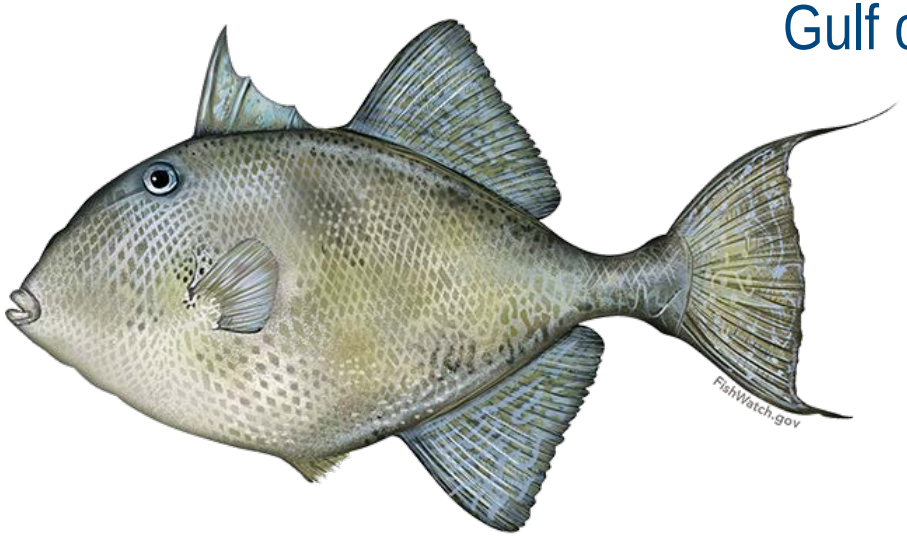
Interim Assessment of Gulf of Mexico Gray Triggerfish

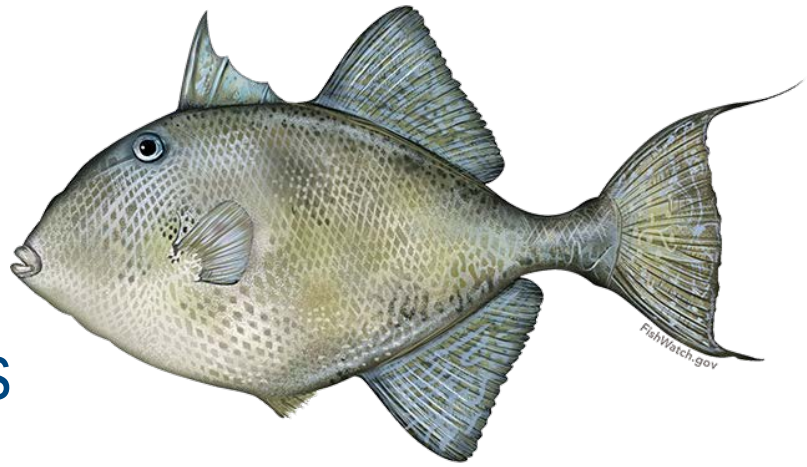


Gulf of Mexico Fishery Management Council
Reef Fish Advisory Panel
Assessment Review

Sustainable Fisheries Division, SEFSC

October 6, 2020

Outline



- Purpose and Need
- Gray triggerfish status
  - Management and landings
  - Indices
- Interim Assessment
  - Harvest Control Rule
  - Index selection and HCR parameterization
    - MSE
  - Results
- Recommendations

Purpose and Need

- Interim assessments
  - Occur on regular interval between assessments
  - Allow catch limits to be adjusted based on current stock conditions (e.g., red tide, recruitment failure)

- Gray triggerfish
  - Last accepted assessment was SEDAR 43 (2015)
  - Catch advice based from SEDAR 9 update (2011)
  - Not overfished or experiencing overfishing, but in a rebuilding plan (2025)

Not actually implemented

Gray triggerfish management and landings

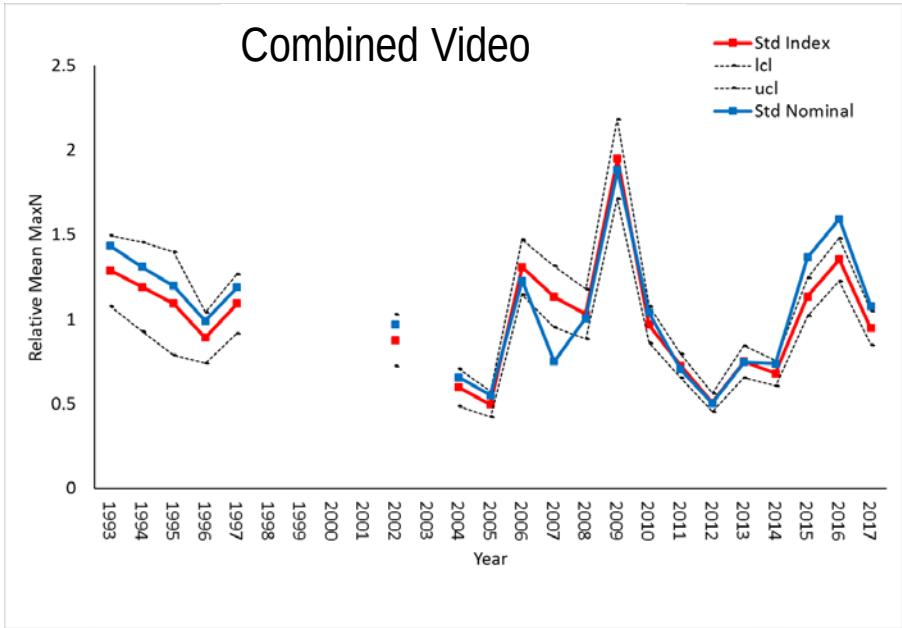
Year	Assessment	OFL	ABC	ABC_{2024} 8-year rebuild	ABC_{2025} 9-year rebuild	ABC_{2026} 10-year rebuild
2012	SEDAR 9 -update	401,600	305,300	–	–	–
2013	SEDAR 9 -update	429,300	348,000	–	–	–
2014	SEDAR 9 -update	449,300	383,900	–	–	–
2015	SEDAR 9 -update	463,600	412,400	–	–	–
2016	SEDAR 9 -update	473,400	433,900	–	–	–
2017	SEDAR43	1,309,000	–	216,000	399,000	546,000
2018	SEDAR 43	1,287,000	–	227,000	412,000	554,000
2019	SEDAR 43	1,218,000	–	233,000	417,000	555,000
2020	SEDAR 43	1,187,000	–	237,000	421,000	558,000

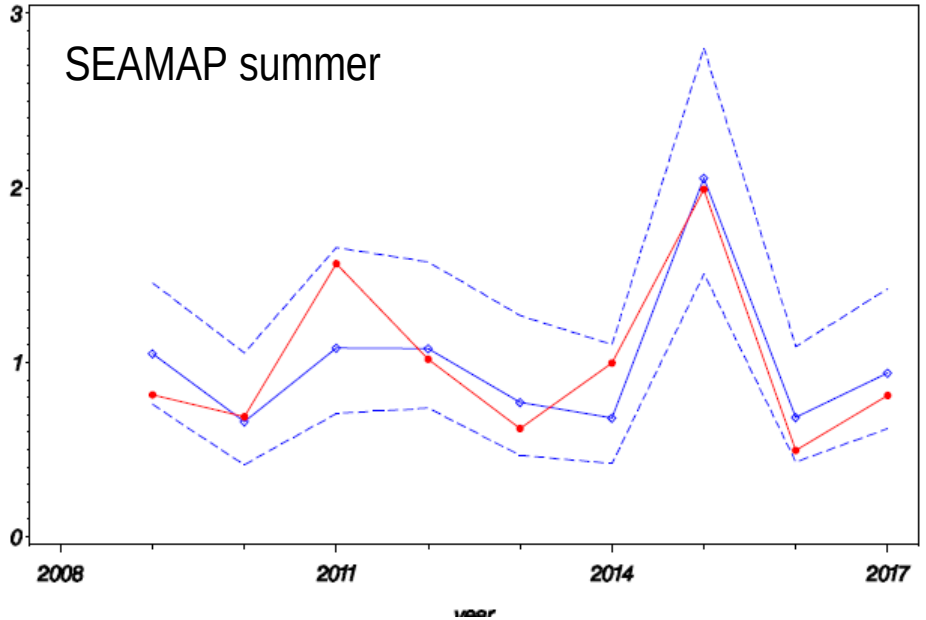
Year	Recreational Landings	Commercial Landings	Total Landings	ABC
2012	277,720	72,778	350,498	305,300
2013	453,251	63,086	516,337	305,300
2014	217,891	40,908	258,799	305,300
2015	94,174	48,013	142,187	305,300
2016	432,641	59,787	492,428	305,300
2017	62,731	63,264	125,995	305,300
2018	461,900	65,372	527,272	305,300
2019	310,868	62,203	373,071	305,300

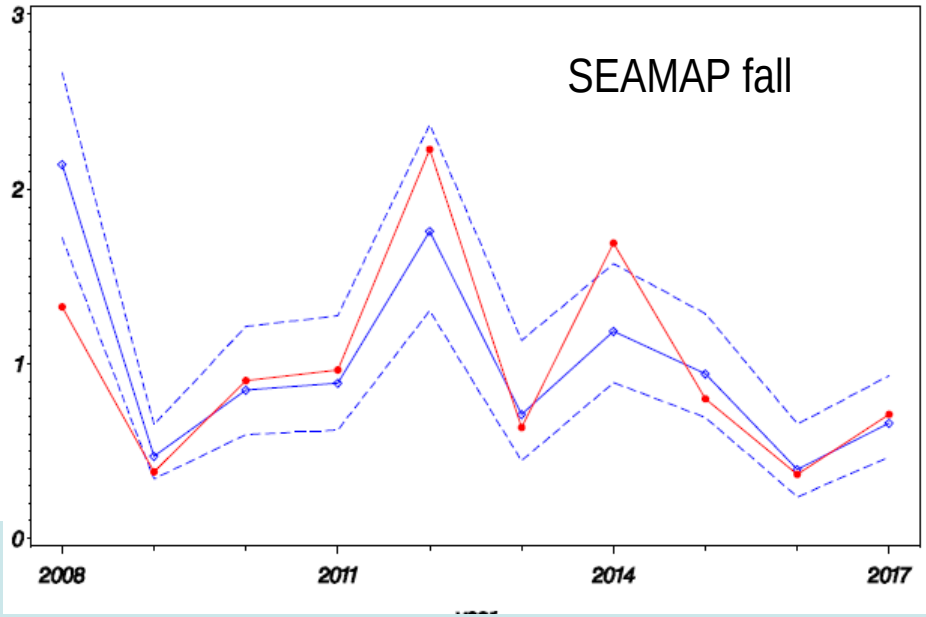
Recreational fishery has experienced periodic overages and paybacks (AM) with annual seasonal closures since 2012

All weights are in pounds ww

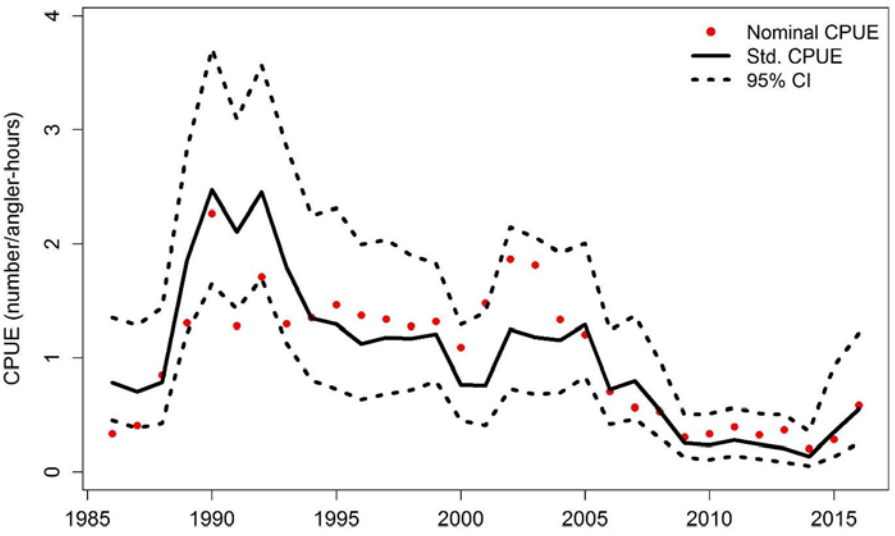
Indices of Abundance FI



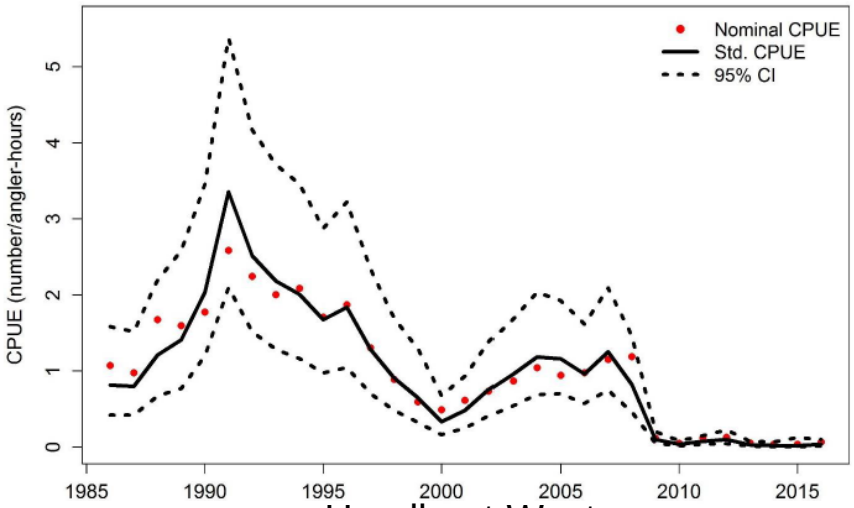




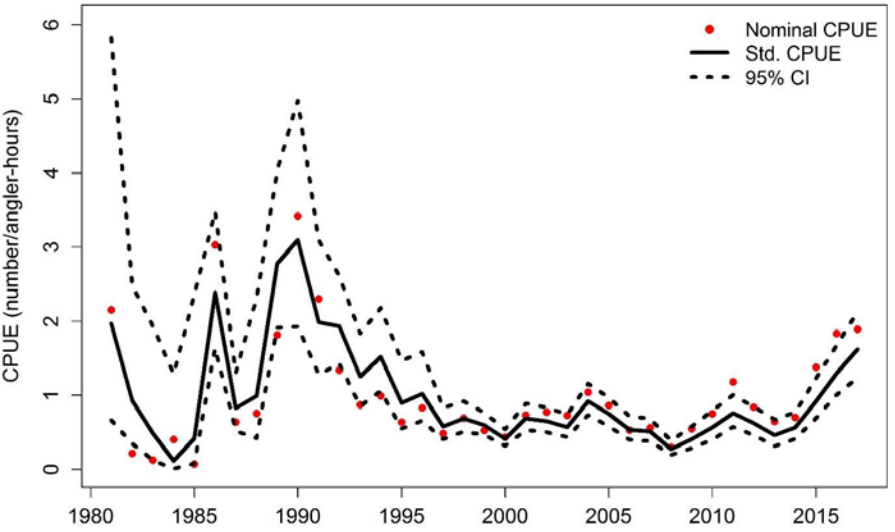
Indices of Abundance - FD



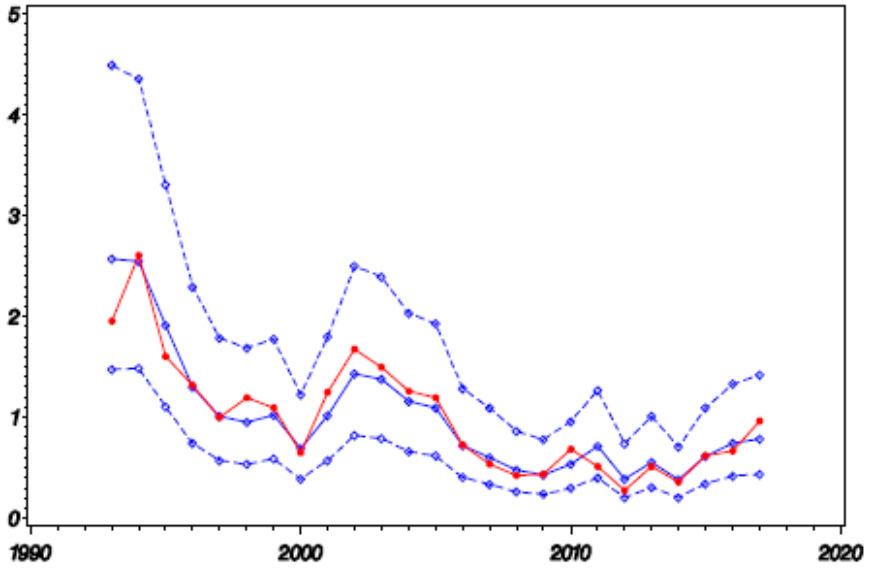
Headboat East



Headboat West



MRIP - East



Commercial handline

Gray triggerfish status

- Current in a 9 year rebuilding plan (2025)
- Indices generally agree that:
  - Abundance hit lowest point in late 2000's, early 2010's
  - Abundance indices have varied since, but generally trended upward especially in the eastern Gulf
- Stock can potentially support increased removals without compromising rebuilding
- Interim assessment can provide advice

Harvest Control Rule

- Index-based interim assessment (Huynh et al. 2020)
  - Buffer for uncertainty in index in one of two ways
    - Average

$$C_{y+1} = C_{ref} * (\frac{1}{3}\sum_{k=y-3}^{y-1} I_k)/I_{ref}$$

    - Smoothing parameter (β)

$$C_{y+1} = C_{ref} * \frac{I_y + \beta\sigma}{I_{ref} + \beta\sigma}$$

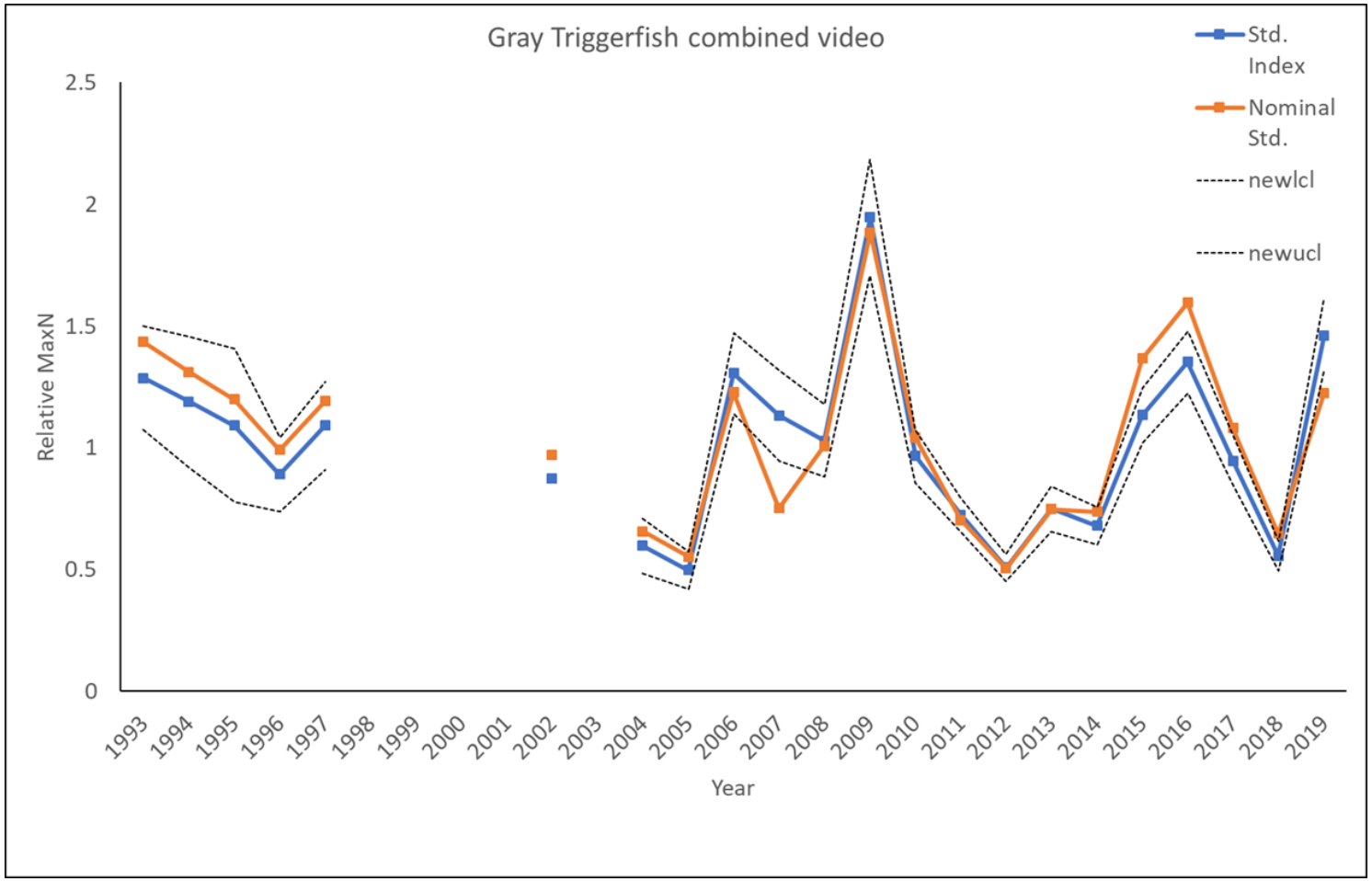
Index Selection and HCR Parameterization

- Interim assessment has two decision points
  - Select index for defining I_{ref}
  - Select HCR (avgerage vs. smooth) and parametrize
- Decisions were informed by preliminary MSE (SSMSE) results and index residual analysis

Index Selection and HCR Parameterization

- Preliminary MSE –identified FI indices and 3 year average as preferred.
- Residual analysis selected the combined video

Updated Combined Video Index



Interim assessment

- Adjust current ABC of 305,300 (C_{ref})

Year	Assessment	OFL	ABC
2012	SEDAR 9 -update	401,600	305,300
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2020	SEDAR 43	1,187,000	–

All weights are in pounds ww

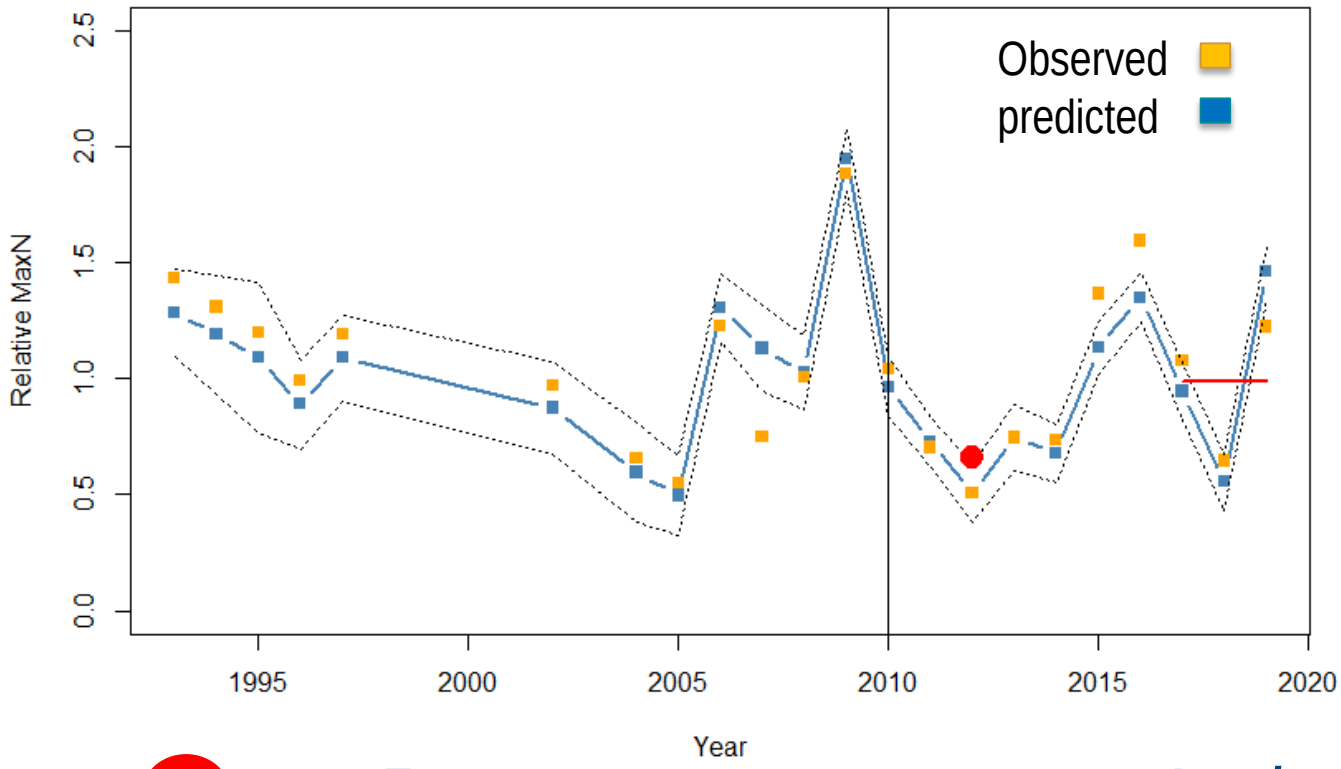
Adjust current ABC of 305,300 (C_{REF})

Year	N	Proportion Positive	Standardized Index	Nominal Index	CV
1993	114	0.32	1.29	1.44	0.19
1994	82	0.37	1.19	1.31	0.26
1995	55	0.29	1.09	1.20	0.33
1996	133	0.29	0.89	0.99	0.19
1997	162	0.31	1.09	1.19	0.19
1998	–	–	–	–	–
1999	–	–	–	–	–
2000	–	–	–	–	–
2001	–	–	–	–	–
2002	151	0.21	0.87	0.97	0.20
2003	–	–	–	–	–
2004	149	0.19	0.60	0.66	0.21
2005	274	0.16	0.50	0.55	0.17
2006	370	0.26	1.31	1.23	0.14
2007	377	0.17	1.13	0.75	0.18
2008	291	0.22	1.03	1.01	0.16
2009	367	0.31	1.95	1.88	0.14
2010	509	0.17	0.97	1.04	0.13
2011	715	0.18	0.72	0.70	0.11
2012	668	0.13	0.51	0.50	0.12
2013	448	0.17	0.75	0.75	0.14
2014	672	0.17	0.68	0.74	0.13
2015	518	0.23	1.13	1.37	0.11
2016	565	0.29	1.35	1.59	0.11
2017	527	0.22	0.95	1.08	0.12
2018	423	0.17	0.56	0.65	0.12
2019	618	0.22	1.46	1.22	0.12
Total	8188	–	–	–	–

$$C_{y+1} = C_{ref} * (\frac{1}{3}\sum_{k=y-3}^{y-1} I_k)/I_{ref}$$

- C_{ref} = 305,300
- I_{ref} = 0.66 — Avg. 2011 - 2013
- Avg. I_k = 0.988 — Avg. 2017 - 2019
- Iratio = 1.496

Adjust current ABC of 305,300 (C_{REF})



Reference year is 2012, index has gone up since 2011-2013 by 1.5, hence under interim approach ABC_{2012} goes up by 1.5

- I_{ref} = ● ; Recent avg. I = — ; *Iratio = 1.496*
- C_{ref} = 305,300; terminal data 2010
- C_{ref} adjust = 456,900

All weights are in pounds ww

Catch Advice Summary

Reference Catch	Reference Value	Iratio	2021 Value	Commercial 2021 ABC (0.21)	Recreational 2021 ABC (0.79)
Cref status quo	305,300	1	305,300	64,100	241,200
Cref adjust	305,300	1.496	456,900	95,900	361,000

- SSC recommended that the ABC be based on the Interim Assessment and set equal to 456,900 lbs.
- OFL (1.2 mp) remains unchanged but not limiting

All weights are in pounds ww

Questions?

Thank you for your attention!

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Preliminary MSE (SSMSE)

- Not fully operational, but early progress is encouraging for future IA