

**Redfish (*Sebastes mentella* and *Sebastes fasciatus*) in Division 3M**











Advice June 2024 for 2025-2026

**Recommendation for 2025 and 2026**

Given the life history of this stock, considering that the current  $F$  levels are below  $F_{0.1}$ , and to try to maintain the stock around the long-term average, Scientific Council advises that catches do not exceed the  $F$  corresponding to the current TAC (17 503 t in 2025 and 15 636 t in 2026).

**Management objectives**

No explicit management plan or management objectives defined by the Commission. General principles from the *Convention on Cooperation in the Northwest Atlantic Fisheries* are applied.

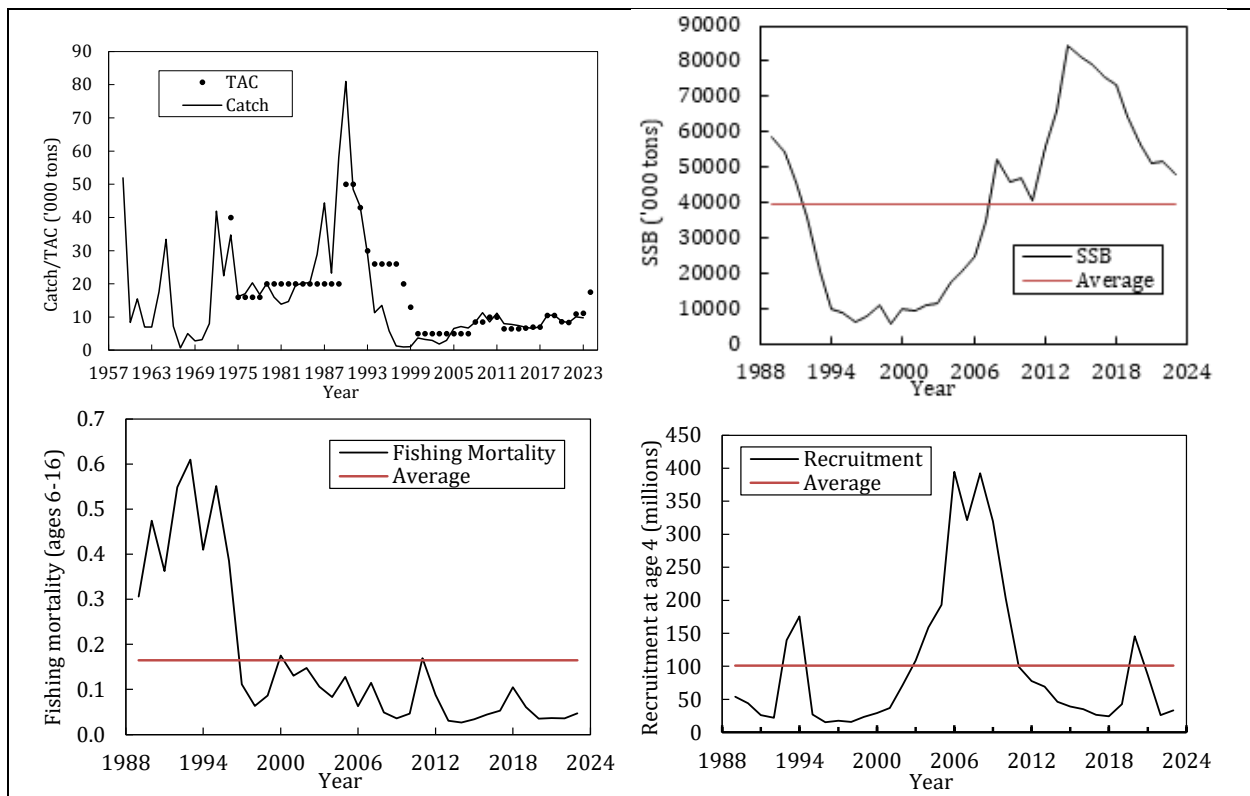
Convention Principle	Status	Comment	
Restore to or maintain at Bmsy		Bmsy and Blim undefined, B above the time series average	 OK
Eliminate Overfishing (Stock)		Flim undefined, F is low	 Intermediate
Eliminate Overfishing (Ecosystem)		Total EPU catches < 2TCI	 Not accomplished
Apply Precautionary Approach		No reference points defined	 Unknown
Minimize harmful impacts on living marine resources and ecosystems		Directed fishery, VME closures in effect, Effectiveness of bycatch regulations uncertain	
Preserve marine biodiversity		Cannot be evaluated	

**Management unit**

Catches of redfish in Division 3M include three species of the genus *Sebastes*; *S. mentella*, *S. norvegicus* (= *S. marinus*) and *S. fasciatus*. For management purposes, they are considered as one stock. The assessment and advice are based on data for only two species (*S. mentella* & *S. fasciatus*), labeled as beaked redfish. The TAC advice is adjusted to reflect all three species on the Flemish Cap, based upon the relative species distribution in recent surveys.

**Stock status**

SSB has declined since 2014, but in 2023 is still well above the long-term mean. After an extended period of declining recruitment, the recruitment estimates for 2020 and 2021 are above or at the mean, while the 2022 and 2023 values are low. Fishing mortality remains relatively low compared to the 1980s and 1990s.



**Reference points**

No reference points have been adopted.

**Projections**

Short term (2025-2027) stochastic projections were carried out for spawning stock biomass (SSB) and catch, under most recent level of natural mortality and considering seven options for fishing mortality and catch levels ( $F_0$ ,  $F_{0.1}$ ,  $F=M$ ,  $F_{statusquo}$ , 1.25 TAC, TAC and 0.75 TAC). Projections assume that redfish catches (all species) in 2024 are equal to the redfish TAC. Recruitment in 2024 was given by the geometric mean of the most recent recruitments (age 4 XSA, 2021-2023) and randomly resampled with residuals from the geometric mean for 2025 and 2026.

The potential yields estimated in the projections are lower than seen in the 2023 assessment, because of the retrospective pattern in the last assessment. With the exception of the  $F=0$  scenario, in all projection scenarios the SSB is projected to decline, and to be at around the average for the assessment time-series (since the late 1980s) by 2027.



**F=0**

Year	SSB Median and 80% CI	Yield	TAC
2024 <sub>deterministic</sub>	52117	17503	17503
2025	47961 ( 42714 - 56635 )	0	0
2026	48861 ( 43686 - 57065 )	0	0
2027	49353 ( 44212 - 57395 )		

**F<sub>0.1</sub>=0.0675**

Year	SSB Median and 80% CI	Yield	TAC
2024 <sub>deterministic</sub>	52117	17503	17503
2025	47961 ( 42714 - 56635 )	20498	21521
2026	42764 ( 38347 - 49877 )	17831	18721
2027	38223 ( 34332 - 44124 )		

**F=M=0.1**

Year	SSB Median and 80% CI	Yield	TAC
2024 <sub>deterministic</sub>	52117	17503	17503
2025	47961 ( 42714 - 56635 )	29379	30846
2026	40154 ( 36071 - 46724 )	24021	25220
2027	33951 ( 30549 - 39038 )		

**F<sub>sq</sub> = 0.0585**

Year	SSB Median and 80% CI	Yield	TAC
2024 <sub>deterministic</sub>	52117	17503	17503
2025	47961 ( 42714 - 56635 )	17917	18811
2026	43531 ( 39018 - 50785 )	15872	16664
2027	39509 ( 35470 - 45624 )		

**1.25 TAC (F= 0.068708)**

Year	SSB Median and 80% CI	Yield	TAC
2024 <sub>deterministic</sub>	52117	17503	17503
2025	47961 ( 42714 - 56635 )	20839	21879
2026	42663 ( 38259 - 49752 )	18088	18990
2027	38056 ( 34176 - 43937 )		

**TAC (F= 0.05416)**

Year	SSB Median and 80% CI	Yield	TAC
2024 <sub>deterministic</sub>	52117	17503	17503
2025	47961 ( 42714 - 56635 )	16671	17503
2026	43888 ( 39345 - 51229 )	14893	15636
2027	40160 ( 36040 - 46393 )		

**0.75 TAC (F=0.040047)**

Year	SSB Median and 80% CI	Yield	TAC
2024 <sub>deterministic</sub>	52117	17503	17503
2025	47961 ( 42714 - 56635 )	12503	13127
2026	45119 ( 40452 - 52695 )	11486	12060
2027	42344 ( 37976 - 49021 )		

average beaked redfish proportion in the 2021-2023 3M redfish catch

0.952

	F=0	F <sub>0.1</sub>	F=M	F <sub>sq</sub>	1.25 TAC	TAC	0.75 TAC
P(SSB <sub>2025</sub> >SSB <sub>2024</sub> )	>10%	>10%	>10%	>10%	>10%	>10%	>10%
P(SSB <sub>2026</sub> >SSB <sub>2024</sub> )	>10%	<10%	<10%	<10%	<10%	<10%	>10%
P(SSB <sub>2027</sub> >SSB <sub>2024</sub> )	>10%	<10%	<10%	<10%	<10%	<10%	<10%



## Assessment

Input data comes from the EU Flemish Cap bottom trawl survey and the fishery. A quantitative model (XSA) introduced in 2003 was used. Increased natural mortality was assumed from 2006 to 2010, but natural mortality was low (more typical of redfish) in other years. There is no evidence that natural mortality has increased recently from the level of 0.1 adopted in the 2017 assessment, and therefore the 2023 XSA assessment was run with average M from 2015 onwards fixed at 0.1.

The next full assessment of this stock will be in 2026.

### *Human impact*

Mainly fishery related mortality. Other sources (e.g., pollution, shipping, oil-industry) are undocumented.

### *Biology and Environmental Interactions*

Shrimp and cod are important prey and predator of redfish. There are strong trophic interactions between these species in the Flemish Cap.

The Flemish Cap (3M) Ecosystem Production Unit (EPU), with the exception of a short-lived increase in 2005-2009, has shown a fairly stable total biomass over time despite the changes in individual stocks. This indicates no major changes in overall ecosystem productivity

## Ecosystem sustainability of catches

3M redfish is included in the piscivores guild of the Flemish Cap (3M) Ecosystem Production Unit (EPU). Other NAFO managed stocks in this guild and EPU are 3M cod and 2+3KLMNOPs Greenland halibut. The Catch/TCI for 2023 was below the 2TCI ecosystem reference point (3M Piscivore Catch<sub>2023</sub>/TCI=1.12).

The impact of bottom fishing activities on VMEs in the NRA was last assessed in 2021. The risk of Significant Adverse Impacts (SAIs) on sponge and large gorgonian VMEs was assessed to be low, while this risk for sea pen VMEs has been assessed as intermediate. The risks of SAIs on small gorgonian, black coral, bryozoan and sea squirt VMEs were assessed as high. A number of areas in the Flemish Cap (3M) EPU have been closed to bottom fishing to protect VMEs.

## Fishery

Redfish is caught in directed bottom trawl fisheries at intermediate depths (300-700m), but also as bycatch in fisheries directed for cod and Greenland halibut. The fishery in NAFO Division 3M is regulated by minimum mesh size and quota.

Recent catch estimates and TACs ('000 t) are as follows:

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
TAC	6.7	7.0	7.0	10.5	10.5	8.6	8.4	10.9	11.2	17.5
STATLANT 21 <sup>1</sup>	6.9	6.6	7.1	10.5	10.5	8.6	8.6	NA <sup>3</sup>	NA <sup>3</sup>	
STACFIS Total catch <sup>1</sup>	6.9	6.6	7.1	10.5	10.6	8.8	8.3	10.0	9.7	
STACFIS Catch <sup>2</sup>	5.2	6.2	6.9	10.3	10.2	8.7	8.3	9.4	9.4	

<sup>1</sup> TAC, STATLANT 21 and STACFIS Total catch refer to all three redfish species combined.

<sup>2</sup> STACFIS beaked redfish catch estimate, based on beaked redfish proportions on observed catch.

<sup>3</sup> NA - In 2022-2023, STATLANT 21 information is incomplete.

## Sources of information

SCR Doc. 24/005, 024, 23/003, 040; SCS Doc. 24/08, 11, 23/06, 13.