0.858	0.847	0.838	0.827	0.818	0.810	0.800	0.792	0.788	0.785	0.783	0.782	0.782
	43	0.935	0.934	0.932	0.928	0.920	0.913	0.901	0.889	0.877	0.866	0.857	0.845	0.837	0.828	0.818	0.810	0.806	0.802	0.800	0.800	0.799
	44	0.964	0.963	0.961	0.956	0.949	0.942	0.929	0.916	0.904	0.893	0.884	0.871	0.863	0.854	0.843	0.835	0.831	0.827	0.825	0.824	0.824
	45	0.995	0.995	0.993	0.988	0.980	0.973	0.960	0.947	0.934	0.923	0.913	0.900	0.891	0.882	0.871	0.863	0.858	0.855	0.853	0.852	0.851
	46	1.017	1.016	1.014	1.009	1.001	0.994	0.980	0.967	0.954	0.943	0.932	0.920	0.911	0.901	0.890	0.881	0.877	0.873	0.871	0.870	0.870
	47	1.045	1.044	1.042	1.037	1.029	1.021	1.008	0.994	0.981	0.969	0.958	0.945	0.936	0.926	0.914	0.906	0.901	0.897	0.895	0.894	0.894
	48	1.064	1.063	1.061	1.056	1.047	1.040	1.026	1.012	0.999	0.987	0.976	0.962	0.953	0.943	0.931	0.922	0.917	0.914	0.911	0.910	0.910
	49	1.098	1.097	1.094	1.089	1.080	1.072	1.058	1.044	1.030	1.018	1.006	0.993	0.983	0.973	0.961	0.951	0.946	0.942	0.940	0.939	0.939
	50	1.121	1.120	1.118	1.113	1.104	1.095	1.081	1.066	1.052	1.039	1.028	1.014	1.004	0.993	0.981	0.972	0.966	0.962	0.960	0.959	0.959

Table 2C.8. (continued)

f. Friday closures

		Friday Closures																				
		None	Starting Sept 22	Starting Sept 15	Starting Sept 8	Starting Sept 1	Starting Aug 25	Starting Aug 18	Starting Aug 11	Starting Aug 4	Starting July 28	Starting July 21	Starting July 14	Starting July 7	Starting June 30	Starting June 23	Starting June 16	Starting June 9	Starting Jun 2	Starting May 26	Starting May 19	All Year
Harvest		80,402	80,379	80,293	79,898	79,287	78,904	77,964	76,741	75,799	74,817	73,735	72,635	71,963	71,095	70,280	69,642	69,180	69,024	68,840	68,736	68,719
Lower Limit (in)	35	0.713	0.713	0.712	0.709	0.703	0.700	0.691	0.681	0.672	0.664	0.654	0.644	0.638	0.631	0.623	0.618	0.613	0.612	0.610	0.609	0.609
	36	0.755	0.754	0.754	0.750	0.744	0.741	0.732	0.720	0.711	0.702	0.692	0.682	0.676	0.667	0.660	0.654	0.649	0.648	0.646	0.645	0.645
	37	0.779	0.779	0.778	0.775	0.769	0.765	0.756	0.744	0.735	0.725	0.715	0.704	0.698	0.689	0.681	0.675	0.670	0.669	0.667	0.666	0.666
	38	0.816	0.816	0.815	0.811	0.805	0.801	0.792	0.779	0.770	0.760	0.749	0.738	0.731	0.722	0.714	0.707	0.702	0.701	0.699	0.698	0.698
	39	0.844	0.843	0.843	0.838	0.832	0.828	0.818	0.805	0.795	0.785	0.774	0.762	0.755	0.746	0.738	0.731	0.726	0.724	0.722	0.721	0.721
	40	0.867	0.867	0.866	0.862	0.855	0.851	0.841	0.828	0.817	0.807	0.795	0.783	0.776	0.767	0.758	0.751	0.746	0.744	0.742	0.741	0.741
	41	0.895	0.894	0.893	0.889	0.882	0.878	0.867	0.854	0.843	0.832	0.820	0.808	0.801	0.791	0.782	0.775	0.770	0.768	0.766	0.764	0.764
	42	0.914	0.914	0.913	0.908	0.901	0.897	0.886	0.872	0.861	0.850	0.838	0.826	0.818	0.808	0.799	0.792	0.786	0.784	0.782	0.781	0.781
	43	0.935	0.934	0.933	0.929	0.922	0.917	0.906	0.892	0.881	0.869	0.857	0.844	0.837	0.827	0.817	0.810	0.804	0.802	0.800	0.798	0.798
	44	0.964	0.963	0.962	0.957	0.950	0.945	0.934	0.920	0.908	0.896	0.884	0.870	0.863	0.852	0.843	0.835	0.829	0.827	0.825	0.823	0.823
	45	0.995	0.995	0.994	0.989	0.981	0.976	0.965	0.950	0.938	0.926	0.913	0.899	0.891	0.881	0.871	0.863	0.856	0.854	0.852	0.850	0.850
	46	1.017	1.017	1.015	1.010	1.003	0.997	0.985	0.970	0.958	0.946	0.932	0.919	0.910	0.900	0.890	0.881	0.875	0.873	0.870	0.869	0.869
	47	1.045	1.045	1.043	1.038	1.030	1.025	1.012	0.997	0.985	0.972	0.958	0.944	0.936	0.924	0.914	0.905	0.899	0.897	0.894	0.893	0.892
	48	1.064	1.064	1.062	1.057	1.049	1.044	1.031	1.015	1.003	0.990	0.976	0.961	0.953	0.941	0.931	0.922	0.915	0.913	0.911	0.909	0.909
	49	1.098	1.097	1.096	1.091	1.082	1.076	1.064	1.047	1.034	1.021	1.006	0.992	0.983	0.971	0.960	0.951	0.944	0.942	0.939	0.938	0.937
	50	1.121	1.121	1.119	1.114	1.105	1.099	1.086	1.070	1.056	1.043	1.028	1.013	1.004	0.992	0.981	0.971	0.964	0.962	0.959	0.958	0.957

g. Saturday closures

		Saturday Closures																				
		None	Starting Sept 23	Starting Sept 16	Starting Sept 9	Starting Sept 2	Starting Aug 26	Starting Aug 19	Starting Aug 12	Starting Aug 5	Starting July 29	Starting July 22	Starting July 15	Starting July 8	Starting July 1	Starting June 24	Starting June 17	Starting June 10	Starting June 3	Starting May 27	Starting May 20	All Year
Harvest		80,402	80,371	80,290	80,019	79,518	78,944	78,192	77,162	76,151	75,233	74,172	73,201	72,377	71,511	70,885	70,266	69,848	69,634	69,448	69,344	69,318
Lower Limit (in)	35	0.713	0.713	0.712	0.710	0.705	0.700	0.694	0.685	0.676	0.667	0.658	0.650	0.643	0.635	0.629	0.624	0.620	0.618	0.616	0.615	0.615
	36	0.755	0.754	0.754	0.751	0.746	0.741	0.734	0.724	0.715	0.706	0.697	0.688	0.680	0.672	0.666	0.660	0.656	0.654	0.652	0.651	0.651
	37	0.779	0.779	0.778	0.776	0.771	0.765	0.758	0.748	0.738	0.730	0.720	0.710	0.702	0.694	0.688	0.682	0.678	0.675	0.673	0.672	0.672
	38	0.816	0.816	0.815	0.813	0.808	0.802	0.794	0.784	0.774	0.764	0.754	0.744	0.736	0.727	0.721	0.714	0.710	0.708	0.706	0.704	0.704
	39	0.844	0.843	0.843	0.840	0.835	0.828	0.821	0.810	0.799	0.790	0.779	0.769	0.760	0.751	0.745	0.738	0.734	0.731	0.729	0.728	0.728
	40	0.867	0.867	0.866	0.863	0.858	0.851	0.843	0.833	0.822	0.812	0.801	0.790	0.782	0.772	0.766	0.759	0.754	0.752	0.750	0.748	0.748
	41	0.895	0.894	0.893	0.890	0.885	0.878	0.870	0.859	0.848	0.838	0.826	0.815	0.807	0.797	0.790	0.783	0.778	0.776	0.773	0.772	0.772
	42	0.914	0.914	0.913	0.910	0.904	0.897	0.889	0.877	0.866	0.856	0.844	0.833	0.824	0.814	0.807	0.800	0.795	0.793	0.790	0.789	0.789
	43	0.935	0.934	0.933	0.930	0.924	0.917	0.909	0.897	0.886	0.875	0.863	0.852	0.843	0.833	0.826	0.818	0.813	0.811	0.808	0.807	0.806
	44	0.964	0.963	0.962	0.959	0.953	0.946	0.937	0.925	0.913	0.902	0.890	0.879	0.869	0.859	0.851	0.844	0.839	0.836	0.833	0.832	0.832
	45	0.995	0.995	0.994	0.991	0.985	0.977	0.968	0.956	0.943	0.932	0.919	0.908	0.898	0.887	0.880	0.872	0.866	0.863	0.861	0.859	0.859
	46	1.017	1.016	1.015	1.012	1.006	0.998	0.989	0.976	0.964	0.952	0.939	0.927	0.917	0.906	0.899	0.891	0.885	0.882	0.879	0.878	0.878
	47	1.045	1.044	1.043	1.040	1.033	1.026	1.016	1.003	0.990	0.978	0.965	0.953	0.943	0.931	0.923	0.915	0.909	0.906	0.904	0.902	0.902
	48	1.064	1.064	1.063	1.059	1.052	1.045	1.035	1.022	1.009	0.996	0.983	0.970	0.960	0.949	0.940	0.932	0.926	0.923	0.920	0.919	0.918
	49	1.098	1.097	1.096	1.092	1.086	1.077	1.067	1.054	1.040	1.028	1.014	1.001	0.990	0.978	0.970	0.962	0.955	0.952	0.949	0.948	0.947
	50	1.121	1.121	1.120	1.116	1.109	1.101	1.090	1.077	1.063	1.050	1.036	1.023	1.012	1.000	0.991	0.982	0.976	0.973	0.970	0.968	0.968

Table 2C.9. Projected charter removals (Mlb) for Area 2C in 2023 under reverse slot limits with lower limits of the protected slot ranging from 35 to 50 inches and an upper limit of 80 inches with days closed for the entire season. Shaded cells represent projections for the most liberal upper and lower size limits that do not exceed the 2022 allocation of 0.82 Mlb. All values in the table include corrections for errors in estimation of average weight and inflation factors for release mortality.

	Closed Day	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Harvest	69,613	68,035	69,000	68,952	68,775	68,719	69,318
Lower Limit (in)	35	0.623	0.608	0.615	0.615	0.615	0.614	0.619
	36	0.660	0.644	0.651	0.651	0.651	0.650	0.656
	37	0.682	0.665	0.673	0.673	0.672	0.671	0.678
	38	0.715	0.697	0.705	0.705	0.705	0.704	0.711
	39	0.739	0.721	0.729	0.729	0.729	0.728	0.735
	40	0.760	0.742	0.749	0.749	0.749	0.748	0.756
	41	0.785	0.765	0.773	0.773	0.773	0.772	0.780
	42	0.802	0.782	0.790	0.790	0.790	0.789	0.797
	43	0.821	0.800	0.808	0.808	0.808	0.807	0.816
	44	0.847	0.826	0.833	0.833	0.834	0.833	0.841
	45	0.875	0.853	0.861	0.861	0.862	0.861	0.870
	46	0.895	0.872	0.880	0.880	0.880	0.879	0.889
	47	0.920	0.897	0.905	0.905	0.905	0.904	0.914
	48	0.937	0.913	0.922	0.922	0.922	0.921	0.931
	49	0.968	0.943	0.951	0.951	0.952	0.950	0.961
	50	0.989	0.963	0.971	0.971	0.972	0.971	0.982

Table 2C.10. Projected charter removals (Mlb) and harvest for Area 2C in 2023 under reverse slot limits with lower limits of the protected slot ranging from 35 to 50 inches and an upper limit of 80 inches with days closed throughout the season and a **three fish annual limit**. Shaded cells represent projections for the most liberal upper and lower size limits that do not exceed the 2022 allocation of 0.82 Mlb. All values in the table include corrections for errors in estimation of average weight and inflation factors for release mortality.

a. Sunday closures

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year	
		Sept 17	Sept 10	Sept 03	Aug 27	Aug 20	Aug 13	Aug 6	July 30	July 23	July 16	July 9	July 2	June 25	June 18	June 11	June 4	May 28	May 21	May 14			
Lower Limit (in)	35	0.666	0.666	0.664	0.660	0.654	0.651	0.642	0.635	0.628	0.620	0.612	0.605	0.599	0.593	0.588	0.584	0.582	0.580	0.578	0.578	65,022	
	36	0.705	0.705	0.703	0.699	0.693	0.689	0.680	0.672	0.664	0.657	0.648	0.641	0.634	0.628	0.622	0.618	0.616	0.613	0.612	0.612	0.612	0.612
	37	0.728	0.728	0.726	0.721	0.715	0.712	0.702	0.694	0.686	0.678	0.669	0.662	0.655	0.648	0.643	0.639	0.636	0.634	0.632	0.632	0.632	0.632
	38	0.763	0.762	0.760	0.756	0.749	0.745	0.736	0.727	0.719	0.710	0.701	0.693	0.686	0.679	0.673	0.669	0.667	0.664	0.662	0.662	0.662	0.662
	39	0.788	0.788	0.786	0.781	0.774	0.770	0.760	0.751	0.743	0.734	0.724	0.716	0.709	0.702	0.696	0.691	0.689	0.686	0.684	0.684	0.684	0.684
	40	0.810	0.810	0.807	0.803	0.796	0.792	0.781	0.772	0.763	0.755	0.744	0.736	0.729	0.721	0.715	0.711	0.708	0.705	0.703	0.703	0.703	0.703
	41	0.836	0.835	0.833	0.828	0.820	0.817	0.806	0.796	0.787	0.778	0.768	0.759	0.752	0.744	0.738	0.733	0.731	0.727	0.726	0.726	0.726	0.725
	42	0.854	0.853	0.851	0.846	0.838	0.834	0.823	0.813	0.804	0.795	0.785	0.776	0.768	0.760	0.754	0.749	0.746	0.743	0.741	0.741	0.741	0.741
	43	0.873	0.872	0.870	0.864	0.857	0.853	0.842	0.831	0.822	0.813	0.802	0.793	0.785	0.777	0.771	0.766	0.763	0.760	0.758	0.758	0.758	0.758
	44	0.900	0.899	0.897	0.891	0.884	0.879	0.868	0.857	0.848	0.839	0.827	0.818	0.810	0.802	0.795	0.790	0.787	0.784	0.782	0.782	0.782	0.781
	45	0.930	0.929	0.926	0.921	0.913	0.908	0.897	0.886	0.876	0.866	0.855	0.845	0.837	0.829	0.822	0.817	0.813	0.810	0.808	0.808	0.808	0.807
	46	0.950	0.949	0.946	0.941	0.933	0.928	0.916	0.905	0.895	0.885	0.873	0.864	0.855	0.847	0.840	0.834	0.831	0.827	0.825	0.825	0.825	0.825
	47	0.976	0.975	0.972	0.967	0.958	0.954	0.941	0.930	0.920	0.910	0.897	0.888	0.879	0.870	0.863	0.858	0.854	0.850	0.848	0.848	0.848	0.848
	48	0.994	0.993	0.990	0.985	0.976	0.971	0.959	0.947	0.937	0.927	0.914	0.904	0.895	0.886	0.879	0.874	0.870	0.866	0.864	0.864	0.864	0.864
	49	1.025	1.024	1.021	1.015	1.007	1.002	0.989	0.977	0.966	0.956	0.943	0.933	0.923	0.914	0.907	0.901	0.897	0.893	0.891	0.891	0.891	0.891
	50	1.047	1.046	1.043	1.037	1.028	1.023	1.010	0.998	0.987	0.976	0.963	0.953	0.943	0.934	0.926	0.920	0.917	0.913	0.910	0.910	0.910	0.910

Table 2C.10. (continued)

b. Monday closures

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year	
		Sept 18	Sept 11	Sept 4	Aug 28	Aug 21	Aug 14	Aug 7	July 31	July 24	July 17	July 10	July 3	June 26	June 19	June 12	June 5	May 29	May 22	May 15		
		75,136	75,112	74,897	74,503	73,983	73,071	71,992	70,982	69,926	68,897	67,837	66,903	66,229	65,362	64,744	64,366	64,031	63,758	63,599	63,571	
Lower Limit (in)	35	0.666	0.666	0.664	0.661	0.656	0.648	0.639	0.630	0.620	0.611	0.602	0.594	0.588	0.580	0.575	0.571	0.568	0.566	0.564	0.564	
	36	0.705	0.705	0.703	0.700	0.695	0.686	0.676	0.667	0.657	0.647	0.638	0.629	0.623	0.614	0.608	0.605	0.602	0.599	0.597	0.597	
	37	0.728	0.728	0.726	0.722	0.717	0.708	0.698	0.688	0.678	0.668	0.668	0.658	0.649	0.643	0.634	0.628	0.625	0.621	0.618	0.617	0.617
	38	0.763	0.763	0.760	0.757	0.751	0.742	0.731	0.721	0.710	0.700	0.690	0.680	0.674	0.665	0.658	0.654	0.651	0.648	0.646	0.646	0.646
	39	0.788	0.788	0.786	0.782	0.776	0.767	0.756	0.745	0.734	0.724	0.713	0.703	0.696	0.687	0.680	0.676	0.672	0.670	0.668	0.667	0.667
	40	0.810	0.810	0.808	0.804	0.798	0.788	0.777	0.766	0.755	0.744	0.733	0.723	0.716	0.706	0.699	0.695	0.691	0.688	0.686	0.686	0.686
	41	0.836	0.835	0.833	0.829	0.823	0.813	0.801	0.790	0.778	0.767	0.756	0.746	0.738	0.728	0.721	0.717	0.713	0.710	0.708	0.708	0.708
	42	0.854	0.853	0.851	0.847	0.841	0.830	0.818	0.807	0.795	0.784	0.772	0.762	0.754	0.744	0.737	0.732	0.728	0.725	0.723	0.723	0.723
	43	0.873	0.872	0.870	0.866	0.859	0.849	0.837	0.825	0.813	0.801	0.789	0.779	0.771	0.761	0.754	0.749	0.745	0.741	0.739	0.739	0.739
	44	0.900	0.900	0.897	0.893	0.886	0.875	0.863	0.851	0.838	0.826	0.814	0.803	0.795	0.785	0.777	0.772	0.768	0.765	0.763	0.762	0.762
	45	0.930	0.929	0.927	0.922	0.916	0.904	0.891	0.879	0.866	0.854	0.841	0.830	0.822	0.811	0.803	0.798	0.793	0.790	0.788	0.787	0.787
	46	0.950	0.950	0.947	0.942	0.935	0.924	0.911	0.898	0.885	0.872	0.859	0.848	0.839	0.829	0.820	0.815	0.811	0.807	0.805	0.804	0.804
	47	0.976	0.976	0.973	0.968	0.961	0.949	0.936	0.923	0.909	0.896	0.883	0.871	0.863	0.851	0.843	0.838	0.833	0.829	0.827	0.827	0.827
	48	0.994	0.994	0.991	0.986	0.979	0.967	0.953	0.940	0.926	0.913	0.900	0.888	0.879	0.867	0.859	0.853	0.849	0.845	0.842	0.842	0.842
	49	1.025	1.025	1.022	1.017	1.009	0.997	0.983	0.969	0.955	0.941	0.928	0.915	0.906	0.894	0.886	0.880	0.875	0.871	0.869	0.868	0.868
	50	1.047	1.047	1.043	1.038	1.031	1.018	1.004	0.990	0.975	0.961	0.947	0.935	0.926	0.914	0.905	0.899	0.894	0.890	0.887	0.887	0.887

c. Tuesday closures

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year
		Sept 19	Sept 12	Sept 5	Aug 29	Aug 22	Aug 15	Aug 8	Aug 1	July 25	July 18	July 11	July 4	June 27	June 20	June 13	June 6	May 30	May 23	May 16	
		75,136	75,097	74,879	74,481	73,901	73,267	72,268	71,228	70,172	69,254	68,403	67,430	66,760	65,910	65,329	65,115	64,817	64,625	64,555	64,521
Lower Limit (in)	35	0.666	0.666	0.664	0.661	0.655	0.650	0.641	0.632	0.622	0.614	0.606	0.598	0.592	0.584	0.579	0.577	0.574	0.573	0.572	0.572
	36	0.705	0.705	0.703	0.699	0.694	0.688	0.678	0.669	0.659	0.650	0.642	0.633	0.627	0.619	0.613	0.611	0.608	0.606	0.606	0.605
	37	0.728	0.728	0.726	0.722	0.716	0.710	0.700	0.690	0.680	0.671	0.663	0.653	0.647	0.639	0.633	0.631	0.628	0.626	0.625	0.625
	38	0.763	0.763	0.760	0.756	0.750	0.744	0.734	0.723	0.712	0.703	0.694	0.684	0.678	0.669	0.663	0.661	0.658	0.656	0.655	0.654
	39	0.788	0.788	0.786	0.782	0.775	0.769	0.758	0.747	0.736	0.726	0.718	0.707	0.700	0.692	0.685	0.683	0.680	0.677	0.677	0.676
	40	0.810	0.810	0.808	0.803	0.797	0.790	0.779	0.768	0.756	0.746	0.737	0.727	0.720	0.711	0.704	0.702	0.698	0.696	0.695	0.695
	41	0.836	0.835	0.833	0.829	0.822	0.815	0.804	0.792	0.780	0.770	0.760	0.750	0.742	0.733	0.726	0.724	0.720	0.718	0.717	0.717
	42	0.854	0.853	0.851	0.846	0.840	0.832	0.821	0.809	0.797	0.786	0.777	0.766	0.758	0.749	0.742	0.739	0.736	0.733	0.732	0.732
	43	0.873	0.872	0.870	0.865	0.858	0.851	0.839	0.827	0.814	0.804	0.794	0.783	0.775	0.765	0.758	0.756	0.752	0.750	0.749	0.748
	44	0.900	0.900	0.897	0.892	0.885	0.877	0.865	0.853	0.840	0.829	0.819	0.807	0.799	0.789	0.782	0.779	0.775	0.773	0.772	0.772
	45	0.930	0.929	0.927	0.922	0.914	0.906	0.894	0.881	0.868	0.856	0.846	0.834	0.826	0.815	0.808	0.805	0.801	0.798	0.798	0.797
	46	0.950	0.949	0.947	0.942	0.934	0.926	0.913	0.900	0.886	0.875	0.864	0.852	0.844	0.833	0.826	0.822	0.818	0.816	0.815	0.814
	47	0.976	0.976	0.973	0.968	0.960	0.951	0.938	0.925	0.911	0.899	0.888	0.875	0.867	0.856	0.848	0.845	0.841	0.838	0.837	0.837
	48	0.994	0.994	0.991	0.986	0.978	0.969	0.956	0.942	0.928	0.915	0.905	0.892	0.883	0.872	0.864	0.861	0.856	0.854	0.853	0.852
	49	1.025	1.025	1.022	1.016	1.008	0.999	0.985	0.971	0.956	0.944	0.933	0.919	0.910	0.899	0.891	0.888	0.883	0.880	0.879	0.879
	50	1.047	1.046	1.043	1.038	1.029	1.020	1.006	0.992	0.977	0.964	0.952	0.939	0.929	0.918	0.910	0.906	0.902	0.899	0.898	0.897

Table 2C.10. (continued)

d. Wednesday closures

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year
		Sept 20	Sept 13	Sept 6	Aug 30	Aug 23	Aug 16	Aug 9	Aug 2	July 26	July 19	July 12	July 5	June 28	June 21	June 14	June 7	May 31	May 24	May 17	May 10
		75,136	75,100	74,926	74,578	73,988	73,385	72,441	71,558	70,529	69,799	68,909	67,940	67,218	66,396	65,695	65,264	64,919	64,672	64,511	64,494
Lower Limit (in)	35	0.666	0.666	0.664	0.661	0.656	0.651	0.642	0.634	0.625	0.619	0.611	0.602	0.596	0.588	0.582	0.578	0.575	0.573	0.571	0.571
	36	0.705	0.705	0.703	0.700	0.695	0.689	0.680	0.672	0.662	0.655	0.647	0.637	0.631	0.623	0.616	0.612	0.609	0.606	0.605	0.605
	37	0.728	0.728	0.726	0.723	0.717	0.711	0.702	0.693	0.683	0.676	0.668	0.658	0.651	0.643	0.636	0.632	0.628	0.626	0.624	0.624
	38	0.763	0.763	0.761	0.757	0.751	0.745	0.735	0.726	0.716	0.708	0.699	0.689	0.682	0.674	0.666	0.662	0.658	0.656	0.654	0.654
	39	0.788	0.788	0.786	0.782	0.776	0.770	0.760	0.751	0.740	0.732	0.723	0.712	0.705	0.696	0.689	0.684	0.680	0.678	0.676	0.676
	40	0.810	0.810	0.808	0.804	0.798	0.791	0.781	0.771	0.760	0.752	0.743	0.732	0.725	0.716	0.708	0.703	0.699	0.696	0.694	0.694
	41	0.836	0.835	0.833	0.829	0.823	0.816	0.805	0.795	0.784	0.776	0.766	0.755	0.747	0.738	0.730	0.725	0.721	0.718	0.716	0.716
	42	0.854	0.853	0.851	0.847	0.840	0.833	0.823	0.812	0.801	0.792	0.782	0.771	0.763	0.754	0.746	0.740	0.736	0.733	0.731	0.731
	43	0.873	0.872	0.870	0.866	0.859	0.852	0.841	0.831	0.818	0.810	0.799	0.788	0.780	0.770	0.762	0.757	0.752	0.749	0.747	0.747
	44	0.900	0.900	0.897	0.893	0.886	0.878	0.867	0.857	0.844	0.835	0.824	0.813	0.805	0.795	0.786	0.780	0.776	0.773	0.771	0.770
	45	0.930	0.929	0.927	0.923	0.915	0.907	0.896	0.885	0.872	0.863	0.852	0.840	0.831	0.821	0.812	0.806	0.802	0.798	0.796	0.796
	46	0.950	0.949	0.947	0.942	0.935	0.927	0.915	0.904	0.891	0.881	0.870	0.858	0.849	0.839	0.829	0.823	0.819	0.815	0.813	0.813
	47	0.976	0.976	0.973	0.968	0.961	0.952	0.940	0.929	0.915	0.905	0.894	0.881	0.872	0.862	0.852	0.846	0.841	0.838	0.835	0.835
	48	0.994	0.994	0.991	0.986	0.979	0.970	0.958	0.946	0.932	0.922	0.911	0.898	0.889	0.878	0.868	0.862	0.857	0.853	0.851	0.851
	49	1.025	1.025	1.022	1.017	1.009	1.000	0.988	0.975	0.961	0.951	0.939	0.926	0.916	0.905	0.895	0.889	0.883	0.880	0.877	0.877
50	1.047	1.046	1.044	1.039	1.030	1.022	1.009	0.996	0.981	0.971	0.959	0.945	0.935	0.924	0.914	0.907	0.902	0.898	0.896	0.895	

e. Thursday closures

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year
		Sept 21	Sept 14	Sept 7	Aug 31	Aug 24	Aug 17	Aug 10	Aug 3	July 27	July 20	July 13	July 6	June 29	June 22	June 15	June 8	June 1	May 25	May 18	May 11
		75,136	75,075	74,935	74,584	73,986	73,442	72,462	71,465	70,490	69,663	68,903	67,939	67,217	66,510	65,682	65,088	64,775	64,515	64,369	64,300
Lower Limit (in)	35	0.666	0.666	0.665	0.662	0.656	0.651	0.643	0.634	0.626	0.618	0.612	0.603	0.597	0.591	0.583	0.578	0.575	0.573	0.571	0.571
	36	0.705	0.705	0.704	0.700	0.695	0.690	0.681	0.671	0.662	0.654	0.647	0.638	0.632	0.625	0.617	0.612	0.608	0.606	0.605	0.604
	37	0.728	0.728	0.726	0.723	0.717	0.712	0.703	0.693	0.684	0.676	0.668	0.659	0.652	0.645	0.637	0.631	0.628	0.626	0.624	0.623
	38	0.763	0.762	0.761	0.757	0.751	0.746	0.736	0.726	0.716	0.708	0.700	0.690	0.683	0.676	0.668	0.661	0.658	0.655	0.654	0.653
	39	0.788	0.788	0.786	0.783	0.776	0.771	0.761	0.750	0.740	0.731	0.723	0.713	0.706	0.699	0.690	0.683	0.680	0.677	0.676	0.675
	40	0.810	0.810	0.808	0.804	0.798	0.792	0.782	0.771	0.761	0.751	0.743	0.733	0.726	0.718	0.709	0.702	0.699	0.696	0.694	0.693
	41	0.836	0.835	0.833	0.830	0.823	0.817	0.806	0.795	0.784	0.775	0.767	0.756	0.748	0.741	0.731	0.724	0.721	0.718	0.716	0.715
	42	0.854	0.853	0.851	0.847	0.841	0.834	0.823	0.812	0.801	0.792	0.783	0.772	0.764	0.756	0.747	0.740	0.736	0.733	0.731	0.731
	43	0.873	0.872	0.870	0.866	0.859	0.853	0.842	0.830	0.819	0.809	0.800	0.789	0.782	0.773	0.764	0.756	0.752	0.749	0.748	0.747
	44	0.900	0.899	0.898	0.893	0.886	0.880	0.868	0.856	0.845	0.835	0.825	0.814	0.806	0.798	0.788	0.780	0.776	0.773	0.771	0.770
	45	0.930	0.929	0.927	0.923	0.915	0.909	0.897	0.884	0.873	0.862	0.853	0.841	0.833	0.824	0.814	0.806	0.802	0.798	0.796	0.795
	46	0.950	0.949	0.947	0.943	0.935	0.928	0.916	0.903	0.891	0.881	0.871	0.859	0.851	0.842	0.831	0.823	0.819	0.816	0.814	0.813
	47	0.976	0.975	0.973	0.969	0.961	0.954	0.941	0.928	0.916	0.905	0.895	0.883	0.874	0.865	0.854	0.846	0.842	0.838	0.836	0.835
	48	0.994	0.993	0.991	0.987	0.979	0.971	0.959	0.945	0.933	0.922	0.912	0.899	0.890	0.881	0.870	0.862	0.857	0.854	0.851	0.850
	49	1.025	1.024	1.022	1.018	1.009	1.002	0.989	0.975	0.962	0.951	0.940	0.927	0.918	0.909	0.897	0.889	0.884	0.880	0.878	0.877
50	1.047	1.046	1.044	1.039	1.031	1.023	1.009	0.996	0.982	0.971	0.960	0.947	0.938	0.928	0.916	0.907	0.903	0.899	0.897	0.896	

Table 2C.10. (continued)

f. Friday closures

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year
		Sept 22	Sept 15	Sept 8	Sept 1	Aug 25	Aug 18	Aug 11	Aug 4	July 28	July 21	July 14	July 7	June 30	June 23	June 16	June 9	June 2	May 26	May 19	May 12
		75,136	75,113	75,033	74,664	74,092	73,741	72,862	71,719	70,842	69,923	68,911	67,880	67,255	66,445	65,679	65,080	64,647	64,502	64,328	64,229
Lower Limit (in)	35	0.666	0.666	0.666	0.662	0.657	0.654	0.646	0.636	0.628	0.620	0.611	0.602	0.597	0.589	0.583	0.577	0.573	0.572	0.570	0.569
	36	0.705	0.705	0.704	0.701	0.696	0.692	0.684	0.673	0.665	0.657	0.647	0.637	0.632	0.624	0.617	0.611	0.607	0.606	0.604	0.603
	37	0.728	0.728	0.727	0.724	0.718	0.715	0.706	0.695	0.687	0.678	0.668	0.658	0.652	0.644	0.637	0.631	0.627	0.625	0.623	0.622
	38	0.763	0.763	0.762	0.758	0.752	0.749	0.740	0.728	0.719	0.710	0.700	0.689	0.683	0.675	0.667	0.661	0.656	0.655	0.653	0.652
	39	0.788	0.788	0.787	0.784	0.778	0.774	0.764	0.753	0.743	0.734	0.723	0.712	0.706	0.698	0.690	0.683	0.678	0.677	0.675	0.674
	40	0.810	0.810	0.809	0.805	0.799	0.795	0.786	0.773	0.764	0.754	0.743	0.732	0.726	0.717	0.709	0.702	0.697	0.696	0.694	0.692
	41	0.836	0.836	0.835	0.830	0.824	0.820	0.810	0.798	0.788	0.778	0.767	0.755	0.748	0.739	0.731	0.724	0.719	0.717	0.715	0.714
	42	0.854	0.853	0.852	0.848	0.842	0.838	0.827	0.815	0.805	0.794	0.783	0.771	0.764	0.755	0.747	0.740	0.734	0.733	0.731	0.729
	43	0.873	0.873	0.871	0.867	0.861	0.856	0.846	0.833	0.823	0.812	0.800	0.789	0.781	0.772	0.763	0.756	0.751	0.749	0.747	0.746
	44	0.900	0.900	0.899	0.894	0.887	0.883	0.872	0.859	0.848	0.837	0.825	0.813	0.806	0.796	0.787	0.780	0.774	0.773	0.770	0.769
	45	0.930	0.930	0.928	0.924	0.917	0.912	0.901	0.887	0.876	0.865	0.853	0.840	0.833	0.823	0.813	0.806	0.800	0.798	0.796	0.794
	46	0.950	0.950	0.948	0.944	0.937	0.932	0.920	0.906	0.895	0.884	0.871	0.858	0.851	0.841	0.831	0.823	0.817	0.815	0.813	0.812
	47	0.976	0.976	0.975	0.970	0.962	0.957	0.946	0.931	0.920	0.908	0.895	0.882	0.874	0.864	0.854	0.846	0.840	0.838	0.835	0.834
	48	0.994	0.994	0.993	0.988	0.980	0.975	0.963	0.949	0.937	0.925	0.912	0.898	0.890	0.880	0.870	0.862	0.855	0.853	0.851	0.849
	49	1.025	1.025	1.024	1.019	1.011	1.006	0.993	0.978	0.966	0.954	0.940	0.926	0.918	0.907	0.897	0.888	0.882	0.880	0.877	0.876
	50	1.047	1.047	1.045	1.040	1.032	1.027	1.014	0.999	0.987	0.974	0.960	0.946	0.937	0.926	0.916	0.907	0.901	0.899	0.896	0.894

g. Saturday closures

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year
		Sept 23	Sept 16	Sept 9	Sept 2	Aug 26	Aug 19	Aug 12	Aug 5	July 29	July 22	July 15	July 8	July 1	June 24	June 17	June 10	June 3	May 27	May 20	May 13
		75,136	75,105	75,028	74,776	74,307	73,772	73,072	72,108	71,160	70,303	69,310	68,401	67,635	66,827	66,239	65,660	65,269	65,066	64,889	64,792
Lower Limit (in)	35	0.666	0.666	0.666	0.663	0.659	0.654	0.648	0.640	0.631	0.624	0.615	0.607	0.600	0.593	0.588	0.583	0.579	0.577	0.576	0.575
	36	0.705	0.705	0.704	0.702	0.698	0.693	0.686	0.677	0.668	0.660	0.651	0.643	0.636	0.628	0.623	0.617	0.613	0.611	0.609	0.608
	37	0.728	0.728	0.727	0.725	0.720	0.715	0.708	0.699	0.690	0.682	0.672	0.664	0.656	0.649	0.643	0.637	0.633	0.631	0.629	0.628
	38	0.763	0.763	0.762	0.759	0.755	0.749	0.742	0.732	0.723	0.714	0.704	0.695	0.688	0.679	0.673	0.667	0.663	0.661	0.659	0.658
	39	0.788	0.788	0.787	0.785	0.780	0.774	0.767	0.757	0.747	0.738	0.728	0.718	0.711	0.702	0.696	0.690	0.686	0.683	0.681	0.680
	40	0.810	0.810	0.809	0.807	0.801	0.796	0.788	0.778	0.768	0.759	0.748	0.739	0.730	0.722	0.715	0.709	0.705	0.702	0.700	0.699
	41	0.836	0.835	0.835	0.832	0.827	0.821	0.813	0.802	0.792	0.782	0.772	0.762	0.753	0.744	0.738	0.731	0.727	0.725	0.722	0.721
	42	0.854	0.853	0.853	0.850	0.844	0.838	0.830	0.820	0.809	0.799	0.788	0.778	0.770	0.761	0.754	0.747	0.743	0.740	0.738	0.737
	43	0.873	0.872	0.872	0.869	0.863	0.857	0.849	0.838	0.827	0.817	0.806	0.796	0.787	0.778	0.771	0.764	0.759	0.757	0.755	0.753
	44	0.900	0.900	0.899	0.896	0.890	0.884	0.875	0.864	0.853	0.843	0.831	0.821	0.812	0.802	0.795	0.788	0.783	0.781	0.778	0.777
	45	0.930	0.929	0.929	0.925	0.920	0.913	0.904	0.893	0.881	0.871	0.859	0.848	0.839	0.829	0.821	0.814	0.809	0.806	0.804	0.803
	46	0.950	0.950	0.949	0.945	0.939	0.932	0.924	0.912	0.900	0.889	0.877	0.866	0.857	0.847	0.839	0.832	0.827	0.824	0.821	0.820
	47	0.976	0.976	0.975	0.971	0.965	0.958	0.949	0.937	0.925	0.914	0.902	0.890	0.880	0.870	0.863	0.855	0.849	0.847	0.844	0.843
	48	0.994	0.994	0.993	0.990	0.983	0.976	0.967	0.955	0.942	0.931	0.918	0.907	0.897	0.886	0.879	0.871	0.865	0.862	0.860	0.858
	49	1.025	1.025	1.024	1.020	1.014	1.006	0.997	0.984	0.972	0.960	0.947	0.935	0.925	0.914	0.906	0.898	0.892	0.889	0.887	0.885
	50	1.047	1.047	1.046	1.042	1.035	1.028	1.018	1.005	0.992	0.980	0.967	0.955	0.945	0.933	0.925	0.917	0.911	0.908	0.906	0.904

Table 2C.11. Projected charter removals (Mlb) and harvest for Area 2C in 2023 under reverse slot limits with lower limits of the protected slot ranging from 35 to 50 inches and an upper limit of 80 inches with days closed throughout the season and a **two fish annual limit**. Shaded cells represent projections for the most liberal upper and lower size limits that do not exceed the 2022 allocation of 0.82 Mlb. All values in the table include corrections for errors in estimation of average weight and inflation factors for release mortality.

a. Sunday closures and 2 fish limit

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year	
		Sept 17	Sept 10	Sept 03	Aug 27	Aug 20	Aug 13	Aug 6	July 30	July 23	July 16	July 9	July 2	June 25	June 18	June 11	June 4	May 28	May 21	May 14		
Lower Limit (in)	35	0.529	0.529	0.527	0.524	0.520	0.517	0.510	0.504	0.498	0.493	0.486	0.481	0.476	0.471	0.467	0.464	0.462	0.460	0.459	0.459	
	36	0.561	0.560	0.559	0.555	0.550	0.548	0.541	0.534	0.528	0.522	0.515	0.509	0.504	0.499	0.495	0.492	0.490	0.488	0.486	0.486	
	37	0.579	0.579	0.577	0.574	0.568	0.566	0.558	0.551	0.545	0.539	0.532	0.526	0.521	0.515	0.511	0.508	0.506	0.504	0.503	0.502	
	38	0.607	0.606	0.605	0.601	0.596	0.593	0.585	0.578	0.572	0.565	0.557	0.551	0.546	0.540	0.536	0.532	0.530	0.528	0.527	0.526	
	39	0.627	0.627	0.625	0.621	0.616	0.613	0.605	0.597	0.591	0.584	0.576	0.570	0.564	0.558	0.554	0.550	0.548	0.546	0.544	0.544	
	40	0.645	0.645	0.643	0.639	0.633	0.630	0.622	0.614	0.608	0.601	0.593	0.586	0.580	0.574	0.570	0.566	0.564	0.562	0.561	0.560	0.560
	41	0.666	0.665	0.663	0.659	0.653	0.650	0.642	0.634	0.627	0.620	0.611	0.605	0.599	0.593	0.588	0.584	0.582	0.579	0.578	0.578	
	42	0.680	0.679	0.677	0.673	0.667	0.664	0.656	0.648	0.641	0.633	0.625	0.618	0.612	0.606	0.601	0.597	0.594	0.592	0.590	0.590	
	43	0.695	0.695	0.693	0.688	0.682	0.679	0.670	0.662	0.655	0.648	0.639	0.632	0.625	0.619	0.614	0.610	0.608	0.605	0.604	0.603	
	44	0.717	0.717	0.714	0.710	0.704	0.701	0.692	0.683	0.676	0.668	0.659	0.652	0.645	0.639	0.634	0.630	0.627	0.625	0.623	0.623	
	45	0.741	0.740	0.738	0.734	0.727	0.724	0.714	0.706	0.698	0.690	0.681	0.674	0.667	0.660	0.655	0.651	0.648	0.645	0.644	0.643	
	46	0.757	0.756	0.754	0.750	0.743	0.740	0.730	0.721	0.713	0.705	0.696	0.688	0.682	0.675	0.669	0.665	0.662	0.659	0.658	0.657	
	47	0.778	0.778	0.775	0.771	0.764	0.760	0.750	0.741	0.733	0.725	0.715	0.708	0.701	0.694	0.688	0.684	0.681	0.678	0.676	0.676	
	48	0.793	0.792	0.790	0.785	0.778	0.775	0.765	0.755	0.747	0.739	0.729	0.721	0.714	0.707	0.701	0.697	0.694	0.691	0.689	0.689	
	49	0.817	0.817	0.814	0.809	0.802	0.799	0.788	0.779	0.770	0.762	0.751	0.744	0.736	0.729	0.723	0.718	0.715	0.712	0.710	0.710	
	50	0.835	0.834	0.832	0.827	0.820	0.816	0.805	0.795	0.787	0.778	0.768	0.759	0.752	0.744	0.739	0.734	0.731	0.728	0.726	0.725	

Table 2C.11. (continued)

d. Wednesday closures and 2 fish limit

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year
		Sept 20	Sept 13	Sept 6	Aug 30	Aug 23	Aug 16	Aug 9	Aug 2	July 26	July 19	July 12	July 5	June 28	June 21	June 14	June 7	May 31	May 24	May 17	
		59,830	59,801	59,660	59,385	58,917	58,436	57,690	56,987	56,164	55,586	54,878	54,106	53,534	52,884	52,323	51,982	51,706	51,508	51,381	51,367
Lower Limit (in)	35	0.529	0.529	0.528	0.525	0.521	0.517	0.510	0.504	0.497	0.491	0.485	0.478	0.473	0.468	0.462	0.459	0.457	0.455	0.454	0.454
	36	0.561	0.561	0.559	0.557	0.552	0.548	0.541	0.534	0.526	0.521	0.514	0.507	0.502	0.495	0.490	0.487	0.484	0.482	0.481	0.481
	37	0.579	0.579	0.577	0.575	0.570	0.565	0.558	0.551	0.543	0.538	0.531	0.523	0.518	0.512	0.506	0.503	0.500	0.498	0.497	0.496
	38	0.607	0.607	0.605	0.602	0.598	0.593	0.585	0.578	0.569	0.563	0.556	0.548	0.543	0.536	0.530	0.527	0.524	0.522	0.520	0.520
	39	0.627	0.627	0.626	0.623	0.618	0.613	0.605	0.597	0.589	0.582	0.575	0.567	0.561	0.554	0.548	0.545	0.541	0.539	0.538	0.538
	40	0.645	0.645	0.643	0.640	0.635	0.630	0.622	0.614	0.605	0.599	0.591	0.583	0.577	0.570	0.564	0.560	0.557	0.554	0.553	0.553
	41	0.666	0.665	0.664	0.661	0.655	0.650	0.642	0.634	0.624	0.618	0.610	0.601	0.595	0.588	0.582	0.577	0.574	0.572	0.570	0.570
	42	0.680	0.680	0.678	0.675	0.669	0.664	0.655	0.647	0.638	0.631	0.623	0.614	0.608	0.600	0.594	0.590	0.586	0.584	0.582	0.582
	43	0.695	0.695	0.693	0.690	0.684	0.679	0.670	0.662	0.652	0.645	0.637	0.628	0.621	0.614	0.607	0.603	0.599	0.597	0.595	0.595
	44	0.717	0.717	0.715	0.712	0.706	0.700	0.691	0.683	0.673	0.665	0.657	0.648	0.641	0.633	0.626	0.622	0.618	0.616	0.614	0.614
	45	0.741	0.741	0.739	0.735	0.729	0.723	0.714	0.705	0.695	0.688	0.679	0.669	0.662	0.654	0.647	0.643	0.639	0.636	0.635	0.634
	46	0.757	0.757	0.755	0.751	0.745	0.739	0.730	0.721	0.710	0.702	0.694	0.684	0.677	0.669	0.661	0.657	0.653	0.650	0.648	0.648
	47	0.778	0.778	0.776	0.772	0.766	0.759	0.750	0.741	0.730	0.722	0.713	0.703	0.696	0.687	0.680	0.675	0.671	0.668	0.666	0.666
	48	0.793	0.793	0.790	0.787	0.780	0.774	0.764	0.755	0.743	0.736	0.726	0.716	0.709	0.700	0.693	0.688	0.684	0.681	0.679	0.679
	49	0.817	0.817	0.815	0.811	0.805	0.798	0.788	0.778	0.766	0.758	0.749	0.738	0.731	0.722	0.714	0.709	0.705	0.702	0.700	0.699
	50	0.835	0.834	0.832	0.828	0.822	0.815	0.804	0.794	0.783	0.774	0.764	0.754	0.746	0.737	0.729	0.723	0.719	0.716	0.714	0.714

e. Thursday closures and 2 fish limit

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year
		Sept 21	Sept 14	Sept 7	Aug 31	Aug 24	Aug 17	Aug 10	Aug 3	July 27	July 20	July 13	July 6	June 29	June 22	June 15	June 8	June 1	May 25	May 18	
		59,830	59,776	59,664	59,382	58,906	58,471	57,685	56,887	56,113	55,457	54,845	54,082	53,506	52,945	52,289	51,822	51,571	51,362	51,248	51,190
Lower Limit (in)	35	0.529	0.529	0.528	0.525	0.521	0.517	0.511	0.503	0.497	0.491	0.486	0.479	0.474	0.469	0.463	0.459	0.457	0.455	0.454	0.453
	36	0.561	0.560	0.559	0.557	0.552	0.548	0.541	0.533	0.526	0.520	0.514	0.507	0.502	0.497	0.491	0.486	0.484	0.482	0.480	0.480
	37	0.579	0.579	0.578	0.575	0.570	0.566	0.559	0.551	0.543	0.537	0.531	0.524	0.519	0.513	0.507	0.502	0.499	0.497	0.496	0.496
	38	0.607	0.606	0.605	0.602	0.598	0.593	0.585	0.577	0.570	0.563	0.557	0.549	0.543	0.538	0.531	0.526	0.523	0.521	0.520	0.519
	39	0.627	0.627	0.626	0.623	0.618	0.613	0.605	0.597	0.589	0.582	0.575	0.567	0.562	0.556	0.549	0.544	0.541	0.539	0.538	0.537
	40	0.645	0.645	0.643	0.640	0.635	0.630	0.622	0.613	0.605	0.598	0.592	0.583	0.577	0.571	0.564	0.559	0.556	0.554	0.553	0.552
	41	0.666	0.665	0.664	0.661	0.655	0.650	0.642	0.633	0.625	0.617	0.610	0.602	0.596	0.590	0.582	0.577	0.574	0.571	0.570	0.569
	42	0.680	0.679	0.678	0.675	0.669	0.664	0.656	0.647	0.638	0.630	0.623	0.615	0.609	0.602	0.595	0.589	0.586	0.584	0.582	0.582
	43	0.695	0.695	0.693	0.690	0.684	0.679	0.670	0.661	0.652	0.644	0.637	0.629	0.622	0.616	0.608	0.602	0.599	0.597	0.595	0.595
	44	0.717	0.717	0.715	0.712	0.706	0.701	0.691	0.682	0.673	0.665	0.657	0.648	0.642	0.635	0.627	0.621	0.618	0.616	0.614	0.613
	45	0.741	0.740	0.739	0.735	0.729	0.724	0.714	0.705	0.695	0.687	0.679	0.670	0.663	0.656	0.648	0.642	0.639	0.636	0.635	0.634
	46	0.757	0.757	0.755	0.751	0.745	0.740	0.730	0.720	0.710	0.702	0.694	0.685	0.678	0.671	0.663	0.656	0.653	0.650	0.648	0.648
	47	0.778	0.778	0.776	0.772	0.766	0.760	0.750	0.740	0.730	0.721	0.713	0.704	0.697	0.689	0.681	0.674	0.671	0.668	0.666	0.666
	48	0.793	0.792	0.791	0.787	0.780	0.775	0.764	0.754	0.744	0.735	0.727	0.717	0.710	0.702	0.694	0.687	0.683	0.681	0.679	0.678
	49	0.817	0.817	0.815	0.811	0.805	0.799	0.788	0.777	0.767	0.758	0.749	0.739	0.732	0.724	0.715	0.708	0.705	0.702	0.700	0.699
	50	0.835	0.834	0.832	0.828	0.822	0.815	0.805	0.794	0.783	0.774	0.765	0.755	0.747	0.740	0.731	0.723	0.720	0.717	0.715	0.714

Table 2C.12. Projected charter removals (Mlb) and harvest for Area 2C in 2023 under reverse slot limits with lower limits of the protected slot ranging from 35 to 50 inches and an upper limit of 80 inches with one days closed for the entire the season and a **second day closed for part of the season with at least two days in between closures, and no annual limit**. Shaded cells represent projections for the most liberal upper and lower size limits that do not exceed the 2022 allocation of 0.82 Mlb. All values in the table include corrections for errors in estimation of average weight and inflation factors for release mortality.

a. All Sundays and variable Wednesdays

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year
		Sept 20	Sept 13	Sept 6	Aug 30	Aug 23	Aug 16	Aug 9	Aug 2	July 26	July 19	July 12	July 5	June 28	June 21	June 14	June 7	May 31	May 24	May 17	
Lower Limit (in)	35	0.623	0.621	0.618	0.612	0.606	0.597	0.589	0.579	0.571	0.563	0.554	0.547	0.539	0.532	0.528	0.524	0.522	0.520	0.520	0.520
	36	0.660	0.658	0.654	0.648	0.642	0.632	0.623	0.613	0.605	0.596	0.586	0.579	0.571	0.563	0.559	0.555	0.553	0.551	0.551	0.551
	37	0.682	0.680	0.676	0.670	0.663	0.653	0.644	0.633	0.625	0.616	0.606	0.598	0.590	0.582	0.577	0.574	0.571	0.569	0.569	0.569
	38	0.715	0.713	0.709	0.702	0.695	0.685	0.675	0.664	0.656	0.646	0.635	0.627	0.618	0.610	0.605	0.601	0.598	0.597	0.596	0.596
	39	0.739	0.737	0.733	0.726	0.719	0.708	0.698	0.686	0.678	0.668	0.657	0.649	0.639	0.631	0.626	0.622	0.619	0.617	0.617	0.616
	40	0.760	0.758	0.754	0.747	0.739	0.728	0.718	0.706	0.697	0.687	0.675	0.667	0.657	0.649	0.644	0.639	0.636	0.634	0.634	0.634
	41	0.785	0.782	0.778	0.771	0.763	0.752	0.741	0.728	0.719	0.709	0.697	0.688	0.678	0.670	0.664	0.660	0.657	0.655	0.654	0.654
	42	0.802	0.800	0.795	0.788	0.780	0.769	0.758	0.745	0.735	0.724	0.712	0.704	0.693	0.685	0.679	0.674	0.671	0.669	0.669	0.669
	43	0.821	0.818	0.814	0.806	0.798	0.786	0.775	0.762	0.752	0.741	0.729	0.720	0.709	0.700	0.694	0.690	0.686	0.684	0.684	0.684
	44	0.847	0.844	0.839	0.832	0.823	0.811	0.800	0.786	0.776	0.765	0.752	0.743	0.732	0.723	0.716	0.712	0.708	0.706	0.706	0.706
	45	0.875	0.872	0.868	0.860	0.851	0.839	0.826	0.812	0.802	0.790	0.777	0.768	0.757	0.747	0.741	0.736	0.732	0.730	0.729	0.729
	46	0.894	0.892	0.887	0.879	0.870	0.857	0.845	0.830	0.820	0.808	0.794	0.785	0.773	0.763	0.757	0.752	0.748	0.746	0.746	0.745
	47	0.920	0.917	0.912	0.903	0.894	0.881	0.869	0.854	0.843	0.831	0.817	0.807	0.795	0.785	0.778	0.773	0.769	0.767	0.766	0.766
	48	0.937	0.934	0.929	0.920	0.911	0.898	0.885	0.870	0.859	0.846	0.832	0.822	0.810	0.800	0.793	0.788	0.784	0.781	0.781	0.781
	49	0.967	0.964	0.959	0.950	0.940	0.927	0.913	0.898	0.886	0.873	0.859	0.848	0.836	0.825	0.818	0.813	0.809	0.806	0.806	0.806
	50	0.989	0.985	0.980	0.971	0.961	0.947	0.933	0.917	0.906	0.892	0.878	0.867	0.854	0.843	0.836	0.830	0.826	0.824	0.823	0.823

Table 2C.12. (continued)

d. All Mondays and variable Fridays

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year	
		Sept 22	Sept 15	Sept 8	Sept 1	Aug 25	Aug 18	Aug 11	Aug 4	July 28	July 21	July 14	July 7	June 30	June 23	June 16	June 9	June 2	May 26	May 19		
Lower Limit (in)	35	0.608	0.607	0.604	0.598	0.595	0.586	0.575	0.567	0.558	0.549	0.539	0.533	0.525	0.518	0.512	0.508	0.506	0.505	0.504	0.503	
	36	0.644	0.643	0.639	0.634	0.630	0.621	0.609	0.600	0.591	0.581	0.571	0.564	0.556	0.548	0.542	0.538	0.536	0.534	0.533	0.533	
	37	0.665	0.664	0.660	0.655	0.651	0.641	0.630	0.620	0.611	0.600	0.590	0.583	0.575	0.567	0.560	0.556	0.554	0.552	0.551	0.551	
	38	0.697	0.696	0.692	0.686	0.682	0.672	0.660	0.650	0.640	0.629	0.618	0.611	0.602	0.594	0.587	0.582	0.581	0.579	0.578	0.578	
	39	0.721	0.720	0.716	0.709	0.705	0.695	0.682	0.672	0.662	0.651	0.639	0.632	0.623	0.614	0.607	0.602	0.600	0.600	0.598	0.597	0.597
	40	0.741	0.740	0.736	0.729	0.725	0.715	0.702	0.691	0.681	0.669	0.657	0.650	0.640	0.632	0.625	0.619	0.617	0.615	0.614	0.614	0.614
	41	0.765	0.764	0.760	0.753	0.748	0.738	0.724	0.714	0.702	0.690	0.678	0.671	0.661	0.652	0.645	0.639	0.637	0.635	0.634	0.634	0.634
	42	0.782	0.781	0.776	0.769	0.765	0.754	0.740	0.729	0.718	0.706	0.693	0.686	0.676	0.666	0.659	0.653	0.651	0.649	0.648	0.648	0.648
	43	0.800	0.799	0.794	0.787	0.782	0.771	0.757	0.746	0.734	0.722	0.709	0.701	0.691	0.682	0.674	0.668	0.666	0.664	0.663	0.663	0.663
	44	0.825	0.824	0.819	0.812	0.807	0.796	0.781	0.770	0.758	0.745	0.731	0.724	0.713	0.703	0.695	0.689	0.688	0.685	0.684	0.684	0.684
	45	0.853	0.852	0.847	0.839	0.834	0.822	0.807	0.795	0.783	0.770	0.756	0.748	0.737	0.727	0.719	0.713	0.711	0.708	0.707	0.706	0.706
	46	0.872	0.870	0.865	0.858	0.852	0.840	0.825	0.813	0.800	0.787	0.773	0.764	0.753	0.743	0.735	0.728	0.726	0.724	0.722	0.722	0.722
	47	0.896	0.895	0.890	0.882	0.876	0.864	0.848	0.836	0.823	0.809	0.794	0.786	0.775	0.764	0.755	0.749	0.747	0.744	0.742	0.742	0.742
	48	0.913	0.912	0.906	0.898	0.893	0.880	0.864	0.851	0.838	0.824	0.809	0.801	0.789	0.778	0.769	0.763	0.761	0.758	0.756	0.756	0.756
	49	0.942	0.941	0.936	0.927	0.921	0.908	0.892	0.879	0.865	0.850	0.835	0.826	0.814	0.803	0.794	0.787	0.785	0.782	0.781	0.780	0.780
	50	0.963	0.962	0.956	0.947	0.941	0.928	0.911	0.898	0.884	0.869	0.853	0.844	0.832	0.821	0.812	0.805	0.802	0.799	0.798	0.797	0.797

e. All Tuesdays and variable Fridays

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year	
		Sept 22	Sept 15	Sept 8	Sept 1	Aug 25	Aug 18	Aug 11	Aug 4	July 28	July 21	July 14	July 7	June 30	June 23	June 16	June 9	June 2	May 26	May 19		
Lower Limit (in)	35	0.616	0.615	0.611	0.606	0.602	0.594	0.583	0.575	0.566	0.556	0.546	0.540	0.533	0.525	0.520	0.515	0.514	0.512	0.511	0.511	
	36	0.652	0.651	0.647	0.642	0.638	0.629	0.618	0.609	0.599	0.589	0.579	0.573	0.564	0.557	0.550	0.546	0.544	0.543	0.542	0.541	0.541
	37	0.674	0.673	0.669	0.663	0.659	0.650	0.638	0.629	0.619	0.609	0.598	0.591	0.583	0.575	0.569	0.564	0.562	0.560	0.559	0.559	0.559
	38	0.706	0.705	0.701	0.695	0.691	0.681	0.669	0.659	0.649	0.638	0.627	0.620	0.611	0.603	0.596	0.591	0.589	0.587	0.586	0.586	0.586
	39	0.730	0.729	0.725	0.718	0.714	0.704	0.691	0.681	0.671	0.660	0.648	0.641	0.632	0.623	0.616	0.611	0.609	0.607	0.606	0.606	0.606
	40	0.750	0.749	0.745	0.738	0.734	0.724	0.711	0.700	0.690	0.678	0.666	0.659	0.650	0.641	0.634	0.628	0.627	0.624	0.623	0.623	0.623
	41	0.774	0.773	0.769	0.762	0.757	0.747	0.733	0.723	0.712	0.700	0.687	0.680	0.670	0.661	0.654	0.648	0.647	0.644	0.643	0.643	0.643
	42	0.791	0.790	0.786	0.779	0.774	0.763	0.749	0.738	0.727	0.715	0.702	0.695	0.685	0.676	0.668	0.662	0.661	0.658	0.657	0.657	0.657
	43	0.809	0.808	0.803	0.796	0.791	0.780	0.766	0.755	0.744	0.731	0.718	0.711	0.700	0.691	0.683	0.678	0.676	0.673	0.672	0.672	0.672
	44	0.835	0.834	0.829	0.822	0.816	0.805	0.791	0.779	0.767	0.754	0.741	0.733	0.723	0.713	0.705	0.699	0.697	0.694	0.693	0.693	0.693
	45	0.863	0.862	0.857	0.849	0.844	0.832	0.817	0.805	0.793	0.780	0.766	0.758	0.747	0.737	0.729	0.722	0.720	0.718	0.716	0.716	0.716
	46	0.882	0.880	0.875	0.868	0.862	0.850	0.835	0.823	0.810	0.797	0.783	0.774	0.763	0.753	0.745	0.738	0.736	0.733	0.732	0.732	0.732
	47	0.906	0.905	0.900	0.892	0.886	0.874	0.858	0.846	0.833	0.819	0.804	0.796	0.785	0.774	0.765	0.759	0.757	0.754	0.752	0.752	0.752
	48	0.923	0.922	0.917	0.909	0.903	0.890	0.874	0.862	0.848	0.834	0.819	0.811	0.799	0.789	0.780	0.773	0.771	0.768	0.767	0.766	0.766
	49	0.953	0.951	0.946	0.937	0.932	0.919	0.902	0.889	0.875	0.861	0.846	0.837	0.825	0.814	0.805	0.798	0.795	0.792	0.791	0.791	0.791
	50	0.973	0.972	0.966	0.958	0.952	0.938	0.922	0.908	0.894	0.879	0.864	0.855	0.842	0.831	0.822	0.815	0.812	0.809	0.808	0.808	0.808

Table 2C.12. (continued)

n. All Saturdays and variable Wednesdays

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting
		Sept 20	Sept 13	Sept 6	Aug 30	Aug 23	Aug 16	Aug 9	Aug 2	July 26	July 19	July 12	July 5	June 28	June 21	June 14	June 7	May 31	May 24	May 17	All Year
		69,282	69,092	68,719	68,088	67,435	66,420	65,471	64,367	63,580	62,624	61,583	60,803	59,916	59,164	58,704	58,337	58,074	57,903	57,885	57,868
Lower Limit (in)	35	0.619	0.617	0.614	0.608	0.602	0.593	0.585	0.575	0.568	0.559	0.550	0.543	0.535	0.528	0.524	0.520	0.518	0.516	0.516	0.516
	36	0.656	0.654	0.650	0.644	0.638	0.628	0.619	0.609	0.601	0.592	0.582	0.575	0.567	0.559	0.555	0.551	0.549	0.547	0.547	0.547
	37	0.678	0.676	0.672	0.666	0.659	0.649	0.640	0.629	0.621	0.612	0.602	0.594	0.585	0.578	0.573	0.569	0.567	0.565	0.565	0.565
	38	0.710	0.708	0.704	0.698	0.691	0.681	0.671	0.659	0.651	0.641	0.631	0.623	0.614	0.606	0.601	0.597	0.594	0.592	0.592	0.592
	39	0.734	0.732	0.728	0.721	0.714	0.704	0.694	0.682	0.673	0.663	0.652	0.644	0.635	0.626	0.621	0.617	0.614	0.612	0.612	0.612
	40	0.755	0.753	0.749	0.742	0.735	0.724	0.713	0.701	0.692	0.682	0.671	0.662	0.653	0.644	0.639	0.635	0.631	0.629	0.629	0.629
	41	0.780	0.777	0.773	0.766	0.758	0.747	0.736	0.723	0.714	0.704	0.692	0.683	0.673	0.665	0.659	0.655	0.652	0.650	0.649	0.649
	42	0.797	0.794	0.790	0.783	0.775	0.763	0.752	0.739	0.730	0.719	0.707	0.698	0.688	0.679	0.674	0.669	0.666	0.664	0.664	0.663
	43	0.815	0.813	0.808	0.801	0.793	0.781	0.770	0.756	0.747	0.736	0.723	0.714	0.704	0.695	0.689	0.684	0.681	0.679	0.679	0.678
	44	0.841	0.838	0.834	0.826	0.818	0.806	0.794	0.780	0.770	0.759	0.746	0.737	0.726	0.717	0.711	0.706	0.703	0.700	0.700	0.700
	45	0.869	0.866	0.862	0.854	0.845	0.833	0.821	0.806	0.796	0.784	0.771	0.762	0.751	0.741	0.735	0.730	0.726	0.724	0.724	0.723
	46	0.888	0.885	0.881	0.872	0.864	0.851	0.838	0.824	0.814	0.802	0.788	0.779	0.767	0.757	0.751	0.746	0.742	0.740	0.739	0.739
	47	0.913	0.910	0.905	0.897	0.888	0.875	0.862	0.847	0.837	0.824	0.810	0.801	0.789	0.778	0.772	0.767	0.763	0.760	0.760	0.760
	48	0.930	0.927	0.922	0.914	0.905	0.891	0.878	0.863	0.852	0.840	0.826	0.816	0.804	0.793	0.786	0.781	0.777	0.775	0.774	0.774
	49	0.960	0.957	0.952	0.943	0.934	0.920	0.906	0.891	0.880	0.866	0.852	0.842	0.829	0.818	0.811	0.806	0.802	0.799	0.799	0.799
50	0.981	0.978	0.973	0.964	0.954	0.940	0.926	0.910	0.899	0.885	0.871	0.860	0.847	0.836	0.829	0.823	0.819	0.816	0.816	0.816	

Table 2C.13. Projected charter removals (Mlb) and harvest for Area 2C in 2023 under reverse slot limits with lower limits of the protected slot ranging from 35 to 50 inches and an upper limit of 80 inches with one days closed for the entire the season and **a second day closed for part of the season with at least two days in between closures, and a 3-fish annual limit**. Shaded cells represent projections for the most liberal upper and lower size limits that do not exceed the 2022 allocation of 0.82 Mlb. All values in the table include corrections for errors in estimation of average weight and inflation factors for release mortality.

a. All Sundays and variable Wednesdays and 3 fish annual limit

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year
		Sept 20	Sept 13	Sept 6	Aug 30	Aug 23	Aug 16	Aug 9	Aug 2	July 26	July 19	July 12	July 5	June 28	June 21	June 14	June 7	May 31	May 24	May 17	
Lower Limit (in)	35	0.582	0.580	0.577	0.572	0.566	0.558	0.550	0.541	0.534	0.526	0.517	0.511	0.504	0.497	0.493	0.490	0.488	0.486	0.486	0.486
	36	0.616	0.614	0.611	0.606	0.600	0.591	0.582	0.573	0.566	0.557	0.548	0.541	0.533	0.527	0.522	0.519	0.517	0.515	0.515	0.515
	37	0.637	0.635	0.631	0.626	0.620	0.610	0.602	0.592	0.584	0.576	0.566	0.559	0.551	0.544	0.540	0.536	0.534	0.532	0.532	0.532
	38	0.667	0.665	0.662	0.656	0.649	0.640	0.631	0.620	0.612	0.603	0.593	0.586	0.578	0.570	0.566	0.562	0.559	0.558	0.557	0.557
	39	0.690	0.688	0.684	0.678	0.671	0.662	0.652	0.641	0.633	0.624	0.614	0.606	0.597	0.590	0.585	0.581	0.578	0.578	0.576	0.576
	40	0.710	0.708	0.704	0.697	0.691	0.680	0.671	0.659	0.651	0.642	0.631	0.623	0.614	0.606	0.601	0.597	0.595	0.595	0.593	0.593
	41	0.732	0.730	0.726	0.720	0.713	0.702	0.692	0.680	0.672	0.662	0.651	0.643	0.634	0.626	0.621	0.617	0.614	0.612	0.611	0.611
	42	0.749	0.746	0.742	0.736	0.728	0.718	0.707	0.695	0.687	0.677	0.665	0.657	0.648	0.640	0.634	0.630	0.627	0.625	0.625	0.625
	43	0.766	0.763	0.759	0.752	0.745	0.734	0.723	0.711	0.702	0.692	0.681	0.672	0.663	0.654	0.649	0.644	0.641	0.639	0.639	0.639
	44	0.790	0.788	0.783	0.776	0.769	0.757	0.747	0.734	0.725	0.714	0.702	0.694	0.684	0.675	0.669	0.665	0.662	0.660	0.659	0.659
	45	0.817	0.814	0.810	0.802	0.795	0.783	0.772	0.759	0.749	0.738	0.726	0.717	0.707	0.698	0.692	0.687	0.684	0.682	0.682	0.681
	46	0.835	0.832	0.828	0.820	0.812	0.800	0.789	0.775	0.766	0.754	0.742	0.733	0.723	0.713	0.707	0.702	0.699	0.697	0.697	0.696
	47	0.858	0.856	0.851	0.843	0.835	0.823	0.811	0.797	0.787	0.776	0.763	0.754	0.743	0.733	0.727	0.722	0.719	0.716	0.716	0.716
	48	0.875	0.872	0.867	0.859	0.851	0.838	0.826	0.812	0.802	0.790	0.777	0.768	0.757	0.747	0.741	0.736	0.732	0.730	0.730	0.729
	49	0.903	0.900	0.895	0.887	0.878	0.865	0.853	0.838	0.828	0.816	0.802	0.793	0.781	0.771	0.764	0.759	0.755	0.753	0.753	0.753
	50	0.922	0.919	0.914	0.906	0.897	0.884	0.871	0.856	0.846	0.833	0.820	0.810	0.798	0.788	0.781	0.776	0.772	0.769	0.769	0.769

Table 2C.13. (continued)

I. All Fridays and variable Tuesdays and 3 fish annual limit

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year	
		Sept 19	Sept 12	Sept 5	Aug 29	Aug 22	Aug 15	Aug 8	Aug 1	July 25	July 18	July 11	July 4	June 27	June 20	June 13	June 6	May 30	May 23	May 16			
Lower Limit (in)	35	0.573	0.571	0.568	0.562	0.557	0.548	0.538	0.529	0.520	0.513	0.504	0.498	0.491	0.485	0.483	0.481	0.479	0.478	0.478	0.478	0.478	
	36	0.607	0.605	0.601	0.596	0.590	0.580	0.570	0.560	0.551	0.543	0.534	0.528	0.520	0.514	0.512	0.509	0.507	0.507	0.507	0.506	0.506	
	37	0.627	0.625	0.621	0.615	0.609	0.599	0.589	0.579	0.569	0.561	0.552	0.545	0.537	0.531	0.529	0.526	0.524	0.524	0.523	0.523	0.523	0.523
	38	0.657	0.655	0.651	0.645	0.638	0.628	0.617	0.606	0.597	0.588	0.578	0.572	0.563	0.557	0.554	0.551	0.549	0.548	0.548	0.548	0.548	0.548
	39	0.680	0.677	0.673	0.667	0.660	0.649	0.638	0.627	0.617	0.608	0.598	0.591	0.582	0.576	0.573	0.570	0.568	0.567	0.567	0.567	0.567	0.567
	40	0.699	0.696	0.692	0.686	0.678	0.668	0.656	0.644	0.634	0.625	0.615	0.608	0.598	0.592	0.589	0.586	0.584	0.584	0.583	0.583	0.583	0.583
	41	0.721	0.718	0.714	0.707	0.700	0.689	0.677	0.665	0.655	0.645	0.634	0.627	0.617	0.611	0.608	0.605	0.602	0.601	0.601	0.601	0.601	0.601
	42	0.737	0.734	0.730	0.723	0.715	0.704	0.692	0.679	0.669	0.659	0.648	0.640	0.631	0.624	0.621	0.618	0.615	0.615	0.614	0.614	0.614	0.614
	43	0.753	0.751	0.746	0.739	0.731	0.720	0.707	0.695	0.684	0.674	0.663	0.655	0.645	0.638	0.635	0.631	0.629	0.628	0.628	0.628	0.628	0.628
	44	0.777	0.775	0.770	0.763	0.754	0.742	0.730	0.717	0.706	0.696	0.684	0.676	0.666	0.658	0.655	0.652	0.649	0.648	0.648	0.648	0.648	0.648
	45	0.803	0.801	0.796	0.788	0.780	0.767	0.754	0.741	0.729	0.719	0.707	0.698	0.688	0.681	0.678	0.673	0.671	0.670	0.670	0.669	0.669	0.669
	46	0.821	0.818	0.813	0.805	0.797	0.784	0.771	0.757	0.745	0.735	0.722	0.714	0.703	0.696	0.692	0.688	0.686	0.685	0.684	0.684	0.684	0.684
	47	0.844	0.841	0.836	0.828	0.819	0.806	0.793	0.778	0.766	0.755	0.742	0.734	0.723	0.715	0.712	0.707	0.705	0.704	0.703	0.703	0.703	0.703
	48	0.860	0.857	0.852	0.844	0.834	0.821	0.808	0.793	0.780	0.769	0.756	0.748	0.737	0.729	0.725	0.721	0.718	0.717	0.717	0.717	0.717	0.716
	49	0.887	0.884	0.879	0.870	0.861	0.847	0.833	0.818	0.805	0.794	0.780	0.771	0.760	0.751	0.748	0.744	0.741	0.740	0.740	0.739	0.739	0.739
	50	0.906	0.903	0.898	0.889	0.879	0.865	0.851	0.835	0.822	0.811	0.797	0.788	0.776	0.768	0.764	0.759	0.756	0.755	0.755	0.755	0.755	0.755

m. All Saturdays and variable Tuesdays and 3 fish annual limit

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year
		Sept 19	Sept 12	Sept 5	Aug 29	Aug 22	Aug 15	Aug 8	Aug 1	July 25	July 18	July 11	July 4	June 27	June 20	June 13	June 6	May 30	May 23	May 16		
Lower Limit (in)	35	0.578	0.577	0.573	0.568	0.562	0.553	0.544	0.534	0.526	0.518	0.510	0.504	0.496	0.491	0.489	0.486	0.484	0.484	0.483	0.483	0.483
	36	0.613	0.611	0.607	0.601	0.595	0.586	0.576	0.566	0.557	0.549	0.540	0.534	0.526	0.520	0.518	0.515	0.513	0.512	0.512	0.512	0.512
	37	0.633	0.631	0.627	0.621	0.615	0.605	0.595	0.584	0.575	0.567	0.558	0.551	0.543	0.537	0.535	0.532	0.530	0.529	0.529	0.529	0.529
	38	0.664	0.661	0.657	0.651	0.644	0.634	0.624	0.613	0.603	0.595	0.585	0.578	0.569	0.563	0.561	0.558	0.555	0.555	0.554	0.554	0.554
	39	0.686	0.684	0.680	0.673	0.666	0.656	0.645	0.633	0.624	0.615	0.604	0.597	0.589	0.582	0.580	0.576	0.574	0.574	0.573	0.573	0.573
	40	0.705	0.703	0.699	0.692	0.685	0.674	0.663	0.651	0.641	0.632	0.622	0.614	0.605	0.599	0.596	0.593	0.591	0.590	0.589	0.589	0.589
	41	0.728	0.726	0.721	0.714	0.707	0.696	0.684	0.672	0.662	0.652	0.641	0.634	0.625	0.618	0.615	0.612	0.609	0.609	0.608	0.608	0.608
	42	0.744	0.742	0.737	0.730	0.722	0.711	0.699	0.687	0.676	0.667	0.655	0.648	0.638	0.631	0.629	0.625	0.623	0.622	0.621	0.621	0.621
	43	0.761	0.758	0.754	0.747	0.739	0.727	0.715	0.702	0.691	0.682	0.670	0.662	0.653	0.646	0.643	0.639	0.637	0.636	0.635	0.635	0.635
	44	0.785	0.783	0.778	0.771	0.762	0.750	0.738	0.725	0.713	0.703	0.692	0.684	0.674	0.666	0.663	0.660	0.657	0.656	0.656	0.656	0.656
	45	0.812	0.809	0.804	0.796	0.788	0.776	0.763	0.749	0.737	0.727	0.715	0.707	0.696	0.689	0.686	0.682	0.679	0.678	0.678	0.678	0.678
	46	0.829	0.827	0.822	0.814	0.805	0.793	0.779	0.765	0.754	0.743	0.731	0.722	0.712	0.704	0.701	0.697	0.694	0.693	0.693	0.693	0.692
	47	0.853	0.850	0.845	0.837	0.828	0.815	0.801	0.787	0.775	0.764	0.751	0.742	0.732	0.724	0.721	0.716	0.713	0.712	0.712	0.712	0.712
	48	0.869	0.866	0.861	0.853	0.843	0.830	0.817	0.802	0.789	0.778	0.765	0.757	0.746	0.738	0.734	0.730	0.727	0.726	0.726	0.726	0.725
	49	0.897	0.894	0.888	0.880	0.870	0.857	0.842	0.827	0.815	0.803	0.790	0.781	0.769	0.761	0.757	0.753	0.750	0.749	0.748	0.748	0.748
	50	0.916	0.913	0.907	0.899	0.889	0.875	0.861	0.845	0.832	0.821	0.807	0.797	0.786	0.777	0.774	0.769	0.766	0.765	0.765	0.765	0.765

Table 2C.14. Projected charter removals (Mlb) and harvest for Area 2C in 2023 under reverse slot limits with lower limits of the protected slot ranging from 35 to 50 inches and an upper limit of 80 inches with one days closed for the entire the season and a **second day closed for part of the season with at least two days in between closures, and a 2-fish annul limit**. All projections were below the 2022 allocation of 0.82 Mlb. All values in the table include corrections for errors in estimation of average weight and inflation factors for release mortality.

a. All Sundays and variable Wednesdays and 2 fish annual limit

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year
		Sept 20	Sept 13	Sept 6	Aug 30	Aug 23	Aug 16	Aug 9	Aug 2	July 26	July 19	July 12	July 5	June 28	June 21	June 14	June 7	May 31	May 24	May 17		
		51,738	51,597	51,322	50,854	50,373	49,627	48,924	48,101	47,523	46,815	46,043	45,471	44,821	44,260	43,919	43,643	43,445	43,318	43,304	43,290	
Lower Limit (in)	35	0.462	0.461	0.458	0.454	0.450	0.443	0.437	0.429	0.424	0.418	0.411	0.406	0.400	0.395	0.392	0.389	0.387	0.386	0.386	0.386	0.386
	36	0.490	0.488	0.486	0.481	0.477	0.470	0.463	0.455	0.450	0.443	0.436	0.430	0.424	0.419	0.415	0.413	0.411	0.409	0.409	0.409	0.409
	37	0.506	0.505	0.502	0.497	0.493	0.485	0.478	0.470	0.465	0.458	0.450	0.445	0.438	0.433	0.429	0.426	0.424	0.423	0.423	0.423	0.423
	38	0.531	0.529	0.526	0.522	0.517	0.509	0.502	0.493	0.487	0.480	0.472	0.466	0.460	0.454	0.450	0.447	0.445	0.444	0.443	0.443	0.443
	39	0.549	0.547	0.544	0.539	0.534	0.526	0.519	0.510	0.504	0.496	0.488	0.482	0.475	0.469	0.466	0.462	0.460	0.459	0.459	0.459	0.459
	40	0.565	0.563	0.560	0.555	0.550	0.542	0.534	0.525	0.518	0.511	0.502	0.496	0.489	0.483	0.479	0.476	0.473	0.473	0.472	0.472	0.472
	41	0.583	0.581	0.578	0.573	0.567	0.559	0.551	0.542	0.535	0.527	0.519	0.512	0.505	0.498	0.494	0.491	0.489	0.487	0.487	0.487	0.487
	42	0.596	0.594	0.591	0.586	0.580	0.572	0.563	0.554	0.547	0.539	0.530	0.524	0.516	0.509	0.505	0.502	0.499	0.498	0.498	0.498	0.498
	43	0.610	0.608	0.605	0.599	0.593	0.585	0.576	0.566	0.559	0.551	0.542	0.536	0.528	0.521	0.517	0.513	0.511	0.509	0.509	0.509	0.509
	44	0.630	0.628	0.624	0.618	0.612	0.603	0.595	0.585	0.577	0.569	0.560	0.553	0.545	0.538	0.533	0.530	0.527	0.526	0.525	0.525	0.525
	45	0.651	0.649	0.645	0.639	0.633	0.624	0.615	0.604	0.597	0.588	0.579	0.572	0.563	0.556	0.551	0.548	0.545	0.543	0.543	0.543	0.543
	46	0.665	0.663	0.660	0.654	0.647	0.638	0.629	0.618	0.610	0.601	0.591	0.584	0.576	0.569	0.564	0.560	0.557	0.555	0.555	0.555	0.555
	47	0.684	0.682	0.678	0.672	0.666	0.656	0.647	0.635	0.628	0.618	0.608	0.601	0.592	0.585	0.580	0.576	0.573	0.571	0.571	0.571	0.571
	48	0.697	0.695	0.691	0.685	0.678	0.669	0.659	0.648	0.640	0.630	0.620	0.613	0.604	0.596	0.591	0.587	0.584	0.582	0.582	0.582	0.582
	49	0.720	0.717	0.713	0.707	0.700	0.690	0.680	0.668	0.660	0.650	0.639	0.632	0.623	0.615	0.610	0.605	0.602	0.600	0.600	0.600	0.600
50	0.735	0.733	0.729	0.722	0.715	0.705	0.695	0.683	0.674	0.664	0.653	0.646	0.636	0.628	0.623	0.618	0.615	0.613	0.613	0.613	0.613	

Table 2C.14. (continued)

f. All Tuesdays and variable Saturdays and 2 fish annual limit

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting
		Sept 23	Sept 16	Sept 9	Sept 2	Aug 26	Aug 19	Aug 12	Aug 5	July 29	July 22	July 15	July 8	July 1	June 24	June 17	June 10	June 3	May 27	May 20	Sept 23
Lower Limit (in)	35	0.457	0.457	0.455	0.452	0.448	0.443	0.436	0.429	0.423	0.416	0.410	0.405	0.399	0.395	0.391	0.388	0.386	0.385	0.384	0.384
	36	0.485	0.484	0.482	0.479	0.475	0.469	0.462	0.455	0.449	0.442	0.435	0.429	0.423	0.419	0.414	0.411	0.410	0.408	0.407	0.407
	37	0.501	0.500	0.498	0.495	0.490	0.485	0.478	0.470	0.464	0.456	0.449	0.443	0.437	0.433	0.428	0.425	0.423	0.422	0.421	0.421
	38	0.525	0.525	0.522	0.519	0.514	0.509	0.501	0.493	0.486	0.478	0.471	0.465	0.458	0.454	0.449	0.446	0.444	0.442	0.441	0.441
	39	0.543	0.542	0.540	0.536	0.532	0.526	0.518	0.510	0.503	0.495	0.487	0.481	0.474	0.469	0.464	0.461	0.459	0.458	0.457	0.456
	40	0.559	0.558	0.556	0.552	0.547	0.541	0.533	0.525	0.517	0.509	0.501	0.495	0.488	0.483	0.478	0.474	0.472	0.471	0.470	0.469
	41	0.577	0.576	0.574	0.569	0.564	0.558	0.550	0.542	0.534	0.525	0.517	0.511	0.503	0.498	0.493	0.490	0.488	0.486	0.485	0.485
	42	0.589	0.588	0.586	0.582	0.577	0.570	0.562	0.553	0.546	0.537	0.529	0.522	0.514	0.509	0.504	0.500	0.498	0.496	0.495	0.495
	43	0.602	0.602	0.599	0.595	0.590	0.583	0.575	0.566	0.558	0.549	0.541	0.534	0.526	0.521	0.515	0.512	0.510	0.508	0.507	0.506
	44	0.622	0.621	0.619	0.614	0.609	0.602	0.593	0.584	0.576	0.567	0.558	0.551	0.543	0.538	0.532	0.528	0.526	0.524	0.523	0.523
	45	0.643	0.642	0.639	0.635	0.629	0.622	0.613	0.604	0.595	0.586	0.577	0.570	0.562	0.556	0.550	0.546	0.544	0.542	0.541	0.540
	46	0.657	0.656	0.654	0.649	0.643	0.636	0.627	0.617	0.609	0.599	0.590	0.582	0.574	0.568	0.562	0.558	0.556	0.554	0.553	0.552
	47	0.676	0.675	0.672	0.667	0.661	0.654	0.645	0.635	0.626	0.616	0.606	0.599	0.590	0.584	0.578	0.574	0.572	0.569	0.568	0.568
	48	0.688	0.688	0.685	0.680	0.674	0.667	0.657	0.647	0.638	0.628	0.618	0.610	0.602	0.596	0.589	0.585	0.583	0.580	0.579	0.579
	49	0.710	0.709	0.706	0.701	0.695	0.688	0.677	0.667	0.658	0.647	0.637	0.629	0.621	0.614	0.608	0.603	0.601	0.599	0.597	0.597
	50	0.725	0.724	0.722	0.716	0.710	0.702	0.692	0.682	0.672	0.661	0.651	0.643	0.634	0.628	0.621	0.616	0.614	0.612	0.610	0.610

g. All Wednesdays and variable Saturdays and 2 fish annual limit

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year
		Sept 23	Sept 16	Sept 9	Sept 2	Aug 26	Aug 19	Aug 12	Aug 5	July 29	July 22	July 15	July 8	July 1	June 24	June 17	June 10	June 3	May 27	May 20	May 20	Sept 23
Lower Limit (in)	35	0.457	0.456	0.454	0.451	0.447	0.442	0.435	0.429	0.423	0.416	0.409	0.404	0.398	0.394	0.390	0.387	0.386	0.384	0.384	0.383	
	36	0.484	0.483	0.482	0.478	0.474	0.469	0.462	0.455	0.448	0.441	0.434	0.428	0.422	0.418	0.414	0.411	0.409	0.408	0.407	0.407	
	37	0.500	0.500	0.498	0.494	0.490	0.484	0.477	0.470	0.463	0.456	0.448	0.443	0.436	0.432	0.427	0.424	0.423	0.421	0.420	0.420	
	38	0.524	0.524	0.522	0.518	0.513	0.508	0.500	0.493	0.486	0.478	0.470	0.464	0.458	0.453	0.448	0.445	0.443	0.442	0.441	0.440	
	39	0.542	0.542	0.540	0.536	0.531	0.525	0.517	0.509	0.502	0.494	0.486	0.480	0.473	0.468	0.464	0.460	0.458	0.457	0.456	0.456	
	40	0.558	0.557	0.555	0.551	0.546	0.540	0.532	0.524	0.516	0.508	0.500	0.494	0.487	0.482	0.477	0.473	0.471	0.470	0.469	0.469	
	41	0.576	0.575	0.573	0.568	0.564	0.557	0.549	0.541	0.533	0.524	0.516	0.510	0.503	0.497	0.492	0.489	0.487	0.485	0.484	0.484	
	42	0.588	0.587	0.585	0.581	0.576	0.569	0.561	0.552	0.545	0.536	0.528	0.521	0.513	0.508	0.503	0.499	0.497	0.495	0.494	0.494	
	43	0.601	0.601	0.598	0.594	0.589	0.582	0.574	0.565	0.557	0.548	0.539	0.533	0.525	0.520	0.514	0.510	0.508	0.507	0.506	0.505	
	44	0.621	0.620	0.617	0.613	0.608	0.601	0.592	0.583	0.575	0.566	0.557	0.550	0.542	0.537	0.531	0.527	0.525	0.523	0.522	0.522	
	45	0.642	0.641	0.638	0.634	0.628	0.621	0.612	0.603	0.594	0.585	0.576	0.568	0.560	0.555	0.549	0.545	0.543	0.541	0.539	0.539	
	46	0.656	0.655	0.652	0.647	0.642	0.635	0.625	0.616	0.607	0.598	0.588	0.581	0.573	0.567	0.561	0.557	0.555	0.552	0.551	0.551	
	47	0.674	0.673	0.671	0.666	0.660	0.653	0.643	0.633	0.624	0.614	0.605	0.597	0.589	0.583	0.577	0.573	0.570	0.568	0.567	0.567	
	48	0.687	0.686	0.684	0.679	0.673	0.665	0.656	0.646	0.636	0.626	0.617	0.609	0.600	0.594	0.588	0.584	0.581	0.579	0.578	0.578	
	49	0.709	0.708	0.705	0.700	0.694	0.686	0.676	0.666	0.656	0.646	0.636	0.628	0.619	0.613	0.606	0.602	0.599	0.597	0.596	0.596	
	50	0.724	0.723	0.720	0.715	0.708	0.701	0.690	0.680	0.670	0.660	0.650	0.641	0.632	0.626	0.619	0.615	0.612	0.610	0.609	0.608	

Table 2C.14. (continued)

I. All Fridays and variable Tuesdays and 2 fish annual limit

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year
		Sept 19	Sept 12	Sept 5	Aug 29	Aug 22	Aug 15	Aug 8	Aug 1	July 25	July 18	July 11	July 4	June 27	June 20	June 13	June 6	May 30	May 23	May 16		
Lower Limit (in)	35	0.455	0.454	0.451	0.447	0.442	0.435	0.428	0.420	0.413	0.407	0.401	0.396	0.390	0.386	0.384	0.382	0.380	0.380	0.380	0.380	0.380
	36	0.483	0.481	0.478	0.473	0.469	0.461	0.453	0.445	0.438	0.432	0.425	0.420	0.413	0.409	0.407	0.405	0.403	0.403	0.403	0.403	0.403
	37	0.499	0.497	0.494	0.489	0.484	0.476	0.468	0.460	0.453	0.446	0.439	0.434	0.427	0.423	0.421	0.418	0.417	0.416	0.416	0.416	0.416
	38	0.523	0.521	0.518	0.513	0.508	0.500	0.491	0.482	0.475	0.468	0.460	0.455	0.448	0.443	0.441	0.439	0.437	0.436	0.436	0.436	0.436
	39	0.541	0.539	0.536	0.531	0.525	0.517	0.508	0.499	0.491	0.484	0.476	0.470	0.463	0.458	0.456	0.454	0.452	0.451	0.451	0.451	0.451
	40	0.556	0.554	0.551	0.546	0.540	0.531	0.522	0.513	0.505	0.498	0.489	0.484	0.476	0.471	0.469	0.467	0.465	0.464	0.464	0.464	0.464
	41	0.574	0.572	0.569	0.563	0.557	0.548	0.539	0.530	0.521	0.514	0.505	0.499	0.492	0.487	0.484	0.482	0.480	0.479	0.479	0.479	0.479
	42	0.587	0.585	0.581	0.576	0.569	0.560	0.551	0.541	0.533	0.525	0.516	0.510	0.502	0.497	0.495	0.492	0.490	0.489	0.489	0.489	0.489
	43	0.600	0.598	0.594	0.589	0.582	0.573	0.563	0.553	0.545	0.537	0.528	0.522	0.514	0.508	0.506	0.503	0.501	0.500	0.500	0.500	0.500
	44	0.619	0.617	0.613	0.607	0.601	0.591	0.582	0.571	0.562	0.554	0.545	0.538	0.530	0.525	0.522	0.519	0.517	0.517	0.516	0.516	0.516
	45	0.640	0.638	0.634	0.628	0.621	0.611	0.601	0.590	0.581	0.573	0.563	0.557	0.548	0.543	0.540	0.537	0.535	0.534	0.534	0.534	0.534
	46	0.654	0.652	0.648	0.642	0.635	0.625	0.614	0.603	0.594	0.586	0.576	0.569	0.561	0.555	0.552	0.549	0.547	0.546	0.545	0.545	0.545
	47	0.673	0.670	0.666	0.660	0.653	0.643	0.632	0.620	0.611	0.602	0.592	0.585	0.576	0.570	0.568	0.564	0.562	0.561	0.561	0.561	0.561
	48	0.686	0.683	0.679	0.673	0.665	0.655	0.644	0.632	0.623	0.614	0.603	0.596	0.587	0.581	0.579	0.575	0.573	0.572	0.572	0.572	0.571
	49	0.707	0.705	0.700	0.694	0.686	0.675	0.664	0.652	0.642	0.633	0.622	0.615	0.606	0.599	0.597	0.593	0.591	0.590	0.589	0.589	0.589
	50	0.723	0.720	0.716	0.709	0.701	0.690	0.679	0.666	0.656	0.647	0.635	0.628	0.619	0.612	0.609	0.606	0.603	0.602	0.602	0.602	0.602

m. All Saturdays and variable Tuesdays and 2 fish annual limit

	Harvest	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	Starting	All Year
		Sept 19	Sept 12	Sept 5	Aug 29	Aug 22	Aug 15	Aug 8	Aug 1	July 25	July 18	July 11	July 4	June 27	June 20	June 13	June 6	May 30	May 23	May 16		
Lower Limit (in)	35	0.460	0.458	0.455	0.451	0.446	0.439	0.432	0.424	0.418	0.412	0.405	0.400	0.394	0.390	0.388	0.386	0.385	0.384	0.384	0.384	
	36	0.487	0.486	0.483	0.478	0.473	0.466	0.458	0.450	0.443	0.437	0.429	0.424	0.418	0.414	0.412	0.410	0.408	0.408	0.407	0.407	0.407
	37	0.503	0.502	0.499	0.494	0.489	0.481	0.473	0.465	0.458	0.451	0.444	0.439	0.432	0.427	0.426	0.423	0.422	0.421	0.421	0.421	0.421
	38	0.528	0.526	0.523	0.518	0.513	0.505	0.496	0.488	0.480	0.473	0.465	0.460	0.453	0.448	0.446	0.444	0.442	0.442	0.441	0.441	0.441
	39	0.546	0.544	0.541	0.536	0.530	0.522	0.513	0.504	0.496	0.489	0.481	0.476	0.469	0.464	0.462	0.459	0.457	0.457	0.456	0.456	0.456
	40	0.562	0.560	0.556	0.551	0.546	0.537	0.528	0.519	0.511	0.503	0.495	0.489	0.482	0.477	0.475	0.472	0.470	0.470	0.469	0.469	0.469
	41	0.580	0.578	0.574	0.569	0.563	0.554	0.545	0.535	0.527	0.520	0.511	0.505	0.498	0.492	0.490	0.487	0.486	0.485	0.485	0.485	0.485
	42	0.593	0.591	0.587	0.582	0.576	0.566	0.557	0.547	0.539	0.531	0.522	0.516	0.509	0.503	0.501	0.498	0.496	0.496	0.495	0.495	0.495
	43	0.606	0.604	0.601	0.595	0.589	0.579	0.570	0.560	0.551	0.543	0.534	0.528	0.520	0.515	0.512	0.509	0.507	0.507	0.506	0.506	0.506
	44	0.626	0.624	0.620	0.614	0.608	0.598	0.588	0.578	0.569	0.561	0.551	0.545	0.537	0.531	0.529	0.526	0.524	0.523	0.523	0.523	0.523
	45	0.647	0.645	0.641	0.635	0.628	0.618	0.608	0.597	0.588	0.580	0.570	0.563	0.555	0.549	0.547	0.544	0.542	0.541	0.540	0.540	0.540
	46	0.661	0.659	0.655	0.649	0.642	0.632	0.621	0.610	0.601	0.593	0.583	0.576	0.568	0.562	0.559	0.556	0.553	0.553	0.552	0.552	0.552
	47	0.680	0.678	0.674	0.667	0.660	0.650	0.639	0.628	0.618	0.609	0.599	0.592	0.584	0.577	0.575	0.571	0.569	0.568	0.568	0.568	0.568
	48	0.693	0.691	0.687	0.680	0.673	0.662	0.651	0.640	0.630	0.621	0.611	0.604	0.595	0.589	0.586	0.582	0.580	0.579	0.579	0.579	0.579
	49	0.715	0.713	0.708	0.702	0.694	0.683	0.672	0.660	0.650	0.641	0.630	0.623	0.614	0.607	0.604	0.601	0.598	0.598	0.597	0.597	0.597
	50	0.731	0.728	0.724	0.717	0.709	0.698	0.687	0.674	0.664	0.655	0.644	0.636	0.627	0.620	0.617	0.614	0.611	0.610	0.610	0.610	0.610

Analysis of Management Options for the Area 3A Charter Halibut Fisheries for 2023

Table 3A.1: Estimated average net weight (headed and gutted) of Pacific halibut by length for Area 3A. Estimates are based on the current International Pacific Halibut Commission length-weight relationships⁵.

Length (in)	Net Weight (lb)	Length (in)	Net Weight (lb)	Length (in)	Net Weight (lb)	Length (in)	Net Weight (lb)
22.5	3.4	40.0	20.6	57.5	64.2	75.0	147.7
23.0	3.6	40.5	21.4	58.0	66.0	75.5	150.8
23.5	3.9	41.0	22.3	58.5	67.8	76.0	153.9
24.0	4.2	41.5	23.1	59.0	69.6	76.5	157.1
24.5	4.4	42.0	24.0	59.5	71.5	77.0	160.4
25.0	4.7	42.5	24.9	60.0	73.4	77.5	163.6
25.5	5.0	43.0	25.8	60.5	75.3	78.0	167.0
26.0	5.3	43.5	26.8	61.0	77.3	78.5	170.3
26.5	5.7	44.0	27.8	61.5	79.3	79.0	173.8
27.0	6.0	44.5	28.8	62.0	81.3	79.5	177.2
27.5	6.4	45.0	29.8	62.5	83.4	80.0	180.8
28.0	6.7	45.5	30.9	63.0	85.5	80.5	184.3
28.5	7.1	46.0	31.9	63.5	87.7	81.0	187.9
29.0	7.5	46.5	33.0	64.0	89.8	81.5	191.6
29.5	7.9	47.0	34.2	64.5	92.1	82.0	195.3
30.0	8.4	47.5	35.3	65.0	94.3	82.5	199.0
30.5	8.8	48.0	36.5	65.5	96.6	83.0	202.9
31.0	9.3	48.5	37.7	66.0	98.9	83.5	206.7
31.5	9.7	49.0	38.9	66.5	101.3	84.0	210.6
32.0	10.2	49.5	40.2	67.0	103.7	84.5	214.6
32.5	10.8	50.0	41.5	67.5	106.2	85.0	218.6
33.0	11.3	50.5	42.8	68.0	108.6	85.5	222.6
33.5	11.8	51.0	44.1	68.5	111.2	86.0	226.7
34.0	12.4	51.5	45.5	69.0	113.7	86.5	230.9
34.5	13.0	52.0	46.9	69.5	116.3	87.0	235.1
35.0	13.6	52.5	48.3	70.0	119.0	87.5	239.3
35.5	14.2	53.0	49.8	70.5	121.6	88.0	243.7
36.0	14.8	53.5	51.2	71.0	124.4	88.5	248.0
36.5	15.5	54.0	52.8	71.5	127.1	89.0	252.4
37.0	16.1	54.5	54.3	72.0	129.9	89.5	256.9
37.5	16.8	55.0	55.9	72.5	132.8	90.0	261.4
38.0	17.5	55.5	57.5	73.0	135.7	90.5	266.0
38.5	18.3	56.0	59.1	73.5	138.6	91.0	270.6
39.0	19.0	56.5	60.8	74.0	141.6	91.5	275.3
39.5	19.8	57.0	62.5	74.5	144.6	92.0	280.1

⁵ IPHC length-weight relationships for IPHC Area 3A are $NetWt(lb) = 1.063 \times 10^{-5} ForkLength(cm)^{3.13}$ from [iphc-2022-lwt-3aimperial.pdf](https://www.iphc.org/2022-3a-imperial.pdf).

Table 3A.2: Subareas of IPHC Areas 2C and 3A, ports where ADF&G halibut sampling occurs, and Subarea abbreviations used in tables and figures in this report.

IPHC Area	Subarea	Ports with Sampling and Angler Interviews	Abbreviations
3A	Glacier Bay (3A portion)	Gustavus, Elfin Cove	GlacB, GlacB-3A, G3A
	Yakutat	Yakutat	Yak, H
	Eastern Prince William Sound	Valdez	EPWS
	Western Prince William Sound	Whittier	WPWS
	North Gulf	Seward	NGulf, NGC
	Lower Cook Inlet	Homer	LCI
	Central Cook Inlet	Anchor Point, Deep Creek	CCI
	Kodiak	Kodiak	Kod, QR

Table 3A.3. Forecasts of effort (angler-days), halibut harvest per unit effort (HPUE), and harvest (numbers of halibut) for Area 3A in 2023 under status quo regulations, with associated standard errors. Status quo regulations include a two-fish bag limit with a maximum size limit of 28 inches on one of the fish, no retention of halibut on Wednesdays and on two Tuesdays, CHP trip limits, and vessel trip limits.

Subarea	Effort		HPUE	Std Error	Harvest	
	(angler-days)	Std Error			(no. halibut)	Std Error
CCI	15,245	NA	1.82	0.13	27,802	1,950
EPWS	4,762	NA	1.32	0.14	6,300	693
GlacB	1,137	NA	0.68	0.17	771	192
Yak	4,186	NA	0.94	0.14	3,936	614
LCI	43,228	NA	1.75	0.08	75,496	3,393
NGulf	30,145	NA	1.21	0.11	36,407	3,190
Kod	12,307	NA	1.11	0.11	13,719	1,389
WPWS	4,699	NA	0.98	0.15	4,615	708
Area 3A	115,709	NA	1.46	NA	169,046	5,368

Table 3A.4. Area 3A projected harvest, change in harvest, and specified dates with status quo management measures combined with Tuesday closures.

Number of Closed Tuesdays	Beginning and Ending Dates	Percentage change in harvest relative to status quo	Projected Harvest (no. Fish)
0	NA	+2.6%	173,458
1	Jul 25	+1.3%	171,206
2	Jul 25 - Aug 01	0.0%	169,046
3	Jul 18 - Aug 01	-1.5%	166,526
4	Jul 11 - Aug 01	-2.8%	164,238
5	Jul 11 - Aug 08	-3.2%	163,616
6	Jul 04 - Aug 08	-4.3%	161,806
7	Jun 27 - Aug 08	-5.4%	159,937
8	Jun 27 - Aug 15	-6.3%	158,355
9	Jun 20 - Aug 15	-7.6%	156,257
10	Jun 13 - Aug 15	-8.6%	154,467
11	Jun 13 - Aug 22	-9.6%	152,741
12	Jun 03 - Aug 22	-10.5%	151,294
13	May 30 - Aug 22	-11.0%	150,404
48 (all season)	Feb 01 - Dec 31	-13.5%	146,266

Table 3A.5. Area 3A projected harvest (upper table) and removals (lower table) for 2023 under a range of maximum size limits on one fish in the bag limit and **Tuesday closures**. Projected removals assume the following status quo measures: two fish bag limit – one of any size, limit of one trip per vessel and one trip per permit per day, Wednesday closure all year. All values in the table include corrections for errors in estimation of average weight and inflation factors for release mortality. Shaded cells represent projections that do not exceed the 2022 allocation of 2.11 Mlb.

Projected Harvest (number of fish)

	Number of Tuesday Closures														All
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	
Harvest	173,458	171,206	169,046	166,526	164,238	163,616	161,806	159,937	158,355	156,257	154,467	152,741	151,294	150,404	146,266

Projected Charter Removals (Mlb)

Size limit	Number of Closed Tuesdays														All
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	
26	1.997	1.971	1.947	1.918	1.891	1.883	1.863	1.841	1.825	1.801	1.780	1.761	1.744	1.734	1.685
27	2.027	2.001	1.976	1.947	1.919	1.912	1.891	1.869	1.853	1.828	1.807	1.787	1.771	1.760	1.710
28	2.075	2.048	2.023	1.993	1.965	1.957	1.936	1.914	1.897	1.871	1.850	1.830	1.812	1.802	1.751
29	2.105	2.078	2.053	2.022	1.994	1.986	1.964	1.942	1.924	1.899	1.877	1.857	1.839	1.828	1.777
30	2.150	2.122	2.096	2.065	2.036	2.028	2.006	1.983	1.965	1.939	1.917	1.896	1.878	1.867	1.814
31	2.180	2.152	2.125	2.094	2.064	2.056	2.034	2.011	1.992	1.966	1.943	1.922	1.904	1.893	1.839
32	2.219	2.190	2.163	2.131	2.101	2.093	2.070	2.046	2.028	2.001	1.977	1.956	1.938	1.926	1.872

Table 3A.6. Area 3A projected harvest, change in harvest, and specified dates with status quo management measures with all Tuesdays closed combined with Monday and Thursday closures and Wednesdays closed all season.

a. Monday closures

Number of Closed Mondays	Beginning and Ending Dates	Percentage change in harvest relative to status quo	Projected Harvest (no. Fish)
0	No Closed Days	-13.5%	146,266
1	26-Jul	-15.1%	143,578
2	Jul 26 - Aug 02	-16.6%	141,013
3	Jul 19- Aug 02	-18.0%	138,676
4	Jul 12 - Aug 02	-18.9%	137,093
5	Jul 12 - Aug 09	-19.6%	135,832
6	Jul 05 - Aug 09	-21.0%	133,618
7	Jun 28 - Aug 09	-22.2%	131,453
8	Jun 28 - Aug 16	-23.2%	129,752
9	Jun 21 - Aug 16	-24.4%	127,825
10	Jun 14 - Aug 16	-25.4%	126,102
11	Jun 14 - Aug 23	-26.1%	124,920
12	Jun 07 - Aug 23	-26.6%	124,007
13	June 07 - Aug 30	-27.5%	122,547
48 (all season)	Feb 01 - Dec 31	-30.0%	118,255

b. Thursday closures

Number of Closed Thursdays	Beginning and Ending Dates	Percentage change in harvest relative to status quo	Projected Harvest (no. Fish)
0	No Closed Days	-13.5%	146,266
1	29-Jul	-14.8%	144,030
2	Jul 29 - Aug 05	-16.4%	141,316
3	Jul 22 - Aug 05	-17.3%	139,748
4	Jul 15 - Aug 05	-19.0%	136,989
5	Jul 15 - Aug 09	-19.9%	135,429
6	Jul 08 - Aug 12	-21.3%	133,057
7	Jul 01 - Aug 12	-22.4%	131,157
8	Jul 01 - Aug 19	-23.7%	128,963
9	Jun 24 - Aug 19	-24.4%	127,867
10	Jun 17 - Aug 19	-25.6%	125,845
11	Jun 17 - Aug 26	-26.6%	124,117
12	Jun 10 - Aug 26	-27.5%	122,574
13	June 03 - Aug 26	-28.3%	121,224
48 (all season)	Feb 01 - Dec 31	-29.8%	118,662

Table 3A.7. Area 3A projected harvest (upper table) and removals (lower table) for 2023 under a range of maximum size limits on one fish in the bag limit and with **Tuesdays** closed all year and **Monday closures**. Projected removals assume the following status quo measures: two fish bag limit – one of any size, limit of one trip per vessel and one trip per permit per day, Wednesday closure all year. All projections were below the 2022 allocation of 2.11 Mlb. All values in the table include corrections for errors in estimation of average weight and inflation factors for release mortality.

Projected Harvest (number of fish)

	Number of Monday Closures														All
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	
Harvest	146,266	143,578	141,013	138,676	137,093	135,832	133,618	131,453	129,752	127,825	126,102	124,920	124,007	122,547	118,255

Projected Charter Removals (Mlb)

Size limit	Number of Monday Closures														All
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	
26	1.685	1.654	1.626	1.601	1.582	1.567	1.542	1.517	1.498	1.477	1.457	1.443	1.432	1.416	1.364
27	1.710	1.679	1.651	1.625	1.606	1.591	1.566	1.540	1.520	1.499	1.479	1.464	1.454	1.437	1.385
28	1.751	1.719	1.690	1.663	1.644	1.628	1.602	1.576	1.556	1.534	1.514	1.499	1.488	1.471	1.417
29	1.777	1.744	1.715	1.687	1.668	1.652	1.626	1.599	1.579	1.557	1.536	1.521	1.510	1.492	1.438
30	1.814	1.781	1.751	1.723	1.703	1.687	1.660	1.633	1.612	1.589	1.568	1.553	1.542	1.524	1.468
31	1.839	1.806	1.775	1.747	1.726	1.710	1.683	1.655	1.634	1.611	1.590	1.574	1.563	1.545	1.489
32	1.872	1.838	1.807	1.778	1.757	1.740	1.713	1.685	1.663	1.640	1.618	1.602	1.590	1.572	1.515

Table 3A.8. Area 3A projected harvest (upper table) and removals (lower table) for 2023 under a range of maximum size limits on one fish in the bag limit and with **Tuesdays** closed all year and **Thursday closures**. Projected removals assume the following status quo measures: two fish bag limit – one of any size, limit of one trip per vessel and one trip per permit per day, Wednesday closure all year. All projections were below the 2022 allocation of 2.11 Mlb. All values in the table include corrections for errors in estimation of average weight and inflation factors for release mortality.

Projected Harvest (number of fish)

	Number of Thursday Closures														All
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	
Harvest	146,266	144,030	141,316	139,748	136,989	135,429	133,057	131,157	128,963	127,867	125,845	124,117	122,574	121,224	118,662

Projected Charter Removals (Mlb)

Size limit	Number of Thursday Closures														All
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	
26	1.685	1.661	1.630	1.612	1.580	1.562	1.534	1.514	1.489	1.476	1.453	1.434	1.416	1.400	1.368
27	1.710	1.686	1.655	1.636	1.604	1.585	1.558	1.536	1.511	1.498	1.475	1.455	1.437	1.422	1.388
28	1.751	1.726	1.694	1.675	1.641	1.623	1.595	1.573	1.547	1.534	1.510	1.489	1.471	1.455	1.421
29	1.777	1.751	1.719	1.699	1.665	1.646	1.618	1.596	1.569	1.556	1.532	1.511	1.493	1.476	1.442
30	1.814	1.788	1.756	1.736	1.701	1.681	1.652	1.629	1.603	1.589	1.564	1.543	1.524	1.507	1.472
31	1.839	1.813	1.780	1.760	1.724	1.704	1.675	1.652	1.625	1.611	1.585	1.564	1.545	1.528	1.493
32	1.872	1.845	1.811	1.791	1.755	1.735	1.705	1.681	1.653	1.639	1.613	1.592	1.572	1.555	1.519

Table 3A.9. Estimated effects of **annual limits of two to four halibut** on Area 3A anglers and projected harvest for 2023 under a maximum size limit on one of two fish in the bag limit, vessel trip limit, permit trip limit, and a Wednesday closure. The percent of affected anglers is the portion of individual anglers that harvested more than each specified annual limit in 2022.

Annual Limit	Subarea									
	CCI	EPWS	GlacBay	Yak	LCI	NGulf	Kod	WPWS	Area 3A	
Estimated percent of anglers affected by an annual limit:										
2	13.8%	8.3%	16.2%	21.6%	14.6%	9.1%	43.3%	3.2%	14.4%	
3	11.9%	4.5%	3.7%	10.7%	11.6%	5.9%	31.0%	1.5%	10.6%	
4	2.7%	1.7%	0.2%	4.6%	2.6%	1.6%	16.4%	0.3%	3.2%	
Estimated percent change in harvest relative to no annual limit:										
2	-15.4%	-8.7%	-12.7%	-21.1%	-14.4%	-9.8%	-38.4%	-3.7%	-15.2%	
3	-9.2%	-4.2%	-2.4%	-9.9%	-7.8%	-5.0%	-23.4%	-1.4%	-8.4%	
4	-3.8%	-1.7%	-0.1%	-4.4%	-2.5%	-1.9%	-12.7%	-0.4%	-3.4%	
Projected harvest (number of halibut):										
2	23,983	5,917	684	3,145	66,292	33,914	8,659	4,553	147,148	
3	25,734	6,210	764	3,591	71,459	35,726	10,775	4,662	158,921	
4	27,248	6,369	782	3,811	75,544	36,893	12,286	4,712	167,646	
No Annual Limit	28,336	6,480	783	3,988	77,485	37,591	14,066	4,729	173,458	

Table 3A.10. Area 3A projected harvest (upper table) and removals (lower table) for 2023 under a range of maximum size limits on one fish in the bag limit and for **annual limits ranging from two to four fish** per year. Projected removals assume the following status quo measures: two fish bag limit, limit of one trip per vessel and one trip per permit per day, and a Wednesday closure all year. All values in the table include corrections for errors in estimation of average weight and inflation factors for release mortality. Shaded cells represent projections that do not exceed the 2022 allocation of 2.11 Mlb.

Projected Harvest (number of fish)			
Year	Annual Limit (number of halibut)		
	2	3	4
2023	147,149	158,921	167,646

Projected Charter Removals (Mlb)			
Size Limit (in)	Annual Limit (number of halibut)		
	2	3	4
26	1.692	1.831	1.928
27	1.717	1.858	1.958
28	1.758	1.902	2.004
29	1.784	1.930	2.034
30	1.823	1.972	2.077
31	1.848	1.999	2.106
32	1.881	2.034	2.143

Table 3A.11. Area 3A projected harvest and removals for 2023 under annual limits with a range of maximum size limits on one fish in the bag limit and Tuesday closures. Projected removals assume the following status quo measures: two fish bag limit – one of any size, limit of one trip per vessel and one trip per permit per day, Wednesday closure all year. All values in the table include corrections for errors in estimation of average weight and inflation factors for release mortality. Shaded cells represent projections that do not exceed the 2022 allocation of 2.11 Mlb.

a. Four-fish annual limit

		Number of Tuesday Closures														
		0	1	2 (Status Quo)	3	4	5	6	7	8	9	10	11	12	13	All
Size Limit (in)	Harvest	167,646	165,466	163,376	160,935	158,719	158,126	156,370	154,559	153,036	150,997	149,259	147,589	146,180	145,317	141,323
	26	1.928	1.904	1.880	1.852	1.826	1.819	1.799	1.778	1.763	1.739	1.719	1.700	1.684	1.674	1.627
	27	1.958	1.932	1.909	1.880	1.854	1.847	1.826	1.805	1.789	1.765	1.745	1.726	1.710	1.700	1.652
	28	2.004	1.978	1.954	1.925	1.898	1.891	1.870	1.848	1.832	1.807	1.786	1.767	1.750	1.740	1.691
	29	2.034	2.008	1.983	1.953	1.926	1.918	1.897	1.876	1.859	1.834	1.812	1.793	1.776	1.766	1.716
	30	2.077	2.050	2.025	1.995	1.967	1.959	1.938	1.916	1.898	1.873	1.851	1.831	1.814	1.803	1.752
	31	2.106	2.079	2.053	2.023	1.994	1.986	1.965	1.942	1.925	1.899	1.877	1.856	1.839	1.828	1.777
	32	2.143	2.116	2.090	2.058	2.029	2.022	1.999	1.976	1.959	1.933	1.910	1.889	1.871	1.860	1.808

b. Three-fish annual limit

		Number of Tuesday Closures														
		0	1	2 (Status Quo)	3	4	5	6	7	8	9	10	11	12	13	All
Size Limit (in)	Harvest	158,921	156,851	154,867	152,547	150,444	149,886	148,218	146,497	145,062	143,123	141,469	139,885	138,542	137,721	133,942
	26	1.831	1.807	1.785	1.758	1.733	1.727	1.707	1.688	1.673	1.651	1.631	1.614	1.598	1.589	1.544
	27	1.858	1.834	1.812	1.784	1.759	1.753	1.733	1.713	1.698	1.675	1.656	1.638	1.622	1.613	1.567
	28	1.902	1.878	1.855	1.827	1.801	1.794	1.775	1.754	1.739	1.715	1.695	1.677	1.661	1.651	1.605
	29	1.930	1.905	1.882	1.854	1.828	1.821	1.801	1.780	1.764	1.740	1.720	1.702	1.685	1.675	1.628
	30	1.972	1.946	1.922	1.893	1.867	1.860	1.839	1.818	1.802	1.778	1.757	1.738	1.721	1.711	1.663
	31	1.999	1.973	1.949	1.919	1.892	1.885	1.864	1.843	1.827	1.802	1.781	1.762	1.745	1.735	1.686
	32	2.034	2.008	1.983	1.953	1.926	1.919	1.897	1.876	1.859	1.834	1.812	1.793	1.776	1.765	1.716

Table 3A.11. (continued)

c. Two-fish annual limit

		Number of Tuesday Closures														
		0	1	2 (Status Quo)	3	4	5	6	7	8	9	10	11	12	13	All
Size Limit (in)	Harvest	147,149	145,226	143,387	141,231	139,279	138,769	137,223	135,622	134,300	132,495	130,955	129,487	128,233	127,469	123,981
	26	1.692	1.670	1.649	1.624	1.601	1.595	1.578	1.560	1.546	1.525	1.507	1.491	1.476	1.468	1.427
	27	1.717	1.695	1.674	1.649	1.626	1.619	1.602	1.583	1.569	1.548	1.530	1.513	1.499	1.490	1.448
	28	1.758	1.736	1.714	1.688	1.664	1.658	1.640	1.621	1.607	1.585	1.566	1.549	1.534	1.526	1.483
	29	1.784	1.761	1.739	1.713	1.689	1.683	1.664	1.645	1.630	1.608	1.589	1.572	1.557	1.548	1.504
	30	1.823	1.799	1.777	1.750	1.725	1.719	1.700	1.680	1.665	1.643	1.623	1.606	1.590	1.581	1.537
	31	1.848	1.824	1.801	1.774	1.749	1.743	1.723	1.704	1.688	1.666	1.646	1.628	1.612	1.603	1.558
	32	1.881	1.856	1.833	1.806	1.780	1.774	1.754	1.734	1.718	1.695	1.675	1.657	1.641	1.631	1.586

Table 3A.12. Area 3A projected harvest and specified dates with Wednesday closures.

a. Wednesday closures

Number of Closed Wednesdays	Beginning and Ending Dates	Projected Harvest (no. Fish)
0	No Closed Days	204,594
1	Aug 02	201,656
2	Aug 02 - Aug 09	200,450
3	Jul 26 - Aug 09	199,234
4	Jul 19 - Aug 09	198,017
5	Jul 19 - Aug 16	196,418
6	Jul 12 - Aug 16	194,283
7	Jul 05 - Aug 16	192,353
8	Jul 05 - Aug 23	189,972
9	Jun 28 - Aug 23	187,252
10	Jun 21 - Aug 23	185,605
11	Jun 21 - Aug 30	182,607
12	Jun 14 - Aug 30	179,547
13	June 07 - Aug 30	176,747
48 (all season)	Feb 01 - Dec 31	173,458

Table 3A.13. Area 3A projected harvest (upper table) and removals (lower table) for 2023 under a range of maximum size limits on one fish in the bag limit and variable **Wednesday closures**. Projected removals assume the other following status quo measures: two fish bag limit – one of any size, limit of one trip per vessel and one trip per permit per day. All values in the table include corrections for errors in estimation of average weight and inflation factors for release mortality. Shaded cells represent projections that do not exceed the 2022 allocation of 2.11 Mlb.

Projected Harvest (number of fish)

	Number of Wednesday Closures														All
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	
Harvest	204,594	201,656	200,450	199,234	198,017	196,418	194,283	192,353	189,972	187,252	185,605	182,607	179,547	176,747	173,458

Projected Charter Removals (Mlb)

Size limit	Number of Wednesday Closures														All
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	
26	2.357	2.323	2.309	2.294	2.279	2.261	2.236	2.213	2.185	2.153	2.135	2.100	2.067	2.034	1.997
27	2.393	2.359	2.344	2.329	2.313	2.295	2.270	2.247	2.218	2.186	2.167	2.132	2.098	2.065	2.027
28	2.450	2.415	2.399	2.384	2.368	2.350	2.324	2.300	2.271	2.238	2.219	2.183	2.148	2.114	2.075
29	2.486	2.450	2.434	2.419	2.403	2.384	2.358	2.334	2.304	2.270	2.251	2.215	2.179	2.145	2.105
30	2.537	2.501	2.486	2.471	2.454	2.435	2.408	2.384	2.353	2.319	2.299	2.262	2.226	2.191	2.150
31	2.574	2.537	2.521	2.505	2.488	2.469	2.441	2.417	2.386	2.351	2.331	2.293	2.256	2.221	2.180
32	2.657	2.619	2.565	2.549	2.532	2.512	2.485	2.459	2.428	2.393	2.373	2.334	2.296	2.261	2.219

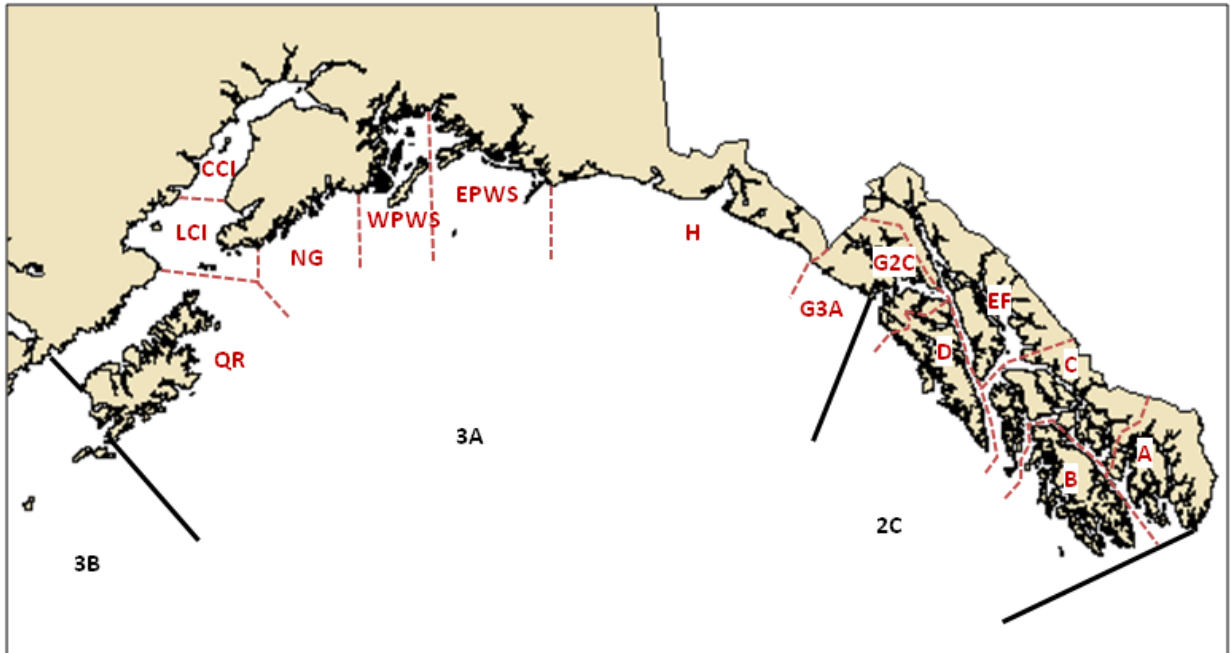
Table 3A.14. Projected harvest and removals with seasonal closures in Area 3A under with all days of the week open. Two options for halibut seasons were analyzed, May 16 – July 31 and June 1 – July 31. Projected removals include all other status quo management measures: bag limit of two fish, maximum size of 28-inches on one fish, and a limit of one trip per vessel and one trip per permit per day. All values in the table include corrections for errors in estimation of average weight and inflation factors for release mortality. All projections were below the 2022 allocation of 2.11 Mlb.

Season dates	Harvest	Removals (Mlb)
May 16 – July 31	133,683	1.596
June 1 – July 31	122,188	1.463

Table 3A.15. Charter logbook effort, harvest per unit effort, and harvest of halibut in IPHC Area 3A, 2013 - 2022. Preliminary estimates for 2022 (in italics) are based on logbook data for charter trips through August 31, 2022, entered as of November 07, 2022.

Year	Subarea								Tot 3A
	GlacB-3A	Yak	EPWS	WPWS	NGulf	CCI	LCI	Kod	
Effort (angler-days)									
2013	1,264	2,919	3,618	3,736	29,872	27,741	40,615	9,313	119,078
2014	1,424	3,315	3,576	3,435	29,613	20,633	37,111	9,927	109,034
2015	1,852	3,267	3,527	3,484	30,864	19,882	33,011	8,756	104,643
2016	1,887	3,382	4,126	4,094	33,007	16,865	36,978	8,427	108,766
2017	2,211	3,405	3,579	3,679	27,934	17,330	35,426	7,899	101,463
2018	2,739	4,412	4,045	3,955	27,535	16,871	33,723	8,476	101,756
2019	2,094	4,365	4,653	4,764	29,889	15,184	33,663	8,961	103,573
2020	958	1,994	3,495	3,770	20,694	10,773	24,250	5,851	71,745
2021	1,282	4,220	4,940	4,721	32,297	17,284	46,506	12,628	123,878
2022	<i>1,137</i>	<i>4,186</i>	<i>4,762</i>	<i>4,699</i>	<i>30,145</i>	<i>15,245</i>	<i>43,228</i>	<i>12307</i>	<i>115,709</i>
Halibut Harvest per Angler-Day (HPUE)									
2013	1.132	1.301	1.506	1.524	1.488	1.878	1.851	1.328	1.684
2014	0.791	1.034	1.225	1.314	1.430	1.866	1.824	1.245	1.599
2015	0.746	0.983	1.218	1.330	1.501	1.802	1.791	1.010	1.564
2016	0.757	0.964	1.149	1.096	1.294	1.705	1.741	1.001	1.455
2017	0.728	0.939	1.143	1.016	1.166	1.665	1.718	0.983	1.406
2018	0.688	0.980	1.187	1.088	1.056	1.670	1.668	0.883	1.340
2019	0.755	0.985	1.103	1.094	1.143	1.660	1.642	0.916	1.343
2020	0.899	1.157	1.379	1.296	1.212	1.779	1.744	1.227	1.486
2021	0.981	1.116	1.431	1.138	1.177	1.831	1.759	1.154	1.489
2022	<i>0.662</i>	<i>0.927</i>	<i>1.374</i>	<i>0.943</i>	<i>1.208</i>	<i>1.824</i>	<i>1.747</i>	<i>1.115</i>	<i>1.467</i>
Harvest (number of halibut)*									
2013	1,431	3,798	5,450	5,695	44,447	52,107	75,181	12,370	200,479
2014	1,126	3,429	4,379	4,514	42,337	38,504	67,701	12,358	174,348
2015	1,381	3,210	4,296	4,635	46,321	35,834	59,110	8,845	163,632
2016	1,428	3,259	4,742	4,487	42,721	28,747	64,392	8,438	158,214
2017	1,609	3,196	4,090	3,737	32,576	28,850	60,845	7,761	142,664
2018	1,884	4,322	4,803	4,302	29,068	28,183	56,262	7,488	136,312
2019	1,582	4,301	5,132	5,214	34,171	25,200	55,274	8,208	139,082
2020	861	2,308	4,882	4,887	25,078	19,094	42,299	7,180	106,589
2021	1,257	4,709	7,070	5,371	38,000	31,640	81,825	14,569	184,441
2022	<i>755</i>	<i>3,874</i>	<i>6,532</i>	<i>4,410</i>	<i>36,351</i>	<i>27,232</i>	<i>74,739</i>	<i>13,197</i>	<i>167,090</i>

*Effort is defined as angler-day on open days with recorded bottomfish hours or harvest of at least one halibut.




 - Subareas for halibut harvest accounting

Figure 1. Subareas of IPHC Areas 2C and 3A used for analysis and reporting. A – Ketchikan; B - Prince of Wales (Craig, Klawock); C - Petersburg, Wrangell; D – Sitka; EF - Juneau, Haines, Skagway; G2C - Glacier Bay, Elfin Cove (2C areas); G3A - Glacier Bay, Elfin Cove (3A Areas); H – Yakutat; EPWS - Eastern Prince William Sound (Valdez, Cordova); WPWS - Western Prince William Sound (Whittier); NG - North Gulf (Seward); CCI - Central Cook Inlet (Deep Creek, Anchor Point); LCI - Lower Cook Inlet (Homer); QR – Kodiak.

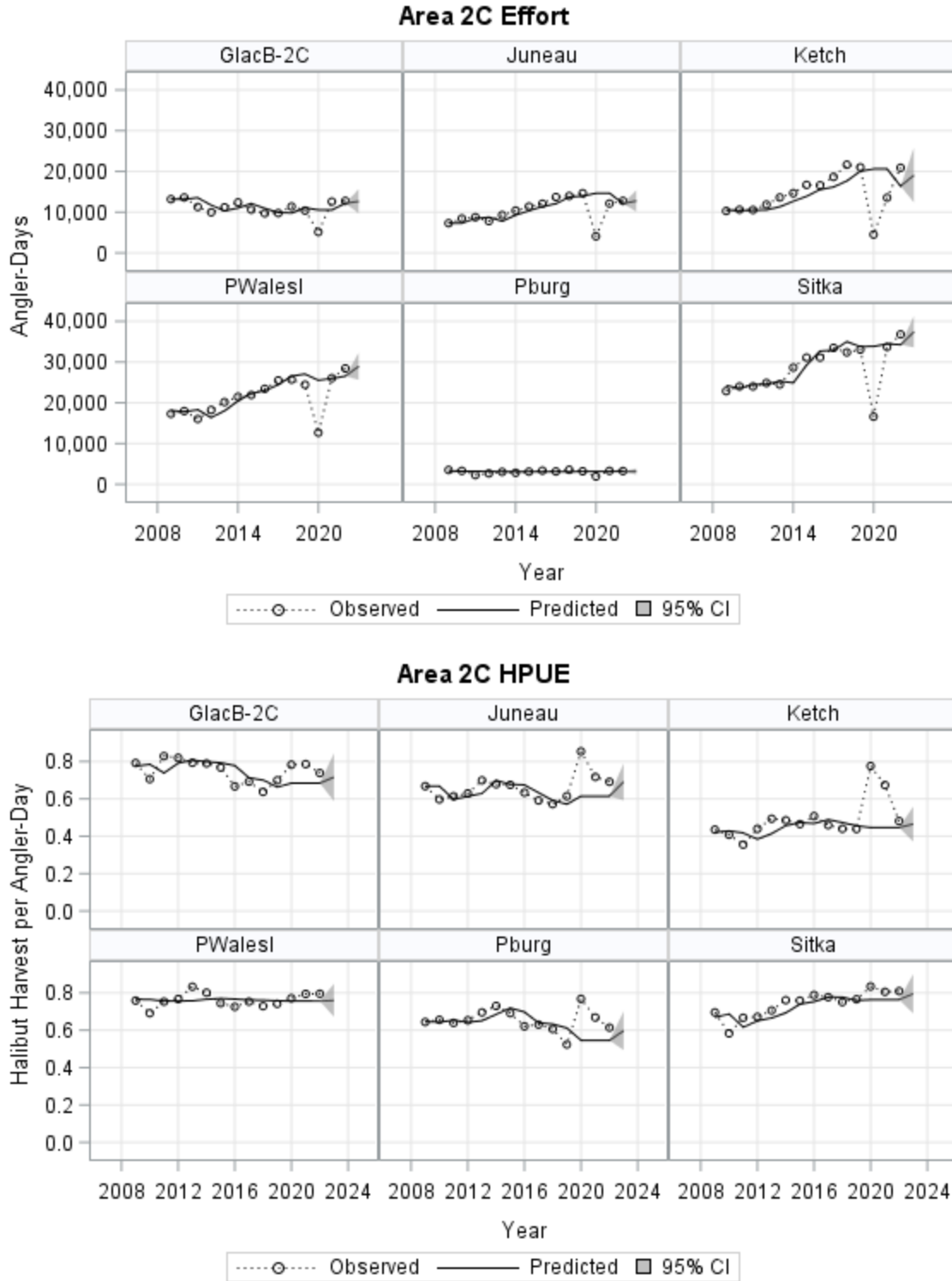


Figure 2. Time series of charter effort (upper) and HPUE (lower) for subareas of Area 2C with predicted values and forecasts for 2023. Shaded bands indicate 95% confidence intervals for the 2023 forecasts. (Source: ADF&G charter logbook)

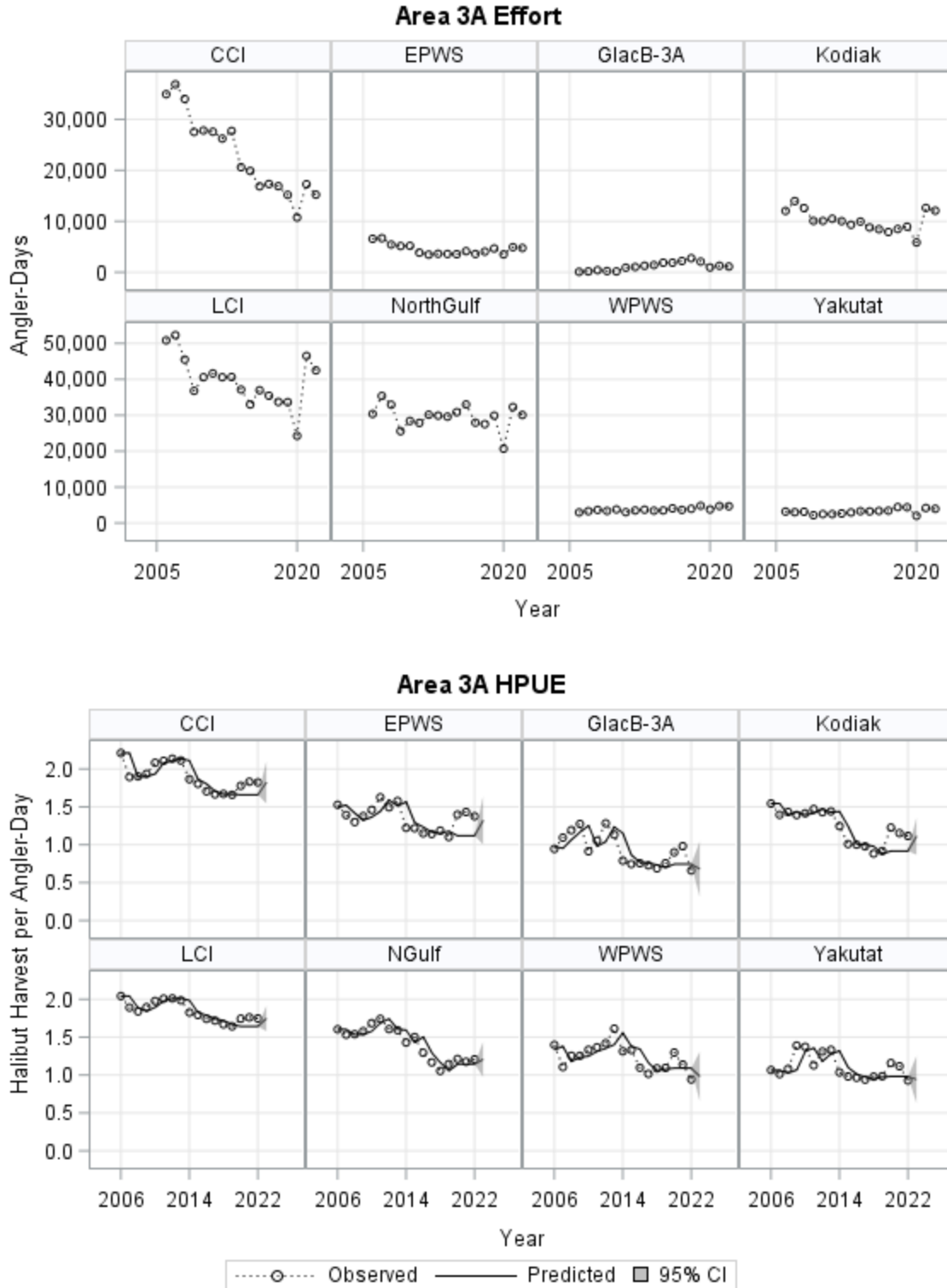


Figure 3. Time series of charter effort (upper) and HPUE (lower) by subarea of Area 3A, with predicted values and 2023 forecasts of HPUE only. No time series forecasts were made for effort. Shaded bands indicate 95% confidence intervals for the 2022 HPUE forecasts. (Source: ADF&G charter logbook)

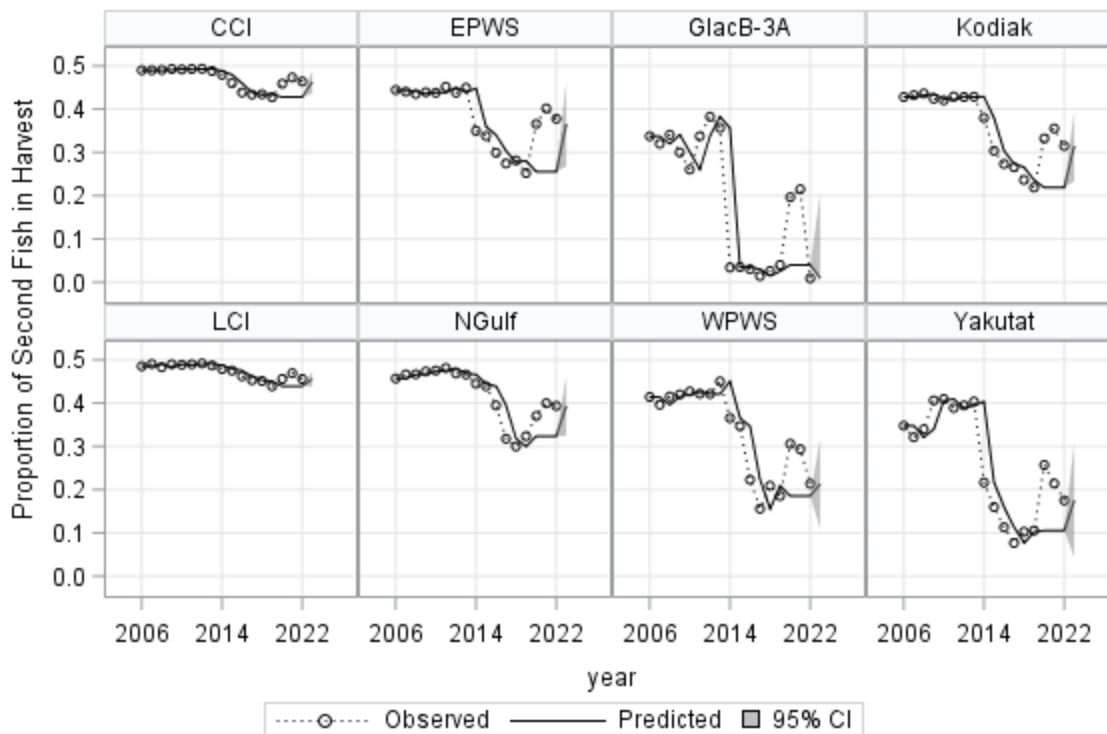


Figure 4. Time series of the proportion of second fish retained by anglers in each subarea of Area 3A, 2010-2023, with predicted values and forecasts for 2023. Shaded bands indicate 95% confidence intervals for the 2023 forecasts. (Source: ADF&G charter logbook)