NOAA FISHERIES

SouthEast Fisheries Science Center

SEDAR 73
South Atlantic Red Snapper

SAFMC meeting

June 2021

SA Red Snapper assessment history

- SEDAR15 found the stock to be overfished ($SSB_{2006}/SSB_{F40\%}$ = 0.03) and undergoing overfishing ($F_{2006}/F_{40\%}$ = 7.7)
- SEDAR24 found the stock to be overfished (SSB_{2009}/MSST= 0.09) and undergoing overfishing ($F_{2007\text{-}2009}/F_{MSY}$ = 4.1)
- SEDAR41 found the stock to be overfished ($SSB_{2014}/SSB_{F30\%}$= 0.14) and undergoing overfishing ($F_{2012\text{-}2014}/F_{30\%}$ = 2.8)
- SEDAR73 finds the stock to be overfished ($SSB_{2019}/SSB_{F30\%}$= 0.44) and undergoing overfishing ($F_{2017\text{-}2019}/F_{30\%}$ = 2.2)
  - Assessment period: 1950 – 2019

- Together, these assessments indicate progress toward rebuilding and ending overfishing
- Since SEDAR24, the proxy for MSY is 30% SPR (codified)

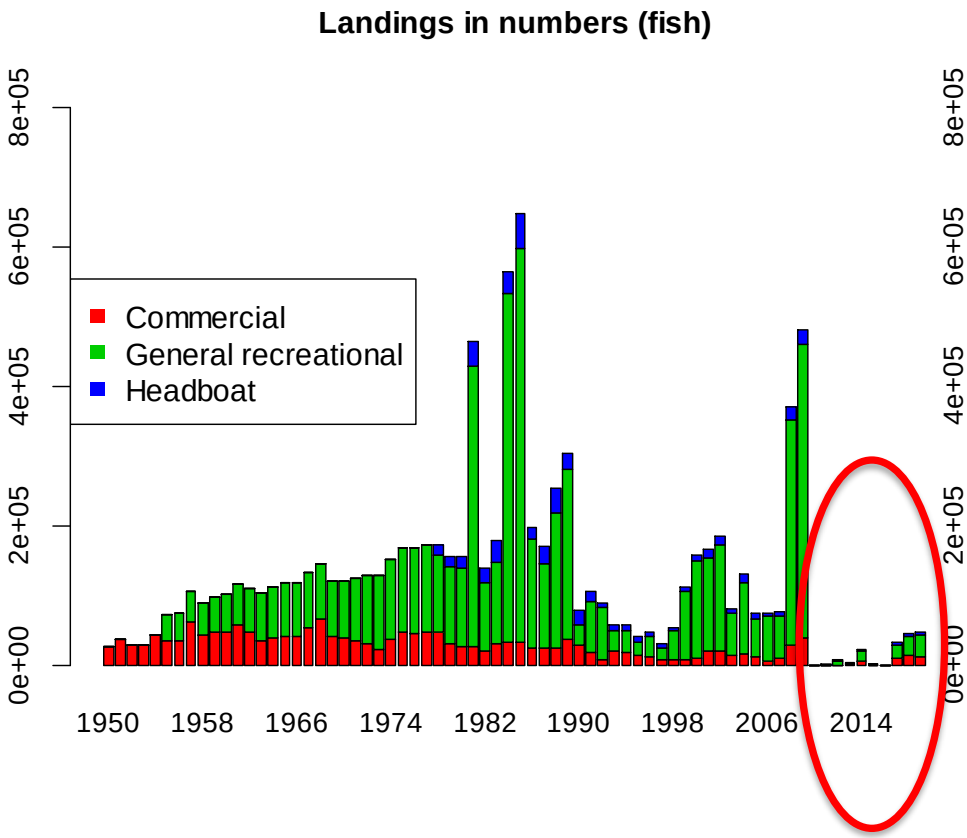
SEDAR73 assessment process

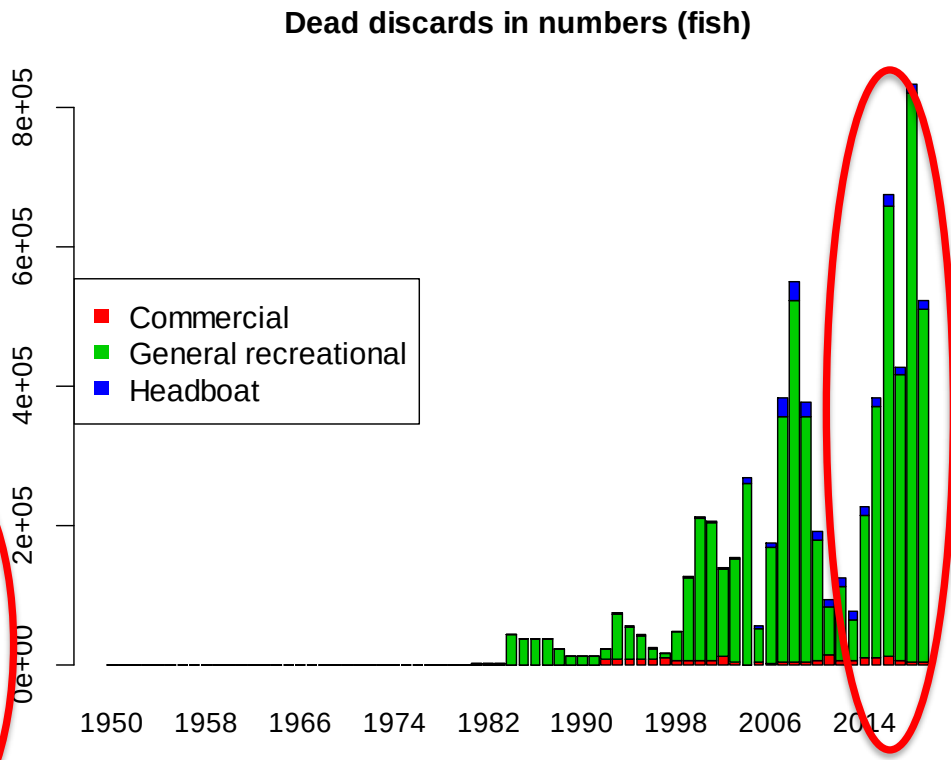
- Data Scoping Webinar (July 9, 2020)
- Selectivity Working Group (Aug – Nov, 2020)
- Data Workshop (December 1-4 & 16, 2020)
- SSC Webinar (Jan 11, 2021)
- Three Assessment Webinars (Jan – Feb, 2021)
- SSC Review (April 27 & May 3, 2021)

New data/information included in SEDAR73

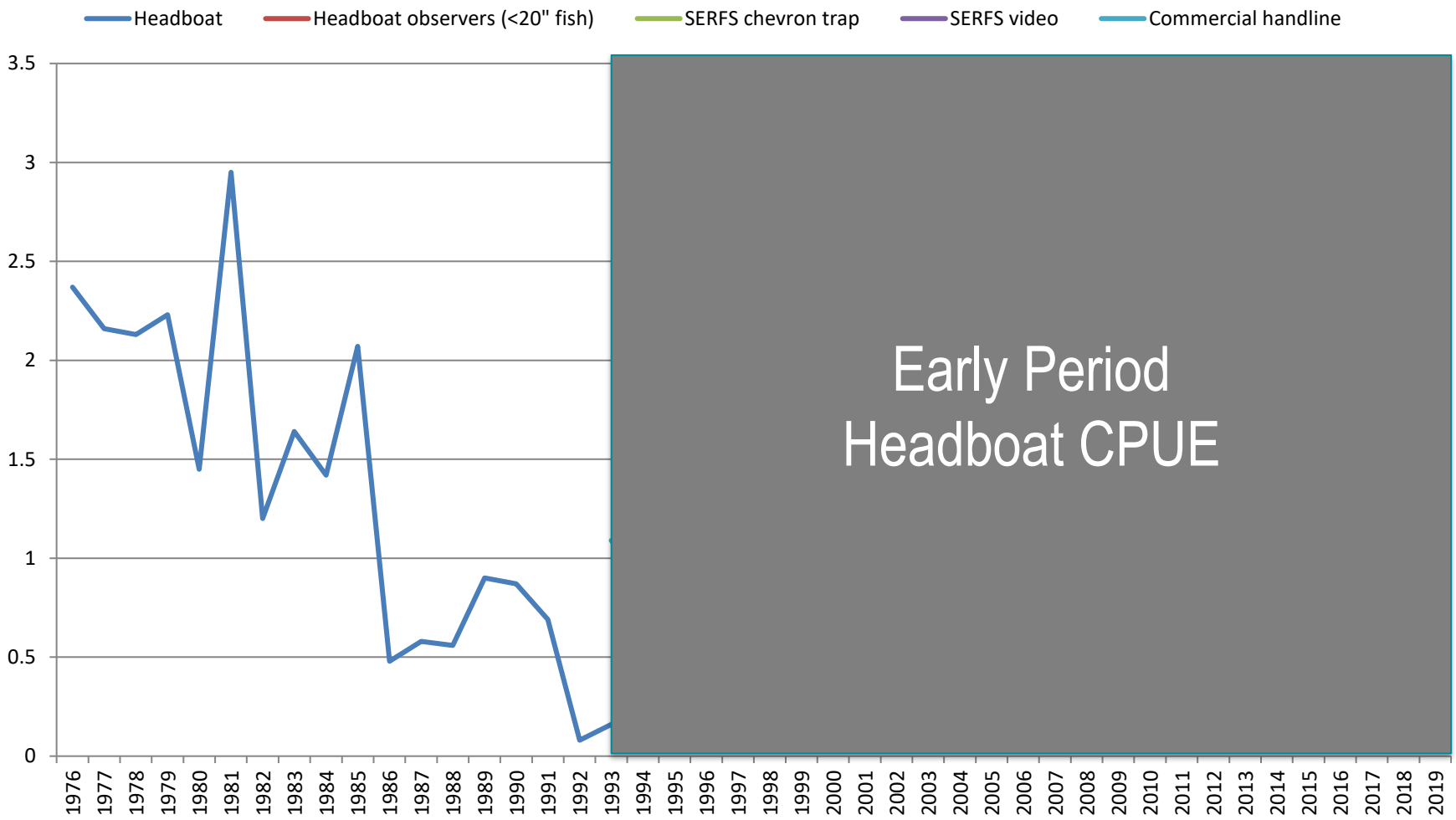
- Current MRIP methodology
- Life history
  - Batch fecundity, Natural mortality
- Indices of abundance
  - SERFS trap and video as separate time series
  - FWRI repetitive timed drop survey (hook-and-line) + age comps
- Discard length comps
  - Commercial: shark bottom longline observer program
  - Headboats: Captain Steve Amick measurements
  - Gen rec: FWRI charterboat observers, MyFishCount
- Discard mortality and use of descender devices

Landings and discard mortalities (in numbers)





Indices


Headboat
Headboat observers (<20" fish)
SERFS chevron trap
SERFS video
Commercial handline
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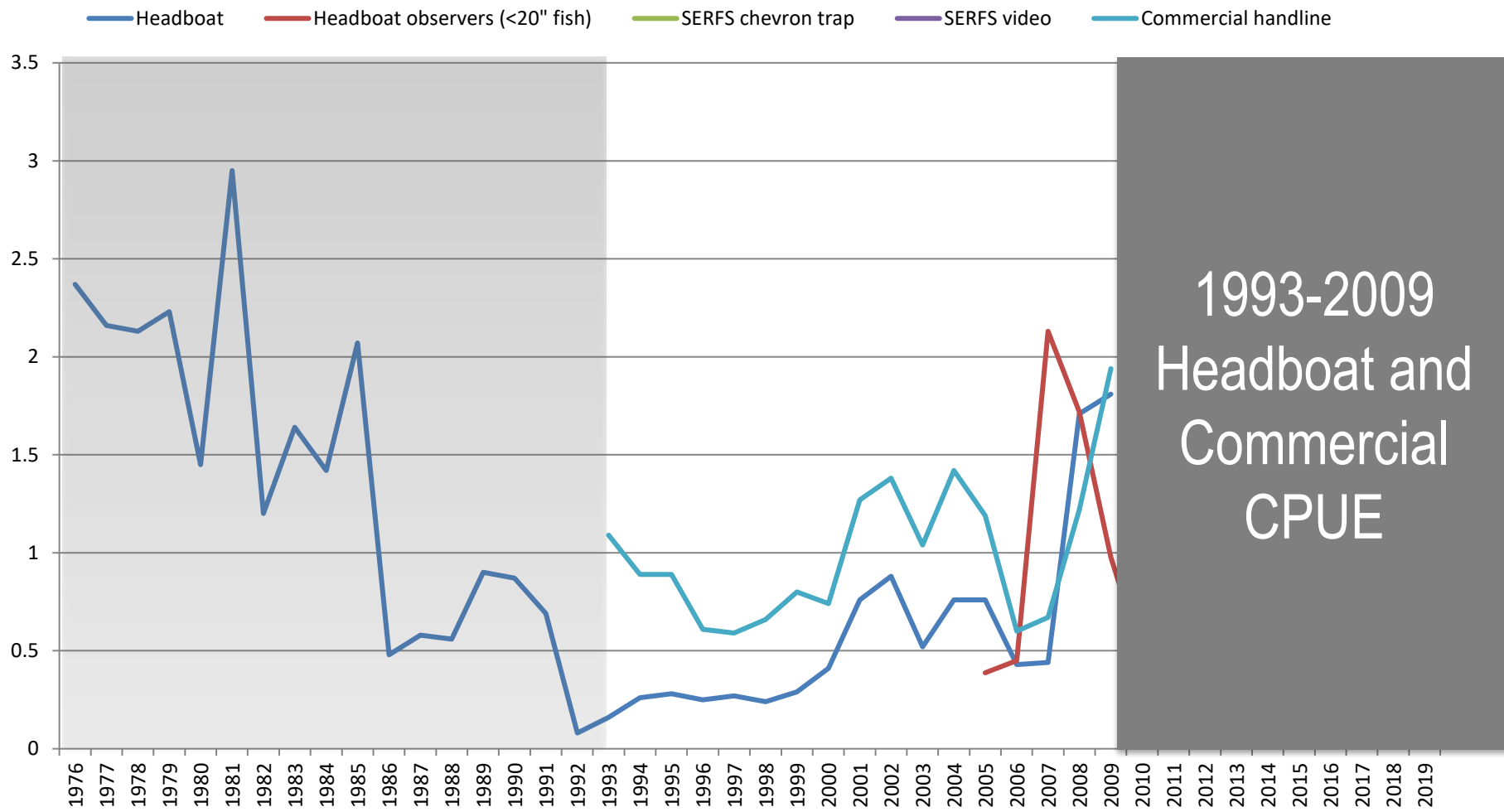
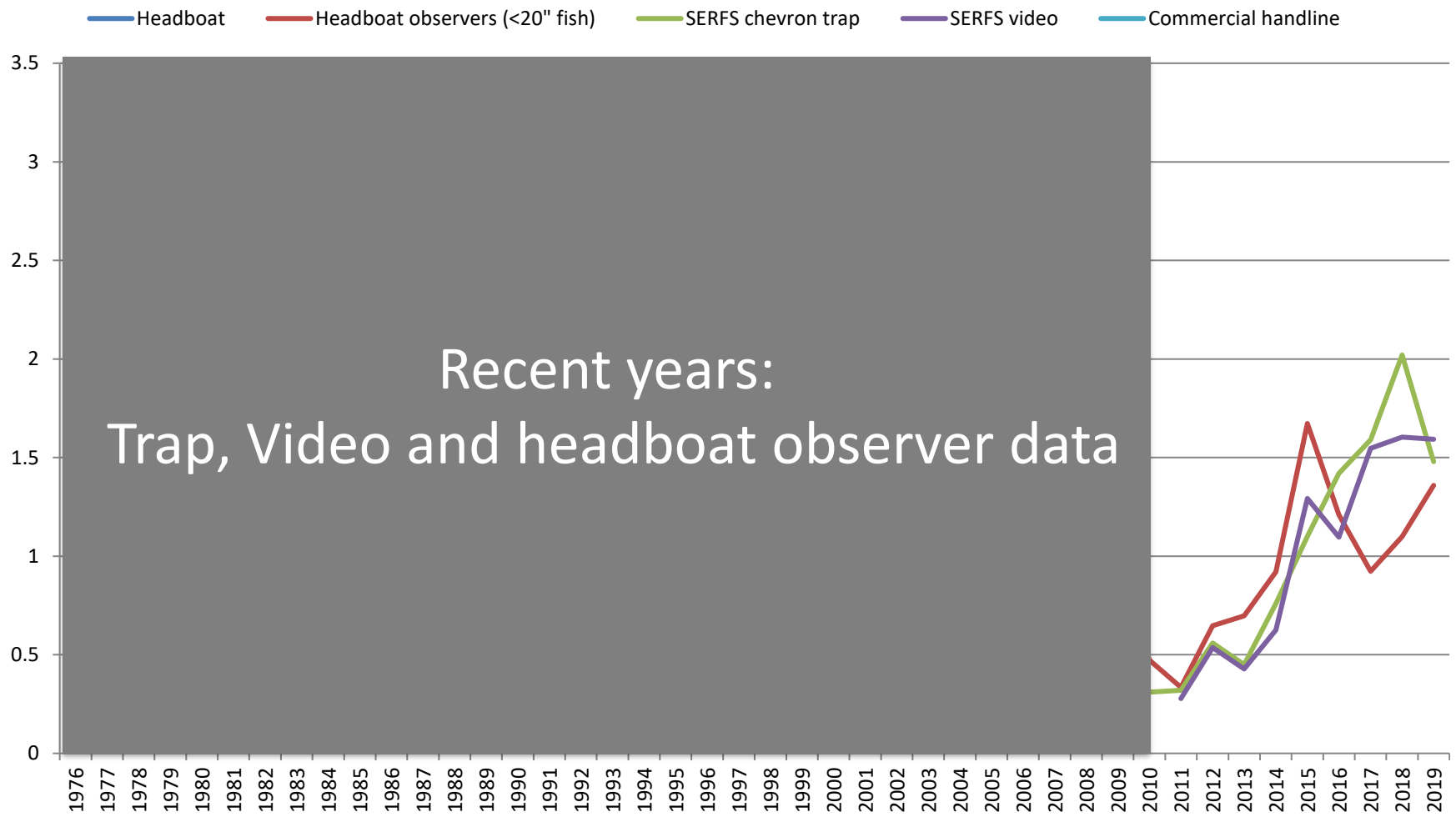
Early Period
Headboat CPUE

Indices of abundance



Indices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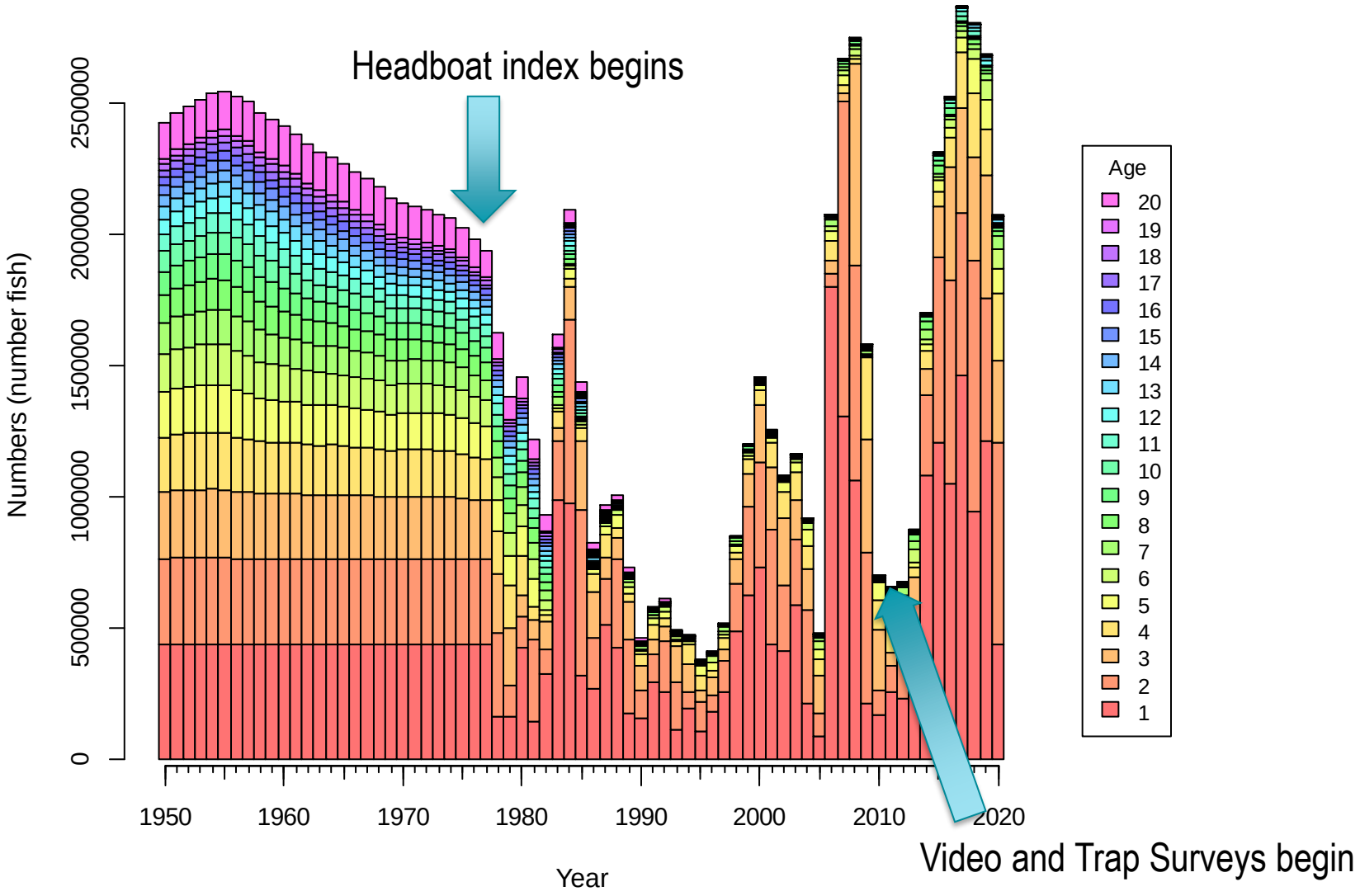
Recent years:
Trap, Video and headboat observer data

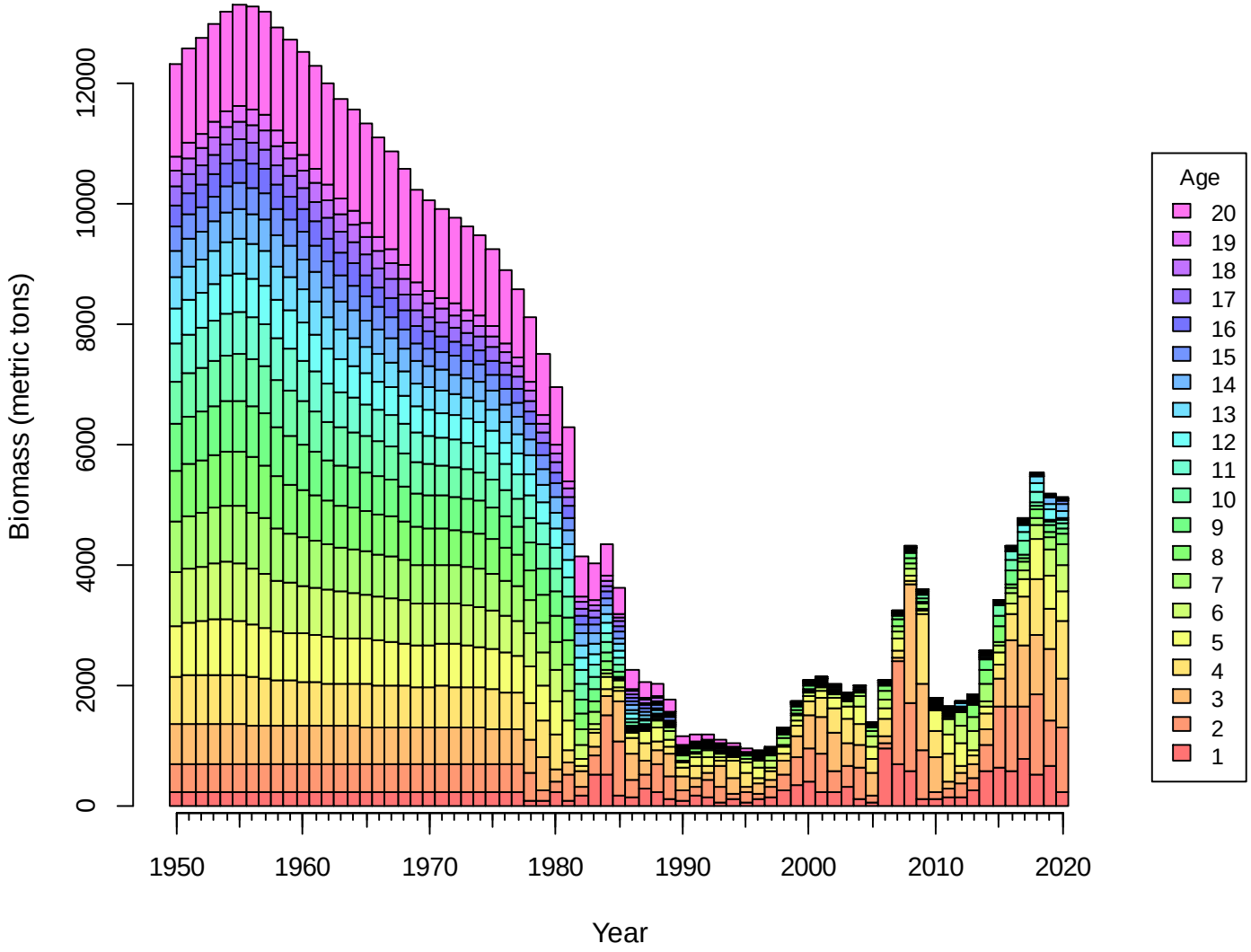
Results

Numbers and Biomass-at-age



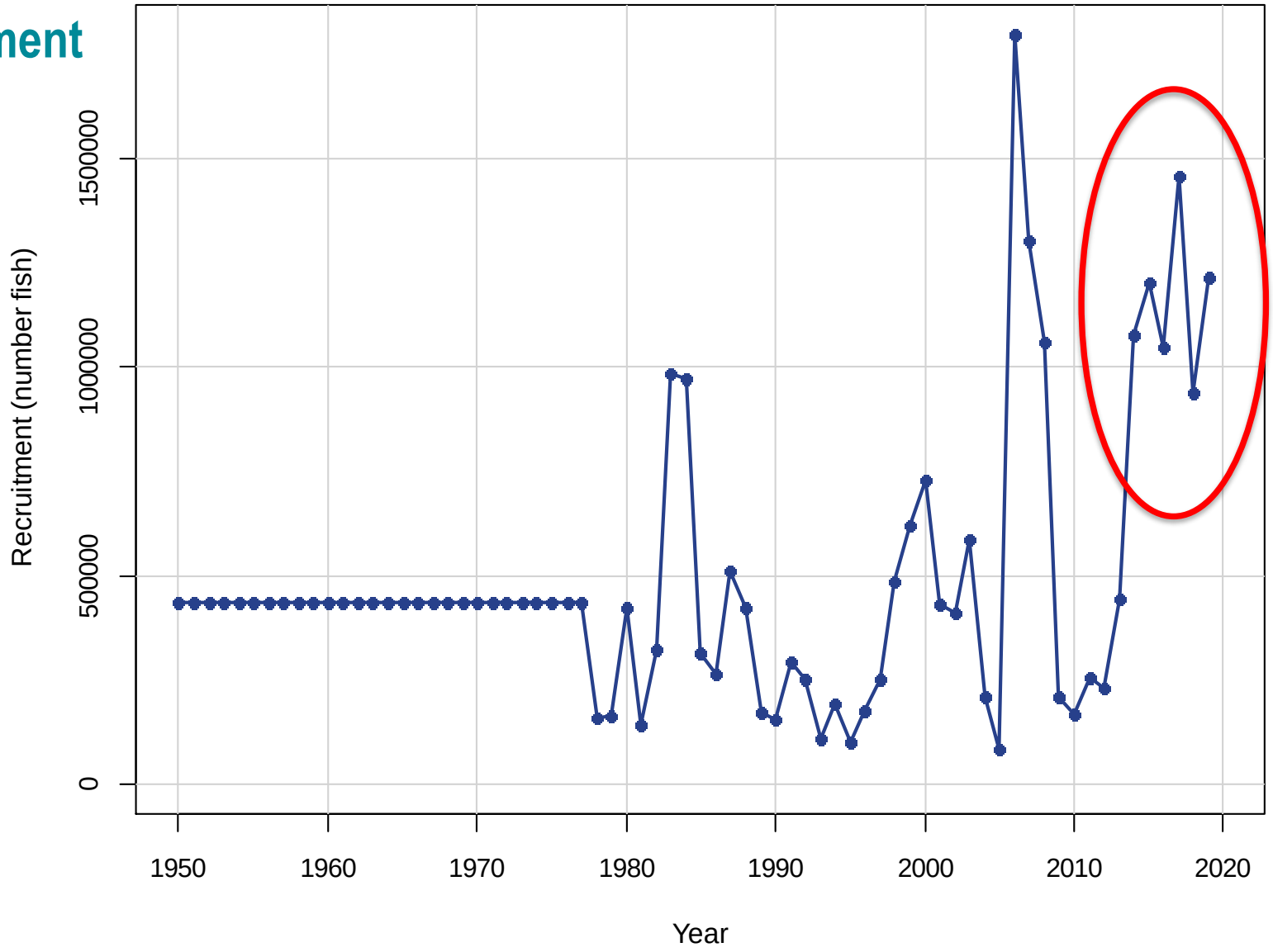
Results

Biomass-at-age



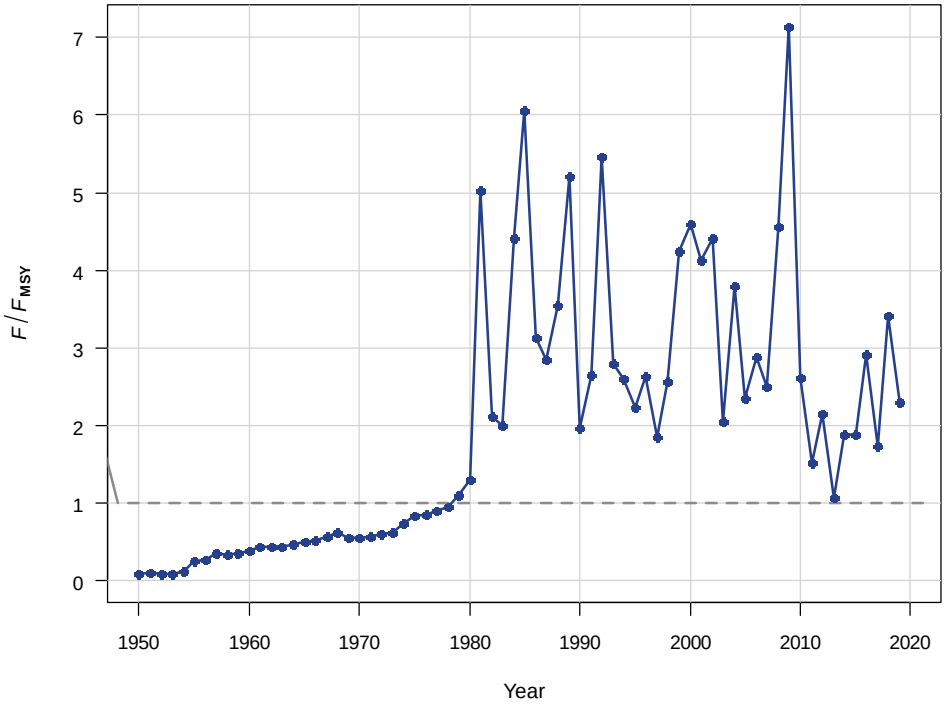
Results

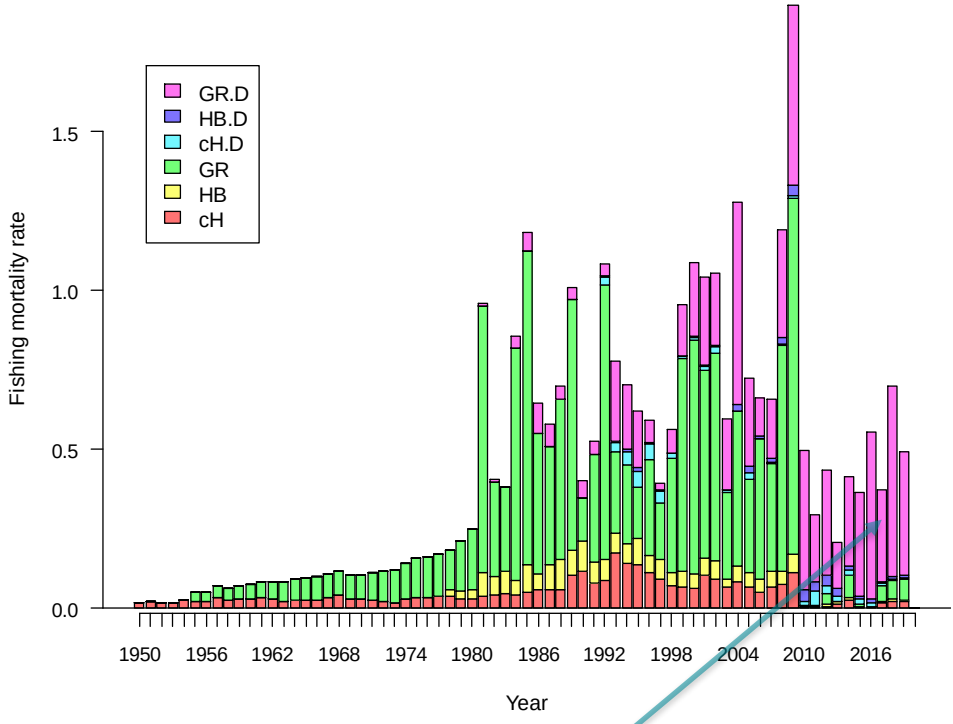
Recruitment



Results

Fishing mortality

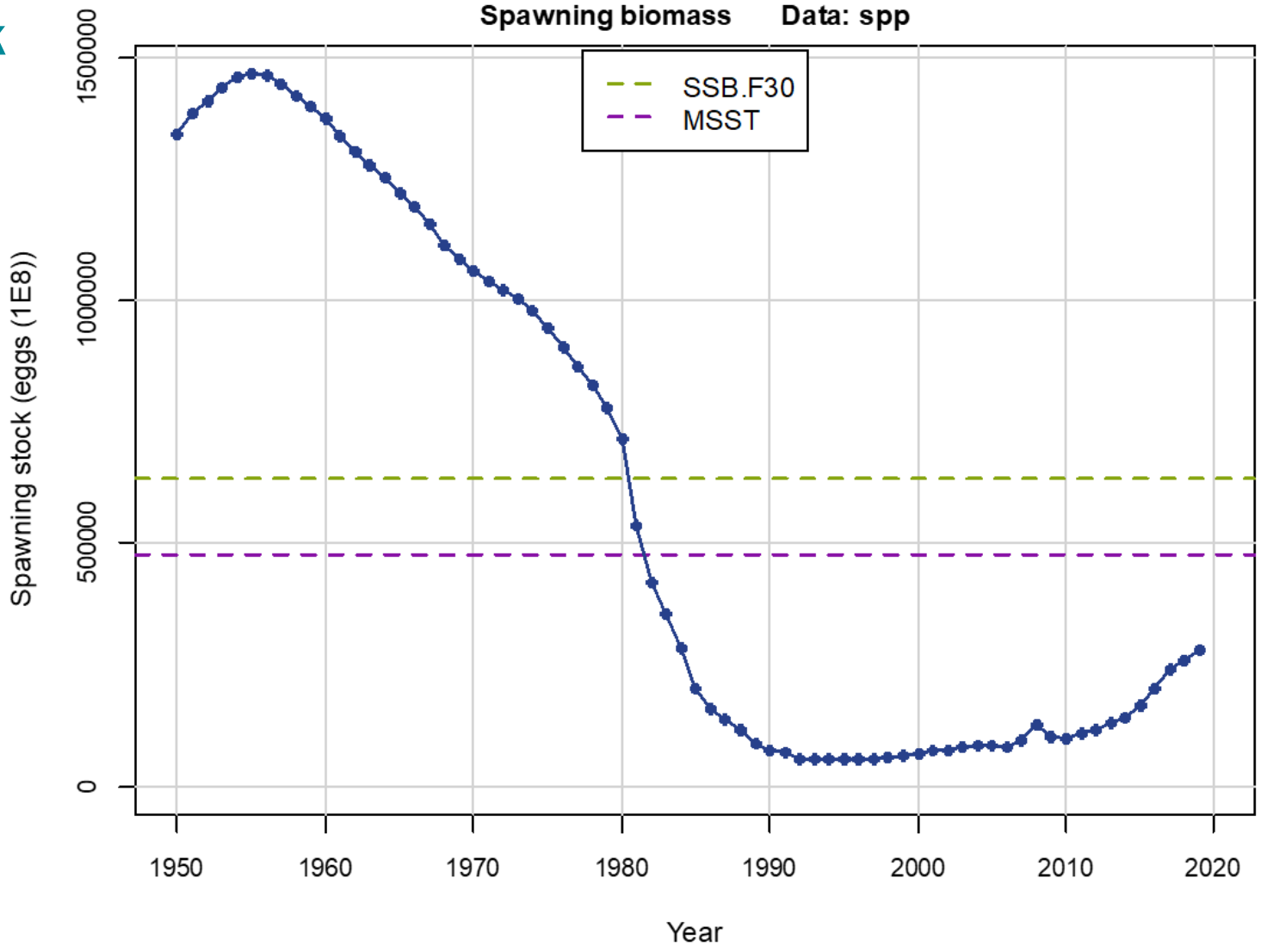




General recreational discards

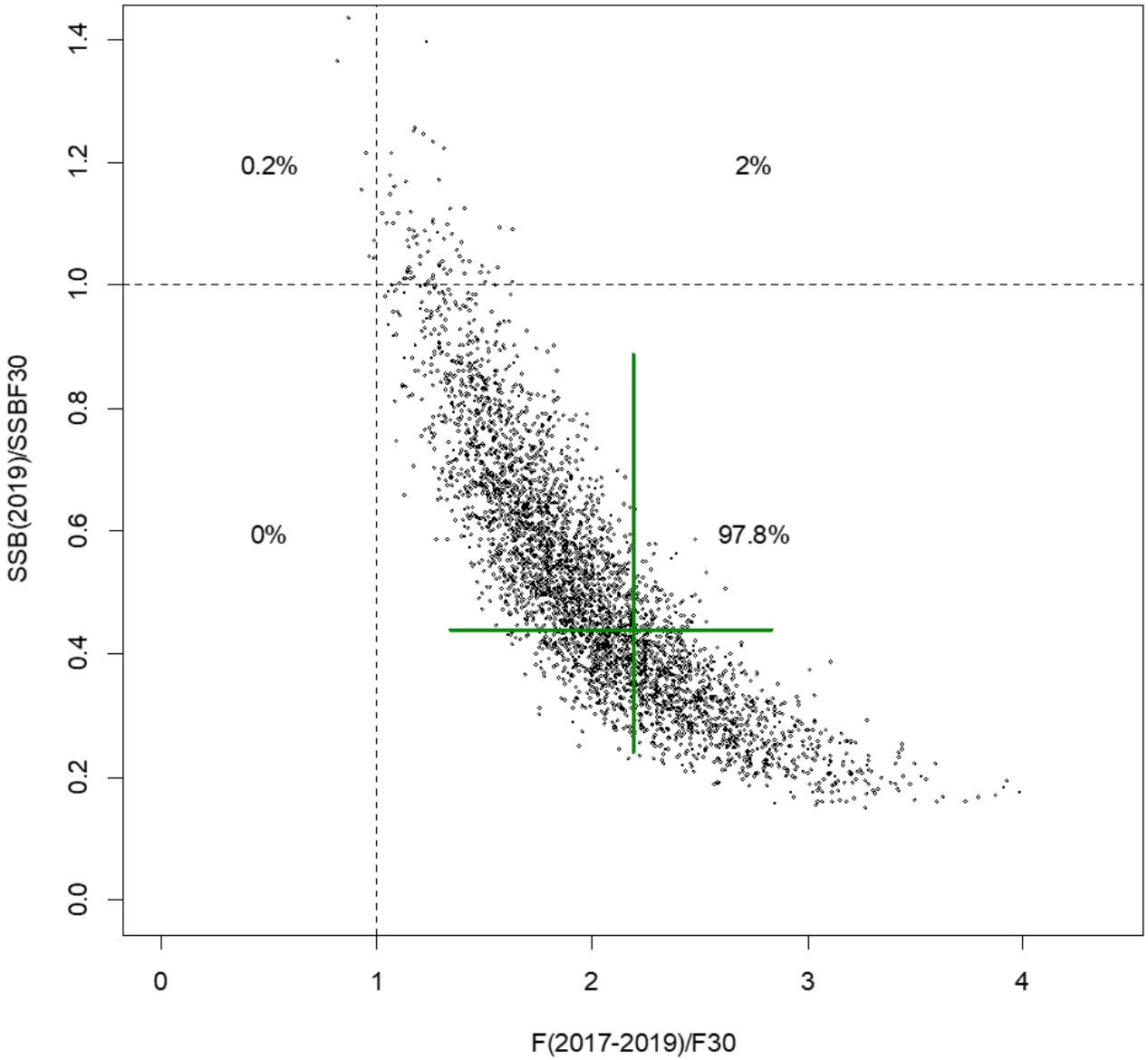
Results

Spawning stock



Results

Status uncertainty



Summary of assessment results

- SA red snapper are not yet rebuilt
- Overfishing continued through 2019
- Overfishing resulted primarily from recreational discards
- Estimated red snapper abundance has increased substantially in recent years, and is highest at the end of the time series
  - This result is driven by high, recent recruitment
- The age structure has filled out, but not yet to the level expected at F30%
- Natural mortality remains a key source of uncertainty in this assessment
  - Though stock status is robust to range used in this assessment

Forecasts

- Six scenarios identified by the SSC working group, 3 F scenarios X 2 recruitment scenarios
- F scenarios
  - $F=F_{30\%}$ (for OFL)
  - Frebuild with 0.500 probability (used previously)
  - Frebuild with 0.675 probability (SSC's P* control rule)
- Recruitment scenarios
  - Long-term average recruitment
  - Recent high recruitment
- These six scenarios are in the assessment report

Forecasts

- SSC requested 12 additional forecasts and information about methodology, to be reviewed later
- Key decision points
  - Is future recruitment most likely to follow recent trends or return to long-term average?
  - Expected use of descender devices? Still under consideration.
  - Probability of rebuilding equal to 0.5 or 0.675? Still under consideration.

Questions?

Extras

Management quantities

Quantity	Units	Estimate	Median	SE
$F_{30\%}$	y^{-1}	0.21	0.21	0.02
$85\%F_{30\%}$	y^{-1}	0.17	0.17	0.02
$75\%F_{30\%}$	y^{-1}	0.15	0.15	0.02
$65\%F_{30\%}$	y^{-1}	0.13	0.13	0.01
$F_{40\%}$	y^{-1}	0.15	0.15	0.02
$E_{F30\%}$	—	0.10	0.10	0.01
$B_{F30\%}$	metric tons	6530.71	6483.54	1475.32
$SSB_{F30\%}$	eggs (1E8)	635426.40	594630.20	233432.64
MSST	eggs (1E8)	476569.80	445972.60	175074.48
$L_{F30\%}$	1000 lb whole	404.70	407.78	99.69
$R_{F30\%}$	number fish	436868.50	439823.20	89925.13
$L_{85\%F30\%}$	1000 lb whole	404.85	407.88	98.99
$L_{75\%F30\%}$	1000 lb whole	398.97	401.84	97.18
$L_{65\%F30\%}$	1000 lb whole	386.75	389.45	93.96
$F_{2017-2019}/F_{30\%}$	—	2.20	1.95	0.45
$E_{2017-2019}/E_{F30\%}$	—	2.20	1.97	0.53
$SSB_{2019}/MSST$	—	0.59	0.66	0.27
$SSB_{2019}/SSB_{F30\%}$	—	0.44	0.49	0.20

SEDAR41

2.84

0.14

Discard Mortality

Fleet	Block 1	Block 2	Block 3	Block 4
cH	$0.48(0.38-0.58)$	$0.38(0.28-0.48)$	$0.36(0.26-0.46)$	$0.32(0.22-0.42)$
HB	$0.37(0.27-0.45)$	$0.26(0.18-0.34)$	$0.25(0.17-0.33)$	$0.22(0.14-0.30)$
GR	$0.37(0.27-0.45)$	$0.28(0.20-0.36)$	$0.26(0.18-0.34)$	$0.23(0.15-0.31)$

Block 1
- Recreational: pre-2011
- Commercial: pre-2007

Block 2 (circle hooks)
- Recreational: 2011-2016
- Commercial: 2007-2016

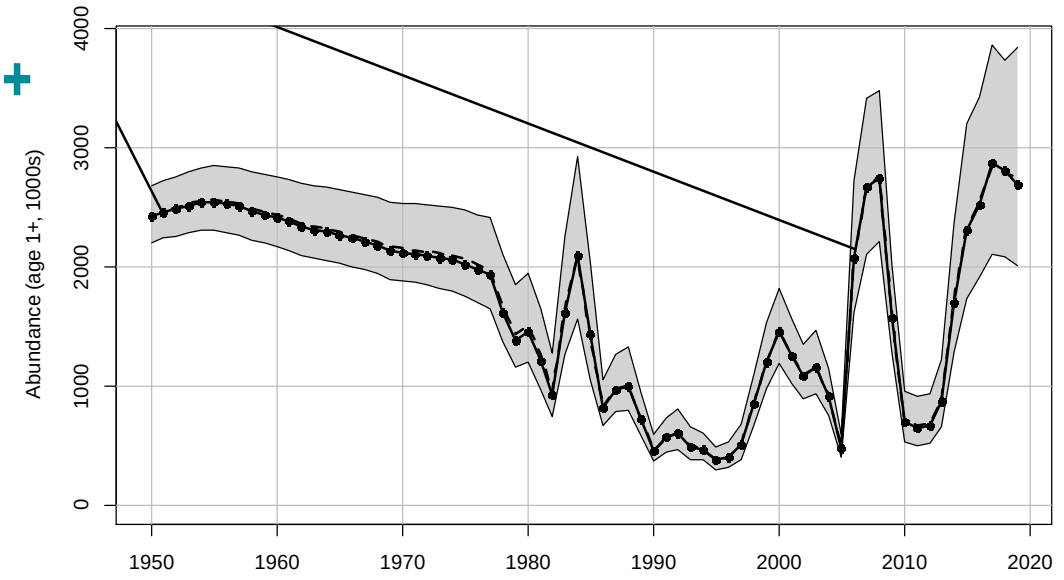
Block 3 (circle hooks + 25% descender device use)
- All fleets: 2017-2020

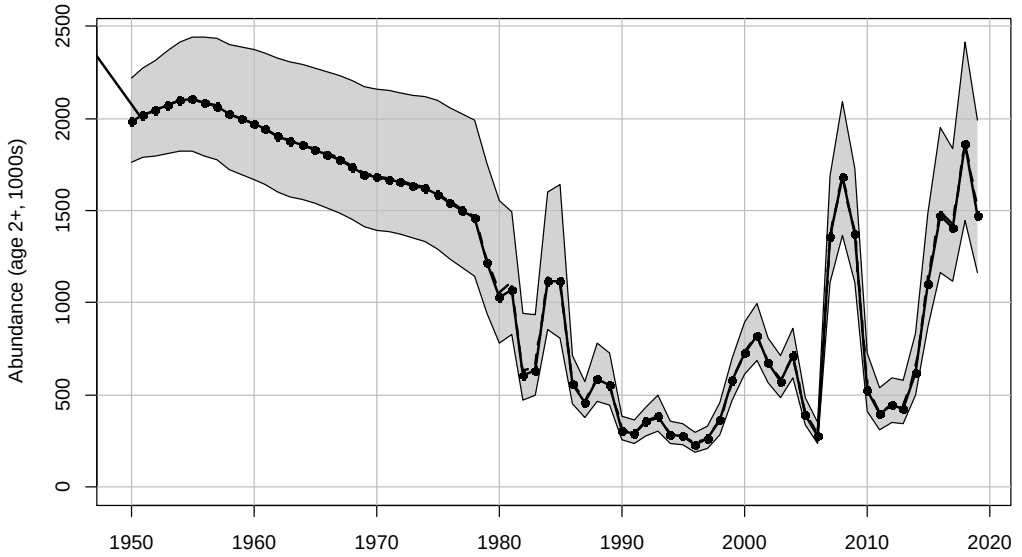
Block 4 (circle hooks + 75% descender device use)
- All fleets: post-2020 (forecasts)

➢ Reductions in Blocks 3 and 4 based on Vecchio et al. (S73-WP15)

Results

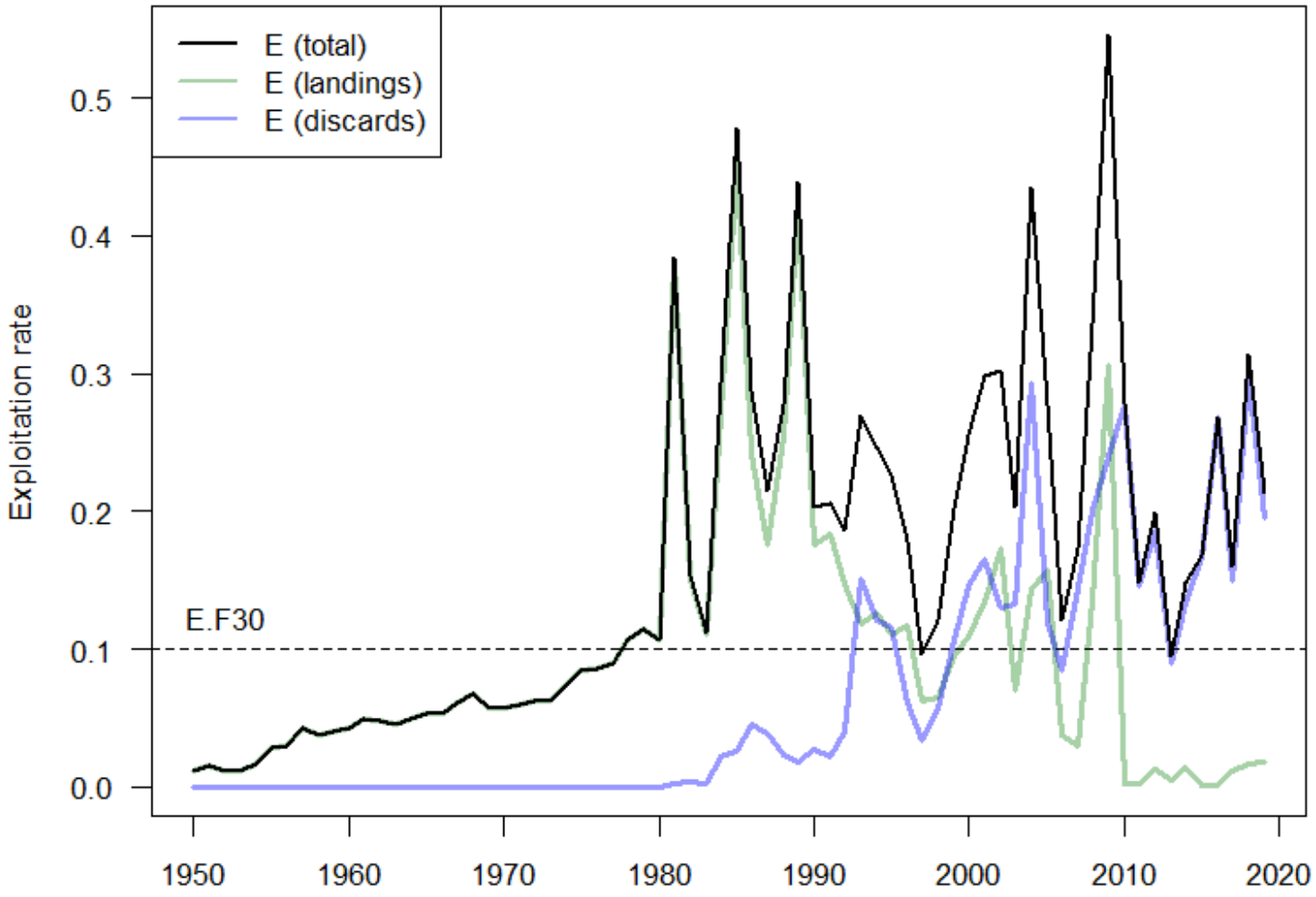
Total abundance of ages 1+ and 2+





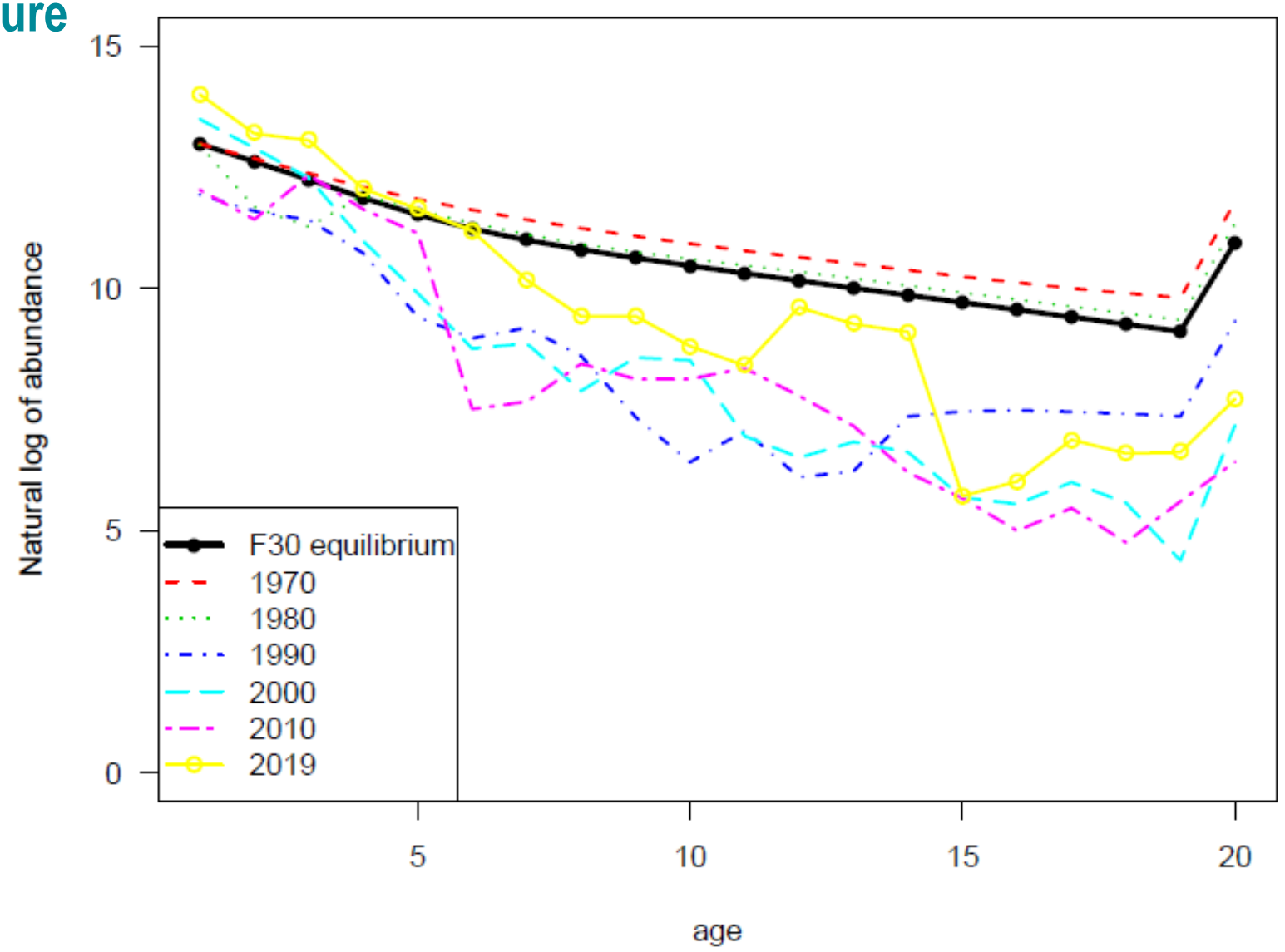
Results

Exploitation rate

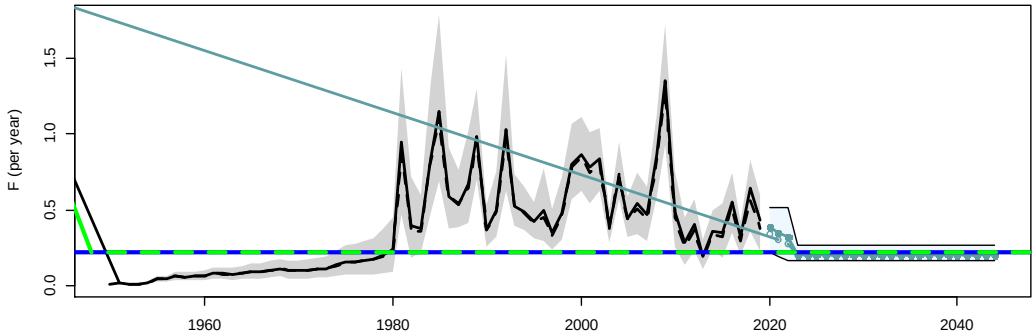


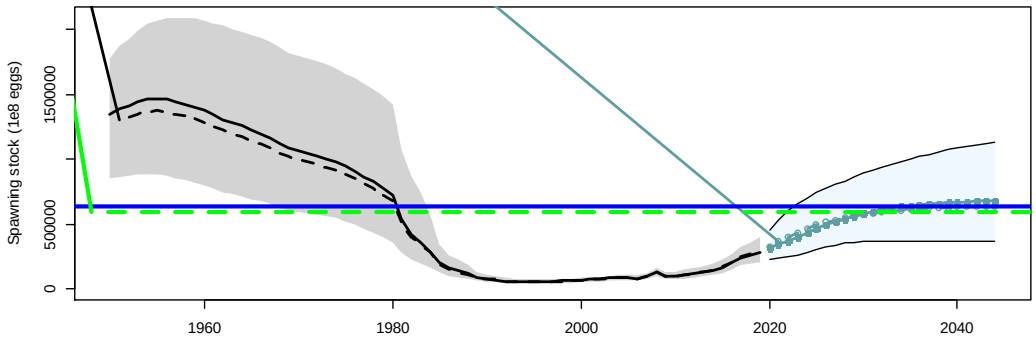
Results

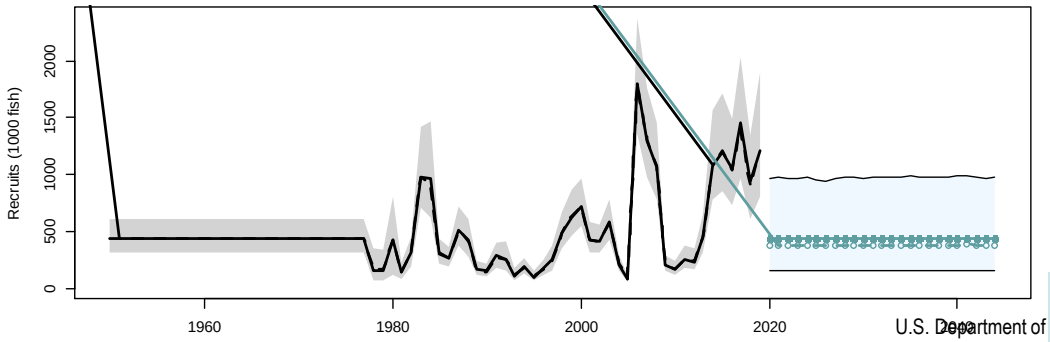
Age structure

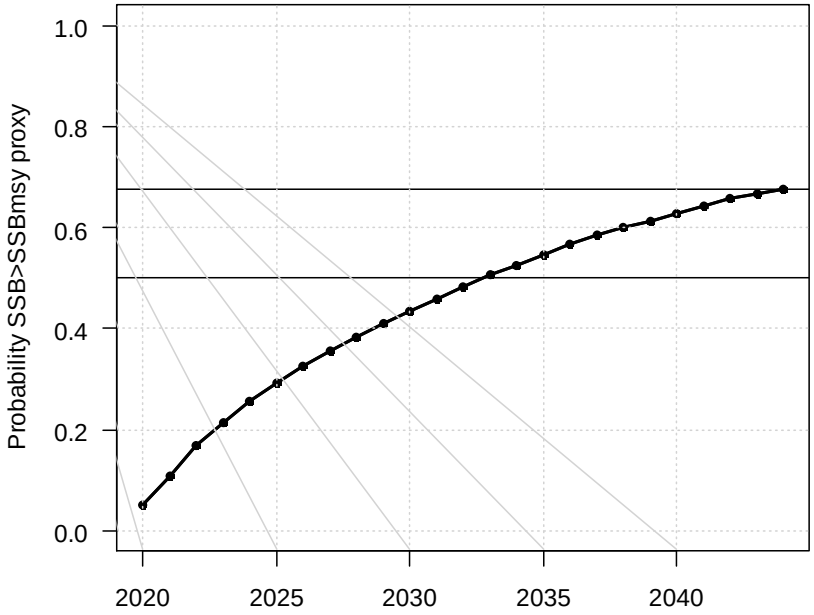


Example forecast (Frebuild with 0.675 prob and mean recruitment)

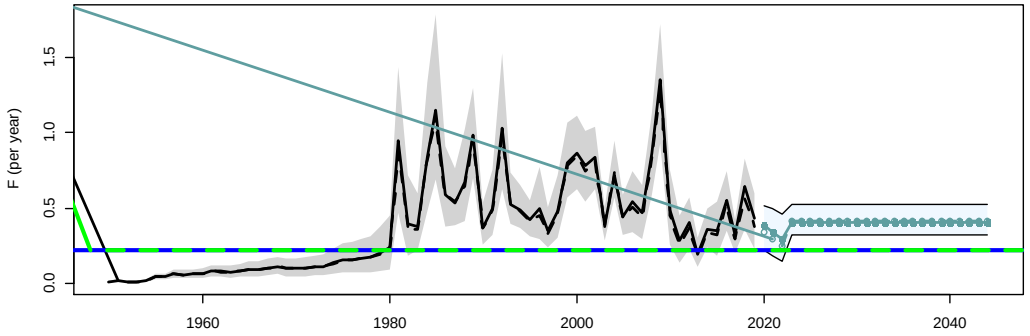


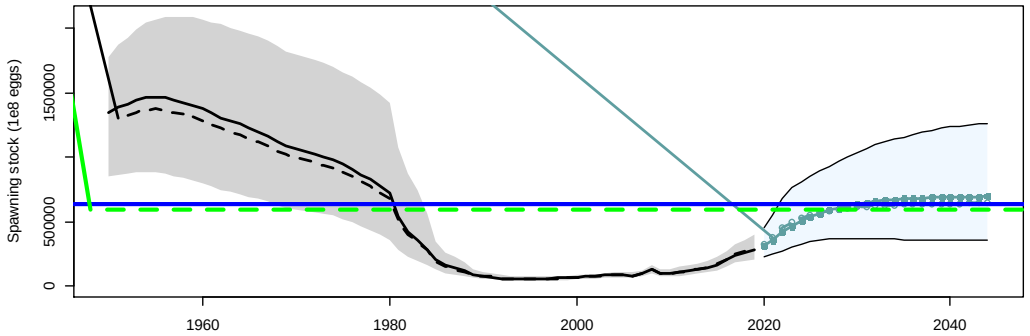


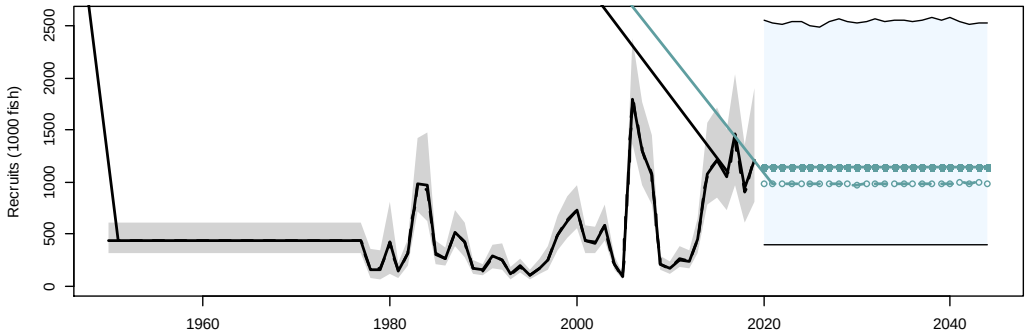




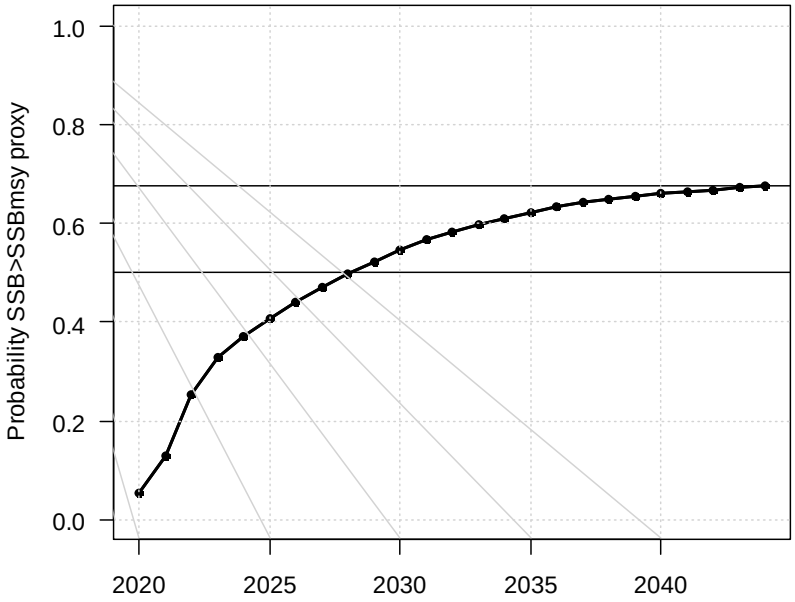
Example forecast (Frebuild with 0.675 prob and high recruitment)







Note, overfishing. Is this acceptable in the short-term?



Comparison to SEDAR41