Review of 2025/26 AIGKC TAC

ADF&G presentation to AIGKC industry, 27 June 2025

Join by ZOOM:
https://us06web.zoom.us/j/85313796872?pwd=OlyCIPdtKOU9JV3rGRMClUSKYoYHyH.1

Meeting ID: 853 1379 6872
Passcode: 560940

2025 Stock Assessment model

- 2 model scenarios
  - **23.1c** 2024 assessment model with corrected bias correction on recruitment deviations before 1981 (i.e., the first data)
  - **25.0b** starts model in 1981 in non-equilibrium state, equal likelihood emphasis on catch data, bootstrap estimated input sample size for size comp data

- CPT/SSC/Council: Endorsed scenario 23.1c (base model)
  - 25.0b sensitive to data weighting without improvements to model performance
  - 25% buffer on ABC: same as last year, same issues as last year
    - Retrospective patterns in EAG, poor fits to EAG CPUE indices for post-rationalization period

Federal 2025/26 OFL + ABC

ABC= 5.234 mill lb total male catch

- including bycatch mortality of males in all fisheries
- based on a 25% buffer on OFL

OFL = 6.980 mill lb total male catch

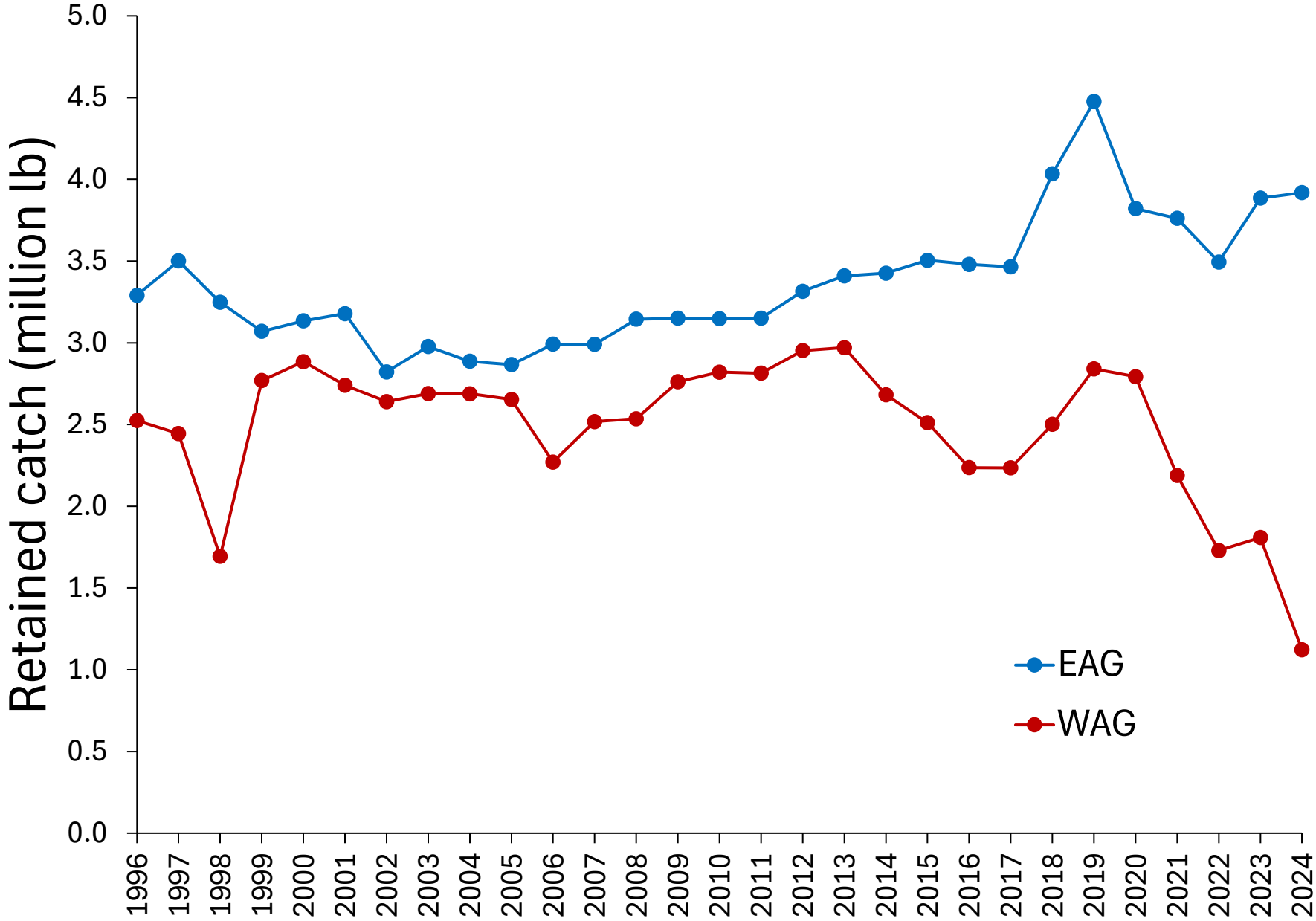
Stock estimated at 98% of B_{MSY} in 2024/25
Stock projected to be at 93% of B_{MSY} in 2025/26

Area-specific OFL/ABC

EAG:	OFL: 5.29 mill lb;	ABC: 3.97 mill lb
WAG:	OFL: 1.69 mill lb;	ABC: 1.26 mill lb

Year	MSST	Biomass (MMB)	TAC	Retained Catch	Total Catch	OFL	ABC
2021/22	12.917	27.761	5.930	5.950	6.737	10.620	7.434
2022/23	12.857	29.983	5.051	5.223	5.758	8.292	6.219
2023/24	12.725	28.034	5.530	5.684	6.096	9.220	6.916
2024/25	12.417	24.443	4.881	4.883	TBA[a]	8.212	6.159
2025/26		23.104				6.980	5.234

2025/26 OFL 15% decrease from last year


Retained catch (million lb)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1996
1997
1998
1999
2000
2001
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2009
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2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
EAG
WAG

Harvest Strategy

Stock threshold for opening the fishery

- MMA is ≥25% of $MMA_{AVG1985-2017}$

Exploitation rate on mature-sized (≥116 mm CL) male abundance

- Increases linearly up to 15% (EAG) or 20% (WAG) with increasing MMA up to the 1985-2017 average
- 15% (EAG) or 20% (WAG), when MMA ≥ 1985-2017 average

Harvest capped at 25% of legal male abundance

*Calculate the **number of animals** for harvest:*

EAG

MMA (current year)	TAC computation	25% Legal Cap
$<0.25*MMA_{AVG1985-2017}$	0	0
$\geq 0.25*MMA_{AVG1985-2017}$, but $<MMA_{AVG1985-2017}$	0.15 x $MMA/MMA_{AVE1985-2017}$ x MMA	0.25 x LMA
$\geq MMA_{AVG1985-2017}$	0.15 x MMA	0.25 x LMA

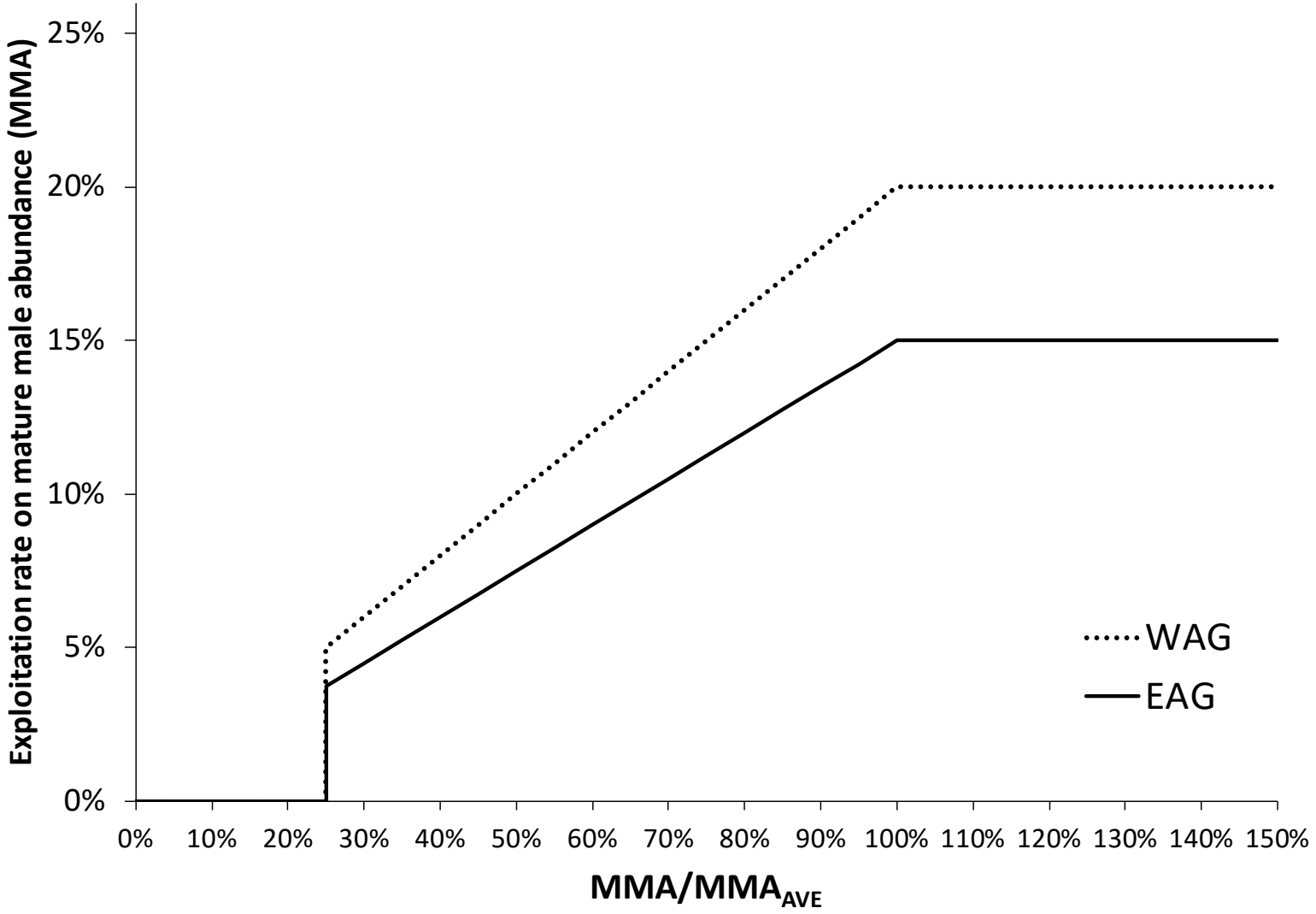
WAG

MMA (current year)	TAC computation	25% Legal Cap
$<0.25*MMA_{AVG1985-2017}$	0	0
$\geq 0.25*MMA_{AVG1985-2017}$, but $<MMA_{AVG1985-2017}$	0.20 x $MMA/MMA_{AVE1985-2017}$ x MMA	0.25 x LMA
$\geq MMA_{AVG1985-2017}$	0.20 x MMA	0.25 x LMA

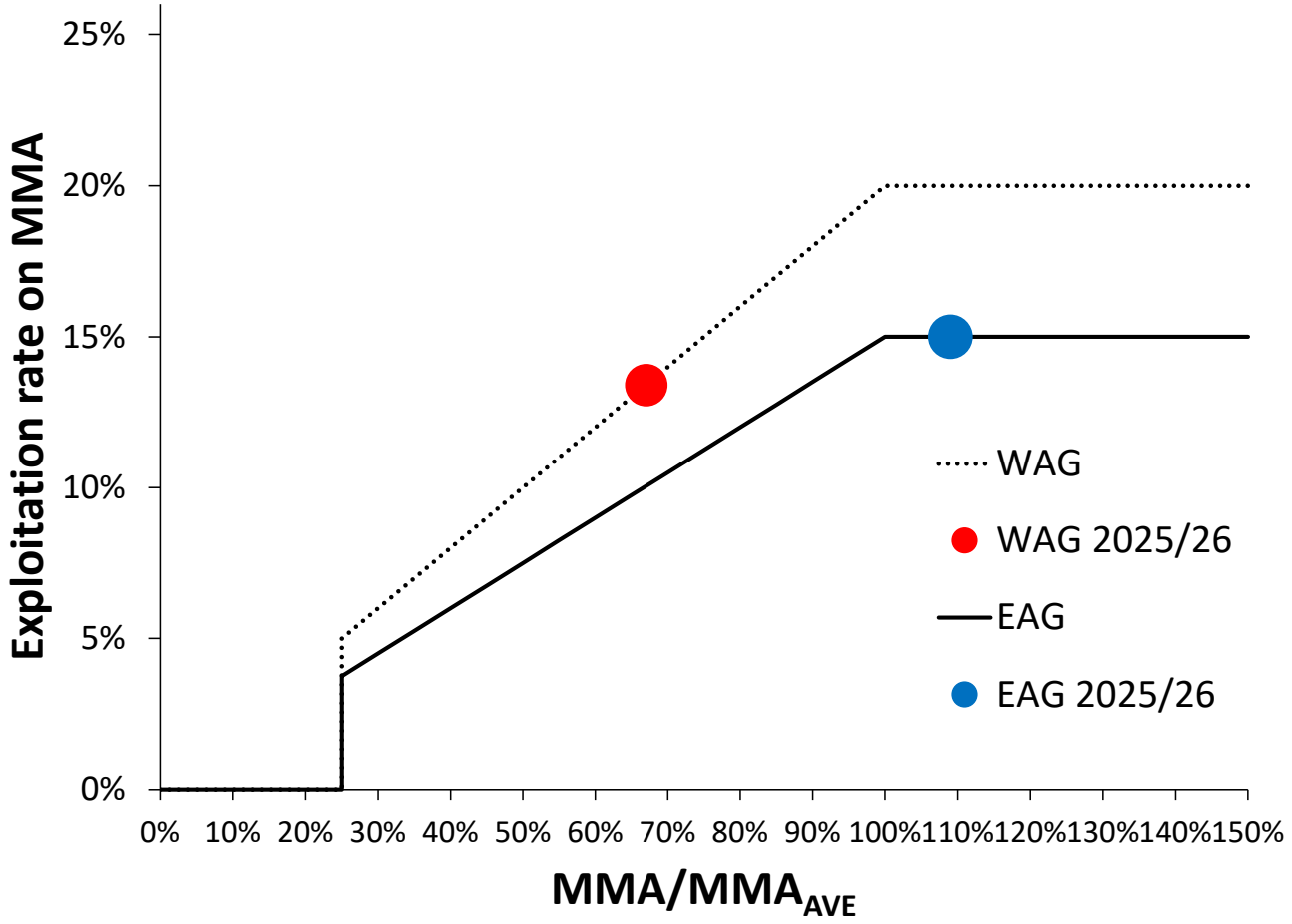
MMA = mature-sized male (≥111 mm CL) abundnace

LMA = legal-size male (≥136 mm CL) abundnace

Sloping control rule



Where are we on the control rule for 2025/26 TAC setting?



Numbers for TAC computations

	EAG	WAG
Current year MMA	5.140	2.231
Average $MMA_{1985\text{-}2017}$	4.720	3.430
MMA/MMA_{AVE}	109%	65%
Expoit. rate on MMA	0.15	0.13
Exp on MMA	0.771	0.290
Current year LMA	3.624	1.430
25% exp on LMA	0.906	0.358
# animals for TAC calc	0.771	0.290
L wt lb (24/25 FT)	4.303	3.999
TAC (million lb): FT ave wt	**3.32**	**1.16**

25% legal cap not limiting TAC in either area

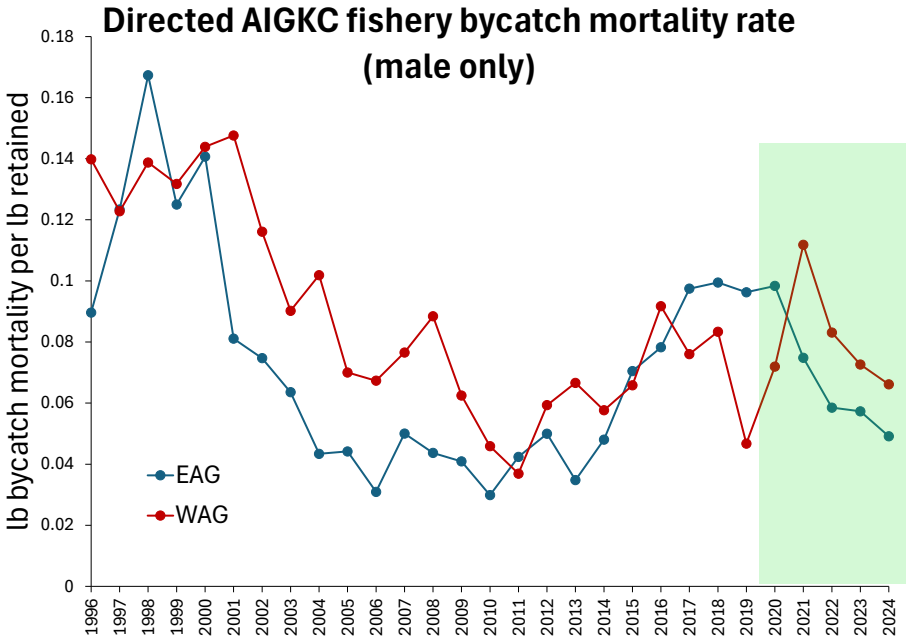
Computed TACs relative to ABC

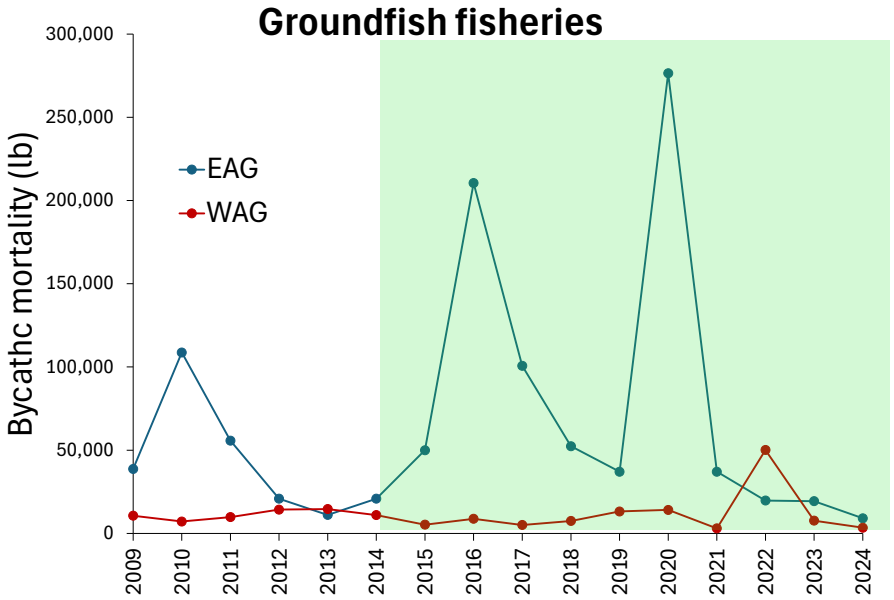
- Combined computed TAC: 4.480 million lb
- Combined ABC: 5.235 million lb

- Computed TACs less than ABC by 0.758 million lb

- Is this enough to account for anticipated bycatch mortality in the directed and groundfish fisheries?
  - What are the estimates of bycatch mortality?

Bycatch mortality: area specific





Assume average from past 5 years:

- **7% for EAG**
- **8% for WAG**

Assume average from past 10 years:

- **81,000 lbs for EAG**
- **12,000 lbs for WAG**

Bycatch mortality: area specific

EAG: 2025/26 maximum total fishery mortality relative to avoiding ABC = 3.97 million lb

Assumptions		Mortality (million lb)
Assume mean mortality in groundfish fisheries, **15/16-24/25 =**		0.08
	Subtotal	0.08
Remaining for directed (incl. bycatch mort), mill lb (ABC-Subtotal) =	3.89	
Assume ave (lb discard mort)/(lb retained) in directed fishery, 20**/21-24/25** =	0.068	
Maximum TAC = (remaining for directed)/(1+0.068) =		**3.64**

WAG: 2025/26 maximum total fishery mortality relative to avoiding ABC = 1.27 million lb

Assumptions		Mortality (million lb)
Assume mean mortality in groundfish fisheries, **15/16-24/25 =**		0.01
	Subtotal	0.01
Remaining for directed (incl. bycatch mort), mill lb (ABC-Subtotal) =	1.25	
Assume ave (lb discard mort)/(lb retained) in directed fishery, **20/21-24/25 =**	0.081	
Maximum TAC = (remaining for directed)/(1+0.081) =		**1.16**

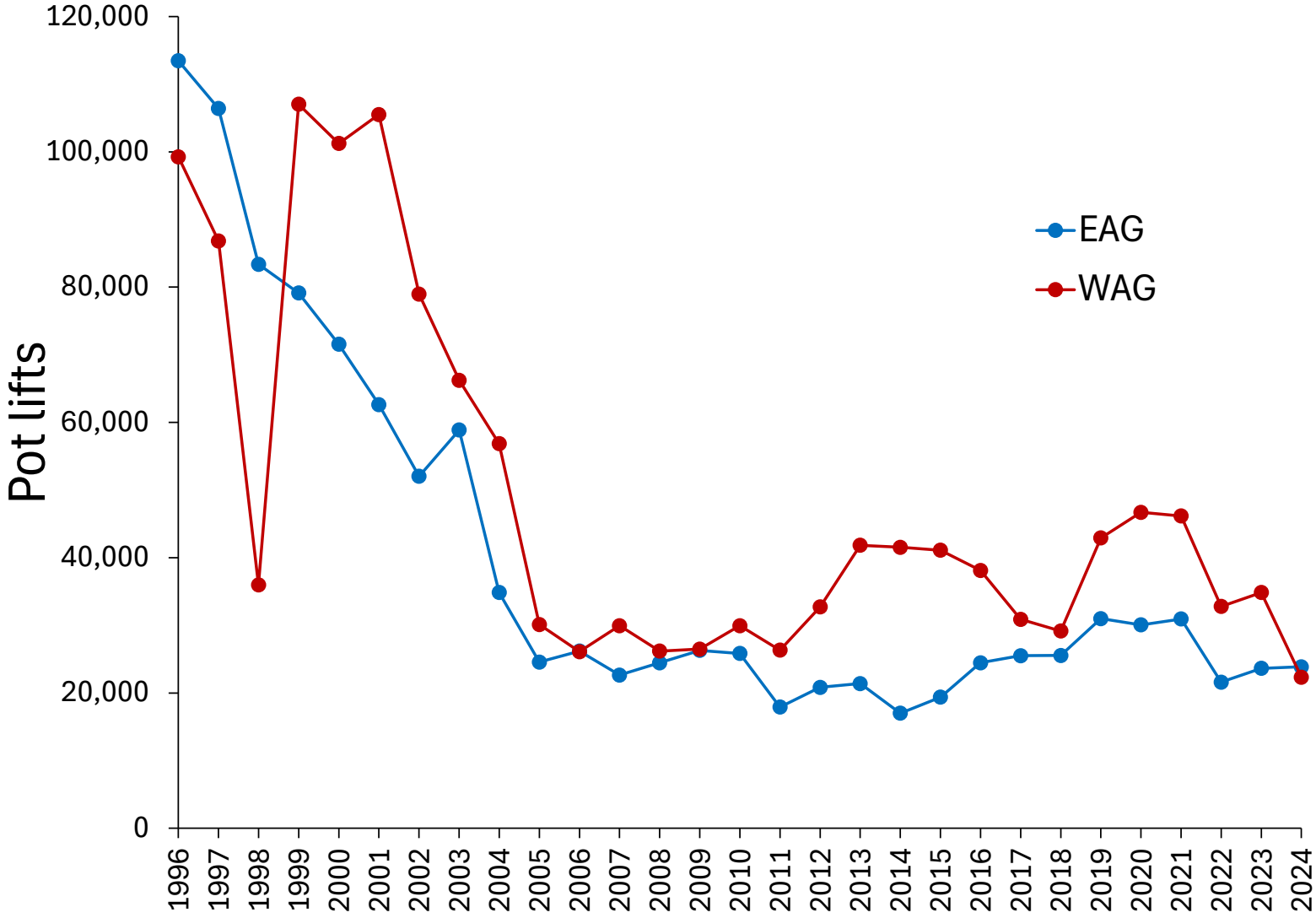
WAG full computed TAC = 1.16

Harvest Strategy implemented in 2019

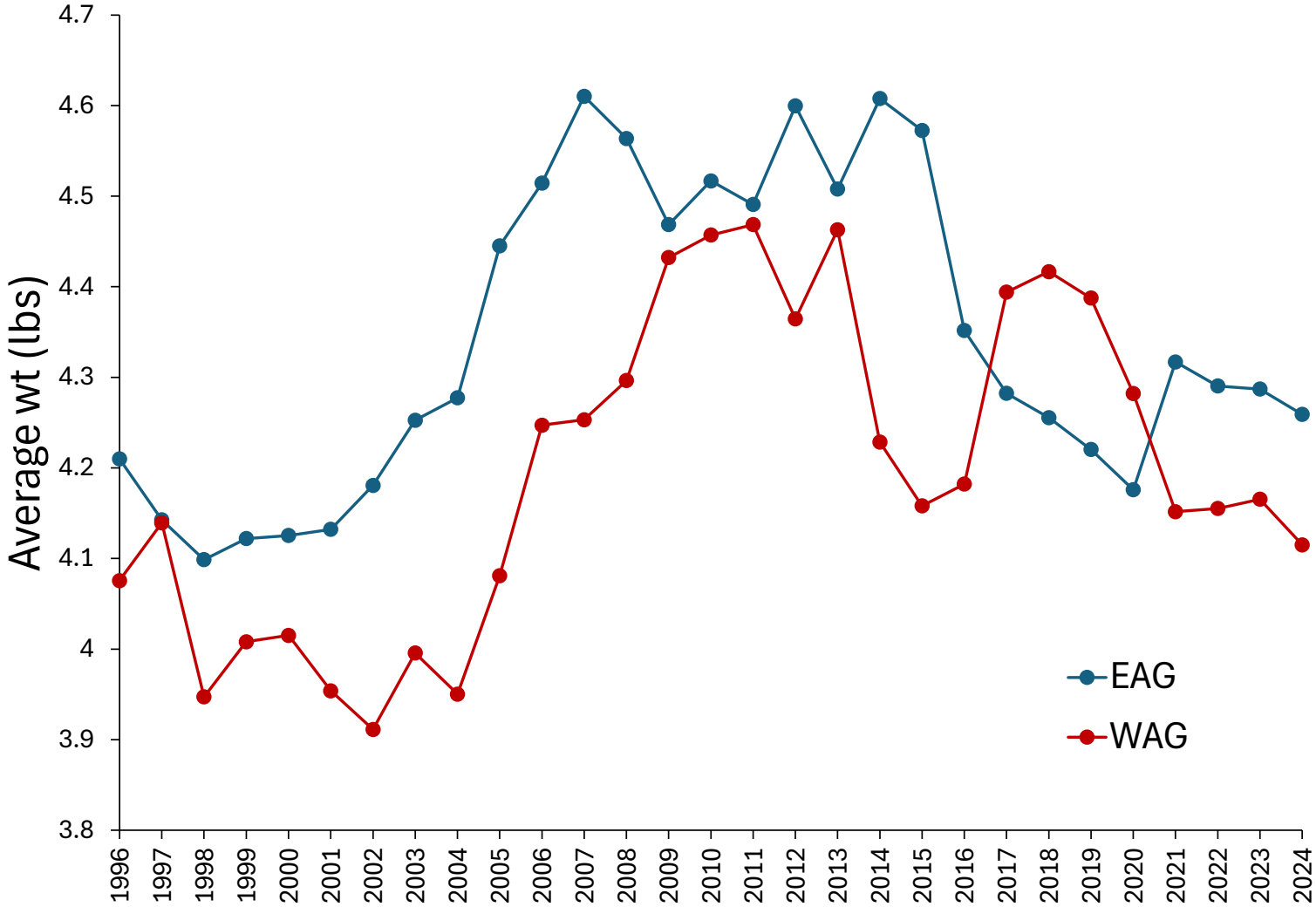
- EAG=15% ramp; WAG=20% ramp
- Thinking then…historical exploitation estimates in WAG supported 20% exploitation
- *"Policies with 15%, 20%, and 17.5% ramps (with a 25% legal cap) are likely the best trade-off between conservation objectives, catch, and catch stability."*
- *"20% exploitation on mature males is approaching a tipping point where the population destabilizes and productivity declines."*
- *"We recommend a range of exploitation rates on mature males from 15% to 20% with a 25% cap on legal male abundance, with policy 15% having the lowest probability of exceeding conservation thresholds, but policies 17.5% and 20% better optimizing catch and catch stability."*
- Now thinking…….historical exploitation rates likely high
  - Continued declining CPUE and MMB

Quotes taken from Daly et al., 2019, BOF report, Fishery manuscript No. 19-03.

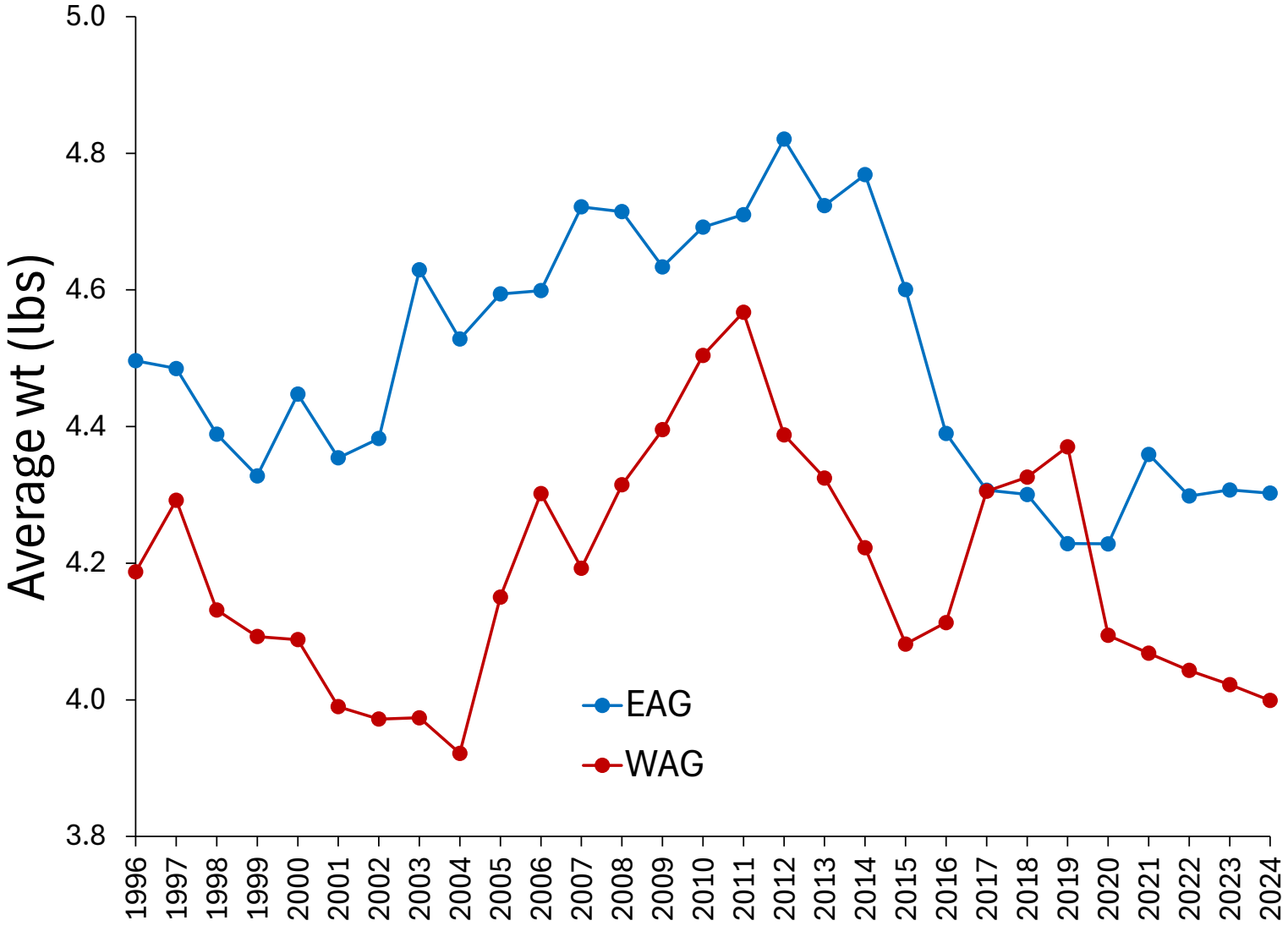
Historical Pot Lifts

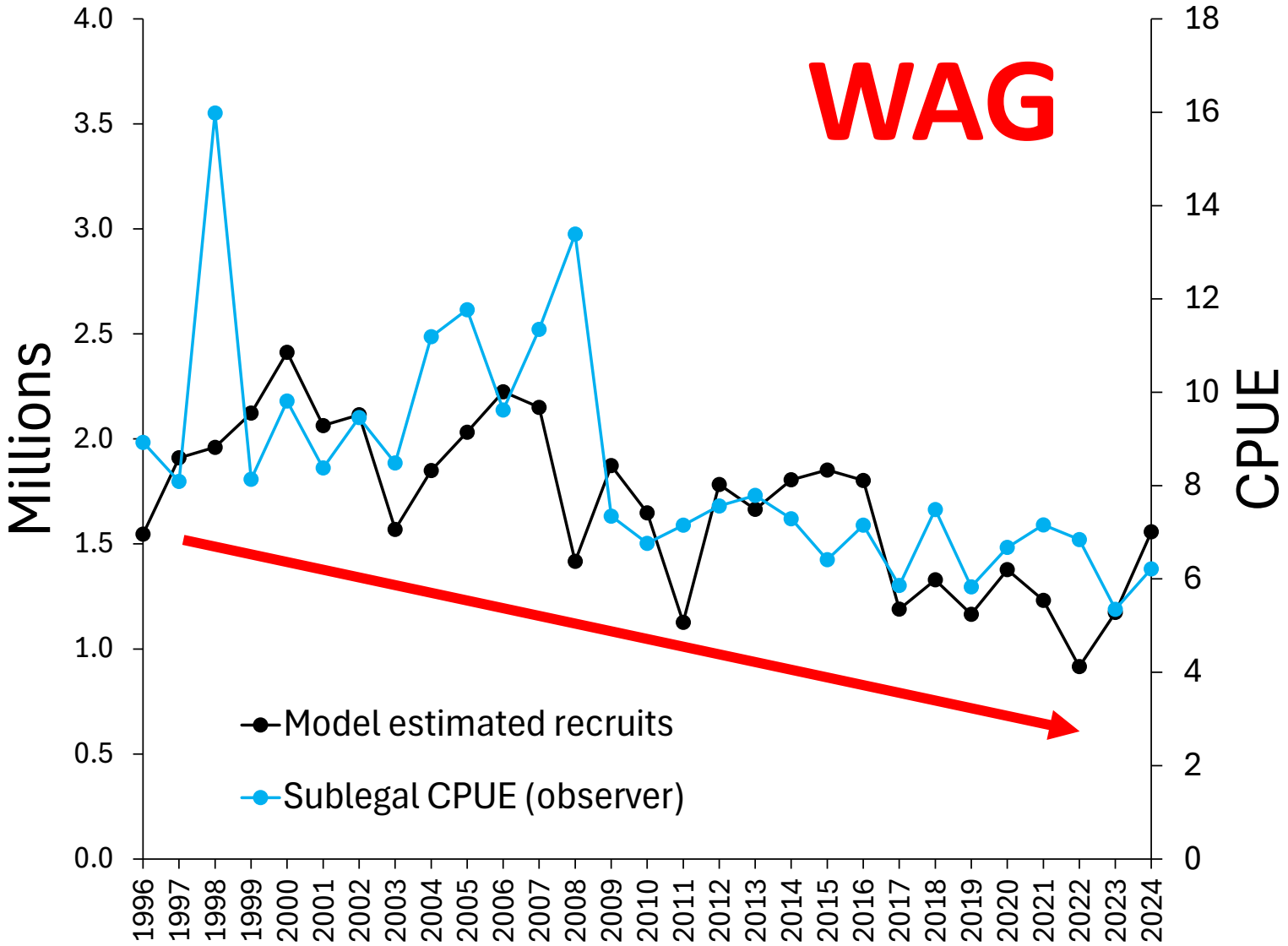


At-sea observer legal crab



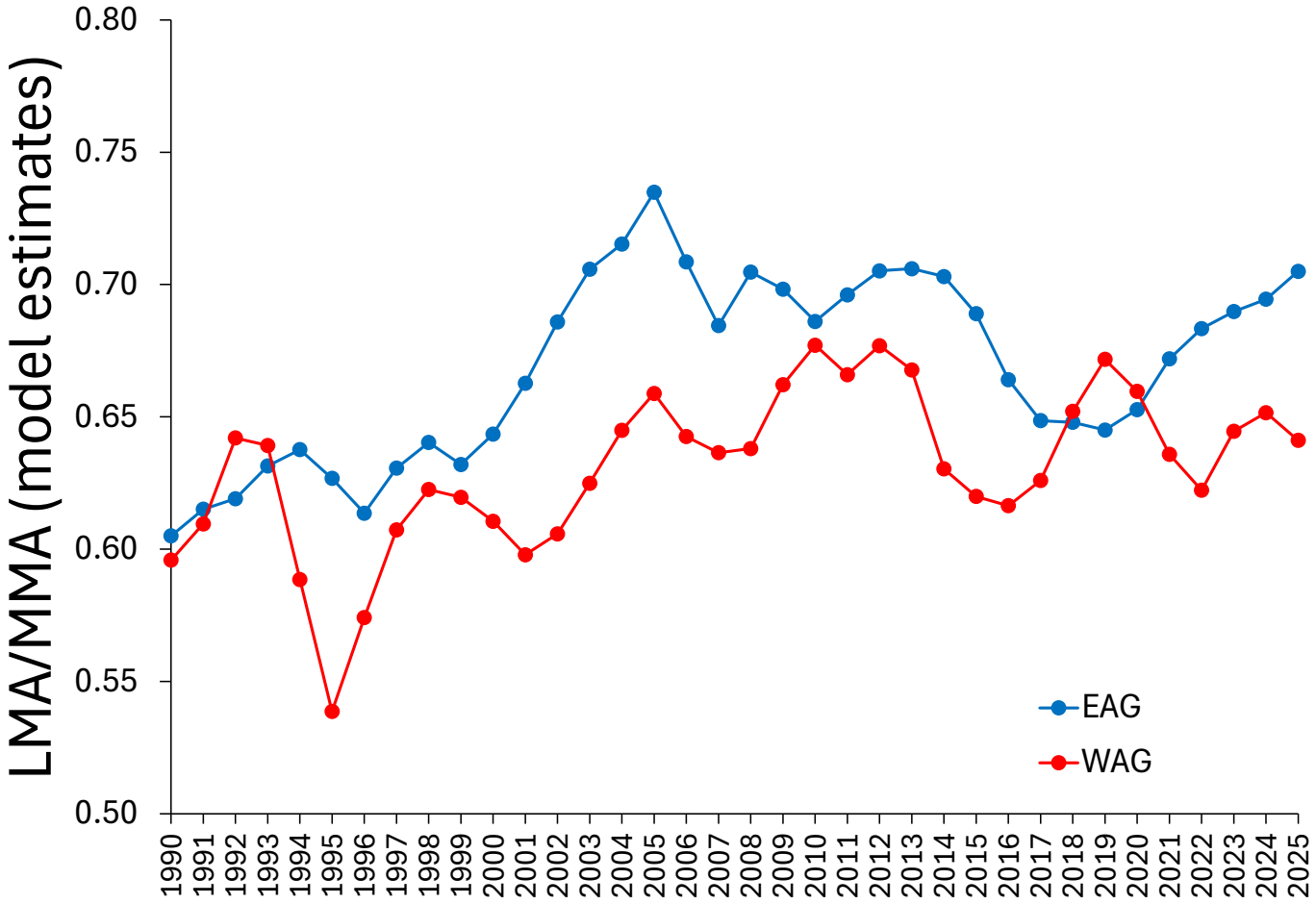
Landed crab ave wt





Decreasing trend in model recruitment and sublegal crab in fishery

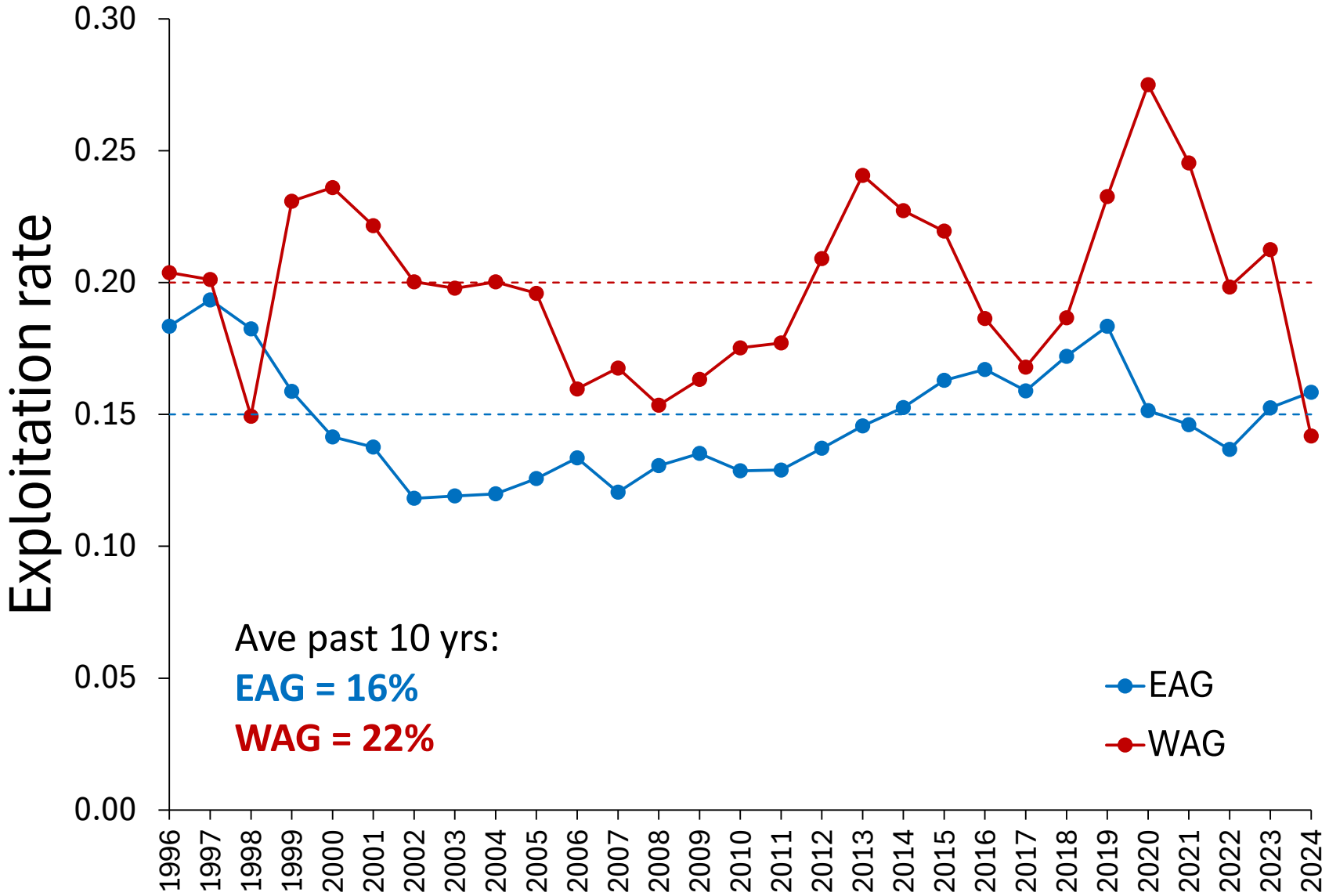
Proportion legal males



Fewer legal males relative to mature males in WAG

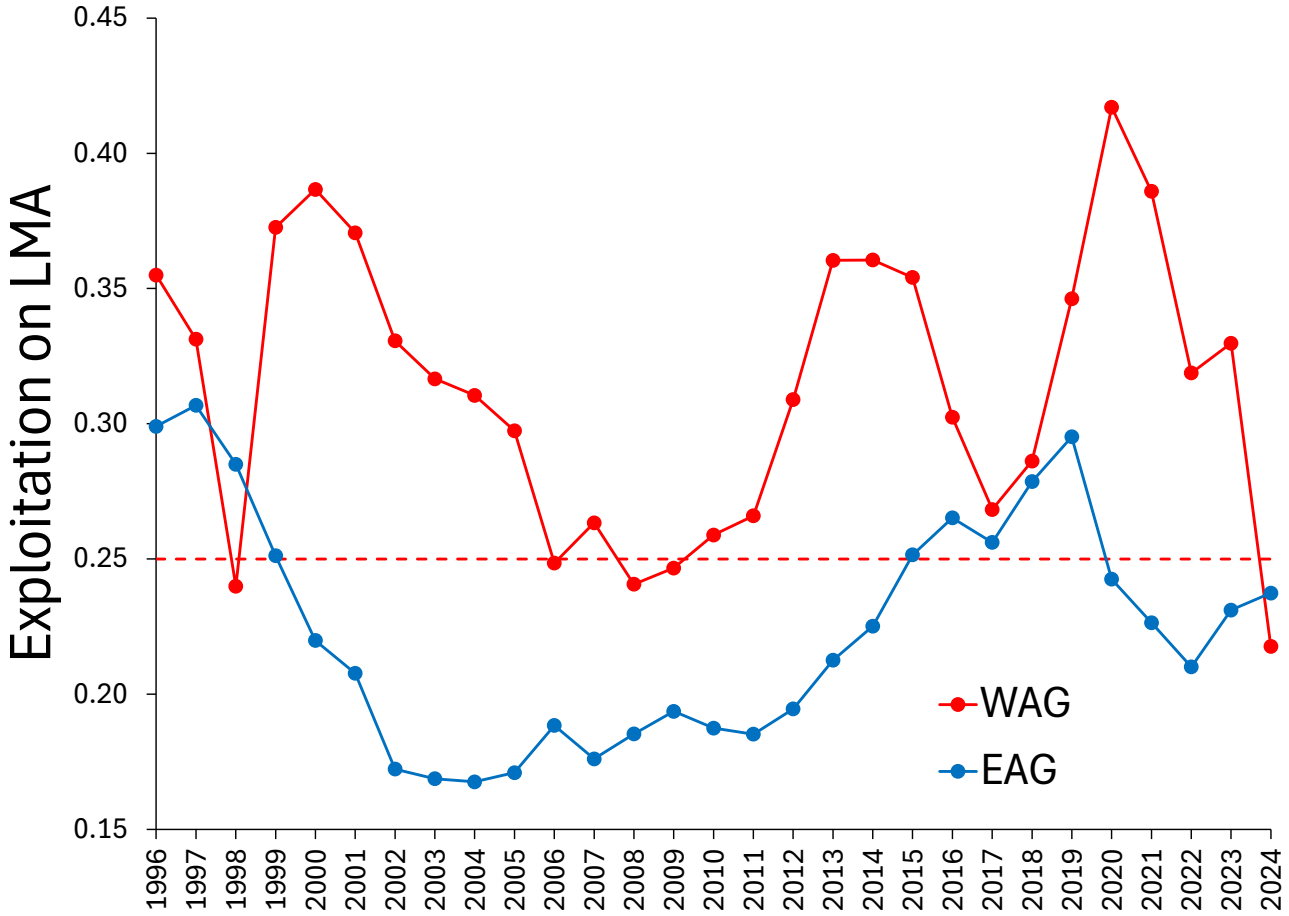
- Harvest strategy: we tend to hit “MAX TAC” in WAG more often

Realized exploitation rate on MMA*



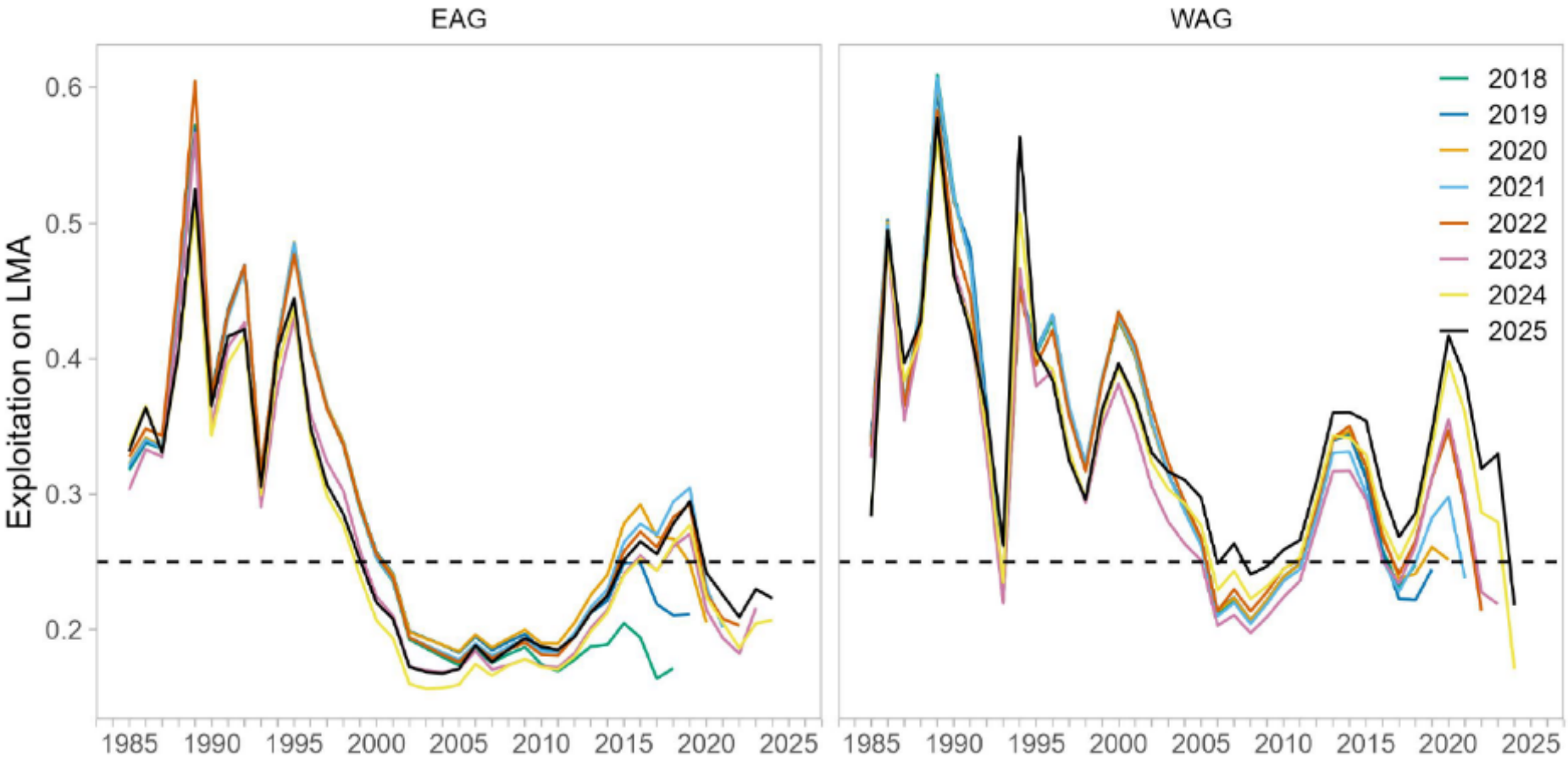
** Calculated from retained catch data and model 23.1c model estimates*

Realized exploitation rate on LMA*



- Calculated using retained catch and 2025 model estimates of LMA
- Suggests realized exploitation in WAG often exceeded 25% MAX cap in harvest strategy

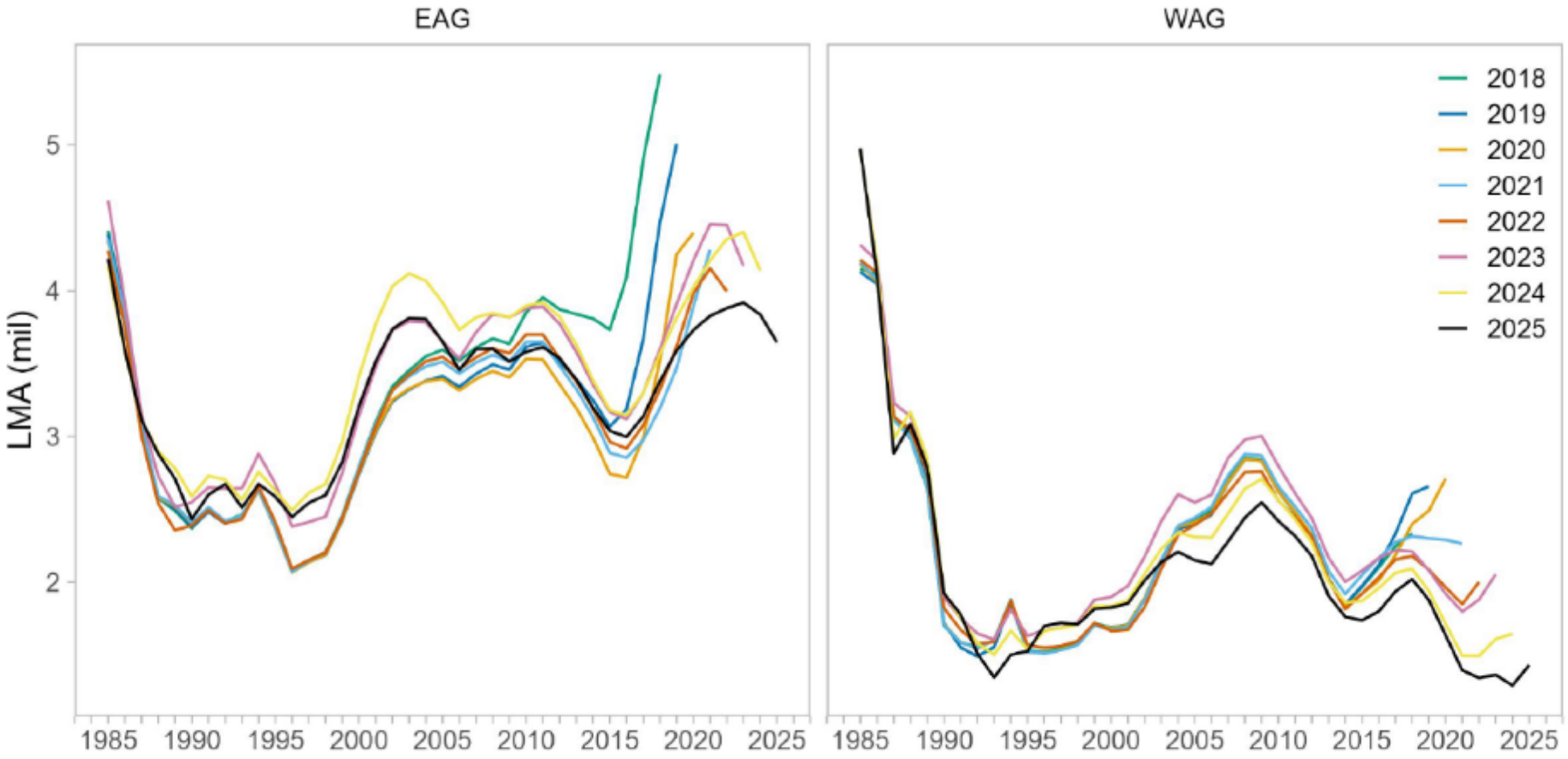
** Calculated from retained catch data and model 23.1c model estimates*



Not exceeding harvest strategy limit in given year

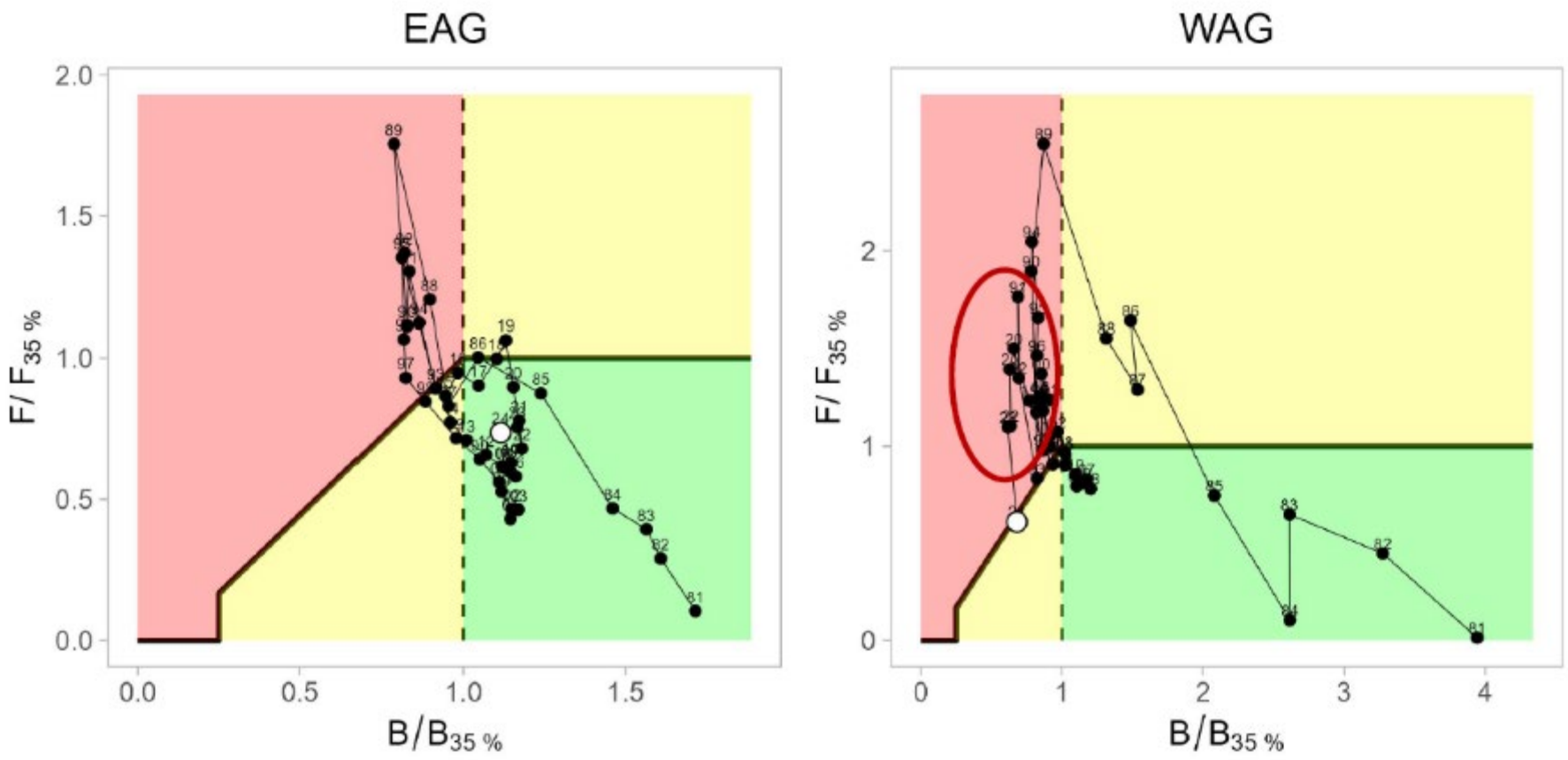
……whats going on?

Figure taken from presentation given by Jackson to CPT May 2025



Updated view of terminal year LMA tends to be lower in WAG, not *always* the case in the EAG

Figure taken from presentation given by Jackson to CPT May 2025



Estimates of recent fishing mortality above that which is advised by F_{OFL} control rule

Suggests that we may have been harvesting too aggressively

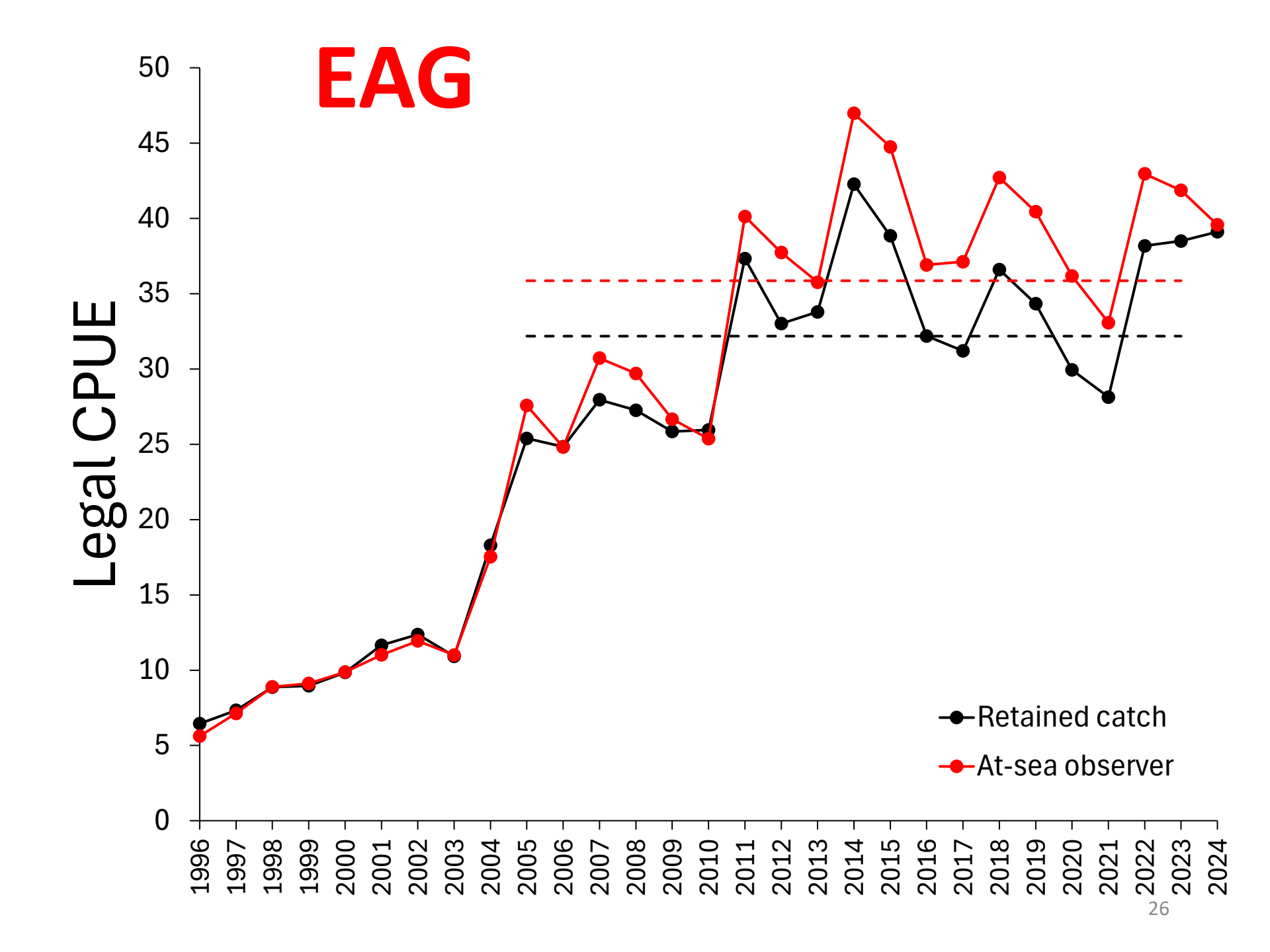
Figure taken from presentation given by Jackson to CPT May 2025

Thoughts on WAG fishery…..

- Both areas generally harvested at maximum exploitation rates allowed by harvest strategy
  - Given 2025 model estimates of MMA, WAG harvested above harvest strategy limits in some years
  - Proportionally fewer legal males in WAG
- WAG: more gear, larger area, lower catch rates (CPUE ~half), higher exploitation rate

- We've been hitting the WAG hard
  - Past 3 seasons have the lowest CPUE since rationalization (2024 lowest ever)
  - Decreasing ave wts + low recruitment (model estimates) + low sublegal crab (fishery CPUE)
  - Uncertainty about whether the 20% ramp is appropriate under prevailing conditions
  - *We used 15% ramp last year*

Fishery and Model performance


EAG
Legal CPUE
50
45
40
35
30
25
20
15
10
5
0
1996
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1998
1999
2000
2001
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2005
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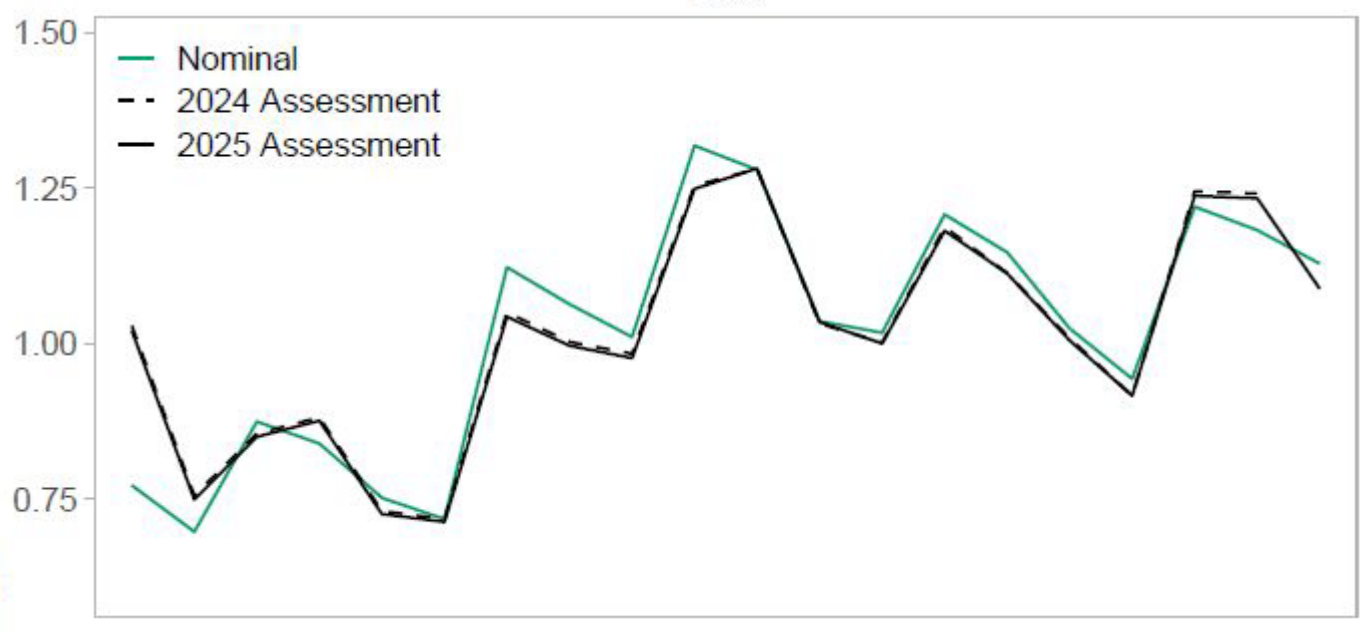
2021
2022
2023
2024
Retained catch
At-sea observer

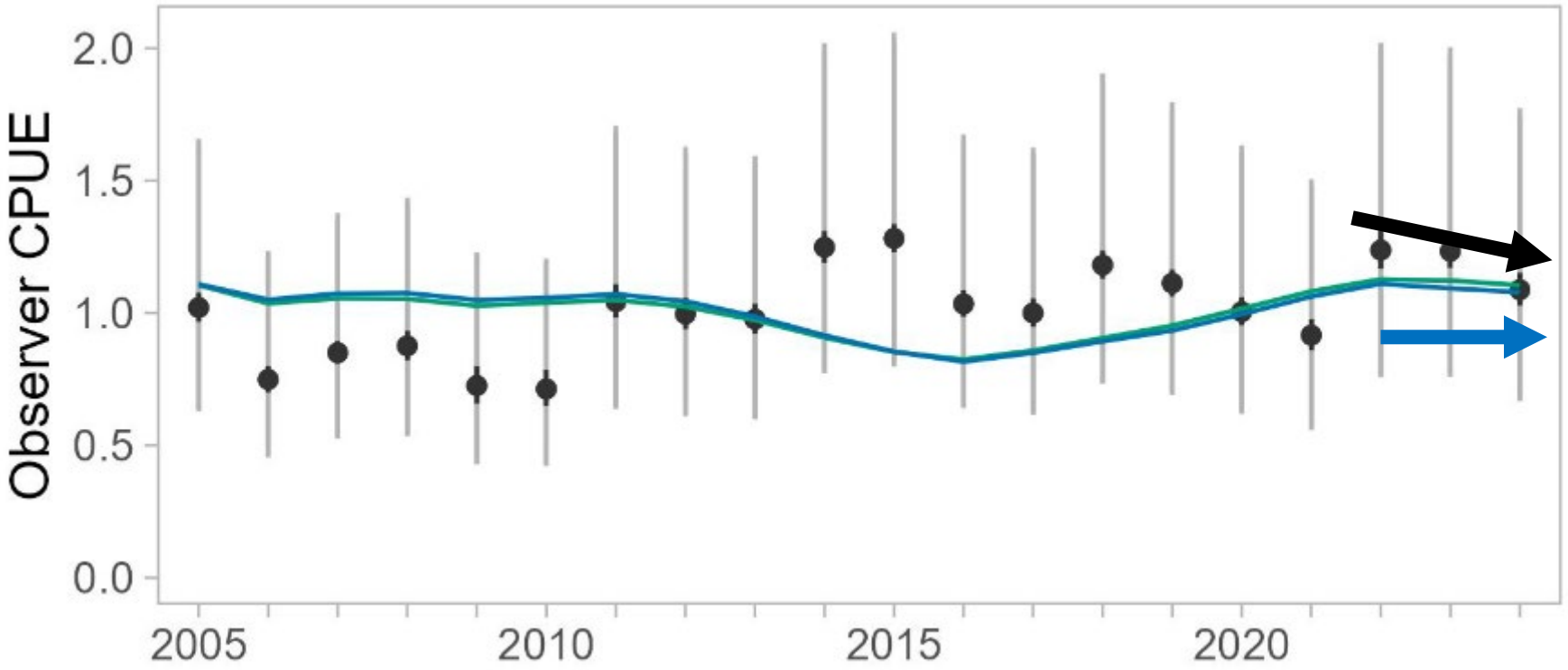
EAG



CPUE shows some decline from 2023 to 2024

Figure taken from presentation given by Jackson to CPT May 2025

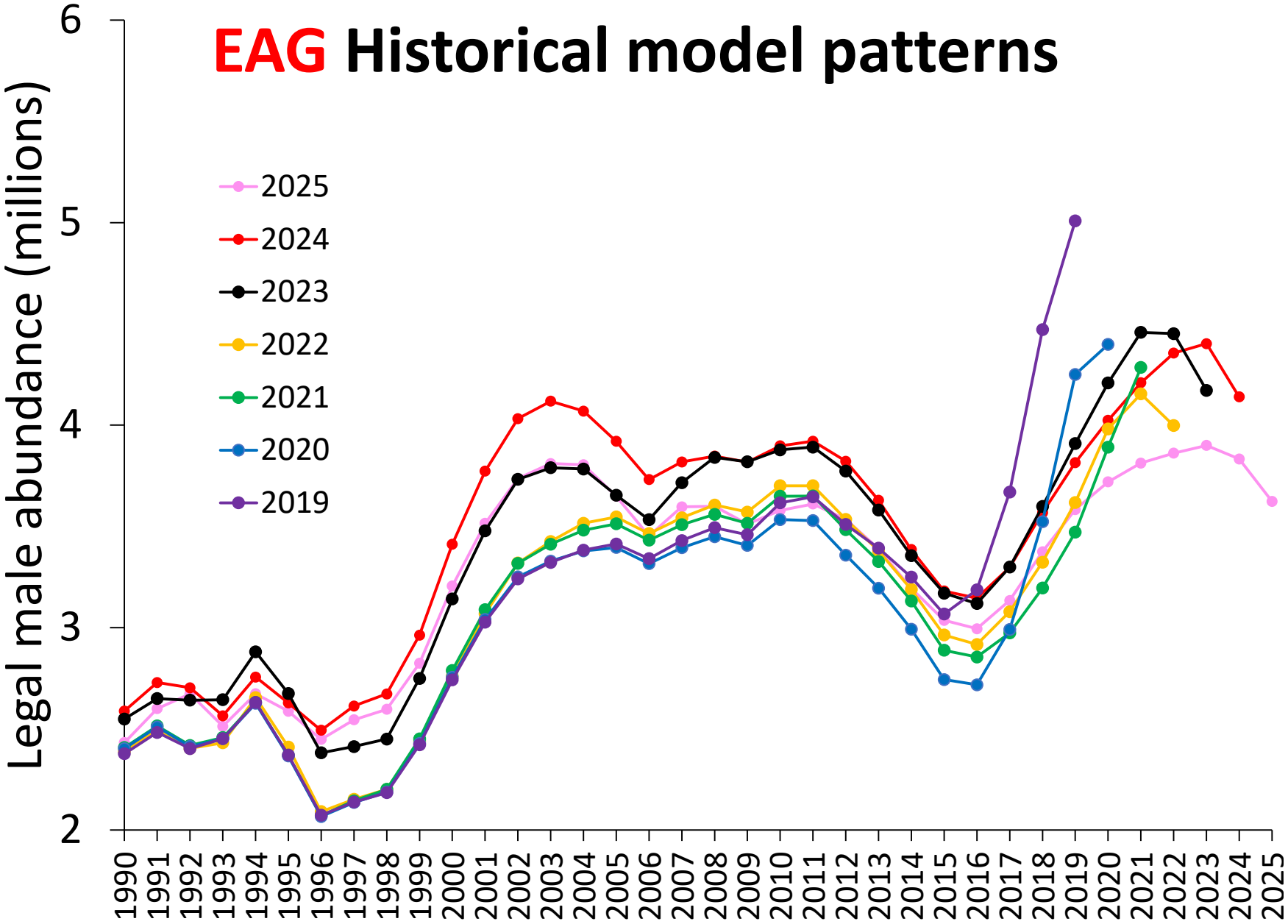
EAG CPUE



- Conflicting trends 2017-2021
- 2022-2024: reasonable fit, model estimate ~flat
- Fit overall is not great (this is nothing new)

Figure taken from presentation given by Jackson to CPT May 2025

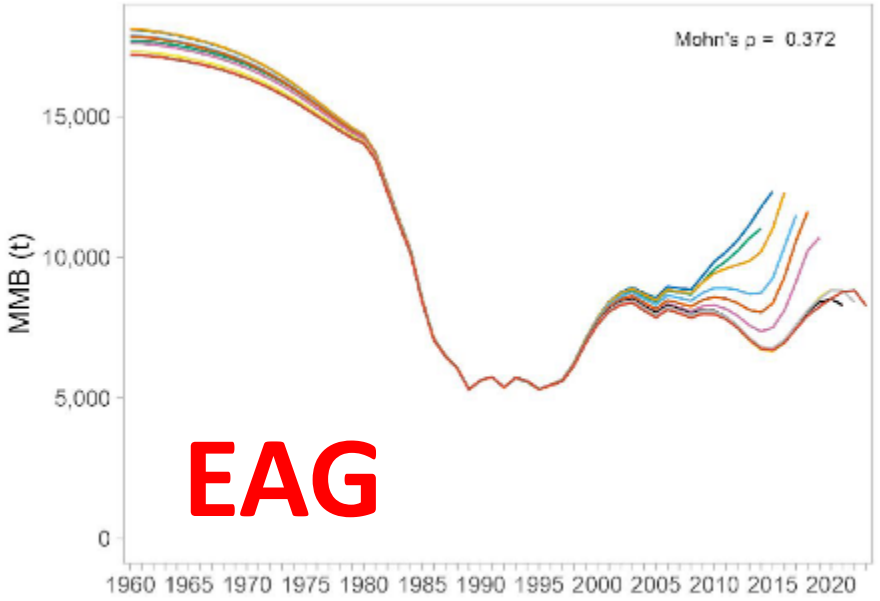
EAG Historical model patterns

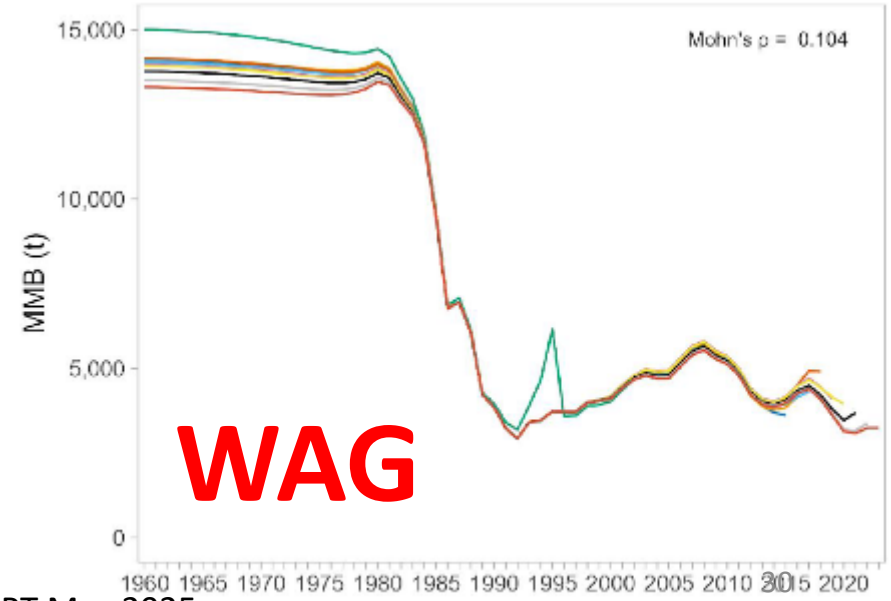


Model performance

Retrospective patterns persist in **EAG**

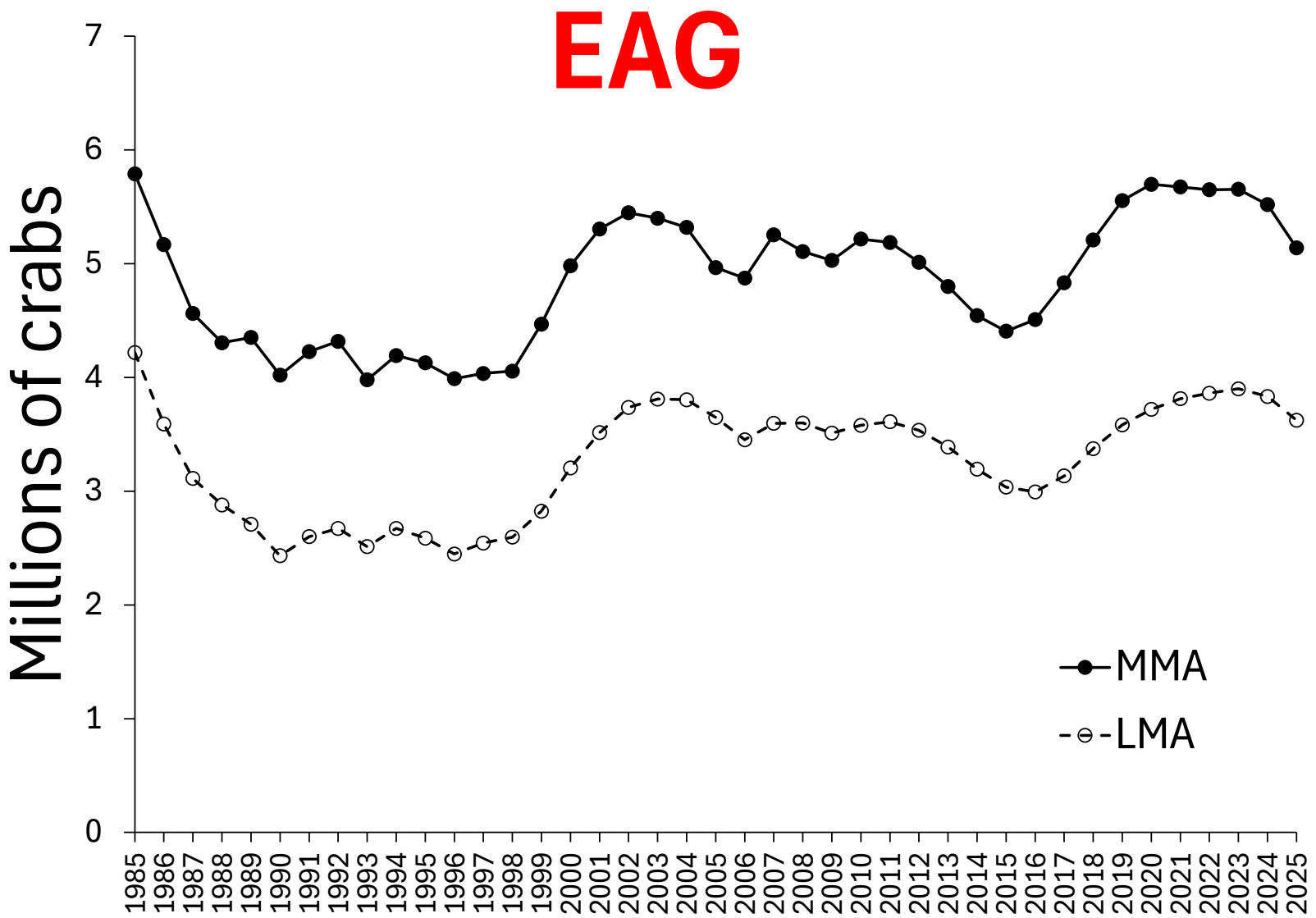
- Generally, more uncertainty in EAG terminal year estimates
- Conflicting signals between CPUE and size comp data
- Same model scenario, peeling back terminal year data and rerunning model, and repeat

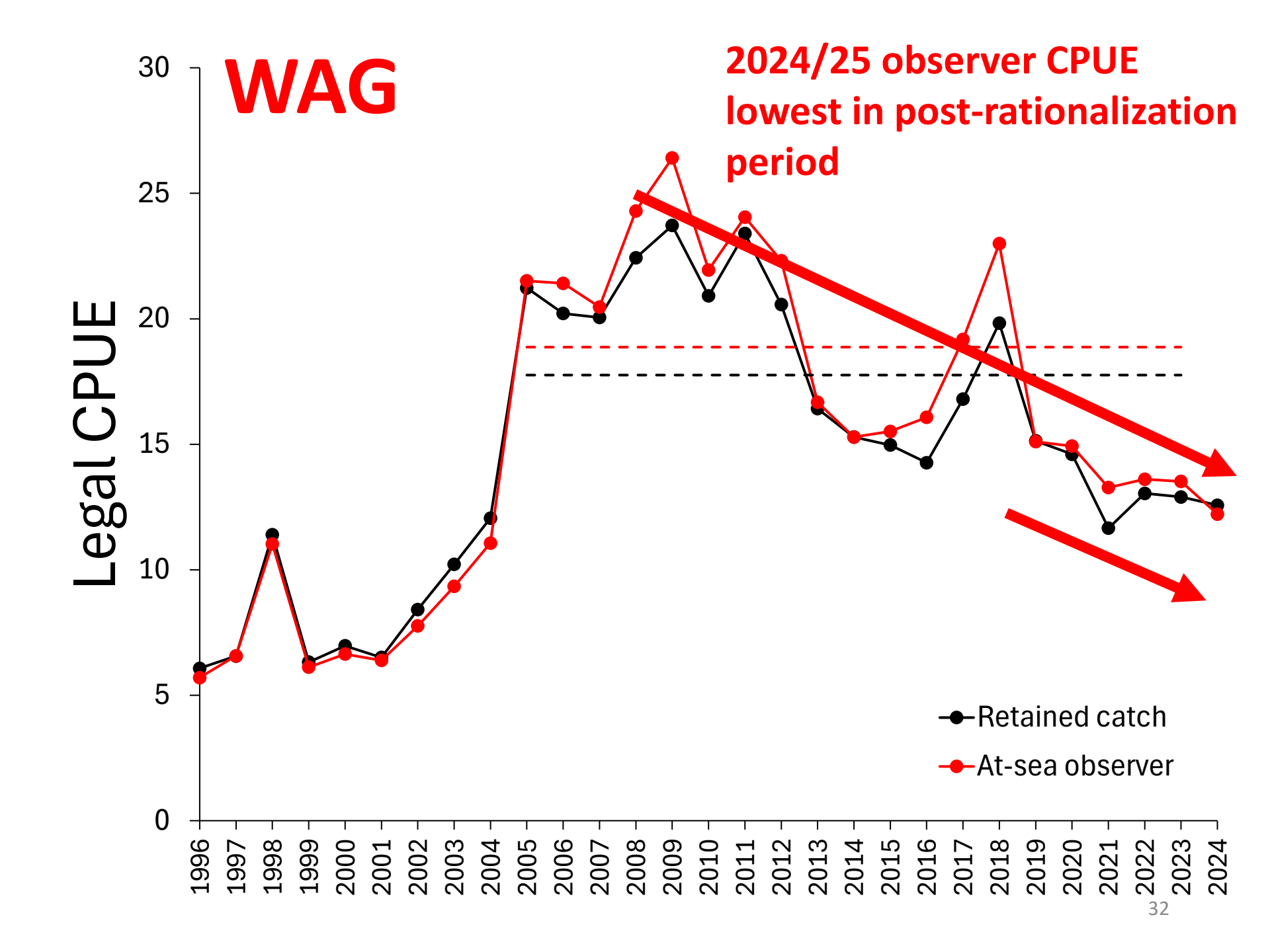




Figures taken from presentation given by Jackson to CPT May 2025

Model estimates: scenario 23.1c




WAG
2024/25 observer CPUE lowest in post-rationalization period
Legal CPUE
30
25
20
15
10
5
0
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1997
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2000
2001
2002
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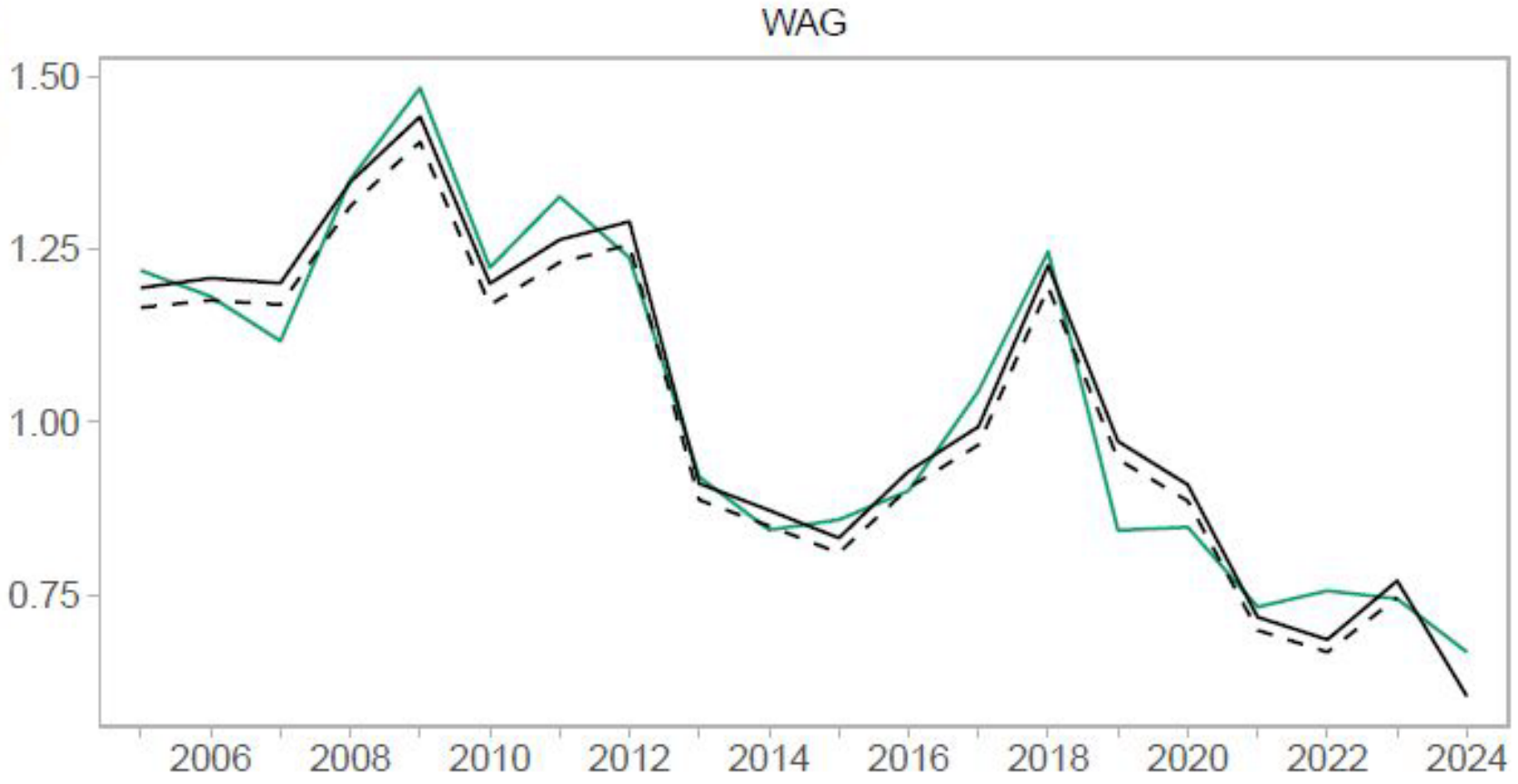
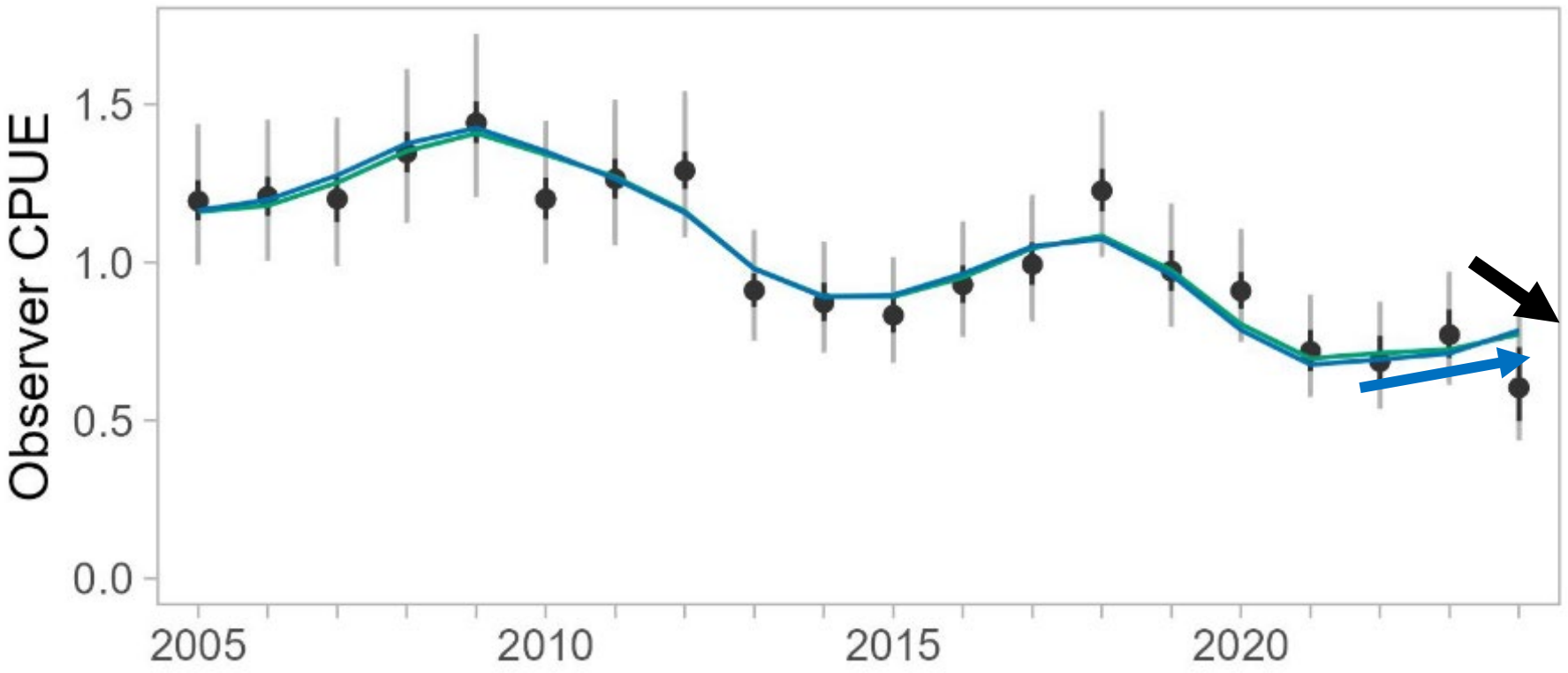
Retained catch
At-sea observer



Standardized CPUE decrease from 2023 to 2024

Figure taken from presentation given by Jackson to CPT May 2025

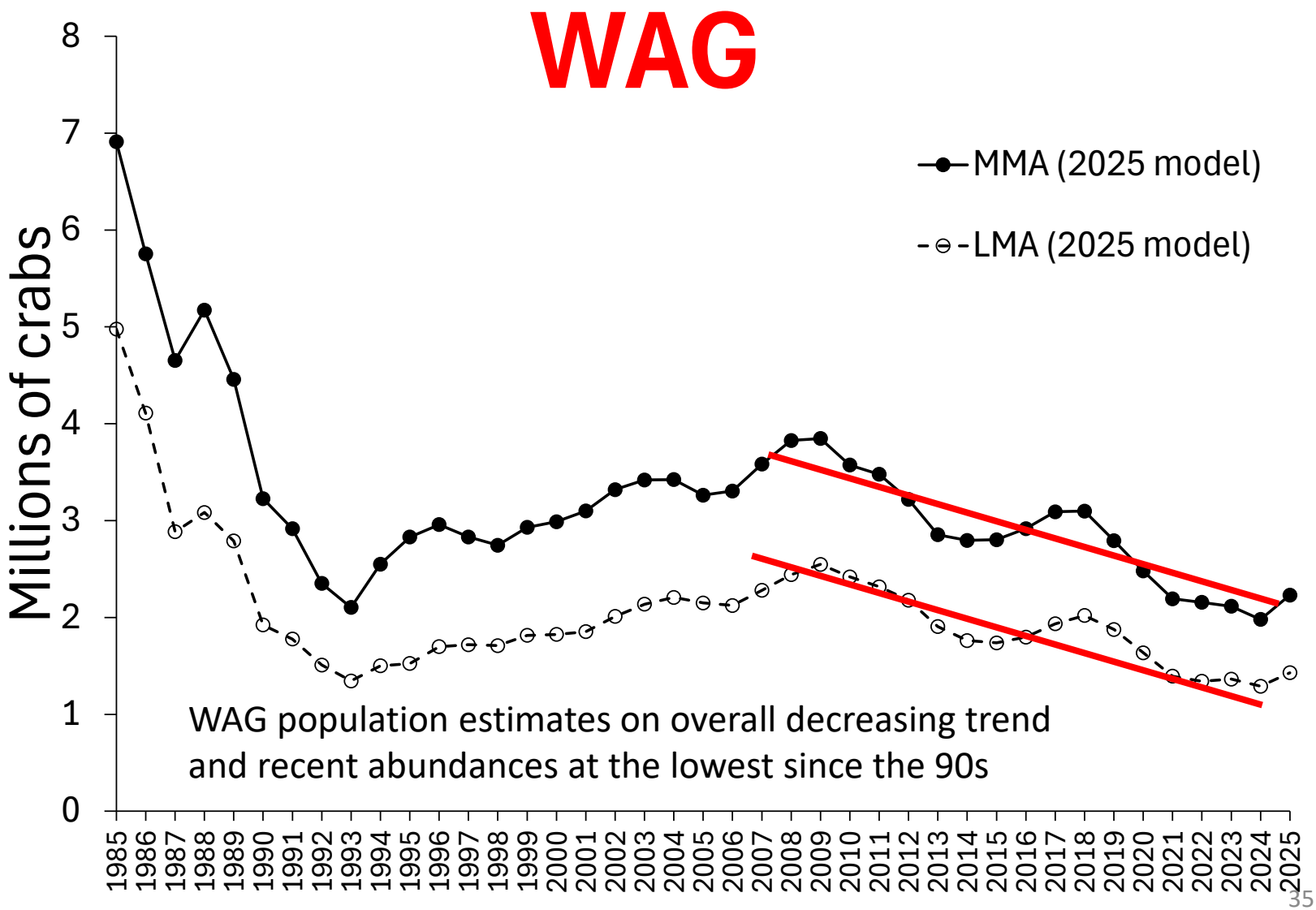
WAG CPUE



2023-2024 change inconsistent between model and CPUE data

Figure taken from presentation given by Jackson to CPT May 2025

Model estimates: scenario 23.1c



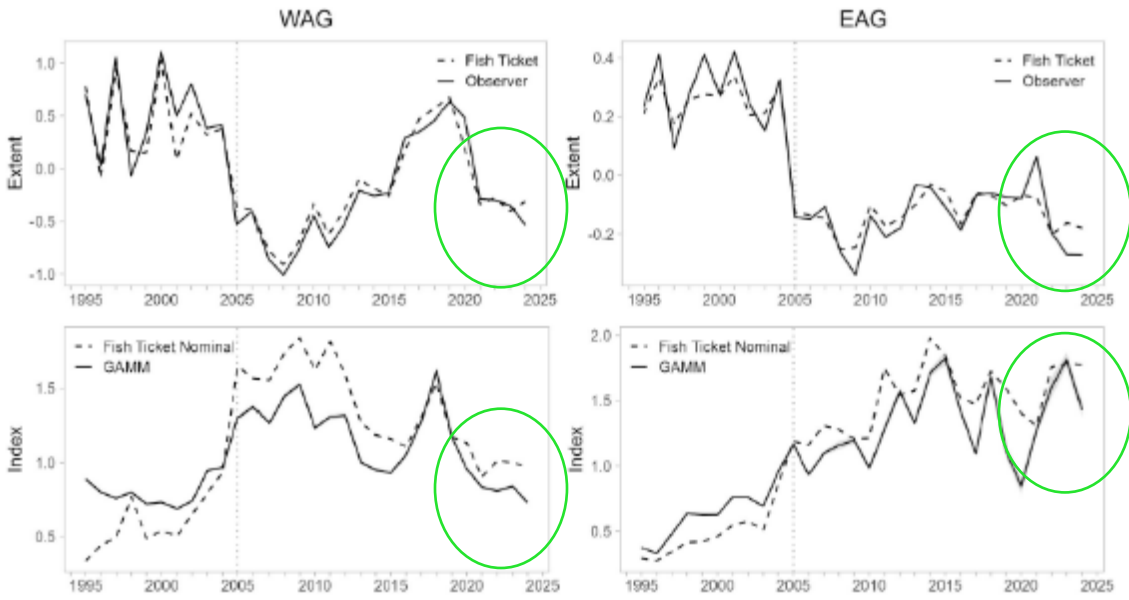
What's going on in the WAG?

Declining recruitment trend since 1999

Declining MMB trend since 2008

Below $B_{35\%}$ since 2022 assessment, and declining (79%)

CPUE remains near post-rationalization low (13 crab per pot)



Would like to see strong CPUE with high or increasing extend index

EAG: In recent years, high CPUE with low extent implies CPUE improvement not necessarily indicative of population growth

WAG: In recent years, low CPUE with average-ish extent

Slide taken from presentation given by Jackson to CPT May 2025

Reference points and TAC options

	EAG	WAG	Notes/Concerns
Reference points			
2025/26 ABC	**3.97**	**1.26**	
ABC reduced for bycatch	**3.64**	**1.16**	ABC minus bycatch in directed + GF. Was used in WAG in 2022 + 2023
2024/25 TAC	**3.76**	**1.12**	EAG: full computed WAG: 15% ramp HCR
2024/25 TAC Options			
Full computed	**3.32**	**1.16**	EAG 15% ramp; WAG 20% ramp
Full computed 15% ramp BOTH areas	**3.32**	**0.87**	10% exploit. rate in WAG

* Green circles indicate recommended TACs

Historical EAG TAC buffering

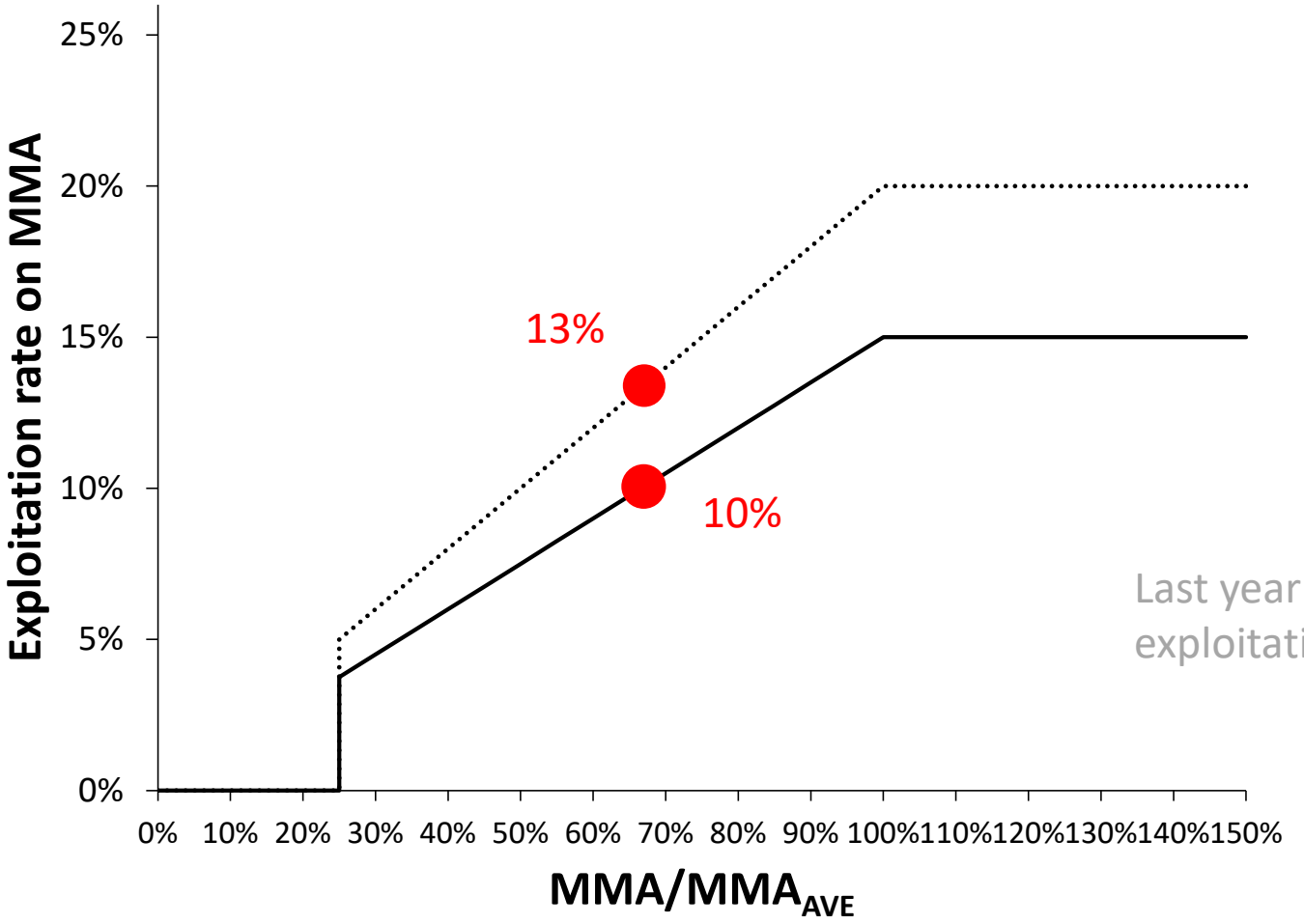
- Implemented a **20% buffer** on EAG computed TACs to reflect model uncertainty (2018-2021)
  - Retrospective bias (Mohns Rho values)
  - Historical model bias: 20% approximated mean overestimation of terminal year
  - Poor CPUE fits
- Decreased to **10% buffer** in 2022 to reflect uncertainty in change in estimated size-at-maturity used in assessment
  - Increase in size-at-maturity means fewer animals in population are "mature" thereby reducing absolute population abundance used to calculate TAC (i.e. lower TAC)
  - Disconnect between what is used in assessment (full-area 116 mm) vs area-specific (EAG: 108 mm)
    - Likely/possible that assessment underestimates number of mature animals in EAG..... thus the reduction in buffer
    - We gave the fleet the benefit of the doubt
      - **2023 + 2024 implement full computed TAC in EAG**

EAG TAC Recommendation

EAG 3.32: full computed (12% decrease from last year)

- Equates to 15% exploitation on MMA
- Have used 20% and 10% buffers in past due to high model retrospective pattern + poor model fit to CPUE data
  - Used full computed last 2 years
- Reduced TAC seems reasonable given declines in CPUE and assessment reference points relative to last year
- Approximates historical fixed TAC

WAG 2025/26 sloping control rule



Last year was 11% exploitation on MMA

Summary: shift from 20% to 15%

MSE conducted in 2019 suggested that both 15% and 20% ramps had best trade-off between meeting conservation objectives and optimizing yield

- Increasing conservation risk within the 15%-20% range
- Predicted similar TACs
- Fleet wanted stability to historical harvest levels, 20% was best approximation

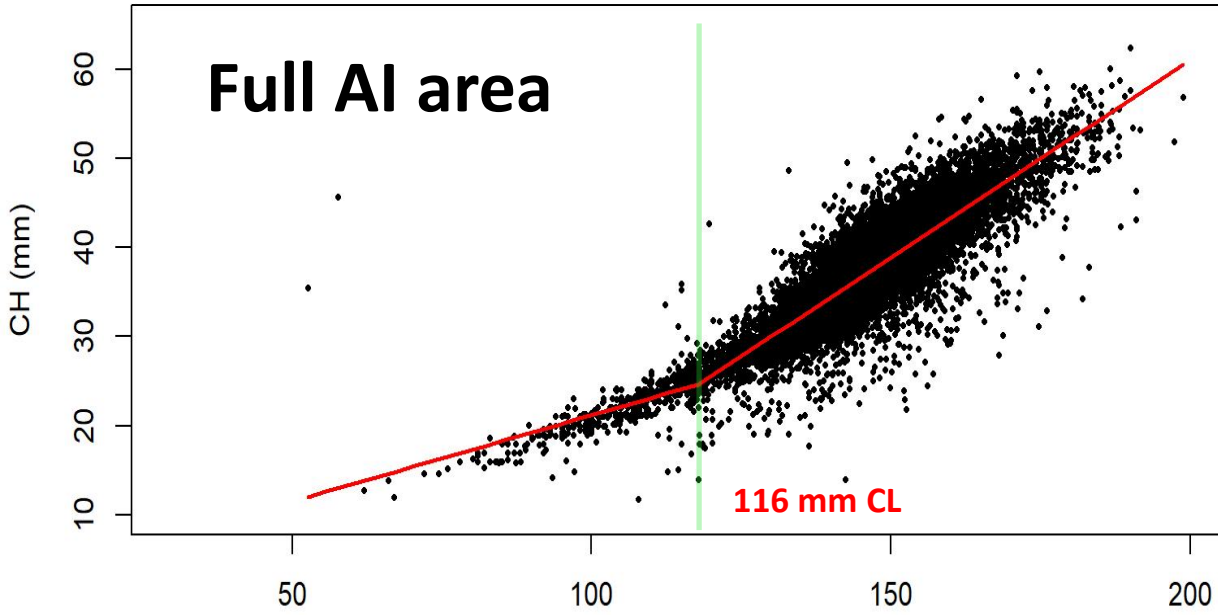
2024 discussion about aggressive harvest rates in the WAG coupled with conservation concerns motivated the implementation of the 15% ramp in the WAG

- Low/declining CPUE, low recruitment, possible overestimation of MMA
- Same concerns as last year

Change in estimated size-at-maturity

Change to larger estimated **size-at-maturity** (116 mm vs 111 mm CL) in 2022 (and later) assessments*

- Predicts fewer animals in population are mature



Area-specific:
EAG 108 mm CL
WAG 120 mm CL

Stock-wide usage of 116 mm CL size-at-maturity may:

- *Underestimate* EAG MMA
- *Overestimate* WAG MMA

** This analysis is being revisited with the existing data.*

WAG TAC considerations

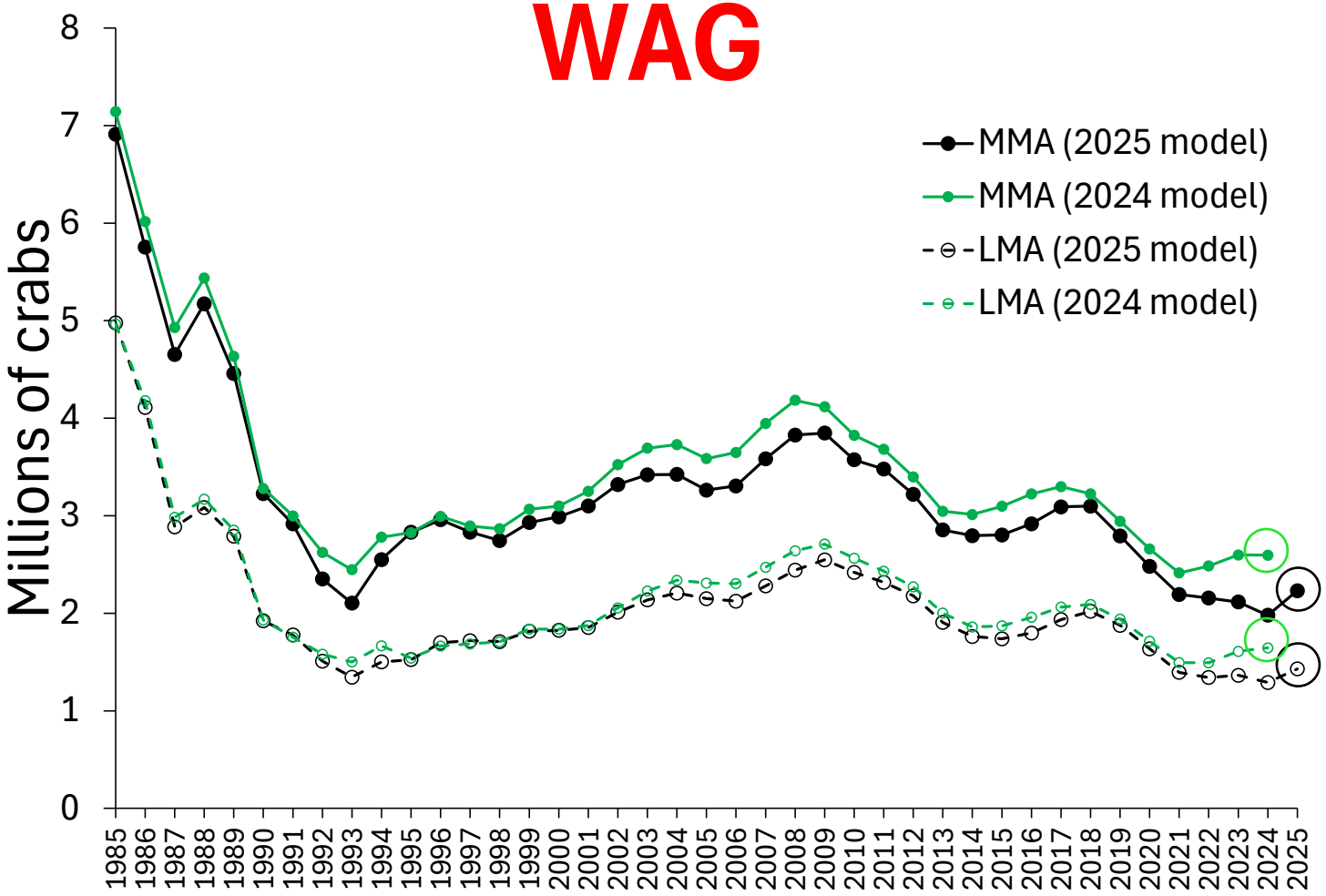
Conservation concern: continued low CPUE, high exploitation, low recruitment

1.16: full computed (~status quo with last year)
0.87: full computed (22% decrease from last year)

	15% HCR	20% HCR
2024/25	1.12	1.49
2025/26	0.87	1.16

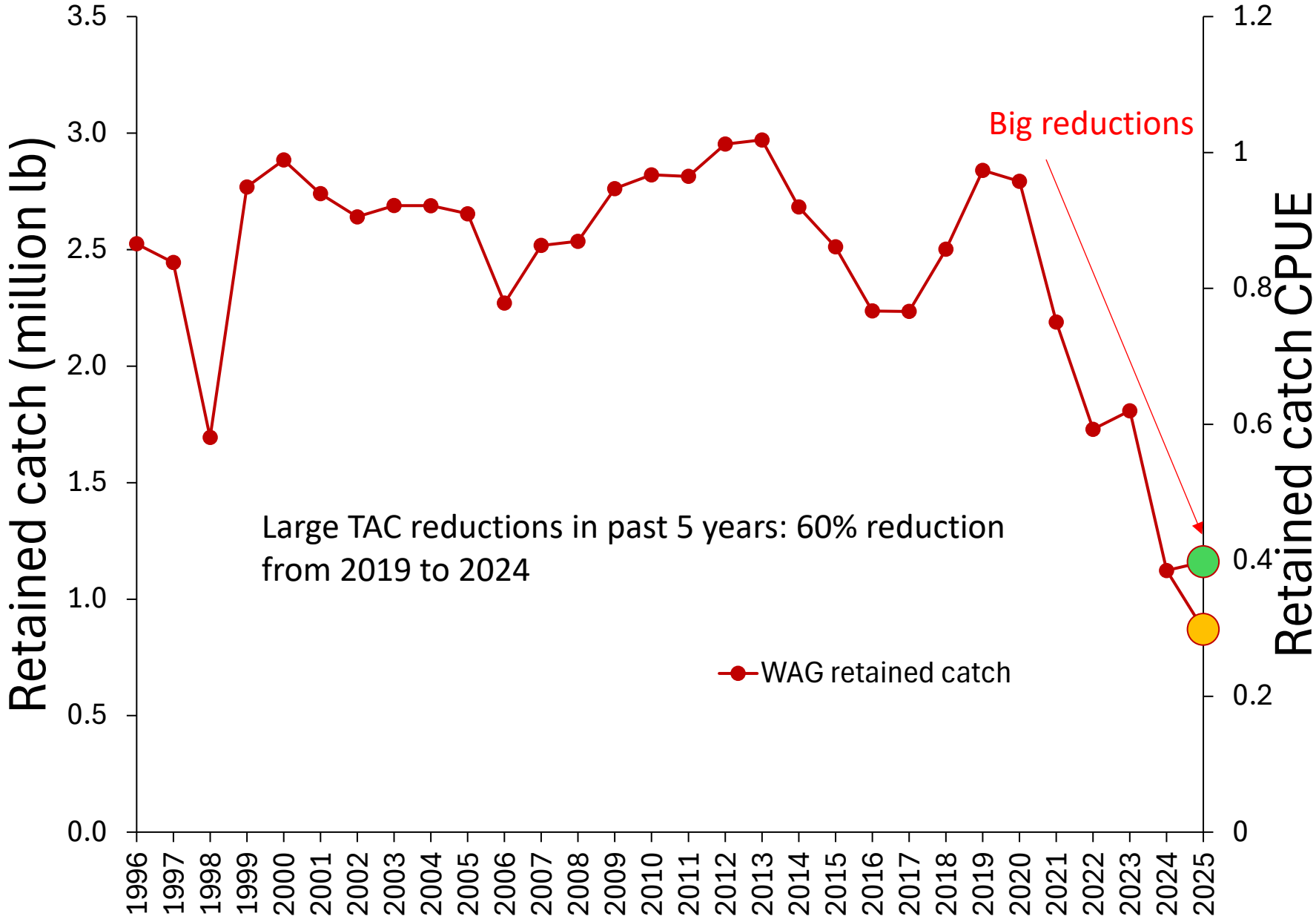
22% decrease **22% decrease**

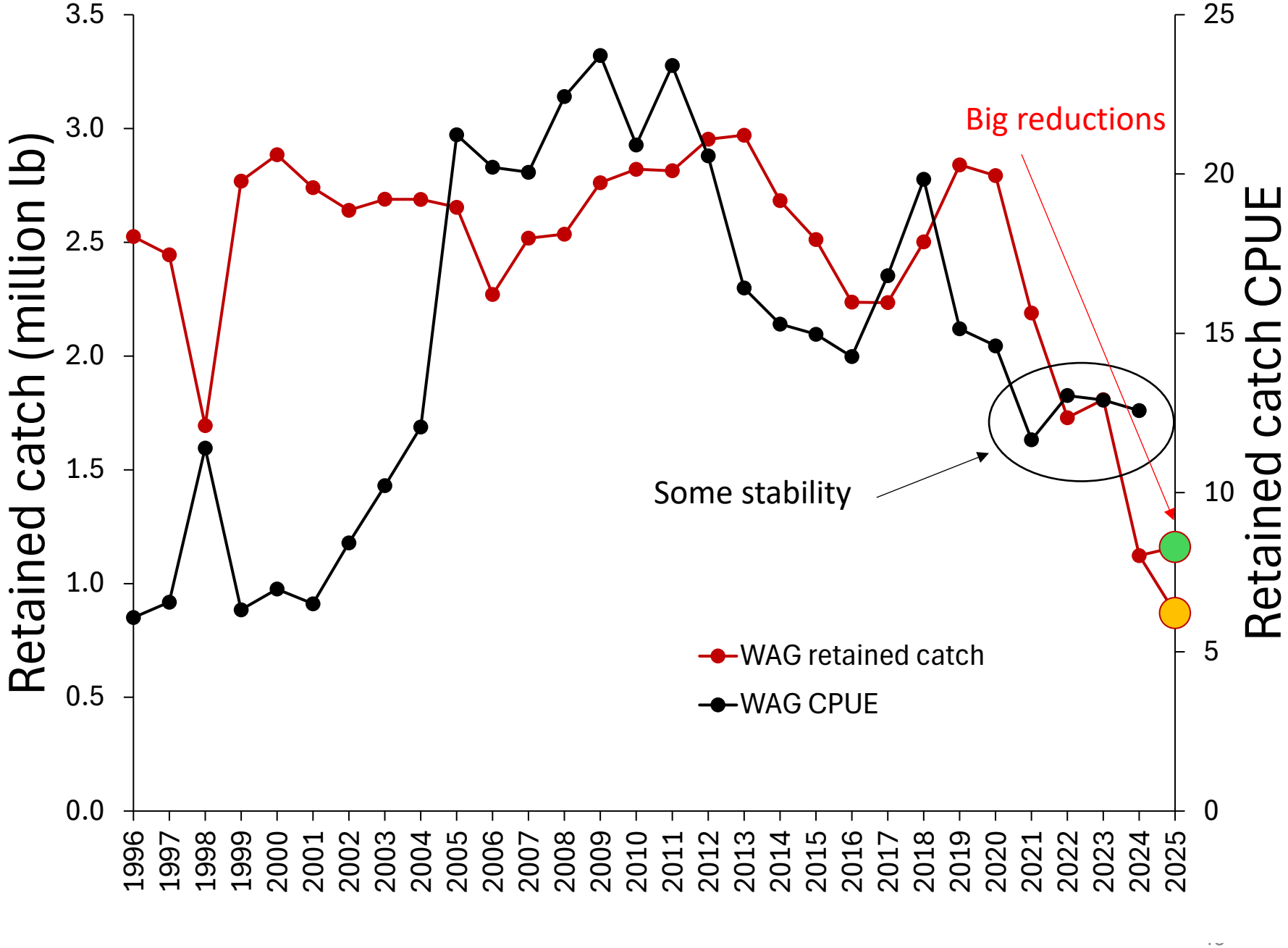
WAG



Why the big (22%) drop in WAG TAC from last year?

- Drop in MMA + LMA
- Lower exploitation rate (lower stock status = farther down on the HCR ramp)


Retained catch (million lb)
Retained catch CPUE
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1.2
1
0.8
0.6
0.4
0.2
0
Big reductions
Large TAC reductions in past 5 years: 60% reduction from 2019 to 2024
WAG retained catch
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025


Retained catch (million lb)
Retained catch CPUE
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
25
20
15
10
5
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
Big reductions
Some stability
WAG retained catch
WAG CPUE

Total fishery mortality

	15% HCR	20% HCR
WAG TAC	**0.87**	**1.16**
EAG TAC	3.32	3.32
Discard mortality	0.30	0.32
Bycatch GF	0.09	0.09
Test fishery	0.09	0.09
State-water fishery	0.05	0.05
TOTAL	**4.67**	**5.03**
ABC	5.24	5.24
TAC % ABC	80%	85%
Total mortality % ABC	**89%**	**96%**

Summary

2024/25 CPUE

- EAG: comparable to prior seasons, above average
- WAG: flat-ish from prior season, past 3 seasons lowest in rationalized timeseries, 2024/25 CPUE lowest since 2005

Assessment model estimates

- EAG has higher uncertainty
  - Conflicting signals between CPUE and size comps
  - Large retrospective pattern, recent data peels suggest some stability
- WAG has less uncertainty but greater conservation concern
  - Low CPUE, high exploitation, low recruitment, decreasing ave wts

TACs relative to last year

- EAG: down 12% (15% ramp)
- WAG: down 22% (15% ramp)

Ecosystem Status Report 2024

ALEUTIAN ISLANDS

Edited by:
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Sea surface temperature

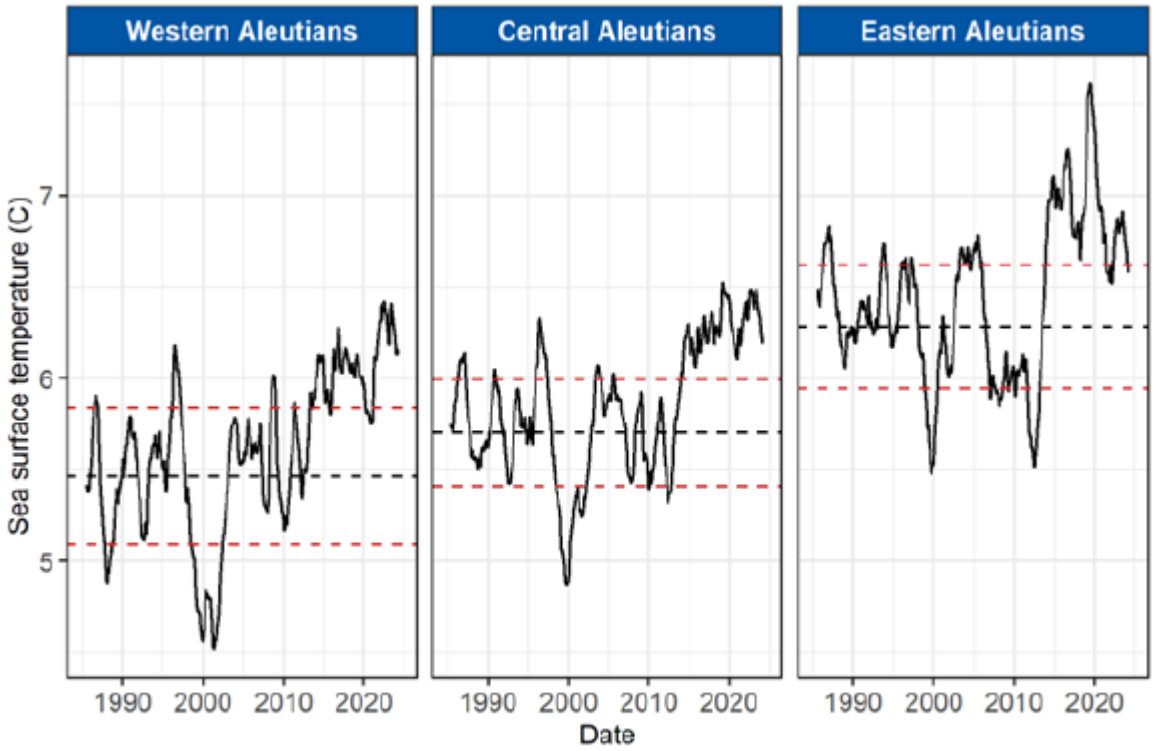
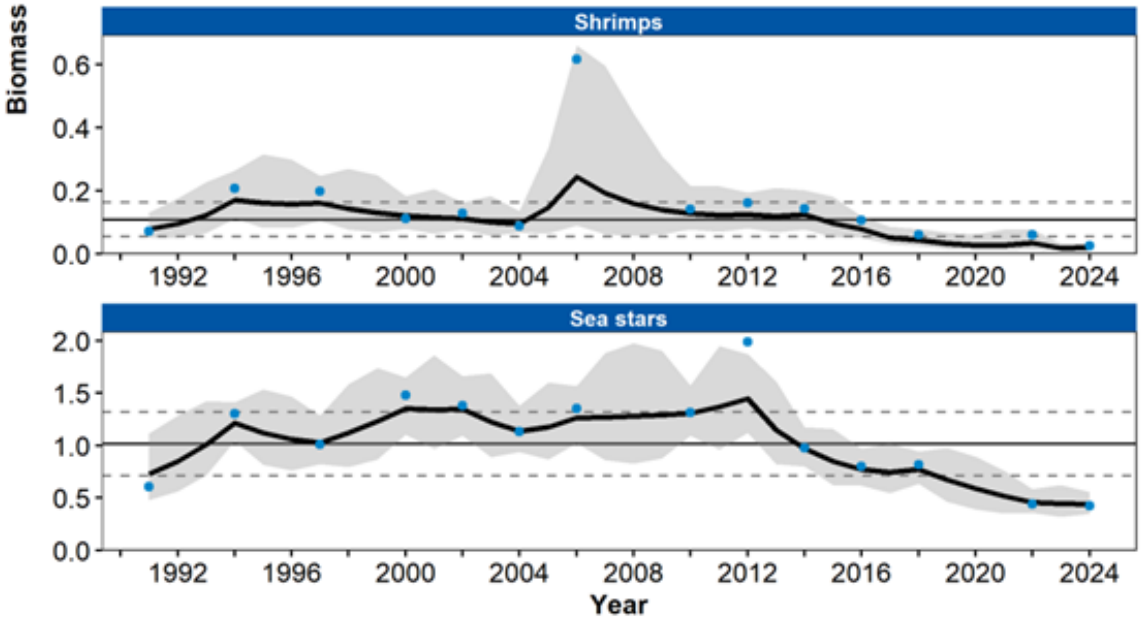


Figure 18: Time series trend (i.e., seasonality and noise removed) of sea surface temperatures. Horizontal dashed lines represent the mean (black) and standard deviation from the mean (red) during the earliest complete 30-yr baseline period (1985-2014).

"Generally, all three regions have trended towards anomalously warm (>1 standard deviation from the long term mean) conditions over the last 10 years."

Little information on benthic species



Broad-scale reduction in invertebrate biomass, particularly in the western Aleutian Islands

Status and trends: Over the first decade of the survey (1991-2000), estimates of sea stars and shrimps indicated relatively stable biomass, with some degree of fluctuation across years (Figure 36). Biomass was largely centered in the Eastern Aleutian Islands (EAI) for sea stars, and in the Western Aleutian Islands (WAI) for shrimps. However, we find steady declines in biomass over the last decade in both invertebrate taxonomic groups, predominantly from the WAI. Since the 2022 survey, shrimps and sea stars remain relatively stable with comparatively low biomass. The subarea pattern of sea star abundance largely mirrors 2022, with the majority of the biomass concentrated in the EAI (Figure 37). In contrast, we find a significant reduction of shrimp biomass in the Southern Bering Sea relative to the previous Aleutian Islands bottom trawl survey.

Planned research activities for 2025/26 season

- Environmental monitoring: ZebraTech temp sensors in EAG and WAG
- Crab movement: EAG hydroacoustic work
- Maturity data: chela measurements (likely EAG)
- WAG growth data: spaghetti tagging

Other research priorities

- Movement via tagging studies
- More weight measurements in WAG for L-W regression
- Size-at-maturity estimation in space/time
  - Better understand size at physiological, morphological, functional maturity
- Small mesh pots (recruitment)
- Larval drift (population connectivity, stock structure)
- Handling mortality rate: is assumed 20% reasonable?

2025/26 Management Notes

- OBSERVERS: Missed the first trimester 50% observer coverage target for past 2 seasons – please coordinate fishing plan with Saltwater Inc ASAP
- RAIL DUMPING: Reduced TACs for 2026 if trend continues

EAG	2023/24	2024/25
Number rail-dumped pots	706	646
Weekly CPUE	26	32
Est. number crab rail-dumped	18,639	20,371
Fishery avg wt	4.31	4.30
Est. lbs crab rail-dumped	80,286	87,645
Est. lbs crab mortality @ 20%	**16,057**	**17,529**

- BOARD OF FISHERIES:
  - 277 – Establish new state-waters GKC fishery – Passed
  - 278 – Pot limits – No Action
  - 276 – Increase storage depth from 75 to 100 fathoms – Failed
  - 279 – Gear share/transfer only on final trip – Passed
  - Spring 2026 – proposal to close AI state waters (0-3 mi) to all trawling

2025/26 Management Notes

New state waters GKC fishery

- East of 169° W. long
- Boats 58 ft and under
- Single pot only (90 pot max)
- Catch limit = 50,000 pounds
- No effect on EAG TAC but does count against ABC
- September 1 – April 30
- State waters (0-3 mi) closed to longline crab gear east of 169° W. long