SEDAR 89

South Atlantic Golden Tilefish Stock Assessment

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Background

- Previous assessment SEDAR 66 completed in February 2021
  - Terminal year of 2018
  - Not overfished and not undergoing overfishing

- Held topical working groups on January 24 and February 14 , 2024
- Data submitted April 5th with working papers by April 19th
- Assessment completed and report written July 31st

Terms of Reference Topical Working Group

- Review and explore the potential utility and incorporation of new life history information, including:
  I. Data collected from expanded SCDNR SBLL survey, new cooperative SADLS survey, and SCDNR CRP pilot study (abundance, life history, etc). Examine spatial differences.
  II. Evidence for hermaphroditism in the South Atlantic (specifically the interpretation and applicability of analyses conducted in Gulf of Mexico by Lombardi-Carlson (2012)).
  III. Evidence for age or size dependence of spawning frequency and spawning season duration.
  IV. Genetic evidence of connectivity between northern and southern stocks (McDowell, VIMS).
  V. Evidence for potential northward range shift.

TOR TWG 1 – Incorporate SADLS

- SSC review of South Atlantic Deepwater Longline Survey determined 5 years of data are need to be incorporated into an assessment
- Only 3 years of data were available
  - Many changes after first year of survey implementation
- Ultimately SADLS was not used

TOR TWG 2 – Hermaphroditism

- No disparity in age frequency of sexes
- No ovarian lumen males and no testicular remnants in females
- 1% of males had previtellogenic oocytes
  - No evidence of functionality
  - Weakest indication of hermaphroditism
  - Common causes that may produce this
- Lack of transitional individuals from both sexes in all months of year
- Do not meet any of 4 criteria to be classified as hermaphroditic

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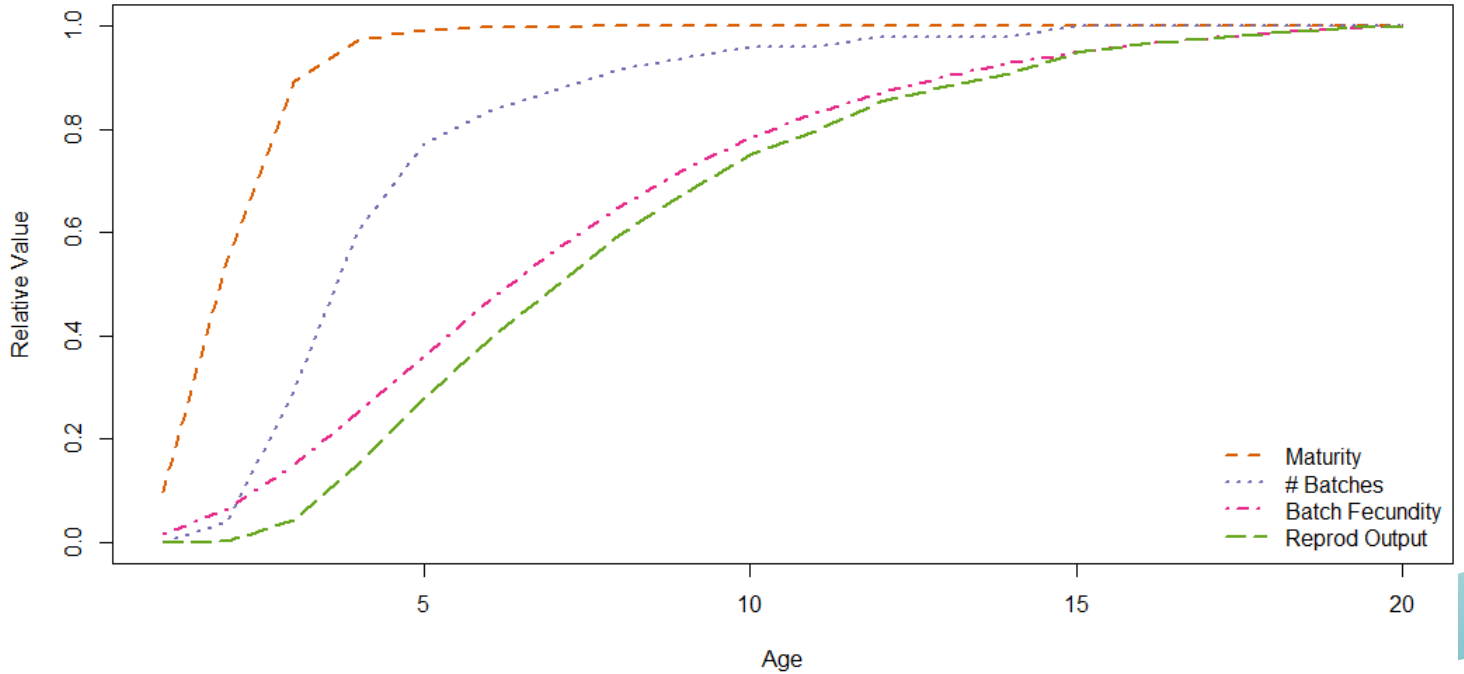
TOR TWG 3 – Spawning Capacity at Age

- Fit maturity at length logit model
- Fit log(batch fecundity) at log(length) model
- Fit plateau model to spawning indicators by length and day
  - Provides spawning frequency at length and peak spawning date



TOR TWG 4 & 5 – Connectivity & Range Shift

- No sufficient data to characterize genetic structure
- Tagging study suggests limited movement of adults
  - Within 2 km after up to 1.6 years at large
- Stock structure analysis had limited samples for South Atlantic with conflicting evidence between meristics and electrophoresis gels
- Would need a historical base line of stock composition and current
- South Atlantic waters are within middle of range of tilefish
  - Nova Scotia to Surinam
- Commercial fishermen suggest no change in extent of population

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Assessment Model

- Applied Beaufort Assessment Model (BAM) with most up to date formulation
  - Numerous updates to model input parameters and data sources
  - Incorporation of ageing error matrix
  - Reproductive output at age used to calculate SSB
  - Uncertainty in a biological inputs used in MCBE
- Assessment time frame 1972 – 2022
- Estimated steepness provides MSY reference points

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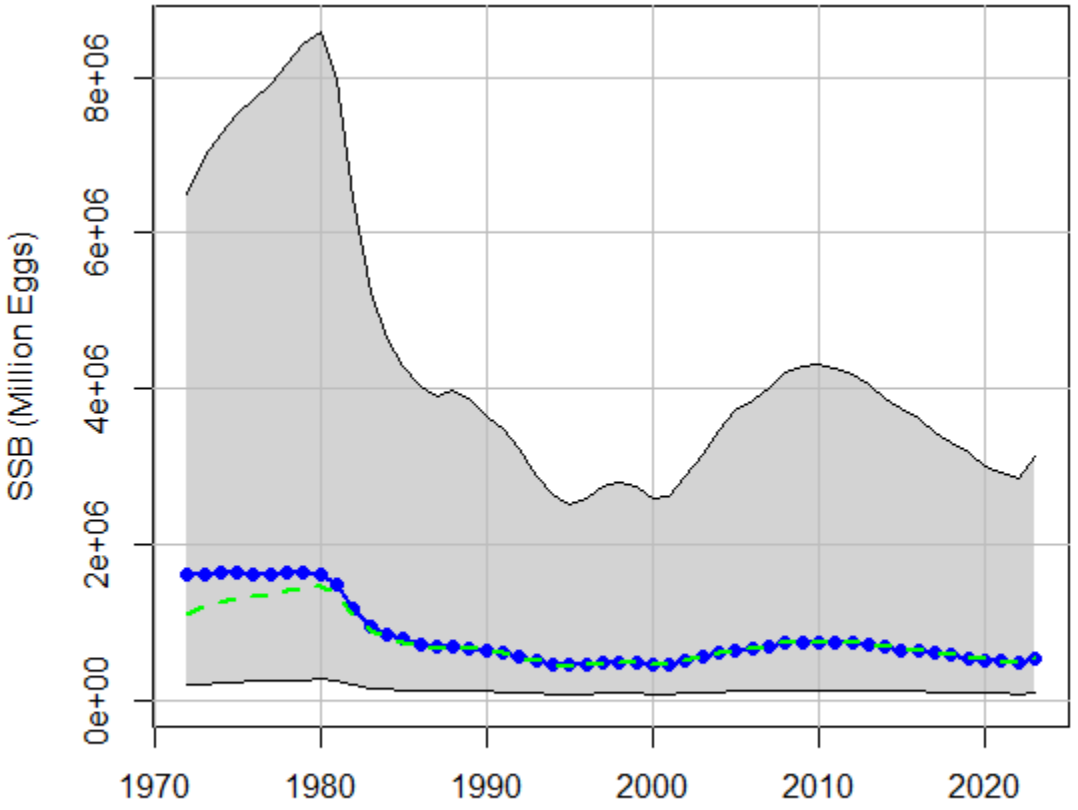
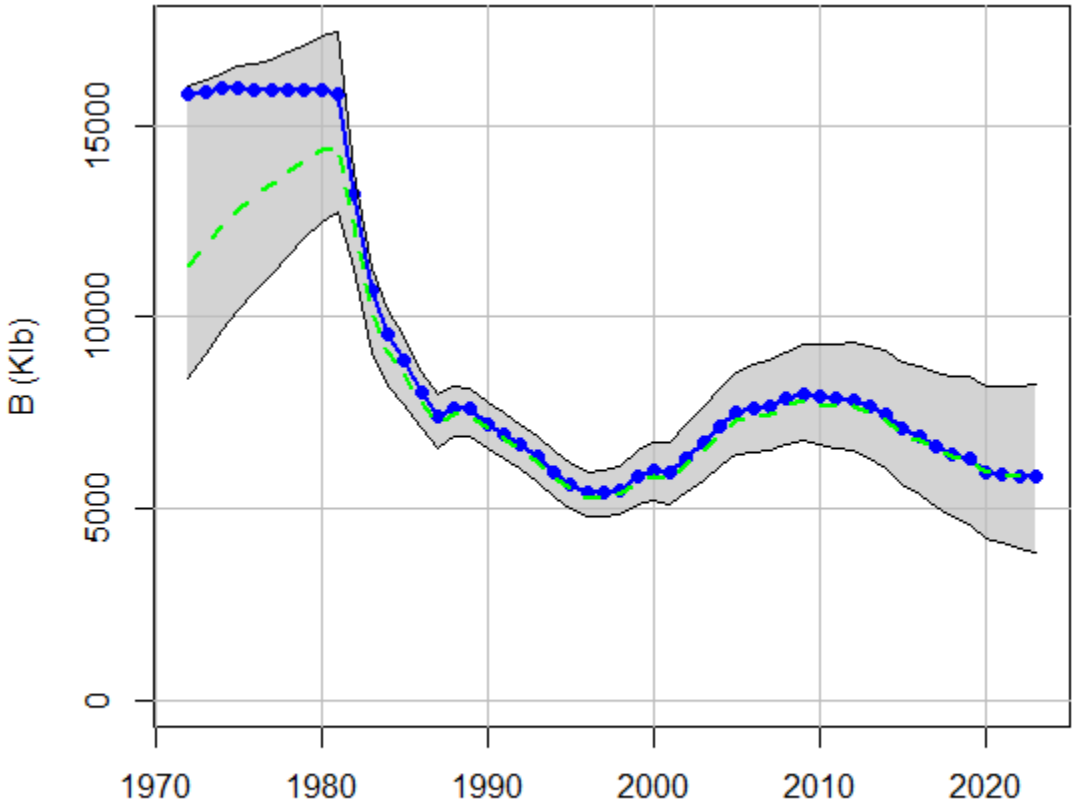
Biomass trends





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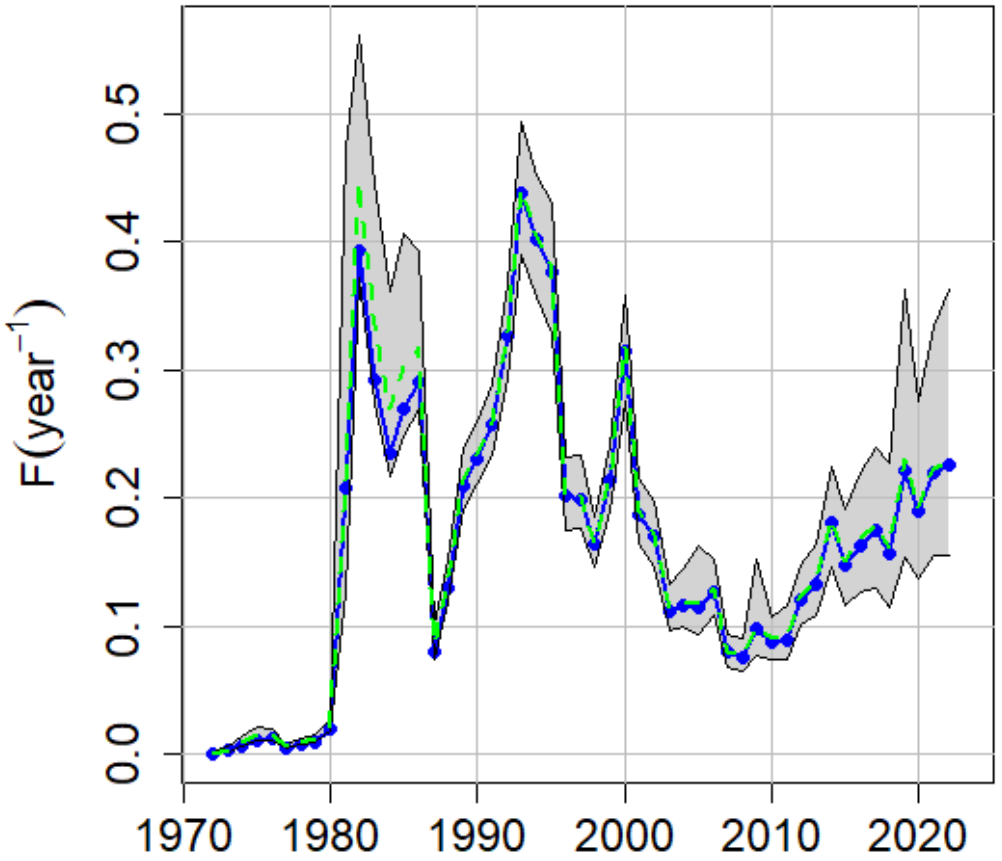
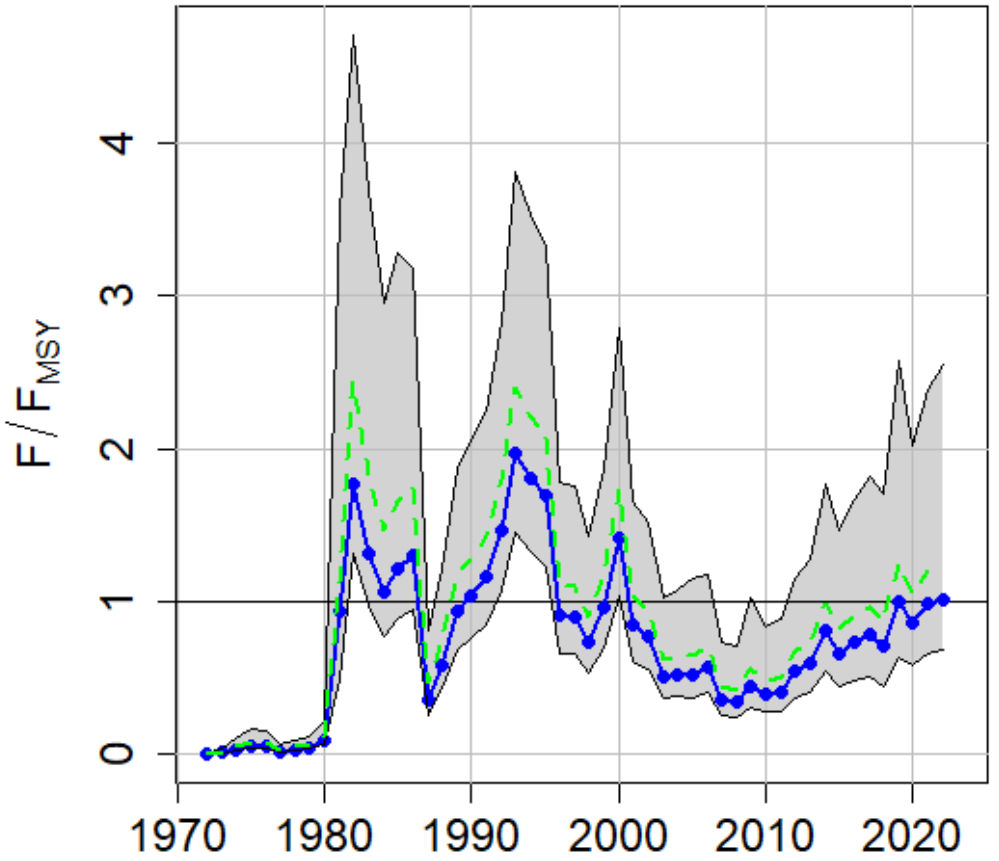
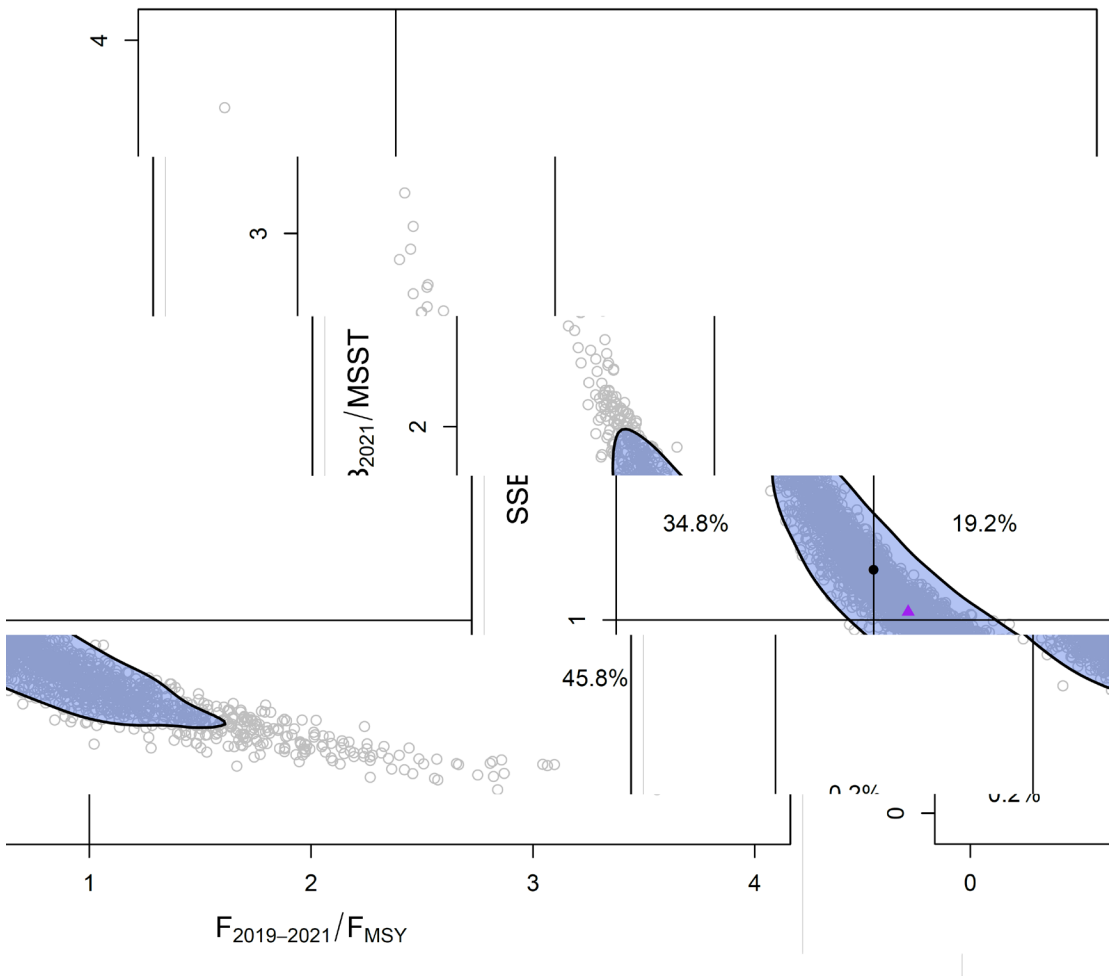
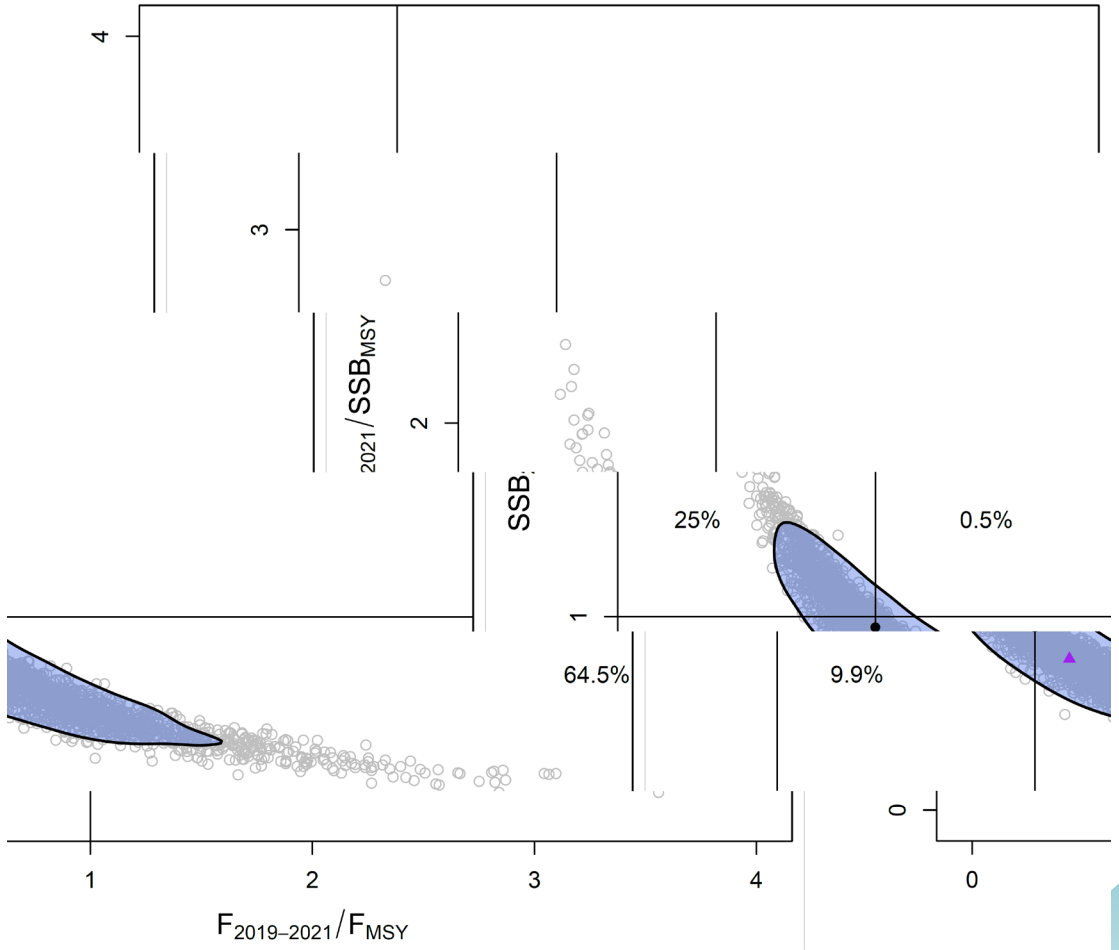
Fishing Mortality





Status Indicators





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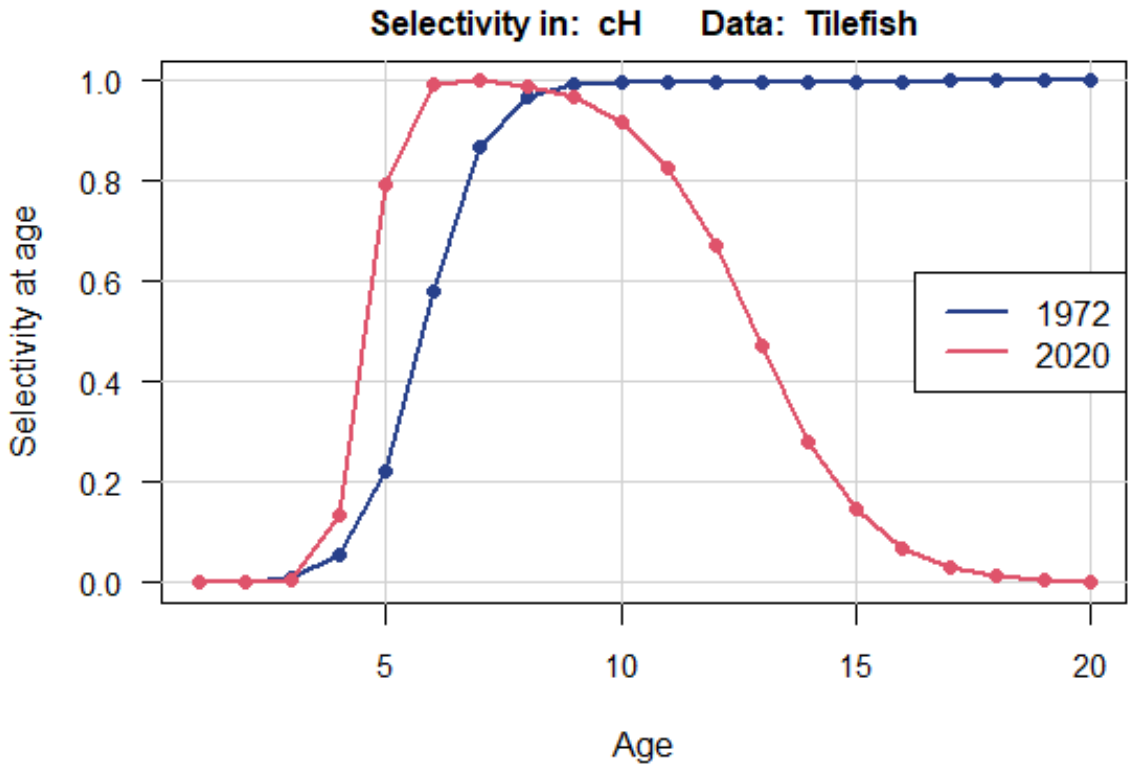
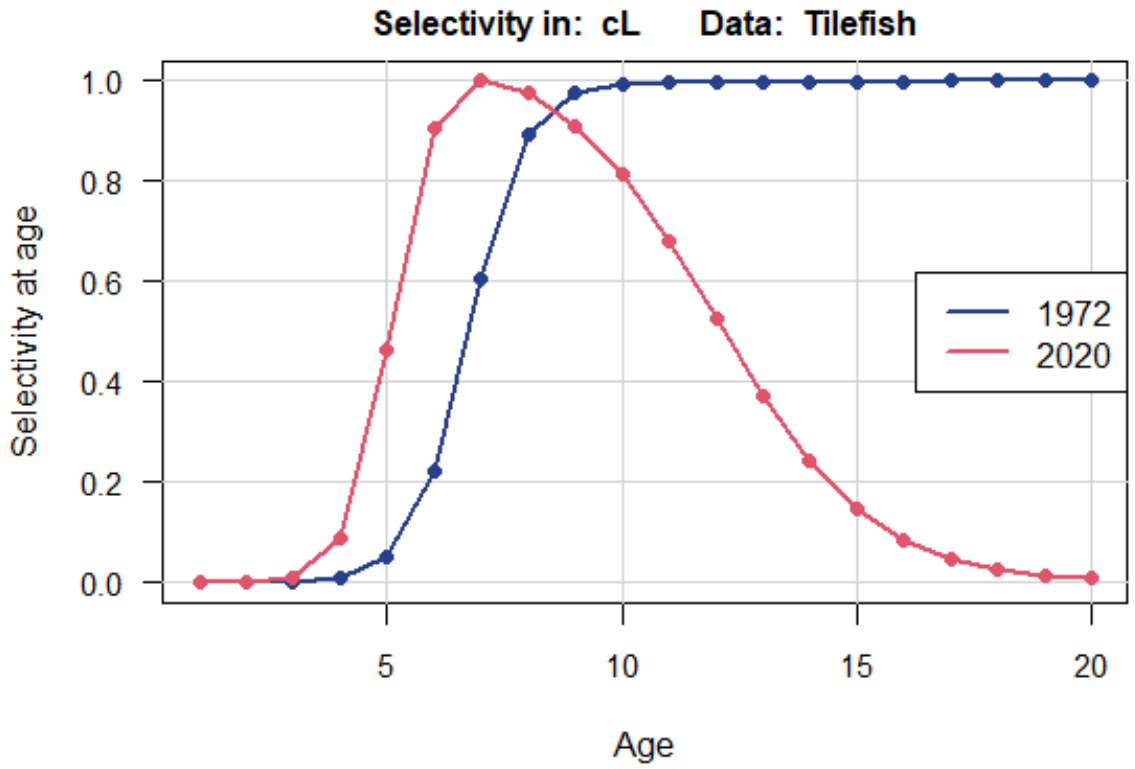
Selectivity





Management Quantities

Quantity	Units	Estimate	Median	SE
F_{MSY}	y^{-1}	0.22	0.18	0.06
$75\%F_{\text{MSY}}$	y^{-1}	0.16	0.14	0.04
B_{MSY}	1000 lb whole	6191.07	7263.71	2446.69
SSB_{MSY}	Trillions of Eggs	0.514	0.651	1.738
MSST	Trillions of Eggs	0.385	0.488	1.304
MSY	1000 lb gutted	545.08	564.30	70.90
$L_{75\%\text{MSY}}$	1000 lb gutted	524.22	540.50	68.97
L_{current}	1000 lb gutted	531.56	530.24	19.54
R_{MSY}	millions fish	0.05	0.05	0.01
$F_{2020-2022}/F_{\text{MSY}}$	—	1.00	1.16	0.52
$\text{SSB}_{2022}/\text{MSST}$	—	1.26	1.04	0.42
$\text{SSB}_{2022}/\text{SSB}_{\text{MSY}}$	—	0.95	0.78	0.32

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Summary of Assessment Results

- Stock is not overfished (SSB_{2022} > MSST)
  - Stock is below SSB_{MSY}
- Stock is fully exploited ($F_{2020\text{-}2022} = F_{MSY}$)
  - $F_{2022} > F_{MSY}$
- Both F and B status are very close to the threshold limits
- Median of MCBE suggests overfishing and 46% MCBE below MSST
  - Uncertainty primarily from estimated steepness and fixed F_{init}
- Projections and reference points based on domed selectivity
  - Logistic selectivity would have ~10% lower MSY
  - Projections assume domed selectivity remains in the future (i.e., doesn't catch the oldest fish in the population)

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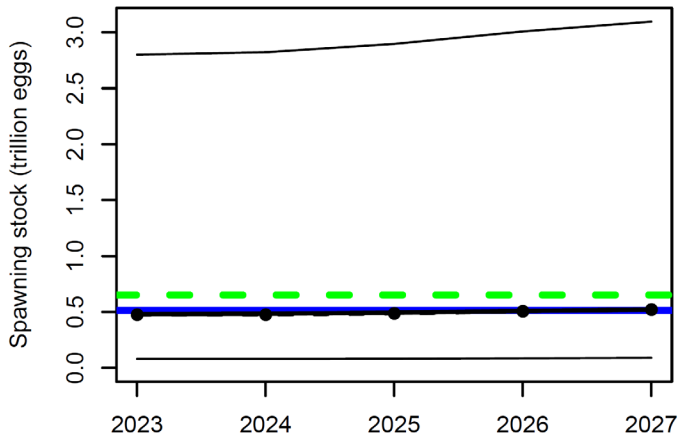
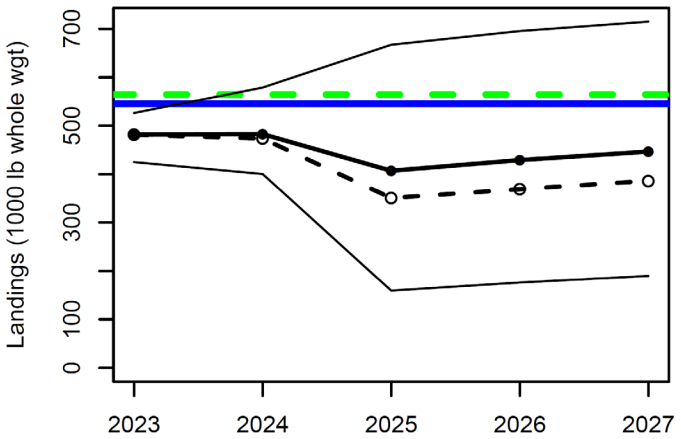
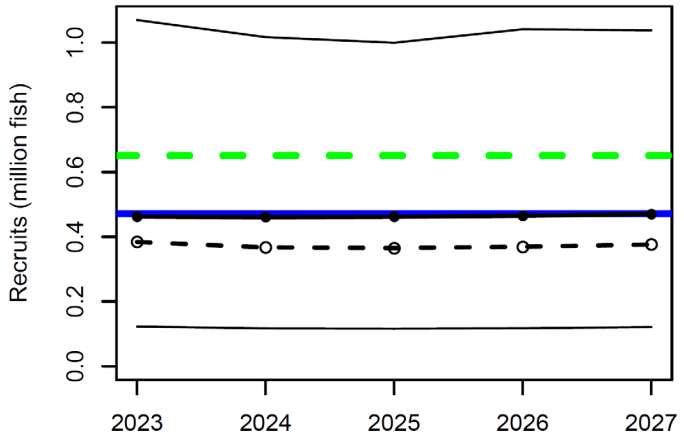
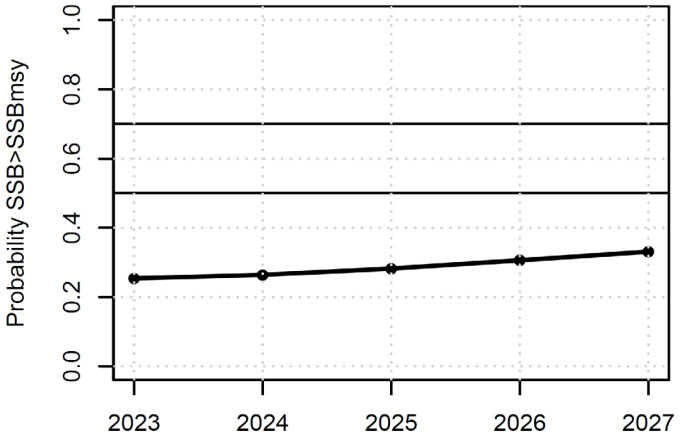
Projection P*=30%

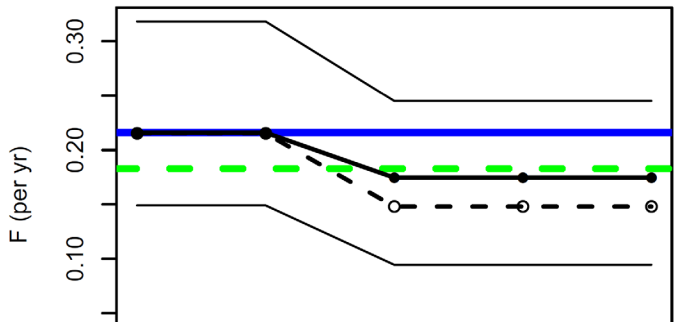
Year	Landings (klb)	Landings(1000s)
2023	482	70
2024	483	72
2025	407	61
2026	429	64
2027	447	67

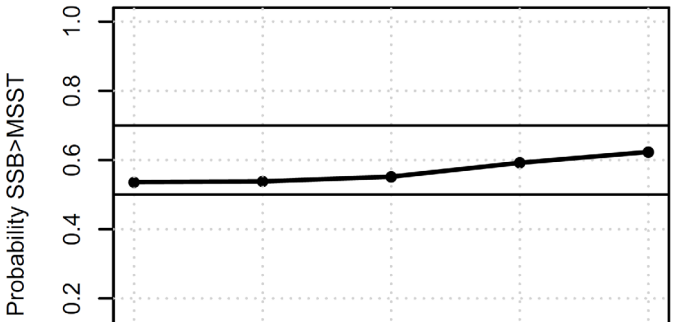












Questions?

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