Gulf of Mexico Lane Snapper Updated OFL and ABC in Landings Only

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Outline

Background

Updated Adjusted OFL/ ABC In Landings Only (Pounds, Whole Weight)

Background Review

Cummings (January 2020)

- Provided updated OFL/ABC in units of total removals for Itarget model using inputs from Cummings and Sagarese for commercial landings and CPUE index
- Results provided for MRIP_FES estimates and MRIP_MRFSS for recreational component (1986-2018)

Cummings and Sagarese (September 2019)

- Provided updated OFL and ABC in total removals from application of DLMTool Itarget Method
  - Results provided using MRIP_MRFSS Estimated Recreational Catches 1986-2018 and updated commercial landings through 2018

Cummings (September 2019)

- Provided updated Headboat CPUE Abundance Index 1986-2018
  - Added 4 new years of CPUE information 2015-2018

Purpose of this Presentation

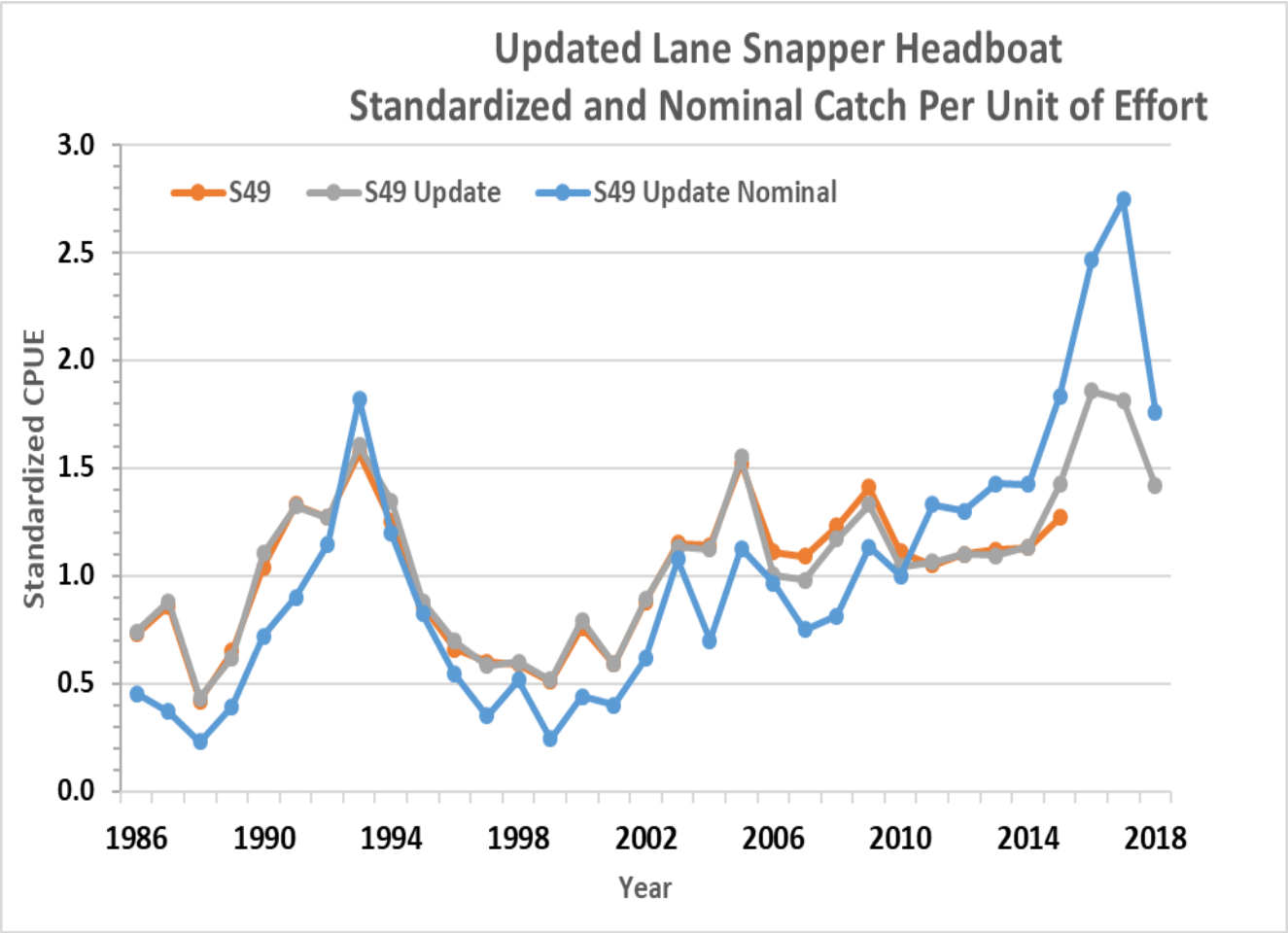
Further Update of OFL and ABC using Itarget DLM method:

Specifically:

- Application of Itarget DLM method using Cummings 2019 headboat CPUE index of abundance to estimate updated OFL and ABC for lane snapper (Cummings January 2020)
  - Incorporating MRIP-FES Estimates of recreational catch
  - Adjusting Cummings (January 2020) OFL/ABC in total removals to landings only (in whole weight)

- Itarget Method described in Cummings and Sagarese (2019) as presented to GMFMC, SSC September 2019.

Review: Lane Snapper Updated Headboat CPUE 1986-2018

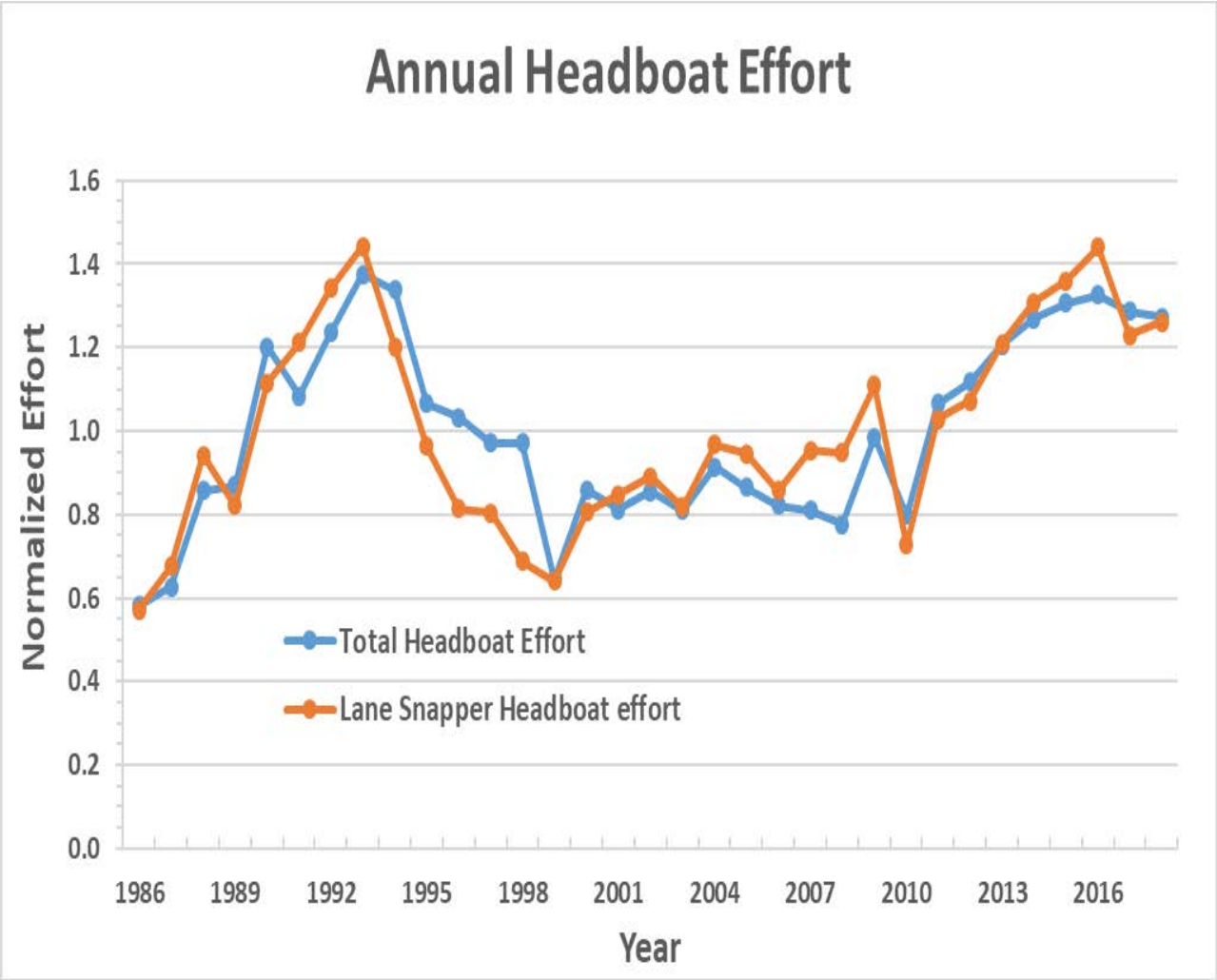


Standardized CPUE
(Updated=gray line)

- Increased from 1986-1993
- Declined 1994 - 2001
- Increased 2001- 2005
- Without trend 2006-2014
- Exhibited a brief 3 year strong increasing trend (through 2016)
- Declined from 2017 to 2018

- Large increase in standardized CPUE in last 5 years (2014-2018) vs the status quo reference period (1999-2008)

Total Headboat fishery and Lane Snapper effort

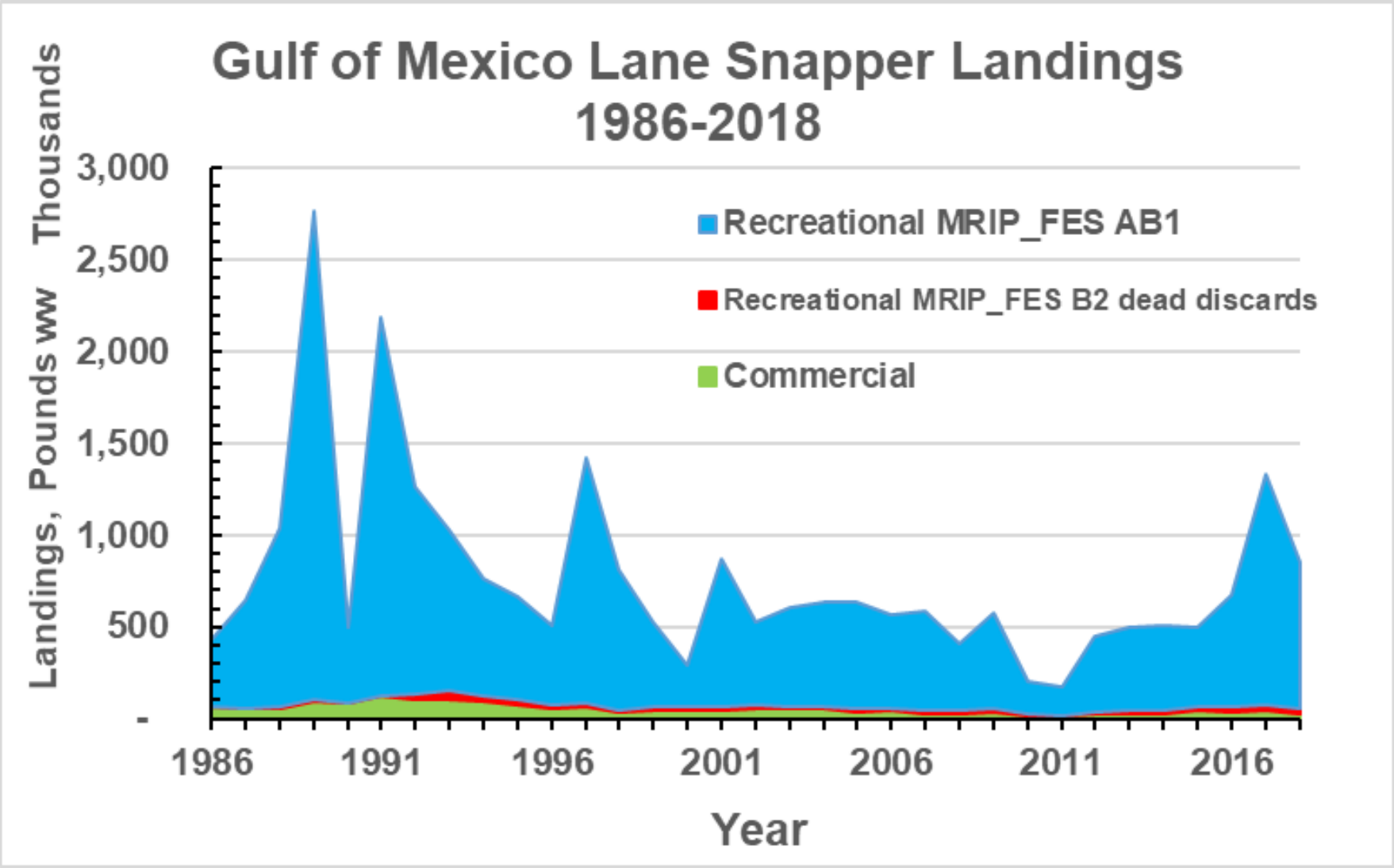


Normalized lane snapper and total headboat effort snapper (orange line)

- Steady increase 1986-1993
- Declined through 1999
- Steady increase since 1999 (except in 2010, and after 2017)

- Generally follows similar trend in total headboat effort (blue line) with minor divergences

Updated Lane Snapper Total Landings 1986-2018



Reminder: Updated Calculations of OFL and ABC

Approach- Apply the Data Limited Method 'Itarget_0.5_0.7_1.0'

The TAC was calculated for lane snapper as:

$$\text{if } I_y^{recent} < 0.7 \text{ x } I^{ave}, \quad \boldsymbol{w} \; x \; C^{ave} \left[\frac{I_y^{recent}}{0.7 \text{ x } I^{ave}}\right]^2$$

$$\text{if } I_y^{recent} \geq 0.7 \text{ x } I^{ave}, \; C^{ave} \left[\mathbf{w} + (1 - \mathbf{w}) \frac{(I_y^{recent} - 0.7 \text{ x } I^{ave})}{(I^{target} - 0.7 \text{ x } I^{ave})}\right.$$

- Where:
- C^{ave} = average catch over reference time series (1999-2008)
- I^{ave} = average index over reference time series (1999-2008)
- I^{recent} = average index over 5 most recent years (2014-2018)
- $I^{target} = I^{ave}$ x I^{multi} - where the "I^{multi}" scalar on I^{ave} was set as 1.0 for SEDAR 49 evaluations based on the assumption that the stock was near MSY during the reference period.
- w = 0.5, where w is the smoothing parameter that defines the catch advice when I^{recent} = 0.7 I^{ave}.

Geromont and Butterworth (2014)

‘Adjusted’ Gulf of Mexico lane snapper OFL and ABC in landings only (Pounds, whole weight)

	ABC					
OFL/ABC Source	**30%**	**40%**	**OFL**	**SD**	**SE**	**CV**
Updated Itarget0.5_0.7_1.0, Cummings January 2020: Using MRIP_FES Recreational Catch Estimates	1,028,973	1,041,873	1,053,834	50,102	501	0.046
Updated Itarget0.5_0.7_1.0, Cummings and Sagarese 2019: Using MRIP_MRFSS Recreational Catch Estimates	578,953	586,211	592,941	27,616	276	0.046

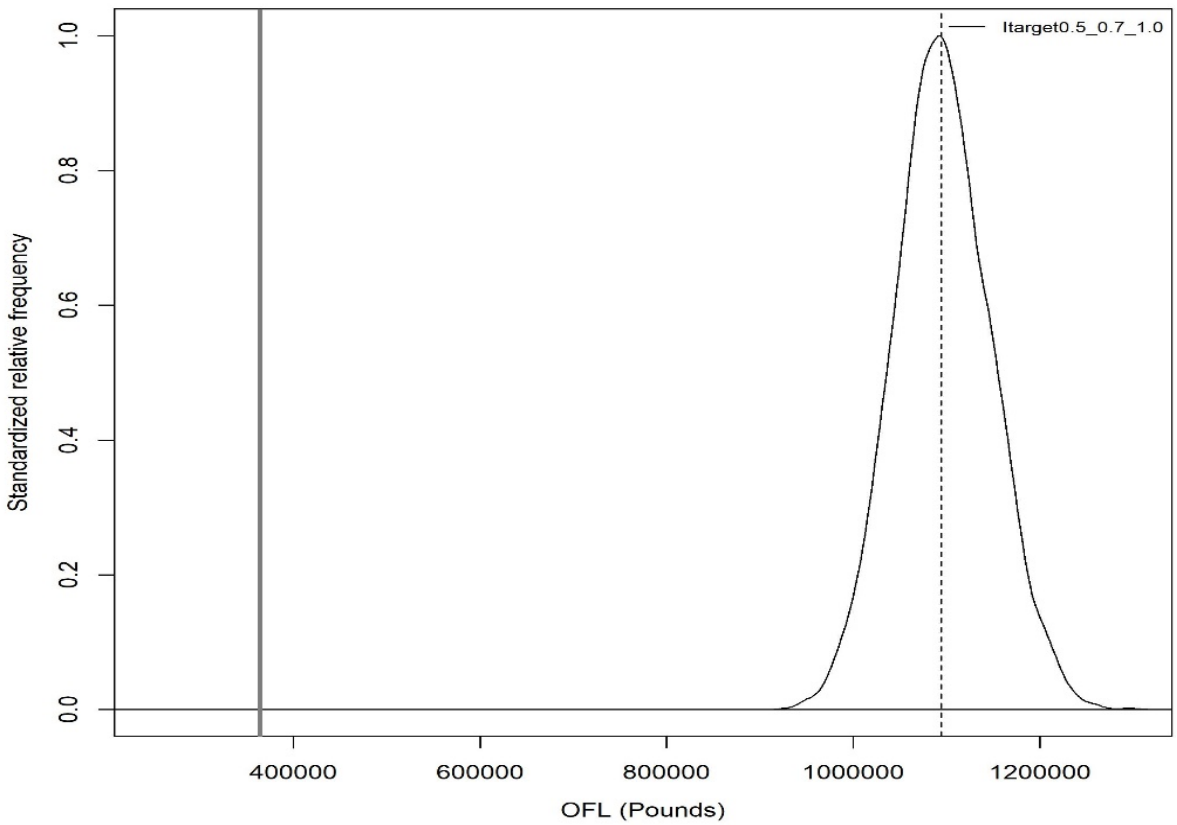
OFL/ABC Adjusted by multiplying the Tabled Values in Cummings 2020, by the three year (2016-2018) AB1/(AB1+B2-dead discard) ratios as follows:

96.3% (Cummings January 2020) and 98.3% (September 2019 Cummings & Sagarese)

Following the March 2017 GMFMC SSC determination that OFL and ABC should be defined as the 50th and 30th percentiles of the OFL distribution

Updated Relative frequency of OFL for Lane Snapper from the DLM 'Itarget_0.5_0.7_1.0' (from Cummings January 2020)

Thick gray line = calculated OFL (estimated TAC= 364,082 pounds ww) at the 50% probability of exceeding OFL from the March 2017 SSC Review of the SEDAR 49 data limited evaluation.



Acknowledgements

- Thanks are given to SEFSC staff for editoral input
- Thanks provided to numerous SEFSC, SFD staff for historical continuity relating to developing catch per unit of effort subsetting and standardization approach dating to mid 1980s as applied to reeffish, coastal mackerels, and many highly migratory species

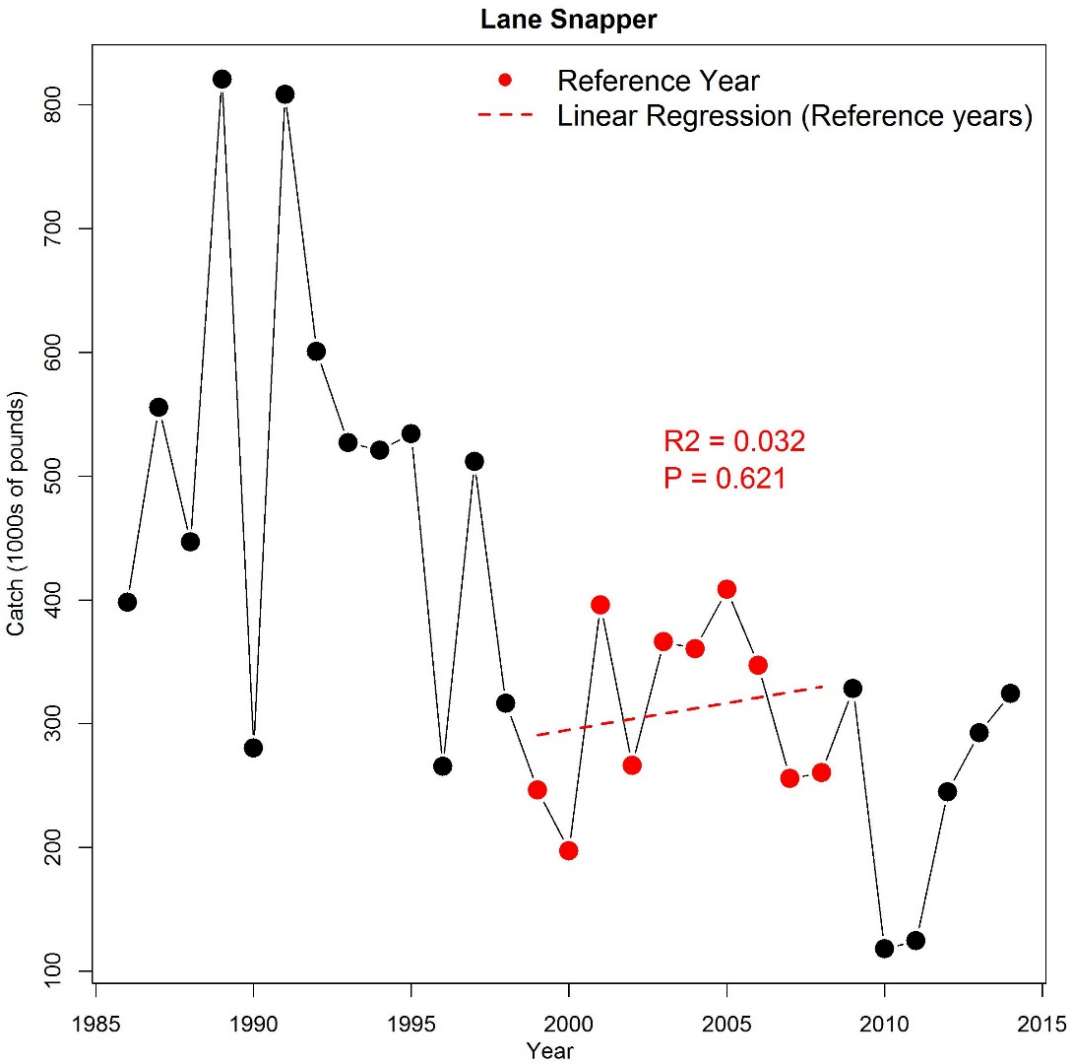
Thank you and any questions please

Cummings (January 2020) Updated Lane Snapper OFL and ABC (Total Removals- Pounds, ww) in total removals from the target_0.5_0.7_1.0 data limited model using MRIP_FES landings and MRIP_MRFSS. OFL and ABC are as defined in Cummings and Sagarese (2019). Recreational inputs are in units of AB1+B2-dead discards.

	ABC					
OFL/ABC Source	**30%**	**40%**	**OFL**	**SD**	**SE**	**CV**
Updated Itarget0.5_0.7_1.0, Cummings January 2020: Using MRIP_FES Recreational Catch Estimates	1,068,508	1,081,903	1,094,324	50,102	501	0.046
Updated Itarget0.5_0.7_1.0, Cummings and Sagarese 2019: Using MRIP_MRFSS Recreational Catch Estimates	588,965	596,349	603,195	27,616	276	0.046
Itarget0.5_0.7_1.0 SEDAR 49, March 2017	355,501	360,059	364,082	16,965	170	0.047

Extra

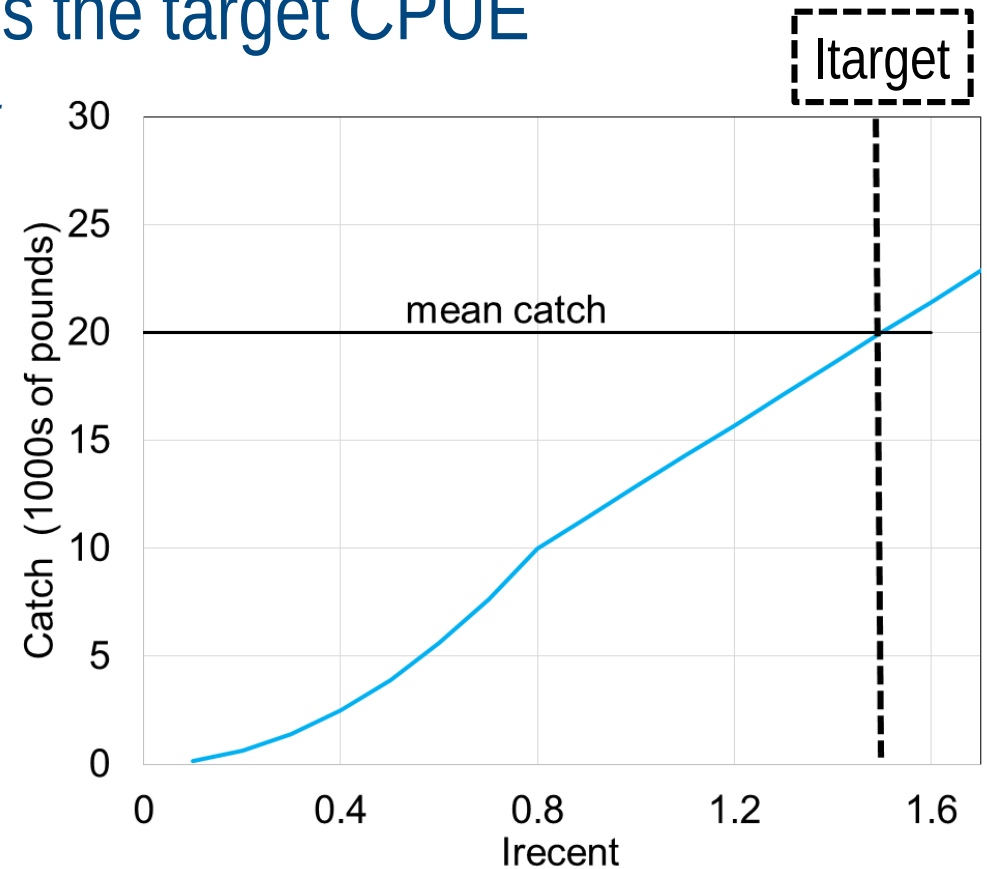
Lane Snapper Reference Catch



Tuning of data-limited methods: Itarget

- **Itarget scalar** = determines the target CPUE
- *Itarget* = *Itarget scalar* x I^{REF}
- How much of mean index during reference period do we want to achieve?

Stock Status During Reference Period	Itarget Scalar
Overexploited	>1
Near MSY	1
Underexploited	<1



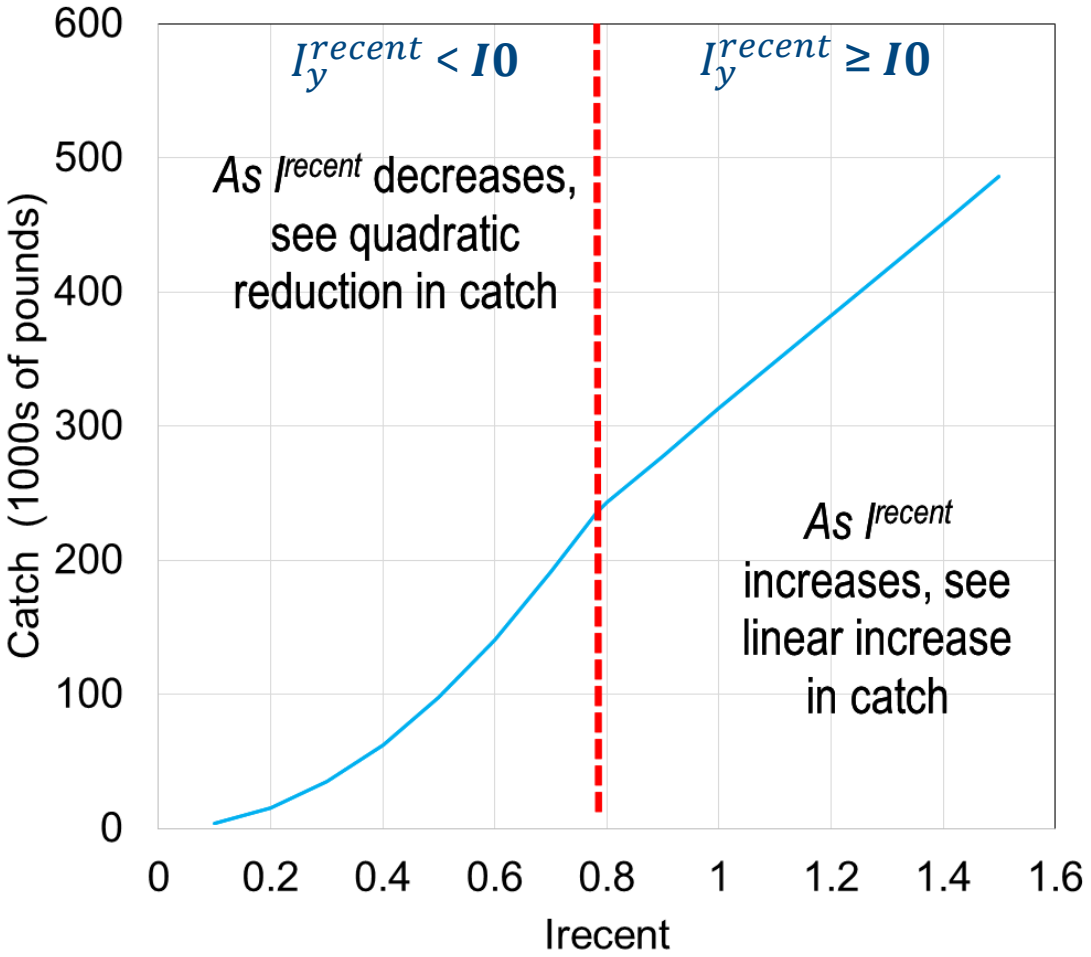
Example (overexploited)

Geromont and Butterworth (2014)

Tuning of data-limited methods: Itarget

- *I0* = determines lower limit
- *I0 = I0 scalar* x I^{REF}

Conditions	I0 scalar
Stock overexploited or is likely to require a long rebuilding period if overfished, low productivity	0.8
Stock near MSY	0.7
Stock underexploited, high productivity	0.5

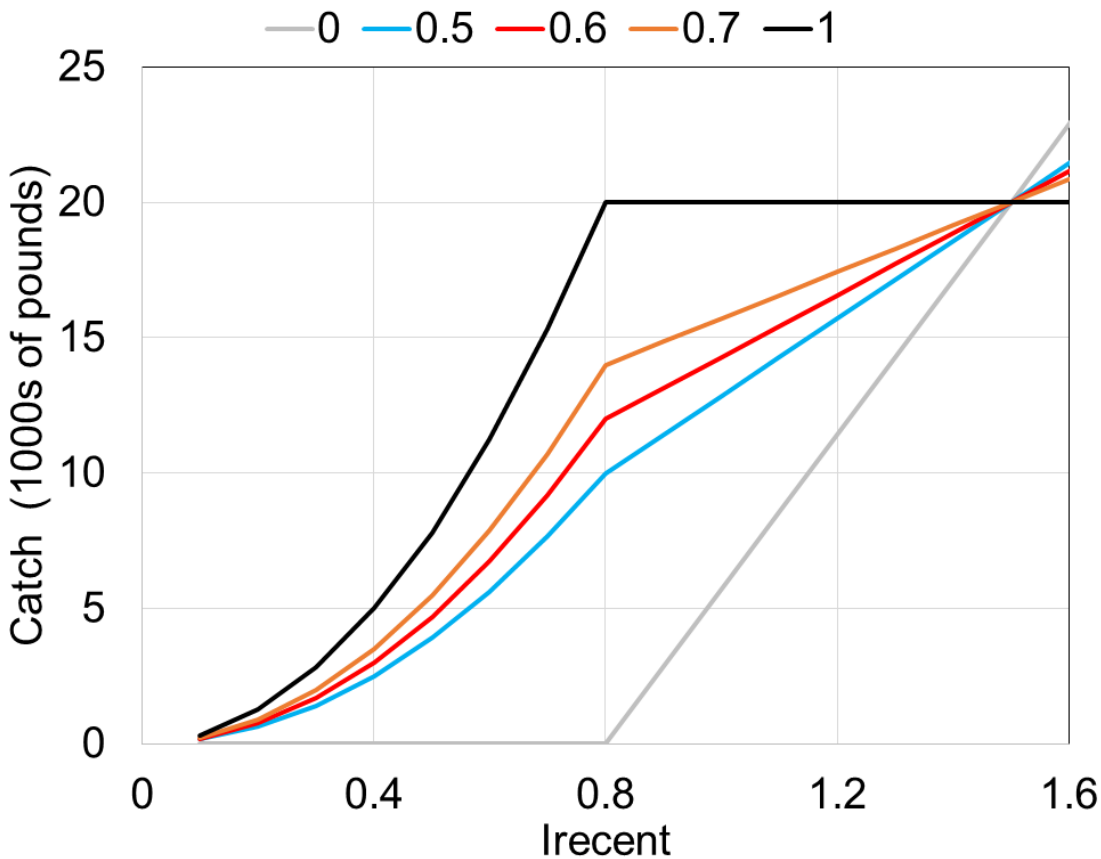


Geromont and Butterworth (2014)

Tuning of data-limited methods: Itarget

- Smoothing parameter (w) = controls the rate of change in catch advice

W	Condition
0	Catch advice = 0 below limit (I0)
0.5	Relatively large slope when above limit (I0)
0.6	Intermediate slope both above and below limit (I0)
0.7	Relatively large slope when below limit (I0)
1.0	Catch advice capped when above limit (I0)



Geromont and Butterworth (2014)