

# C6: ANALYSIS OF MANAGEMENT MEASURES FOR THE AREA 2C AND 3A CHARTER HALIBUT FISHERIES FOR 2023

BRIANNA BOWMAN - DECEMBER 2022



# FISHERY REVIEW THROUGH 2022



# PRELIMINARY CHARTER ESTIMATES FOR 2022

| Area | Mean Weight (lb) | Harvest (no. fish) | Yield (lb) | Release Mortality (lb) | Total Removals (lb) | Allocation (lb) | Overage (lb) | Overage % |
|------|------------------|--------------------|------------|------------------------|---------------------|-----------------|--------------|-----------|
| 2C   | 9.74             | 82,888             | 806,948    | 36,551                 | 843,500             | 820,000         | 23,500       | 2.9%      |
| 3A   | 10.53            | 167,090            | 1,759,710  | 13,397                 | 1,773,107           | 2,110,000       | -336,893     | -16.0%    |

## 2022 Regulations:

### 2C –

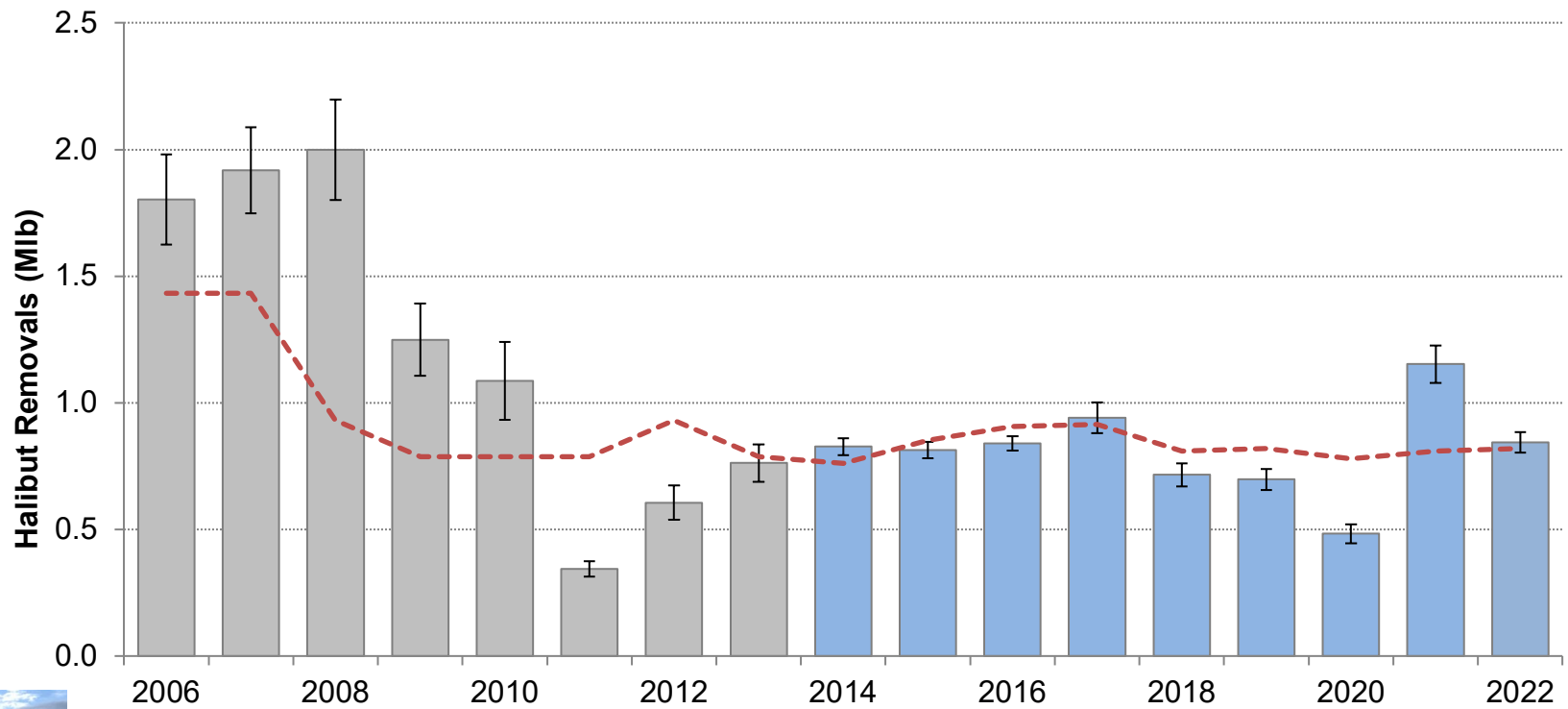
- One fish bag limit
- Reverse slot size limit of less than or equal to 40 inches or greater than or equal to 80 inches

### 3A –

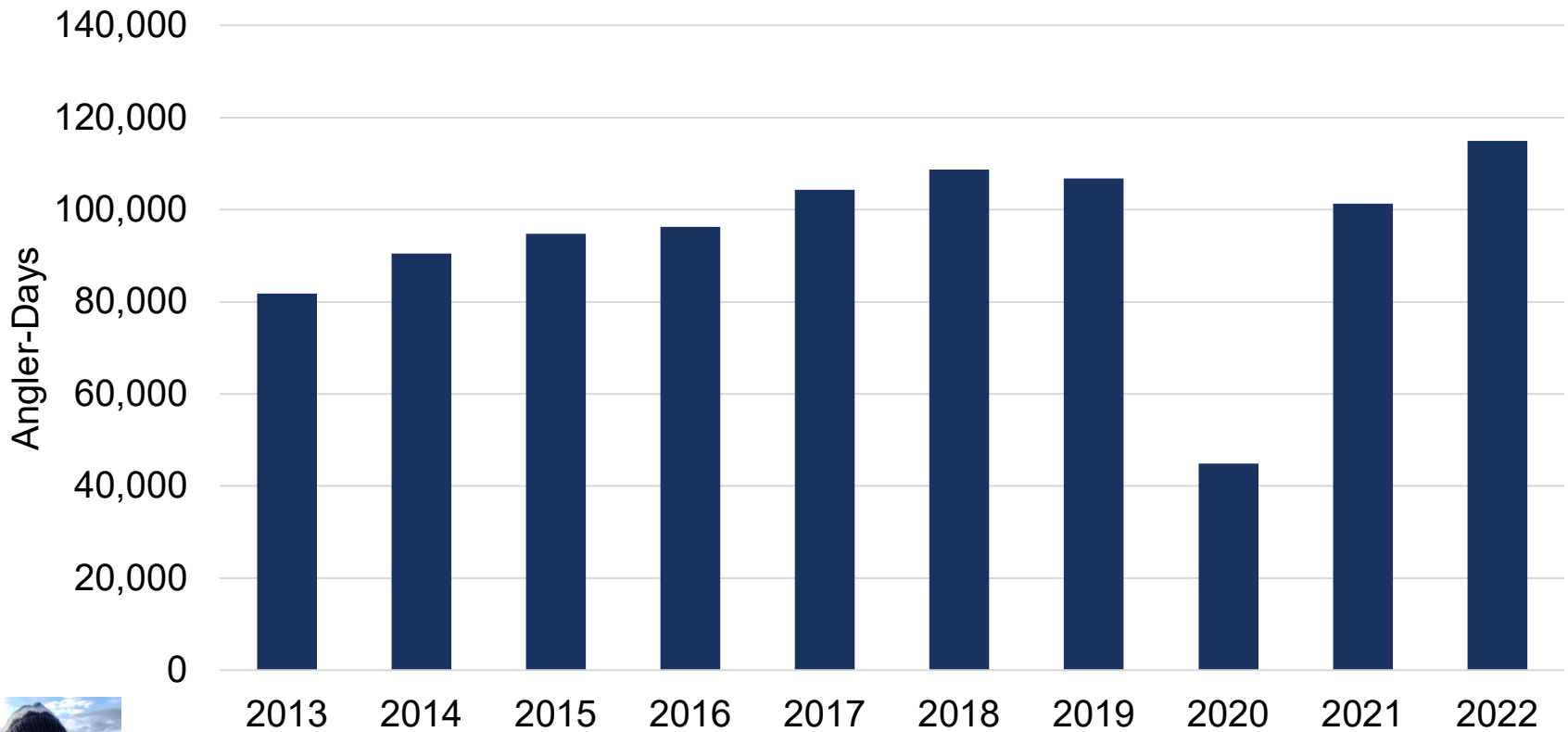
- Two fish bag limit: one fish of any size, one fish less than or equal to 28 inches
- One trip per vessel per day and per charter halibut permit per day
- Wednesdays closed to retention of halibut
- Two Tuesdays closed to retention of halibut



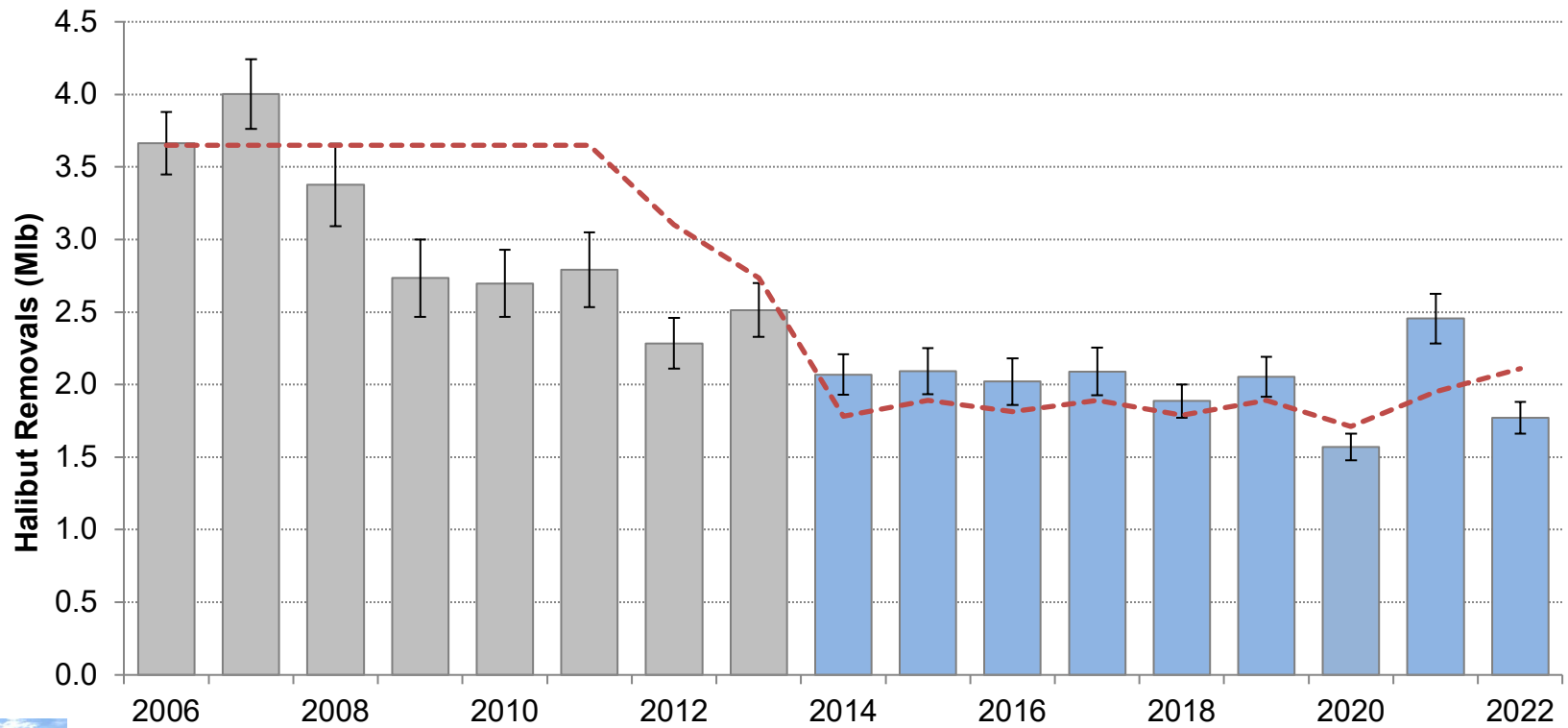
# 2C CHARTER HALIBUT REMOVALS



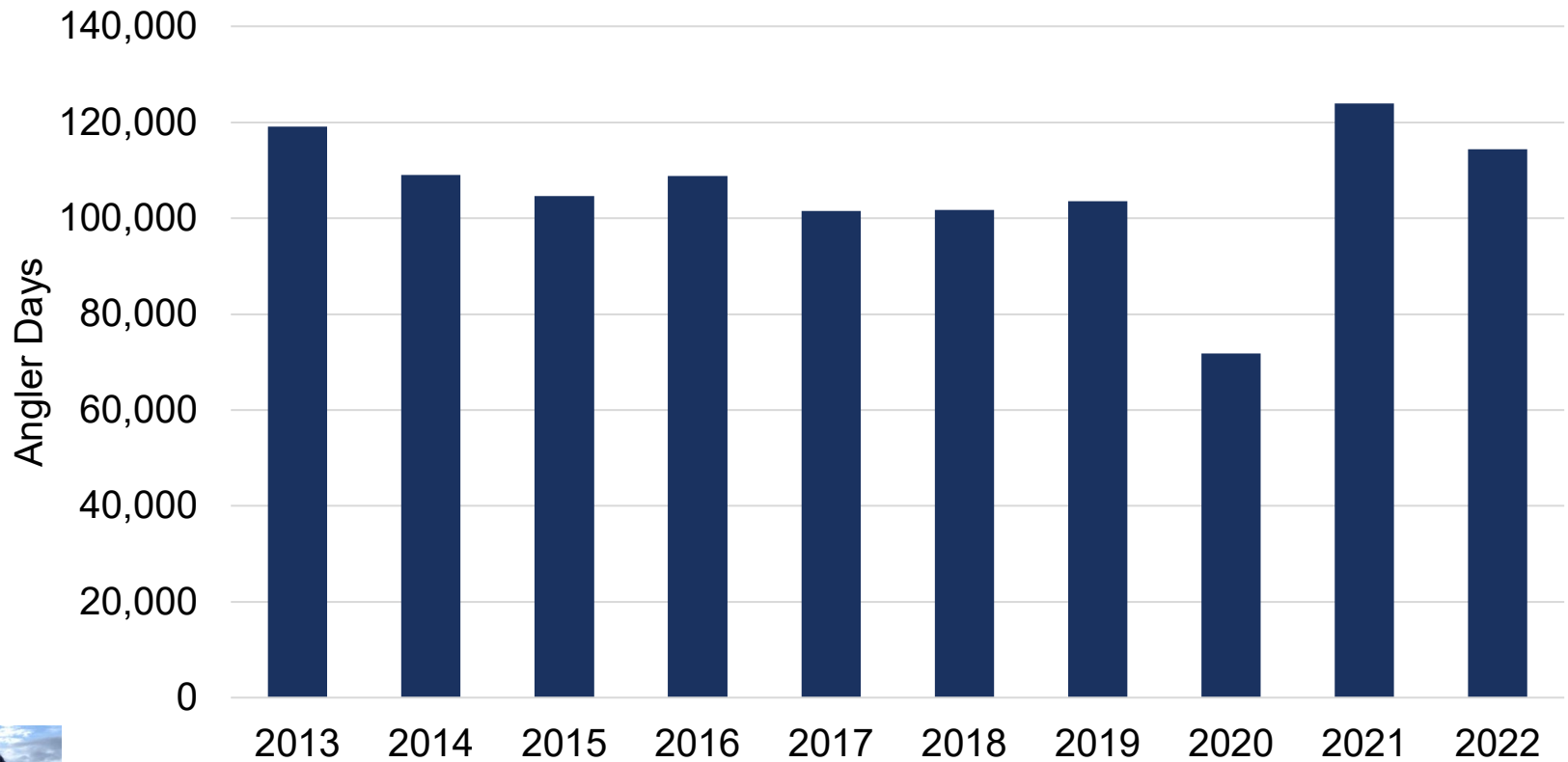
# 2C EFFORT



# 3A CHARTER HALIBUT REMOVALS



# 3A EFFORT



# BUSINESSES AND VESSELS HARVESTING HALIBUT

## 2C

|             | Businesses | Vessels |
|-------------|------------|---------|
| <b>2013</b> | 250        | 501     |
| <b>2014</b> | 246        | 520     |
| <b>2015</b> | 241        | 515     |
| <b>2016</b> | 248        | 532     |
| <b>2017</b> | 248        | 537     |
| <b>2018</b> | 244        | 534     |
| <b>2019</b> | 256        | 545     |
| <b>2020</b> | 192        | 386     |
| <b>2021</b> | 232        | 496     |
| <b>2022</b> | 229        | 520     |

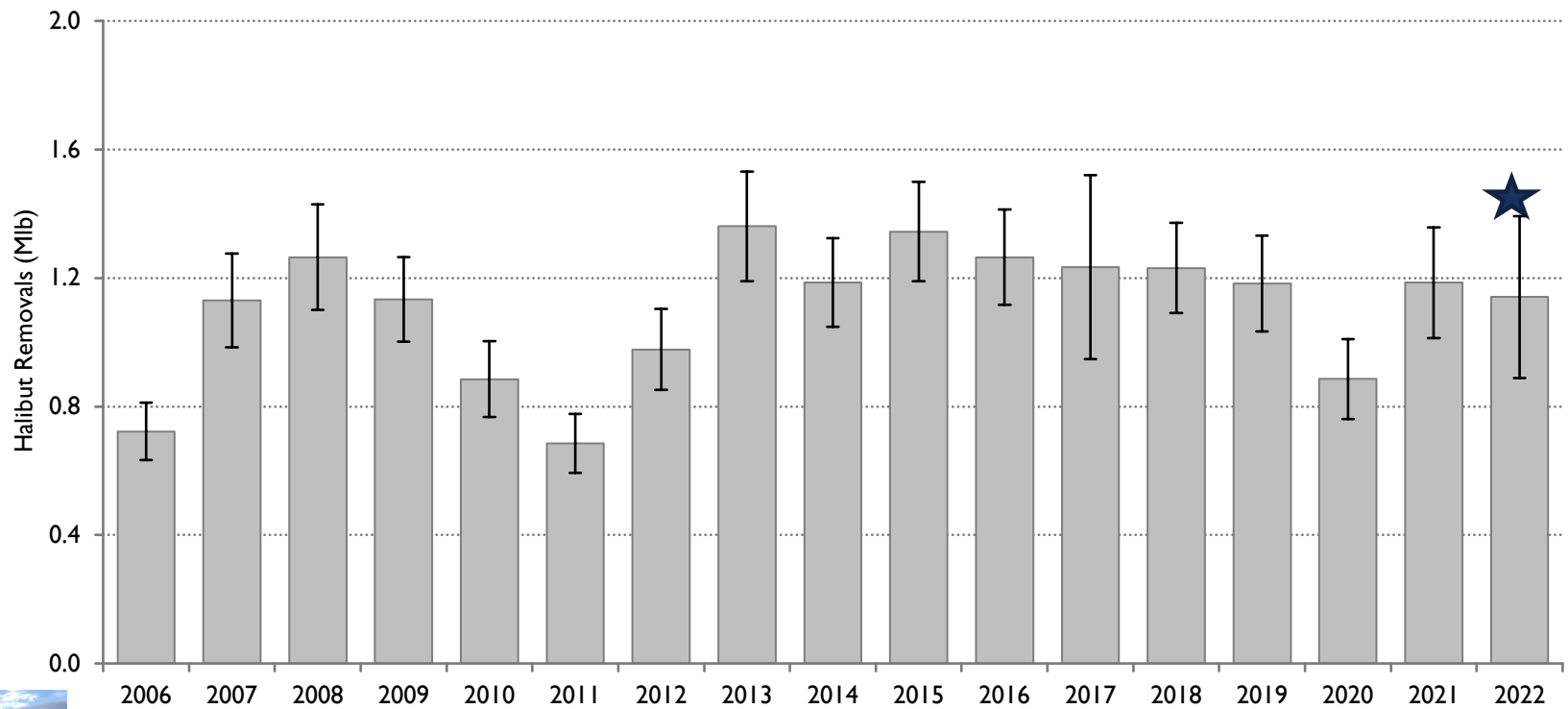
## 3A

|             | Businesses | Vessels |
|-------------|------------|---------|
| <b>2013</b> | 255        | 386     |
| <b>2014</b> | 259        | 399     |
| <b>2015</b> | 250        | 407     |
| <b>2016</b> | 240        | 388     |
| <b>2017</b> | 227        | 374     |
| <b>2018</b> | 232        | 391     |
| <b>2019</b> | 226        | 399     |
| <b>2020</b> | 203        | 343     |
| <b>2021</b> | 231        | 392     |
| <b>2022</b> | 215        | 384     |

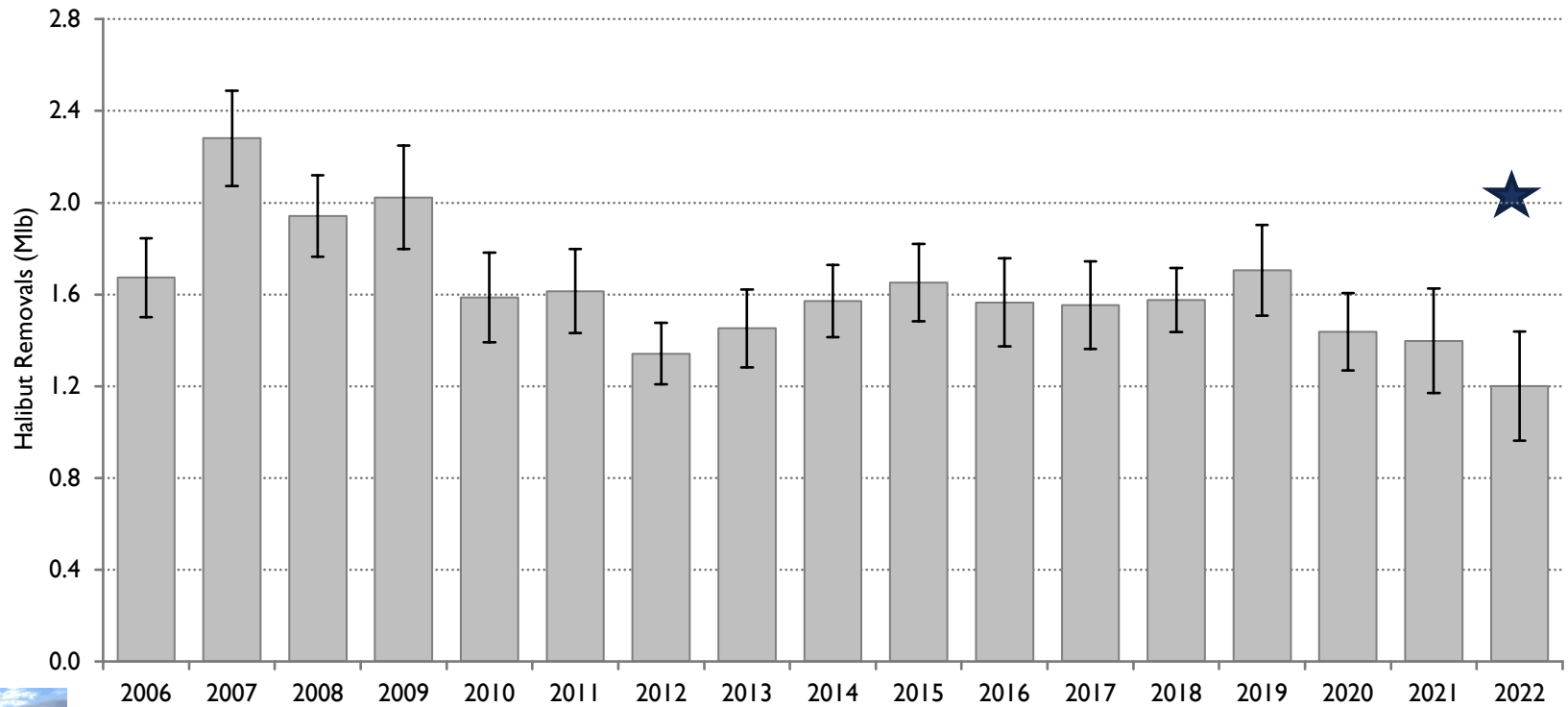




# 2C – UNGUIDED HALIBUT REMOVALS



# 3A – UNGUIDED HALIBUT REMOVALS



# ANALYSIS OF MANAGEMENT MEASURES FOR 2023



# CHARTER ALLOCATION FOR 2023

- Allocations are currently unknown
- The IPHC's interim agreement has expired, and so the Regulatory Area TCEYs and Allocations are unknown
- We have used the 2022 allocations as a reference for this analysis

|           | <b>2022<br/>Allocation</b> |
|-----------|----------------------------|
| <b>2C</b> | 0.82 MIb                   |
| <b>3A</b> | 2.11 MIb                   |



# CHARTER ALLOCATION FOR 2023

| <b>2C</b>                                     | <b>2019-22 Interim Agreement (2A +2B agreements, 2022 FISS dist, and relative harvest rates)</b> | <b>Pre 2019 Interim Management Procedure (2022 FISS dist and relative harvest rates)</b> |
|---|--|--|
| <b>2022 coastwide TCEY (41.2 Mlb)</b>         | <b>0.87</b>  | <b>0.92</b>  |
| <b>2023 coastwide ref TCEY (F43) (52 Mlb)</b> | <b>1.02</b>  | <b>1.09</b>  |
| <b>3A</b>                                     | <b>2019-22 Interim Agreement (2A +2B agreements, 2022 FISS dist, and relative harvest rates)</b> | <b>Pre 2019 Interim Management Procedure (2022 FISS dist and relative harvest rates)</b> |
| <b>2022 coastwide TCEY (41.2 Mlb)</b>         | <b>1.82</b>  | <b>1.89</b>  |
| <b>2023 coastwide ref TCEY (F43) (52Mlb)</b>  | <b>2.23</b>  | <b>2.37</b>  |



# 2C – STATUS QUO FORECAST

- Table 2C.4
- 80,402 halibut
  - 95% confidence interval 76,772 – 84,032 halibut
  - Effort used data from 2009 – 2019 and 2021 - 2022
    - 2020 excluded from all forecasts
  - HPUE used data from 2009 – 2019 and 2022
    - Substantial HPUE increases in 2020 and 2021, likely related to changes in size limits
  - Figure 2 in the analysis document



# 2C – STATUS QUO FORECAST

## Status Quo Regulations:

- One fish bag limit
- Reverse slot limit of less than or equal to 40 or greater than or equal to 80 inches
- Projected average weight: 10.13 lb
- Table 2C.5

**Status Quo  
Regulations  
Removals  
Projection**

**0.867 Mlb**



## 2C – MANAGEMENT MEASURES FOR 2023

- Reverse slot limit with U35-U50 on the low end and O50-O80 on the high end (includes Status Quo of a U40-O80 reverse slot limit).
- 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.
- 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).
- Annual limits of 2-3 fish, in combination with each of the above options.





# 2C – SUMMARY

## Management Measures

## Options Below 2022 Allocation (0.82 Milb)?

**Status Quo (reverse slot with lower limit of 40 inches and upper limit of 80 inches)**

**No**

**Reverse slot limit with U35-U50 on the low end and O50-O80 on the high end.**

**Yes**

**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.**

**Yes**

**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).**

**Yes**



# 2C – SUMMARY

## Management Measures (with annual limits)

## Options Below 2022 Allocation (0.82 Milb)?

Reverse slot limit with U35-U50 on the low end and O50-O80 on the high end combined with annual limits of 2-3 fish.

Yes

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 combined with annual limits of 2-3 fish.

Yes

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) combined with annual limits of 2-3 fish.

Yes



# 2C – IMPLEMENTATION CONSIDERATIONS AND SUMMARY

- Day of the week closures
- Annual limits
- Many options within likely range of allocations for 2023
- Recommend a narrower focus for future measure analyses



# 3A – STATUS QUO FORECAST

- 169,046 halibut
  - 95% confidence interval 163,678 – 174,414 halibut
  - 2022 effort was used as forecast
  - HPUE forecast used data through 2019 and includes 2022
  - Figure 3 in the analysis document for Effort and HPUE
  - Figure 4 is proportion of second fish in the harvest



# 3A – STATUS QUO FORECAST

## Status Quo Regulations:

- Two fish bag limit: one any size, one less than or equal to 28 inches
- One trip per vessel per day and per charter halibut permit per day
- Wednesdays closed to retention of halibut
- Two Tuesdays closed to retention of halibut

**Status Quo  
Regulations  
Removals  
Projection**

**2.023 Mlb**



# 3A – MANAGEMENT MEASURES FOR 2023

- 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
- 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 and additional days closed on Mondays or Thursdays
- Maximum size limit on one fish combined with annual limits of 2 – 4 fish
- Maximum size limit on one fish combined with annual limits of 2 – 4 fish and Tuesday closures
- Status quo with all days of the week open and a season closure prior to May 16 or June 1 and after July 31
- 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



# 3A – SUMMARY

## Management Measures

## Options Below 2022 Allocation (2.11 Mlb)?

Status quo (two-fish bag limit with a 28-inch maximum size limit on one fish, one trip per vessel and one trip per CHP per day, Wednesday closures all year, and two Tuesdays closed)

Yes

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, with Wednesdays closed all season

Yes

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 and additional days closed on Mondays or Thursdays

Yes

Maximum size limit on one fish combined with annual limits of 2 – 4 fish

Yes

Maximum size limit on one fish combined with annual limits of 2 – 4 fish and Tuesday closures, with Wednesdays closed all season

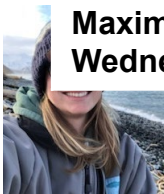
Yes

Status quo with all days of the week open and a season closure prior to May 16 or June 1 and after July 31

Yes

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

Yes



# 3A – IMPLEMENTATION CONSIDERATIONS AND SUMMARY

- Day of the week closures
- Annual limits
- Recommend more specific requests for future analyses
- Many options within likely range of allocations for 2023
- Recommend a narrower focus for future measure analyses





# ACKNOWLEDGEMENTS

- Ben Jevons and Kayla Carr –logbook data summaries and review
- Diana Tersteeg and Mike Jaenicke – Southeast data
- Martin Schuster and Marian Ford – Southcentral data
- Countless technicians – halibut measurements and angler interviews
- Sarah Marrinan – Council Staff
- Sarah Webster – ADF&G Fisheries Scientist
  
- Funding:
  - State of Alaska General Funds
  - DJ-WB Federal Aid in Fish Restoration
  - Fish and Game Fund



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# EXTRA

# SLIDES



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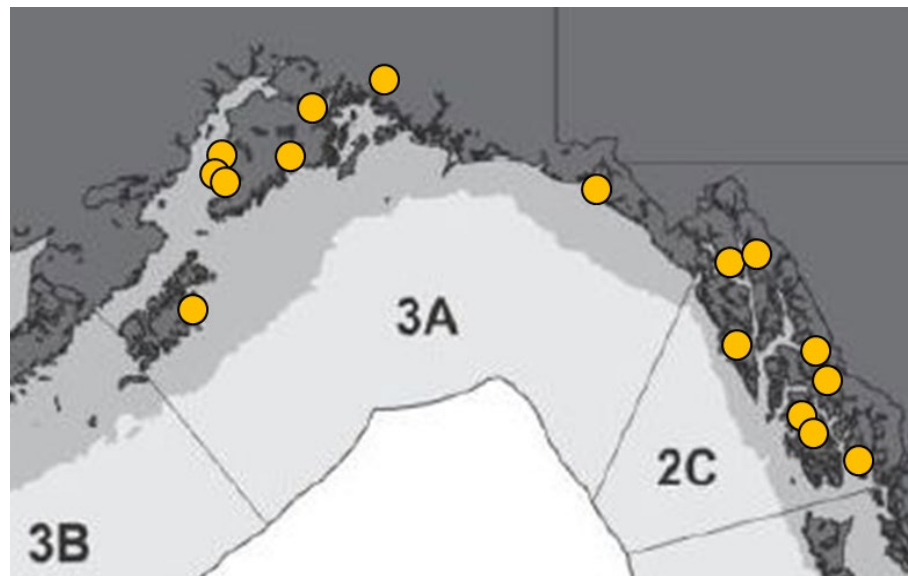
# FISHERY

# REVIEW



# DATA SOURCES

- Charter logbook (mandatory, statewide)
- Statewide harvest survey (mail)
- Creel sampling at major ports in 2C, 3A



# GENERAL METHODS

$\text{Effort} \times \text{HPUE} = \text{Harvest}$

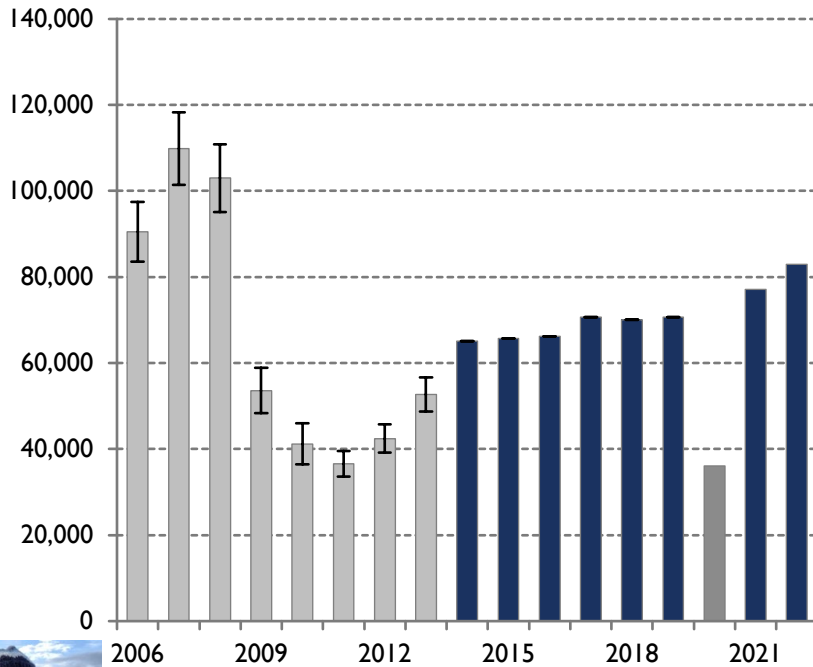
$\text{Harvest} \times \text{Average weight} = \text{Yield}$

$\text{Yield} + \text{Release Mortality} = \text{Removals}$

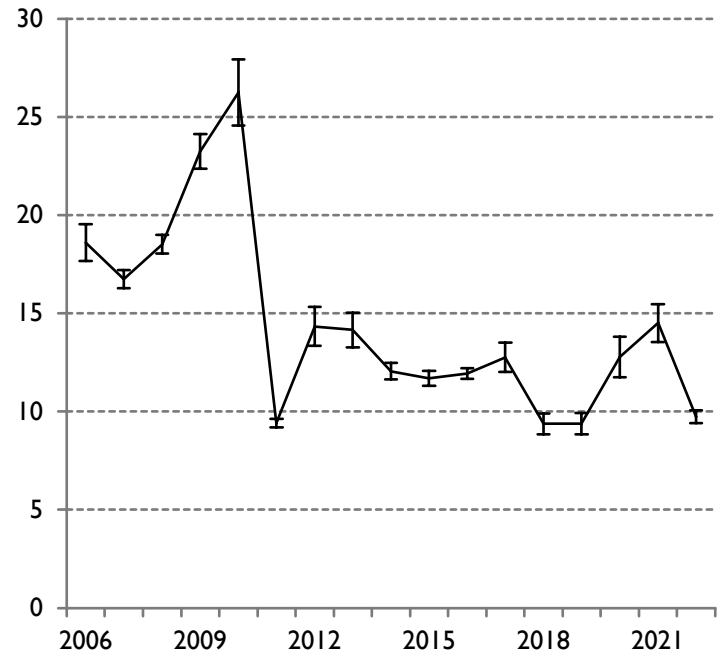


# 2C – CHARTER HALIBUT HARVEST AND MEAN WEIGHT

Number of Halibut

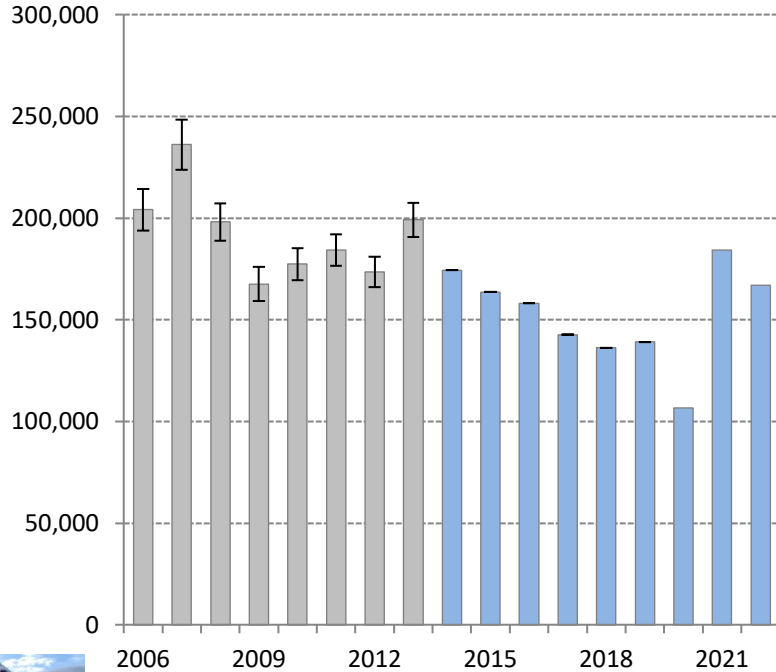


Average Net Weight (lb)

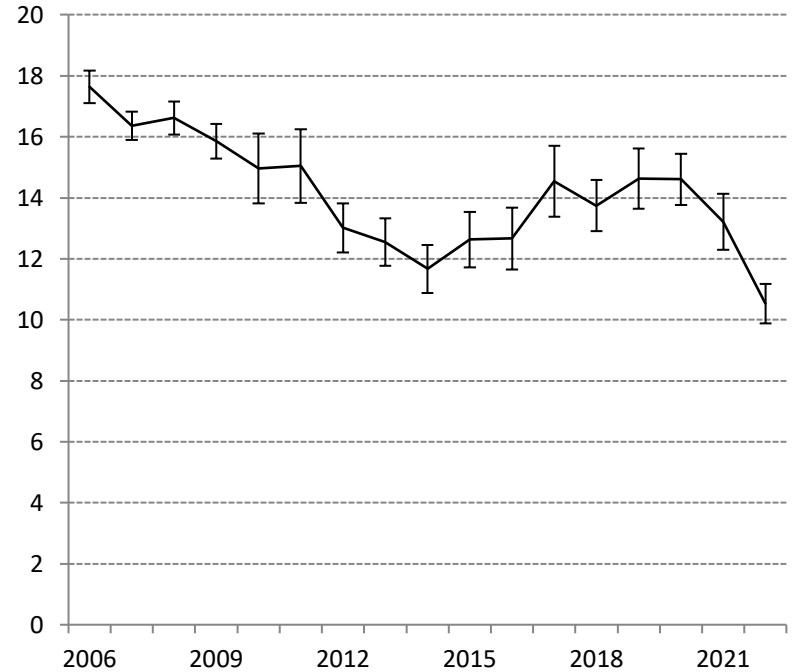


# 3A – CHARTER HALIBUT HARVEST AND MEAN WEIGHT

Number of Halibut



Average Net Weight (lb)



# 2022 FORECASTS AND PRELIMINARY ESTIMATES

| Area | Component            | Forecast | Preliminary Oct 2022 |
|------|----------------------|----------|----------------------|
| 2C   | Harvest (no. fish)   | 72,865   | 82,888               |
|      | Average wt (lb)      | 14.58    | 9.74                 |
|      | Yield (Mlb)          | 1.062    | 0.807                |
|      | Release mort (Mlb)   | 0.033    | 0.035                |
|      | Total removals (Mlb) | 1.095    | 0.842                |
| 3A   | Harvest (no. fish)   | 164,382  | 167,090              |
|      | Average wt (lb)      | 13.88    | 10.53                |
|      | Yield (Mlb)          | 2.281    | 1.760                |
|      | Release mort (Mlb)   | 0.021    | 0.017                |
|      | Total removals (Mlb) | 2.302    | 1.77                 |

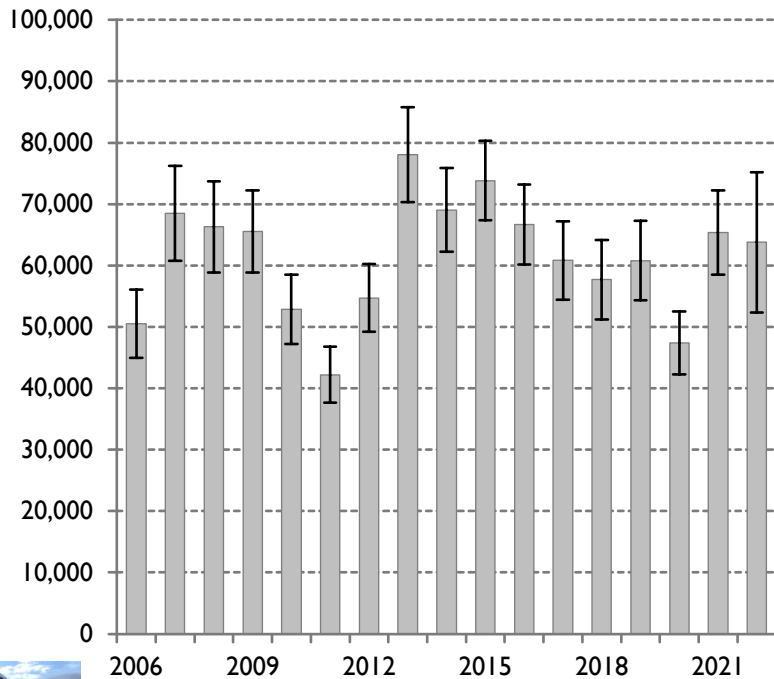


# PERFORMANCE OF COUNCIL-RECOMMENDED MANAGEMENT MEASURES

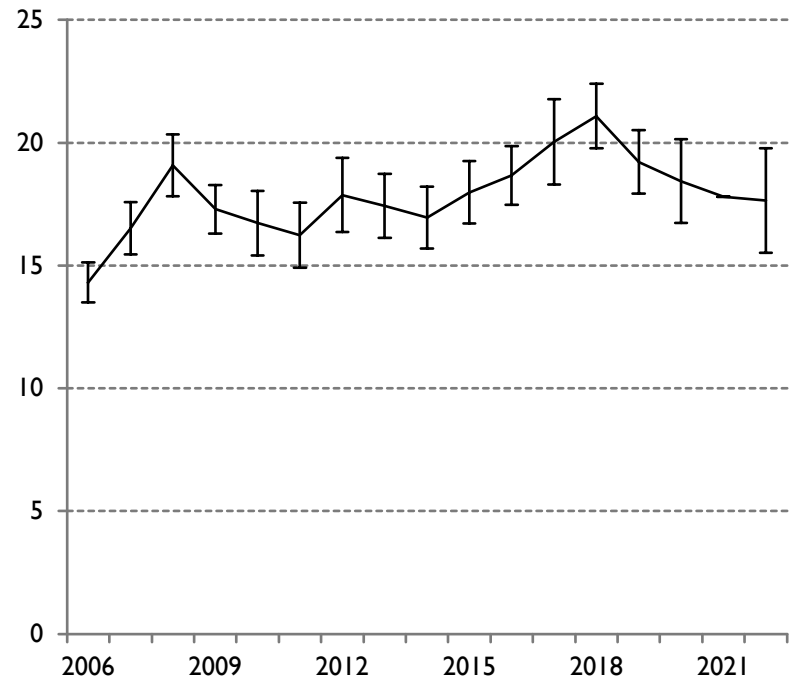
| Area | Year | Management measure   | Mgmt | Allocation | Removals     | Overage      | Overage      |
|------|------|--|------|------------|--------------|--------------|--------------|
|      |      |  | Type | (Mlb)      | (Mlb)        | (Mlb)        | Percent      |
| 2C   | 2015 | One fish, U42-O80 rev slot   | CSP  | 0.851      | 0.814        | -0.037       | -4%          |
|      | 2016 | One fish, U43-O80 rev slot   | CSP  | 0.906      | 0.839        | -0.067       | -7%          |
|      | 2017 | One fish, U44-O80 rev slot   | CSP  | 0.915      | 0.941        | 0.026        | 3%           |
|      | 2018 | One fish, U38-O80 rev slot   | CSP  | 0.810      | 0.716        | -0.094       | -12%         |
|      | 2019 | One fish, U38-O80 rev slot   | CSP  | 0.820      | 0.697        | -0.123       | -15%         |
|      | 2020 | One fish, U40-O80 rev slot thru 6/14, U45-O80 after 6/14   | CSP  | 0.780      | 0.483        | -0.297       | -38%         |
|      | 2021 | One fish, U50-O72 rev slot   | CSP  | 0.810      | 1.163        | 0.353        | 43.6%        |
|      | 2022 | One fish, U40-O80 rev slot   | CSP  | 0.820      | <b>1.095</b> | <b>0.275</b> | <b>33.5%</b> |
| 3A   | 2015 | Two fish, one ≤ 29", Thursday closed Jun 15-Aug 31, annual limit 5 halibut, one trip/day with halibut harvest.   | CSP  | 1.890      | 2.094        | 0.204        | 11%          |
|      | 2016 | Two fish, one ≤ 28", Wednesday closed all year, annual limit 4 halibut, one trip/day with halibut harvest.   | CSP  | 1.814      | 2.021        | 0.207        | 11%          |
|      | 2017 | Two fish, one ≤ 28", Wednesday closed all year, three Tuesdays closed, annual limit 4 halibut, one trip/day with halibut harvest.  | CSP  | 1.890      | 2.089        | 0.199        | 11%          |
|      | 2018 | Two fish, one ≤ 28", Wednesday closed all year, six Tuesdays closed, annual limit 4 halibut, one trip/day with halibut harvest.  | CSP  | 1.790      | 1.886        | 0.096        | 5%           |
|      | 2019 | Two fish, one ≤ 28", Wednesday closed all year, five Tuesdays closed, annual limit 4 halibut, one trip/day with halibut harvest.   | CSP  | 1.890      | 2.054        | 0.122        | 6%           |
|      | 2020 | Two fish (one ≤ 26" thru 6/14, ≤ 32" after 6/14), Tuesday and Wednesday closed thru 6/14, all days open after 6/14, annual limit 4 halibut thru 6/14, no annual limit after 6/14, one trip/day with halibut harvest. | CSP  | 1.710      | 1.567        | -0.143       | -8%          |
|      | 2021 | Two fish, one ≤ 32", Wednesday closed all year, one trip/day with halibut harvest.   | CSP  | 1.950      | 2.455        | 0.505        | 25.9         |
|      | 2022 | Two fish, one ≤ 32", Wednesday closed all year, two Tuesdays, one trip/day with halibut harvest.   | CSP  | 2.11       | <b>2.302</b> | <b>0.192</b> | <b>9.1%</b>  |

# 2C – UNGUIDED HALIBUT HARVEST AND MEAN WEIGHT

Number of Halibut

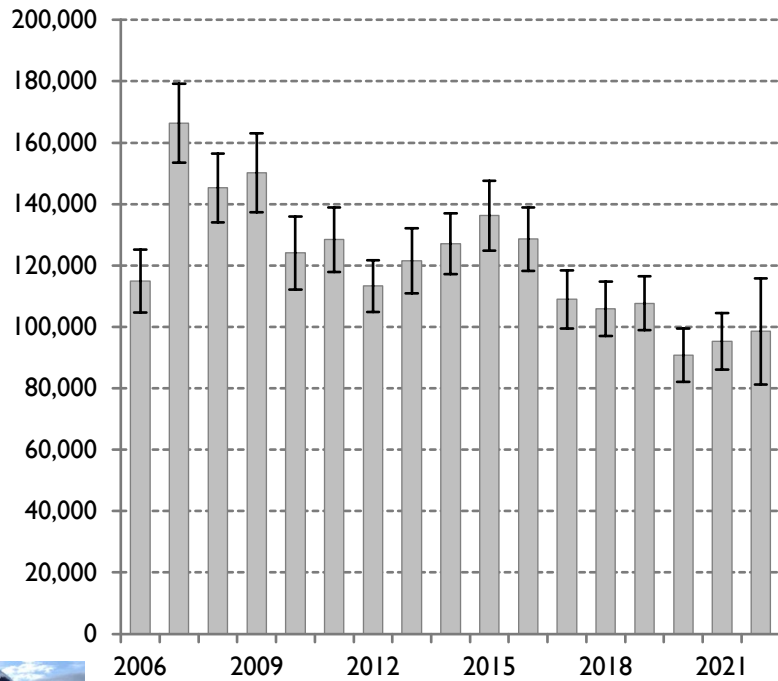


Average Net Weight (lb)

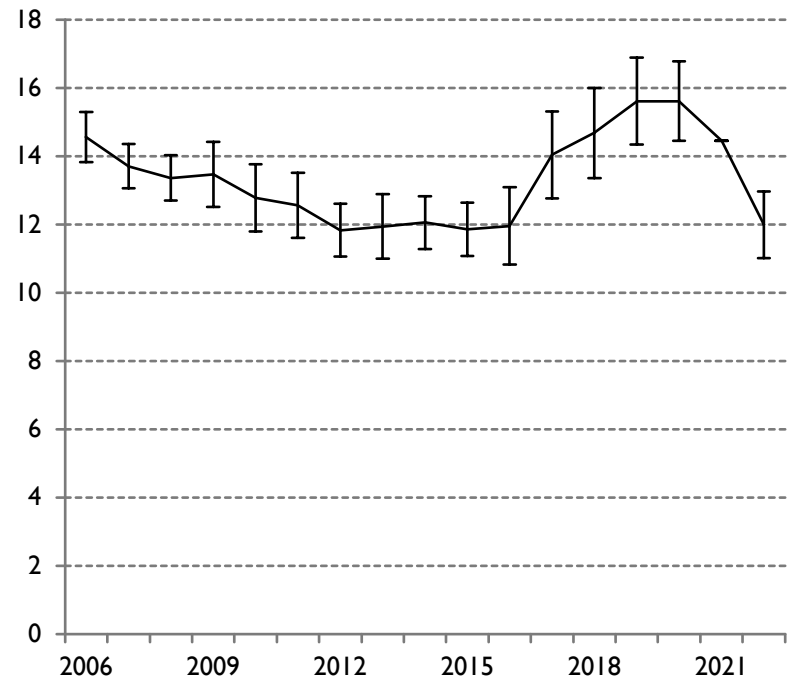


# 3A – UNGUIDED HALIBUT HARVEST AND MEAN WEIGHT

Number of Halibut



Average Net Weight (lb)

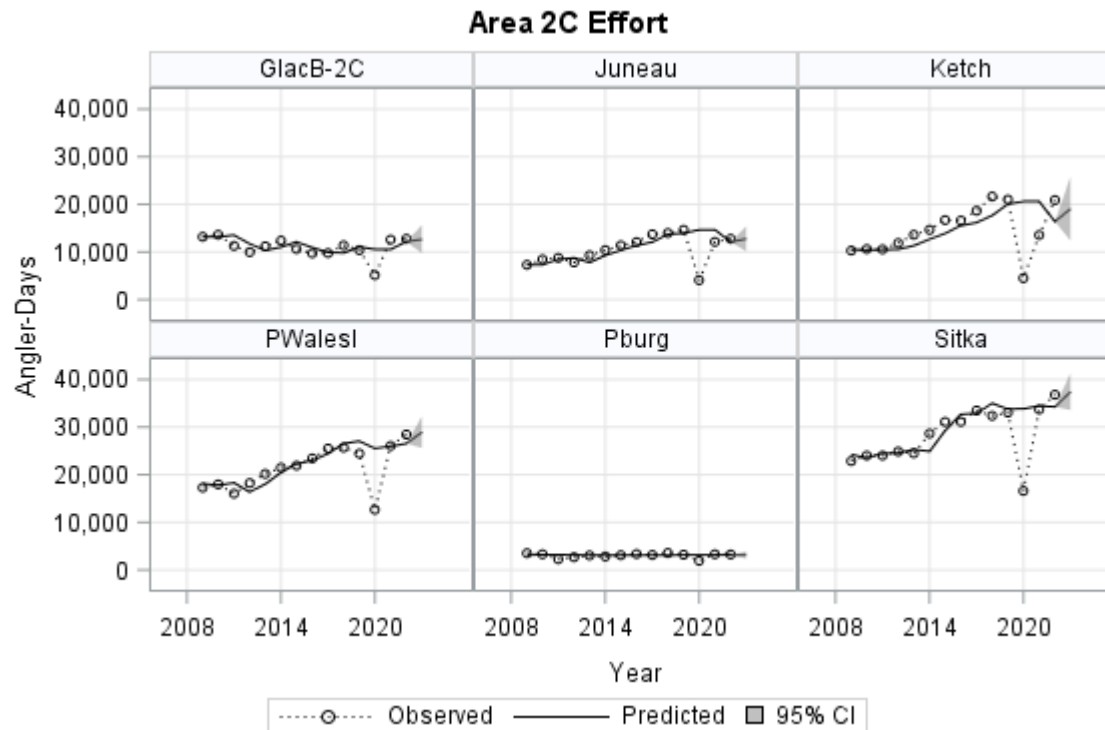


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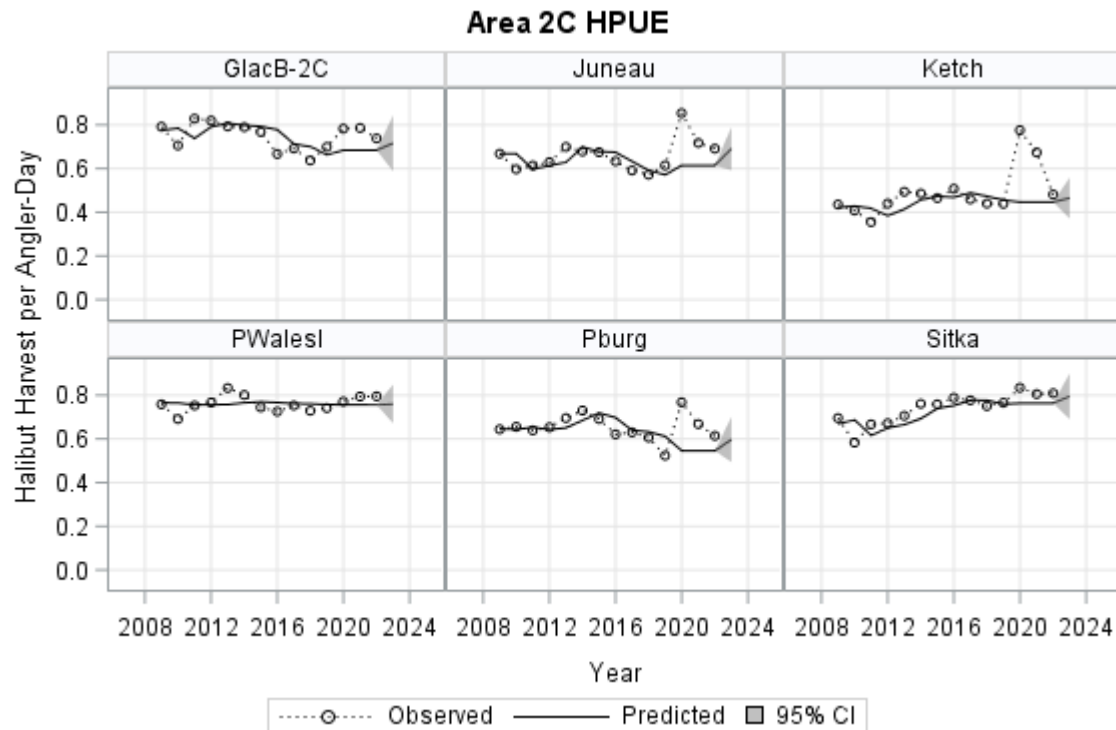
# FIGURES



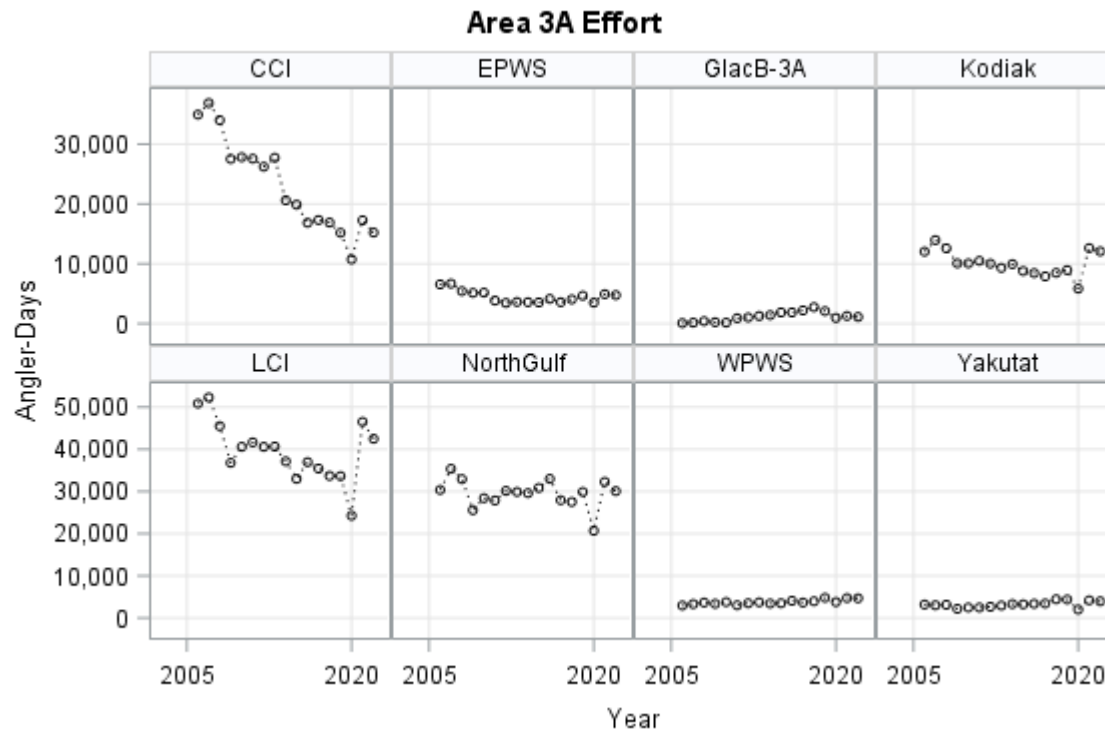
# 2C EFFORT FORECASTS



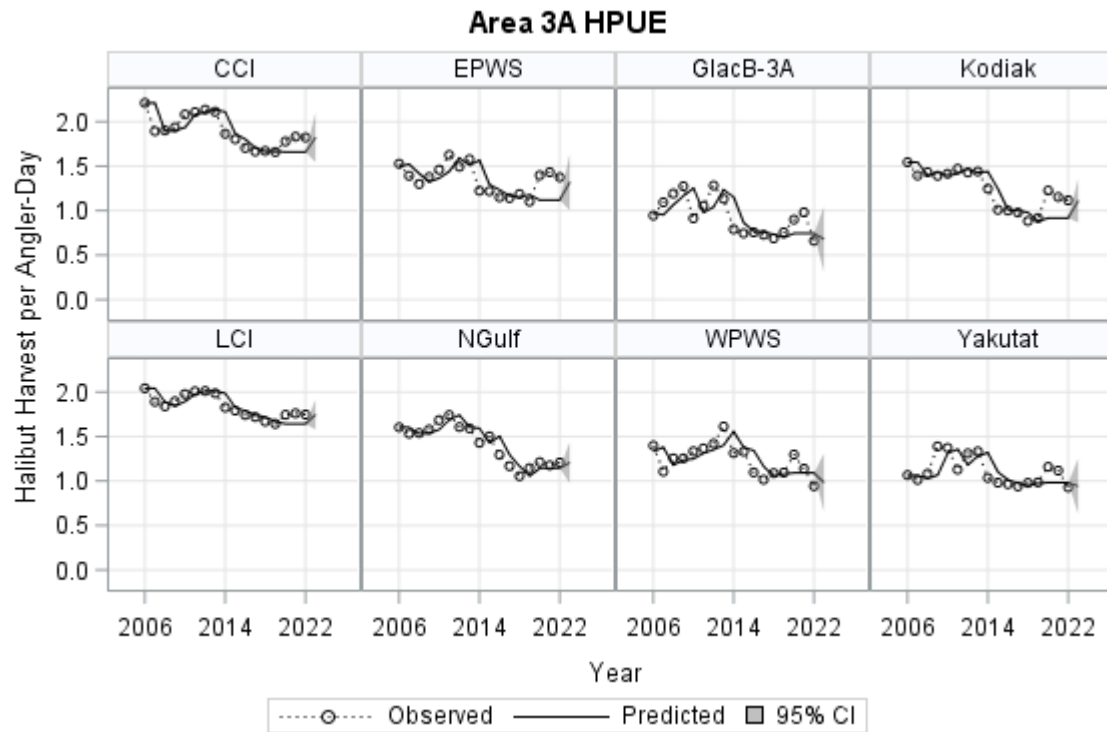
# 2C HPUE FORECASTS



# 3A EFFORT FORECASTS

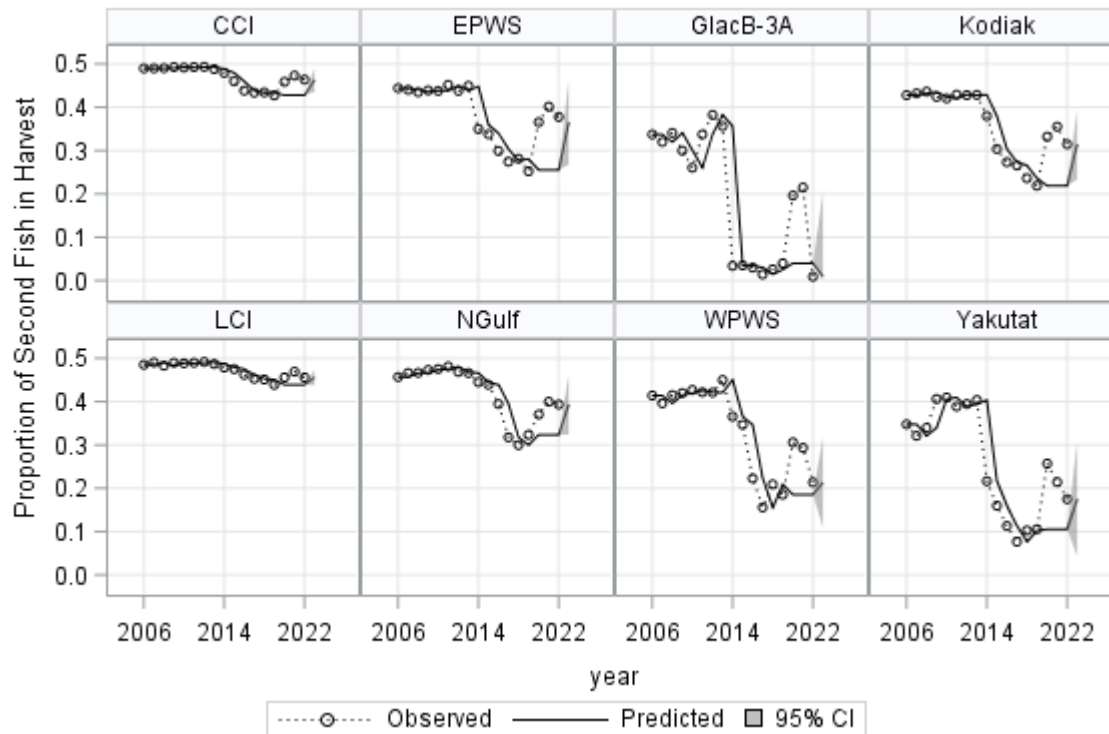


# 3A HPUE FORECASTS

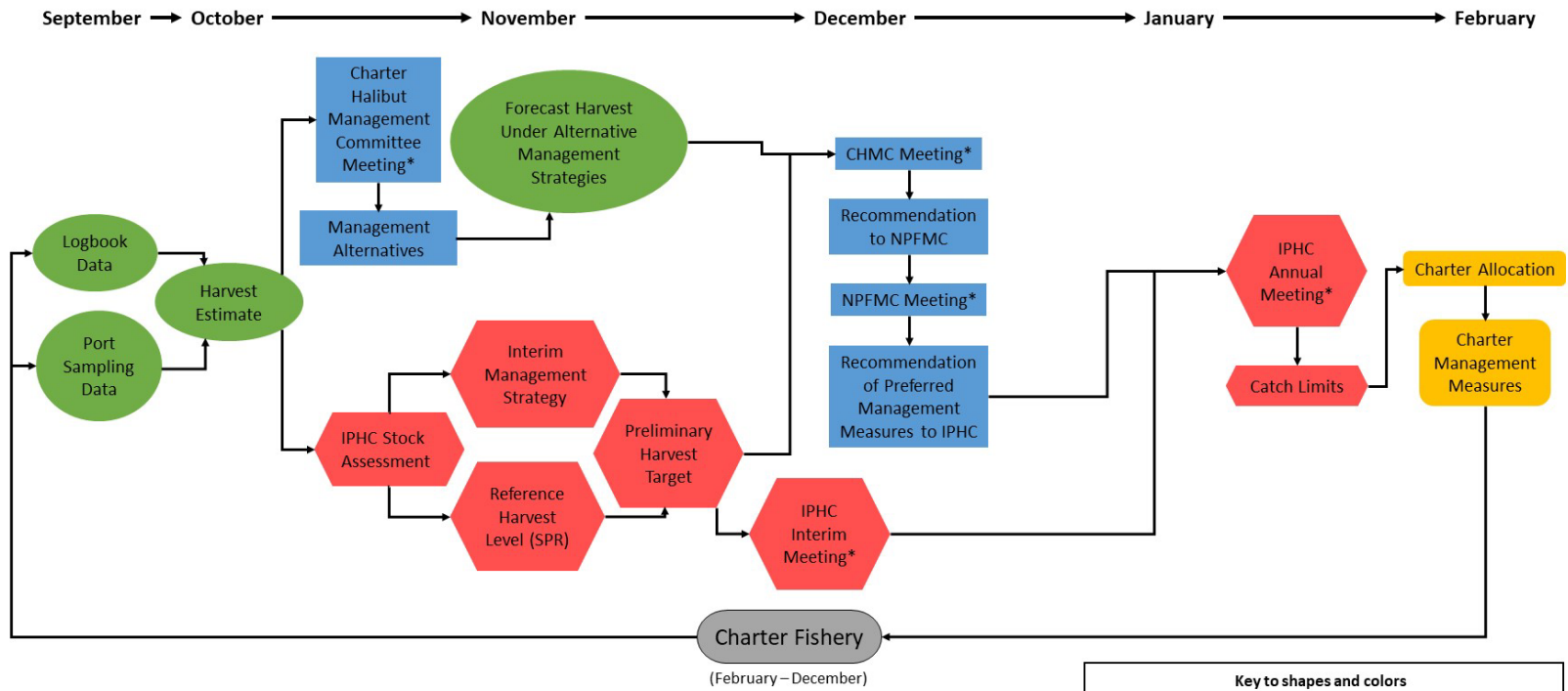




# 3A PROPORTION OF SECOND FISH FORECASTS



# CHARTER HALIBUT MANAGEMENT PROCESS



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# 2C SLIDES



# 2C – REVERSE SLOT LIMIT

- Table 2C.5
- Lower limits of 35 – 50 inches, upper limits of 50 – 80 inches
- Removal estimates range from 0.713 Mlb to 1.685 Mlb

**Options Below 2022  
Allocation (0.82 Mlb)?**

**Yes**



| <b>Lower Slot Limit</b> | <b>Forecast Proportion of Removals Going to Discard Mortality</b> |
|-------------------------|---|
| 35                      | 7.9%  |
| 36                      | 7.6%  |
| 37                      | 7.3%  |
| 38                      | 7.0%  |
| 39                      | 6.7%  |
| 40                      | 6.5%  |
| 41                      | 6.2%  |
| 42                      | 5.9%  |
| 43                      | 5.6%  |
| 44                      | 5.3%  |
| 45                      | 5.0%  |
| 46                      | 4.7%  |
| 47                      | 4.4%  |
| 48                      | 4.1%  |
| 49                      | 3.8%  |
| 50                      | 3.6%  |

## 2C – REVERSE SLOT LIMIT WITH ANNUAL LIMIT

- Table 2C.7 a-b
- Same as reverse slot analysis, but with annual limits of two to three fish
- Annual limits of two or three fish could reduce harvest projections by 25.6% or 6.5%, respectively (Table 2C.6)
- Removal estimates range from 0.529 Mlb to 1.573 Mlb (Table 7a-b)
- Would require a recording requirement

Options Below 2022  
Allocation (0.82 Mlb)?

Yes



## 2C – REVERSE SLOT WITH CLOSURE DAYS

- Table 2C.8a-g
- Lower limits of reverse slot 35 – 50 inches, upper limit of 80 inches
- Evaluated each day of the week
  - Mondays have most savings for season closure (Table 2C.8b)
- Closed days starting with the end of season (after September 17<sup>th</sup>)
  - Assumed all harvest would be eliminated on closed days
- Removal estimates range from 0.604 Mlb to 1.121 Mlb

**Options Below 2022  
Allocation (0.82 Mlb)?**

**Yes**



# 2C – REVERSE SLOT WITH 2ND CLOSURE DAY

- Closes one day for the entire season (Table 2C.12a-n)
- Second closed day is a least three days later
  - Sunday and Wednesday
  - Sunday and Thursday
  - Monday and Thursday
- Lower limits of reverse slot 35 – 50 inches, upper limit of 80 inches
- Evaluated closures starting in mid-Sept through mid-May
- Removal estimates range from 0.503 Mlb to 0.989 Mlb



**Options Below 2022  
Allocation (0.82 Mlb)?**

**Yes**



# 2C – REVERSE SLOT WITH ANNUAL LIMITS AND CLOSURE DAYS

- Tables 2C.10, 2C.11
- Lower limits of reverse slot 35 – 50 inches, upper limit of 80 inches
- Annual limits of 2 – 3 fish
- Evaluated all days of the week
- Closed days starting with the end of season
  - Assumed all harvest would be eliminated on closed days
- Removal estimates range from 0.448 Mlb to 1.047 Mlb



**Options Below 2022  
Allocation (0.82 Mlb)?**

**Yes**





# 2C – REVERSE SLOT WITH ANNUAL LIMITS AND TWO CLOSURE DAYS

- Tables 2C.13a-n, 2C.14a-n
- Lower limits of reverse slot 35 – 50 inches, upper limit of 80 inches
- Annual limits of 2 – 3 fish
- Evaluated all days of the week
- Closed days starting with the end of season
  - Assumed all harvest would be eliminated on closed days
- Removal estimates range from 0.373 Mlb to 0.922 Mlb



**Options Below 2022  
Allocation (0.82 Mlb)?**

**Yes**



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# 3A SLIDES



# 3A – CHANGES TO MAXIMUM SIZE LIMIT COMBINE WITH TUESDAY CLOSURES

- Table 3A.5
- Assumes all other status quo management measure (including closed Wednesdays)
- Projected for 26-to-32-inch size limits on one fish
- Projected under various numbers of closed Tuesdays throughout year
  - Specific dates in Table 3A.4
- Projected removals assume closing days will have maximum effect, no shifting of effort to other days
- Removal estimates range from 1.685 Mlb to 2.219 Mlb



**Options Below 2021  
Allocation (2.11 Mlb)?**

**Yes**



# 3A – CHANGES TO MAXIMUM SIZE LIMIT COMBINE WITH TUESDAYS CLOSED AND MONDAY OR THURSDAY CLOSURES

- Table 3A.6, 3A.7, and 3A.8
- Assumes all Tuesdays closed and all other status quo management measure
- Projected for 26-to-32-inch size limits on one fish
- Projected under various numbers of closed Mondays or Thursdays
  - Specific dates in Table 3A.6
- Projected removals assume closing days will have maximum effect, no shifting of effort to other days
- Removal estimates range from 1.364 Mlb to 1.872 Mlb



Options Below 2022  
Allocation (2.11 Mlb)?

Yes



# 3A – MAXIMUM SIZE LIMITS COMBINED WITH ANNUAL LIMITS

- Table 3A.10
- Assume all other status quo management measures
- Projected for 26-to-32-inch size limits on one fish
- Projected for annual limits of two to four fish
- Annual limits of two to four fish could reduce harvest projections by 15.2% to 3.4%, respectively (Table 3A.9)
- Removal estimates range from 1.692 Mlb to 2.143 Mlb
- Would require a recording requirement
- Past violations of annual limits have included 0.2 – 1.0% of anglers



**Options Below 2022  
Allocation (2.11 Mlb)?**

**Yes**



# 3A – MAXIMUM SIZE LIMITS COMBINED WITH ANNUAL LIMITS AND TUESDAY CLOSURES

- Table 3A.11
- Assume other status quo management measures
- Projected for 26-to-32-inch size limits on one fish
- Projected under various numbers of closed Tuesdays throughout year
- Projected removals assume opening days will have maximum effect
- Removal estimates range from 1.427 Mlb to 2.143 Mlb



Options Below 2022  
Allocation (2.11 Mlb)?

Yes



# 3A – CHANGES TO MAXIMUM SIZE LIMIT COMBINE WITH WEDNESDAY CLOSURES

- Table 3A.12 and 3A.13
- Assumes all Tuesdays are open and all other status quo management measures
- Projected for 26-to-32-inch size limits on one fish
- Projected under various numbers of closed Wednesdays throughout year
  - Specific dates in Table 3A.12
- Projected removals assume opening days will have maximum effect
- Removal estimates range from 1.997 Mlb to 2.657 Mlb

**Options Below 2022  
Allocation (2.11 Mlb)?**

**Yes**



# 3A – LENGTH OF FISHING SEASON

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

- Table 3A.14
- Open season of May 16 – July 31 or June 1 – July 31
- All days of the week open during fishing season
- Status quo size limits and trip limits
- Harvest Forecast 122,188 – 133,683 fish
- Projected removals assume closing days will have maximum effect, no shifting of effort to other days



**Options Below 2022  
Allocation (2.11 Mlb)?**

**Yes**

