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SEDAR 61: US Gulf of Mexico Red Grouper

2023 Interim Analysis

Gulf of Mexico Fishery Management Council
Scientific and Statistical Committee



January 10-12, 2023

Recent interim analyses

2021:

- Catch advice adjusted using index-based harvest control rule (HCR) and 3-year moving average of NMFS bottom longline survey index of abundance
 - Reduced spatial area index was used due to reduced survey coverage in 2020
 - **Framework Action set ABC = 4.96 million pounds gutted weight (mp gw)**

2022:

- Used as a health check, not used to adjust catch advice

2023 Interim Analysis

- Catch advice adjusted using index-based HCR and both 3- or 5-year moving average of the NMFS bottom longline survey index of abundance:

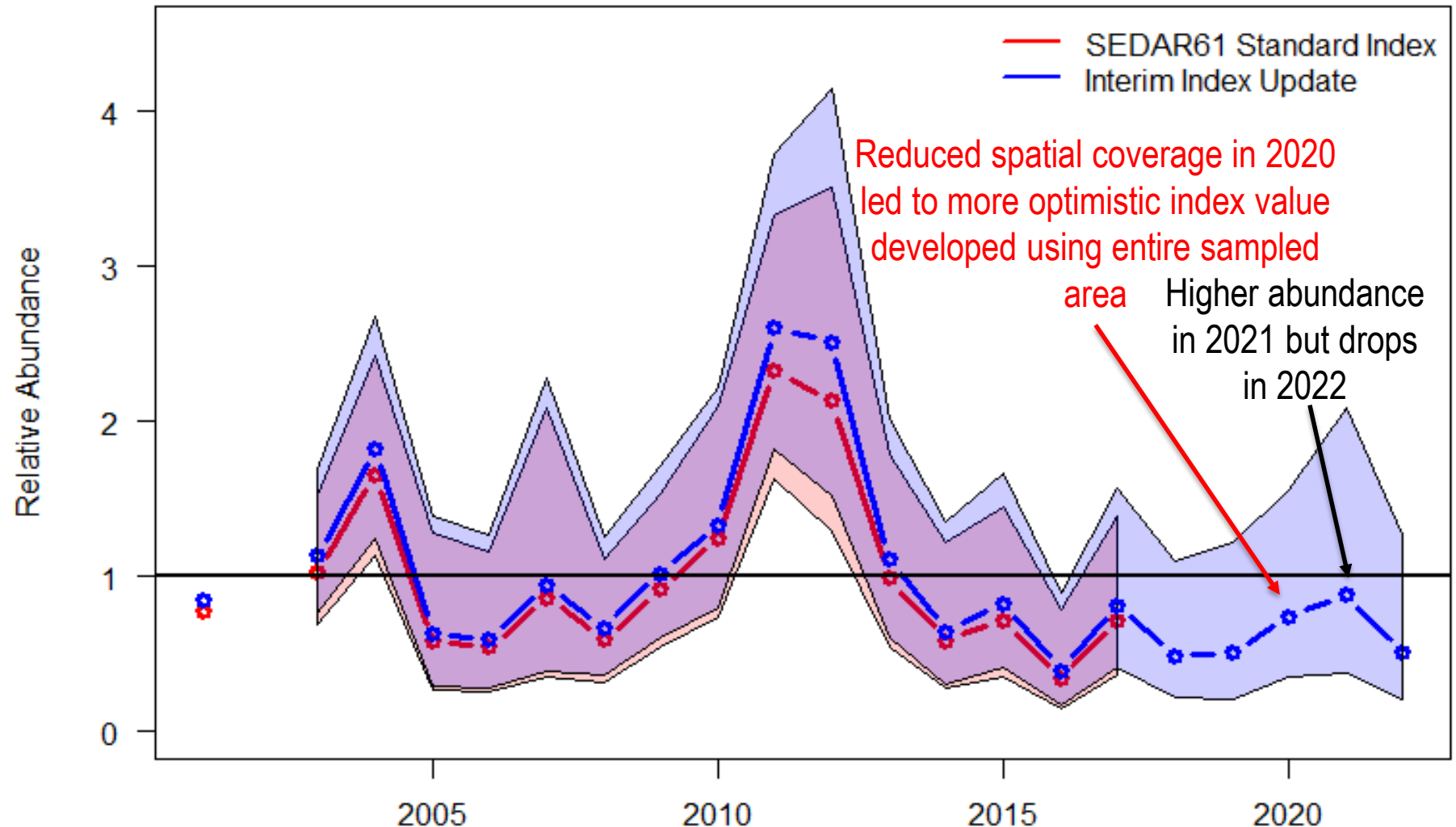
$$C_{y+1} = C_{ref} * \left(\frac{1}{3 \text{ (or } 5)} \sum_{k=y-2 \text{ (or } -4)}^y I_k \right) / \left(\frac{1}{3 \text{ (or } 5)} \sum_{Y_{ref}-1 \text{ (or } -3)}^{Y_{ref}+1} I_{ref} \right)$$

The equation is presented within two light blue boxes. The left box is titled "Recent Mean Index (I_k)" and contains the numerator of the fraction: $\left(\frac{1}{3 \text{ (or } 5)} \sum_{k=y-2 \text{ (or } -4)}^y I_k \right)$. The right box is titled "Reference Mean Index (I_{ref})" and contains the denominator of the fraction: $\left(\frac{1}{3 \text{ (or } 5)} \sum_{Y_{ref}-1 \text{ (or } -3)}^{Y_{ref}+1} I_{ref} \right)$.

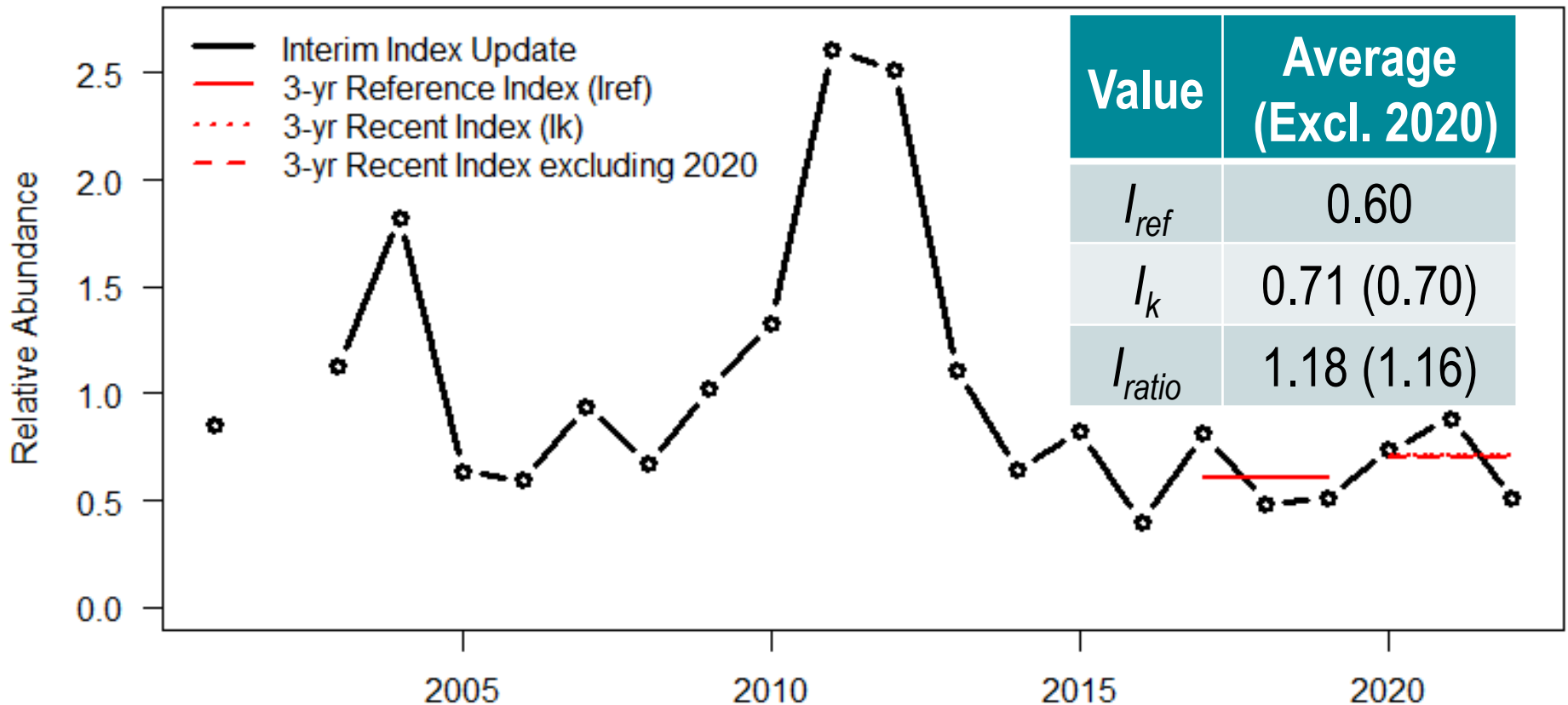
- Reference Year* (Y_{ref}) = 2018; the first year following the terminal year of the assessment (2017)
 - $C_{ref} = 5.57$ mp gw

Updated bottom longline index

Index shown is for the entire Eastern Gulf



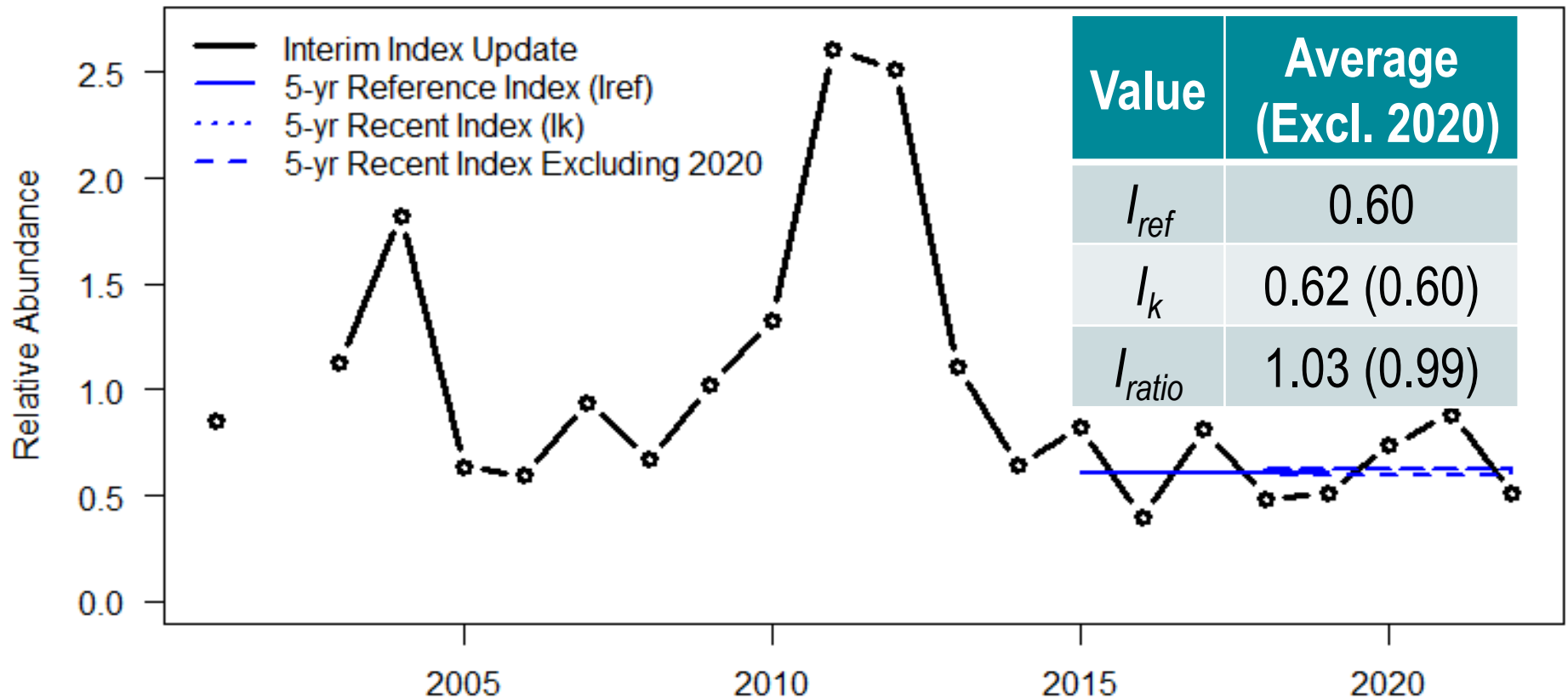
Adjust ABC* using 3-year average



$$*C_{ref} = 5.57 \text{ mp gw}$$

C_{ref} 3-yr adjust = 6.58 or 6.45 (exclude 2020 from recent mean) mp gw

Adjust ABC* using 5-year average



$$*C_{ref} = 5.57 \text{ mp gw}$$

C_{ref} 5-yr adjust = 5.75 or 5.49 (exclude 2020 from recent mean) mp gw

Catch advice summary

- Decisions needed:
 - 3-year or 5-year recent average
 - Include or exclude 2020 value in the recent mean
- Adjusted ABC (mp gw):

| 2020 in recent mean | 3-year recent average | 5-year recent average |
|---------------------|-----------------------|-----------------------|
| Yes | 6.58 | 5.75 |
| No | 6.45 | 5.49 |

Catch advice considerations

Southwest Coast *Karenia brevis*
concentrations
11/01/2022 – 11/08/2022

- Unknown impact of the ongoing 2022 red tide event

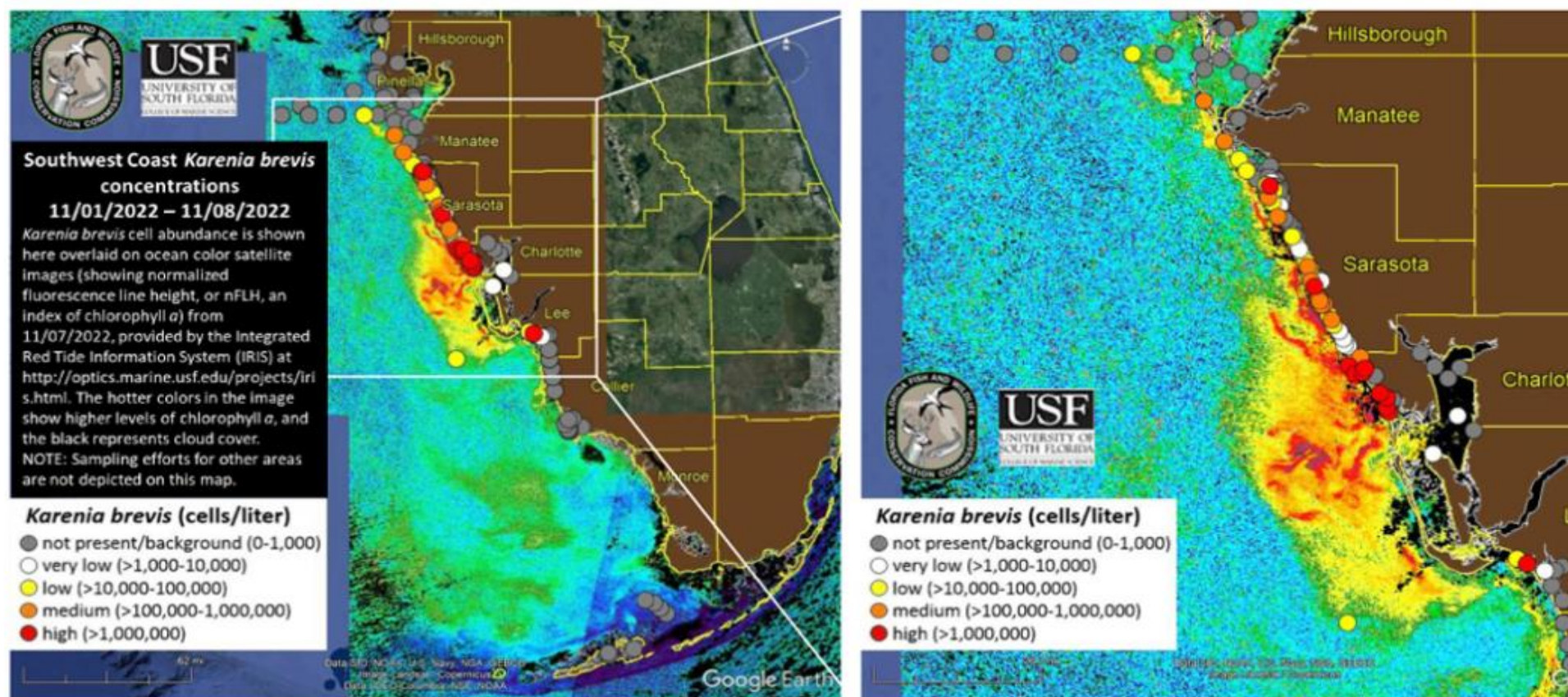


Image accessed 11/9/2022 at <https://myfwc.com/research/redtide/statewide/>,
maps updated frequently

Future improvements

- MSE development for Red Grouper
 - MSE can be used to compare HCRs that best achieve management goals
- Design multitude of HCRs with stakeholder input
- Test HCR/Index combinations to identify optimum HCR

Questions?

Thank you to all SEDAR61 data providers and for your attention!

Point of Contact:

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NMFS Bottom Longline Index

| Survey Year | Frequency | N | Delta-Lognormal Index | Scaled Index (mean = 1) | Coefficient of Variation | Lower Confidence Level | Upper Confidence Level |
|-------------|-----------|-----|-----------------------|-------------------------|--------------------------|------------------------|------------------------|
| 2001 | 0.21505 | 93 | 0.74337 | 0.84739 | 0.29078 | 0.47932 | 1.49811 |
| 2002 | | | | | | | |
| 2003 | 0.34188 | 117 | 0.99083 | 1.12949 | 0.20250 | 0.75641 | 1.68658 |
| 2004 | 0.41837 | 98 | 1.59984 | 1.82372 | 0.19345 | 1.24299 | 2.67576 |
| 2005 | 0.25000 | 40 | 0.55518 | 0.63288 | 0.40697 | 0.28926 | 1.38469 |
| 2006 | 0.28205 | 39 | 0.51909 | 0.59173 | 0.39321 | 0.27719 | 1.26319 |
| 2007 | 0.19048 | 42 | 0.82512 | 0.94059 | 0.46525 | 0.38808 | 2.27973 |
| 2008 | 0.26667 | 60 | 0.58777 | 0.67002 | 0.32179 | 0.35764 | 1.25525 |
| 2009 | 0.34921 | 63 | 0.89436 | 1.01952 | 0.26440 | 0.60619 | 1.71468 |
| 2010 | 0.34328 | 67 | 1.16656 | 1.32980 | 0.26010 | 0.79718 | 2.21828 |
| 2011 | 0.40164 | 122 | 2.28392 | 2.60354 | 0.18121 | 1.81734 | 3.72985 |
| 2012 | 0.46939 | 49 | 2.20397 | 2.51239 | 0.25471 | 1.52165 | 4.14819 |
| 2013 | 0.34043 | 47 | 0.97185 | 1.10786 | 0.30465 | 0.61054 | 2.01025 |
| 2014 | 0.26190 | 42 | 0.56366 | 0.64254 | 0.38424 | 0.30590 | 1.34967 |
| 2015 | 0.25000 | 52 | 0.72554 | 0.82707 | 0.35923 | 0.41204 | 1.66016 |
| 2016 | 0.18000 | 50 | 0.34360 | 0.39169 | 0.43434 | 0.17055 | 0.89954 |
| 2017 | 0.31818 | 44 | 0.71068 | 0.81013 | 0.34042 | 0.41777 | 1.57100 |
| 2018 | 0.18750 | 48 | 0.42551 | 0.48505 | 0.42667 | 0.21408 | 1.09902 |
| 2019 | 0.21053 | 38 | 0.44374 | 0.50584 | 0.46147 | 0.21007 | 1.21801 |
| 2020 | 0.31429 | 35 | 0.64733 | 0.73792 | 0.38574 | 0.35035 | 1.55420 |
| 2021 | 0.21622 | 37 | 0.77466 | 0.88307 | 0.44992 | 0.37417 | 2.08411 |
| 2022 | 0.16667 | 42 | 0.44544 | 0.50778 | 0.48353 | 0.20302 | 1.27001 |

Reference catch level

- C_{ref} = reference catch level to be adjusted
For Red Grouper = **5.57 million pounds gutted weight**
- Allocation of 59.3% commercial and 40.7% recreational from Amendment 53 (GMFMC 2021)
 - Gulf of Mexico Fishery Management Council (GMFMC). 2021. Revised Draft Reef Fish Amendment 53. Red Grouper Allocations and Annual Catch Levels and Targets. National Marine Fisheries Service, NA15NMF4410011, Tampa, Florida.
- An ABC adjustment that scales up assessment predicted recreational landings in weights using mean weight from ACL monitoring dataset (SEFSC 2021)
 - Southeast Fisheries Science Center (SEFSC). 2021. Adjustment of SEDAR61 Gulf Red Grouper Projected Catch Streams Using Mean Weight of Recreationally Landed Fish from ACL Monitoring. 10 pp.