



17. september 2023

J.nr. 20.00-11

## Sammendrag af rådgivning for 2024 om fiskeri på rejebestandene ved Vest- og Østgrønland

Dette sammendrag beskriver kort ændringer i forhold til sidste års rådgivning og præsenterer de anbefalede fangstmængder fra NAFO. Anbefalingerne uddybes i Appendiks.

Den anbefalede fangst af rejer ved Vestgrønland i 2024 er på 95.000 tons, hvilket er en nedgang på 15.000 t i forhold til 2023. Den anbefalede fangst af rejer ved Østgrønland i 2024 er på 2.500 tons, hvilket er en fremgang på 500 tons i forhold til 2023.

### Rådgivning om rejer for 2024

#### Vestgrønland

95.000 tons.

Rådgivning for 2023: 110.000 tons.

Total fangst forventet i 2023: ca. 110.000 tons.

#### Østgrønland

2.500 tons.

Rådgivning for 2023: 2.000 tons.

Total fangst forventet i 2023: < 6.000 tons.

Den officielle rådgivning, som Departementet for Fiskeri modtager en kopi af, vil være tilgængelig på NAFOs hjemmeside ([www.nafo.int](http://www.nafo.int)) senere på året. Dette gælder også de af Grønlands Naturinstitut udarbejdede baggrundsdokumenter til rådgivningen. Hvis der ønskes yderligere dokumentation, står Naturinstituttet naturligvis til rådighed.

Grønlands Naturinstitut vil snarest invitere repræsentanter fra forvaltningen og erhvervet til en grundig gennemgang af baggrunden for rådgivningen, herunder besvarelse af spørgsmål og udveksling af viden.

Med venlig hilsen

Helle Siegstad  
Afdelingschef

## Rejer i Vestgrønland

NAFO rådgiver, at fangsterne i 2024 ikke bør overstige 95.000 tons, hvilket er 15.000 mindre end rådgivningen for 2023.

### Om rådgivningen

Det rådgivne fangstniveau ved *Vestgrønland* er fastsat med udgangspunkt i, at årets bestandsvurdering viser, at *rejebestanden er stabil*, men at *fangstraterne har været faldende*, samtidig med at der over de seneste år er kommet *flere torsk*, som forventes at spise flere rejer. Dette medfører en risiko på 50 % for at overskride den optimale dødelighed i indeværende år.

I 2023 har den havgående trawlerflåde frem til slutningen af juli været udfordret af havisen i Vestgrønland (den kystnære flåde har ikke været påvirket). Isen har også været en udfordring for Grønlands Naturinstituts trawlundersøgelser, og nogle områder er derfor ikke dækket af 2023-surveyet. På grund af manglen på surveydata er der i rådgivningen for disse områder anvendt et gennemsnit af de sidste 5 års data, og rådgivningen for 2024 er derfor behæftet med større usikkerhed end sædvanligt.

Modellen, der beregner udviklingen i bestanden, anvender som i tidligere år rejefiskeriets *fangster* (Figur 1), *rejebiomassen* beregnet ud fra de biologiske undersøgelser, fiskeriets *fangstrater* og *biomassen af de torsk*, der spiser rejer. Der er beregnet en maksimal biomasse i 2004 og herefter et fald frem til 2014. Siden 2017 har biomassen været stabil og er i slutningen af 2024 beregnet til at være over den biomasse, der kan sikre et optimalt, bæredygtigt udbytte af rejebestanden (Figur 2).

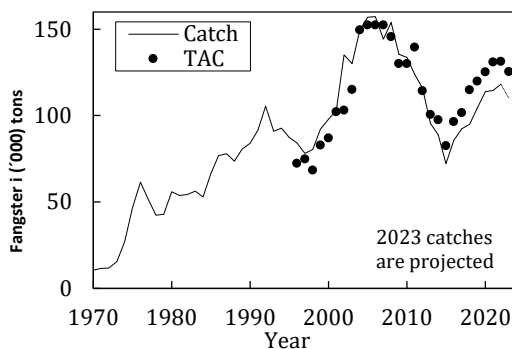
Antallet af 2-årige rejer, der forventes at komme ind i fiskeriet inden for de næste 3 år, ligger i 2023 på gennemsnittet for tidsserien (Figur 4).

Den totale dødelighed (Figur 3) falder i perioden efter 2014 kortvarigt, men stiger igen frem til 2023 til et niveau tæt på  $Z_{msy}$ .

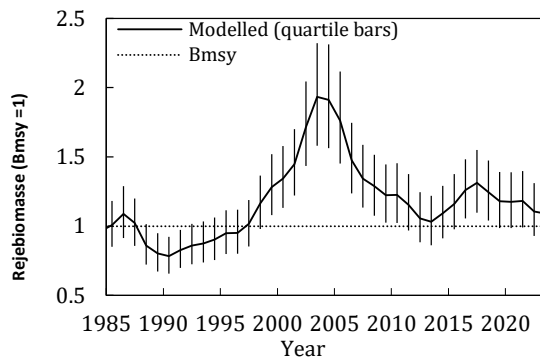
Table 1. Totale landinger (tons) af rejer i Vestgrønland og Canada fra 2014 til 2023

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
NIPAG	88 765	72 256	85 527	92 584	94 878	104 314	113 758	114 569	118 127	110 000 <sup>2</sup>

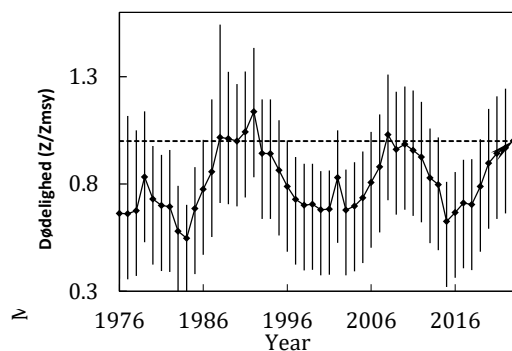
<sup>1</sup> forventet



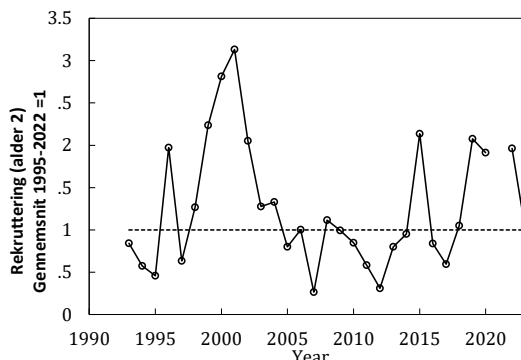
Figur 1. Samlede fangster (1970-2023)



Figur 2. Biomasse af rejer (fra model; 1970-2023)



Figur 3. Total dødelighed (fiskeri og torsk prædation (1970-2023))



Figur 4. Rekruttering (alder 2; 1970-2023)

## Appendiks

Det videnskabelige råd har med udgangspunkt i de af Naalakkersuisut fastsatte forvaltningskriterier for reje-fiskeriet i Vestgrønland vurderet, at et fiskeri på 95.000 t i 2024 vil sikre en bæredygtig udnyttelse af bestanden. Det betyder, at risikoen for at overskride en dødelighed, hvor fiskeriet ikke længere er bæredygtigt, ( $Z_{msy}$ ), holder sig inden for 35 %, og risikoen for, at biomassen kommer under det laveste niveau ( $B_{lim}$ ), er lav.

### Rejer i Østgrønland

NAFO rådgiver, at fangsterne i 2024 ikke bør overstige 2.500 tons, hvilket er 500 tons mere end rådgivningen for 2023. Der er usikkerhed om udbredelse af bestanden, men tilgængelige data fra biologiske undersøgelser og fiskeri peger på, at bestanden er koncentreret i et begrænset område. NAFOs videnskabelige råd har i år accepteret anvendelse af SPiCT-modellen som værktøj til vurdering af rejebestanden i Østgrønland.

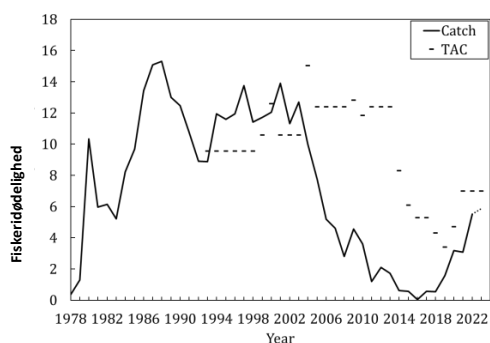
#### Om rådgivningen

Fangsterne har været stigende siden 2017 (Figur 5). I 2023 er rejebestanden beregnet til at ligge 22 % under optimal biomasse (Figur 6), og samtidig er fiskeridødeligheden over den optimale grænse (Figur 7). Fiskeriaktiviteten har været på et lavt niveau, og det er usikkert, om fangstraterne afspejler bestandens status. Endvidere viser de biologiske undersøgelser i 2020 og 2022-2023 og data fra fiskeriet siden 2014, at bestanden er koncentreret i et begrænset geografisk område. Der er intet rekrutteringsindeks for bestanden, da kun meget få unge (juvenile) rejer fanges i området.

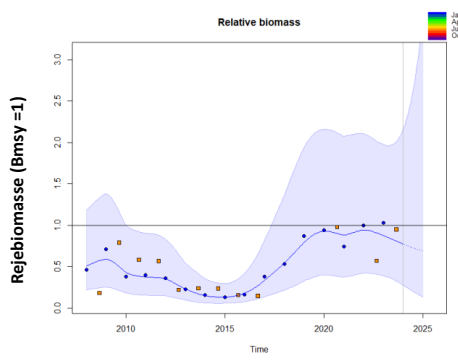
Tabel 2. Totale landinger (tons) af rejer i Østgrønland fra 2014 til 2023

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
NIPAG fangst	622	576	49	561	547	1 580	3 172	3 067	5 596	5 867 <sup>1</sup>

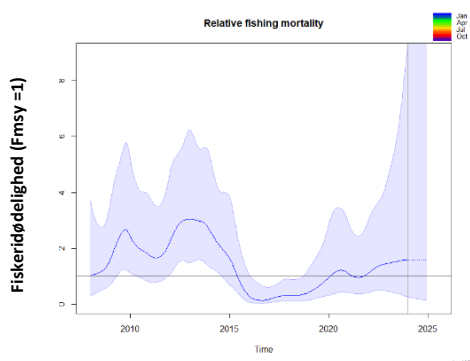
<sup>1</sup> forventet



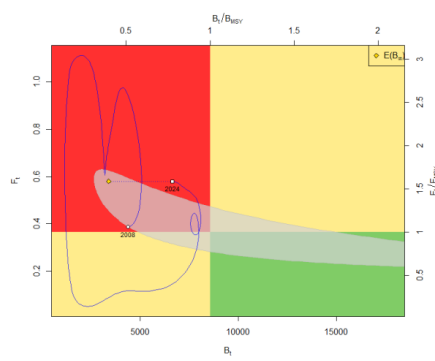
Figur 5. Samlede fangster (1978-2023)



Figur 6. Biomasse af rejer fra model (1987-2023)



Figur 7. Fiskeridødelighed fra model (1987-2023)



Figur 8. Bestandsstatus fra model (1987-2023)

# Appendiks

## Northern shrimp in Subarea 1 and Div. 0A

Advice September 2023 for 2024




### Recommendation

In line with Greenland’s stated management objective of maintaining a mortality risk of no more than 35% (subject to a risk of biomass being below  $B_{lim}$  of less than 5%), Scientific Council advises that catches in 2024 should not exceed 95 000 t.

With regard to the Canadian harvest strategy, Scientific Council notes that catches of 95 000 t in 2024 would result in a 35% risk of exceeding  $Z_{msy}$  in 2024, and a 34% risk of exceeding  $Z_{msy}$  in 2025 and 2026, assuming catches at the same level as in 2024.

### Management Objectives

A management plan and management objectives have been defined by the Government of Greenland in 2018. The objective is to maintain a mortality risk of no more than 35% (subject to a risk of biomass being below  $B_{lim}$  of less than 5%). Canada has a harvest strategy with the objective to maintain the stock in the Healthy Zone (>80% of  $B_{msy}$ ); when the biomass is above 80% of  $B_{msy}$ , the risk of being above  $Z_{msy}$  should not exceed 35%, based on the 3-year projections. Advice was also drafted to be consistent with the NAFO precautionary approach (FC Doc. 04-12).

Objective	Status	Comment/consideration
Maintain risk of being above $Z_{msy}$ not exceeding 35%		The TAC set for 2023 equates to a risk of being above $Z_{msy}$ by the end of 2023 of 50%
Maintain the stock in the Healthy Zone (>80% of $B_{msy}$ )		The stock is above $B_{msy}$ in 2023
Maintain risk of biomass being below $B_{lim}$ of less than 1%		The risk of biomass in 2023 being below $B_{lim}$ is less than 1%



OK



Intermediate

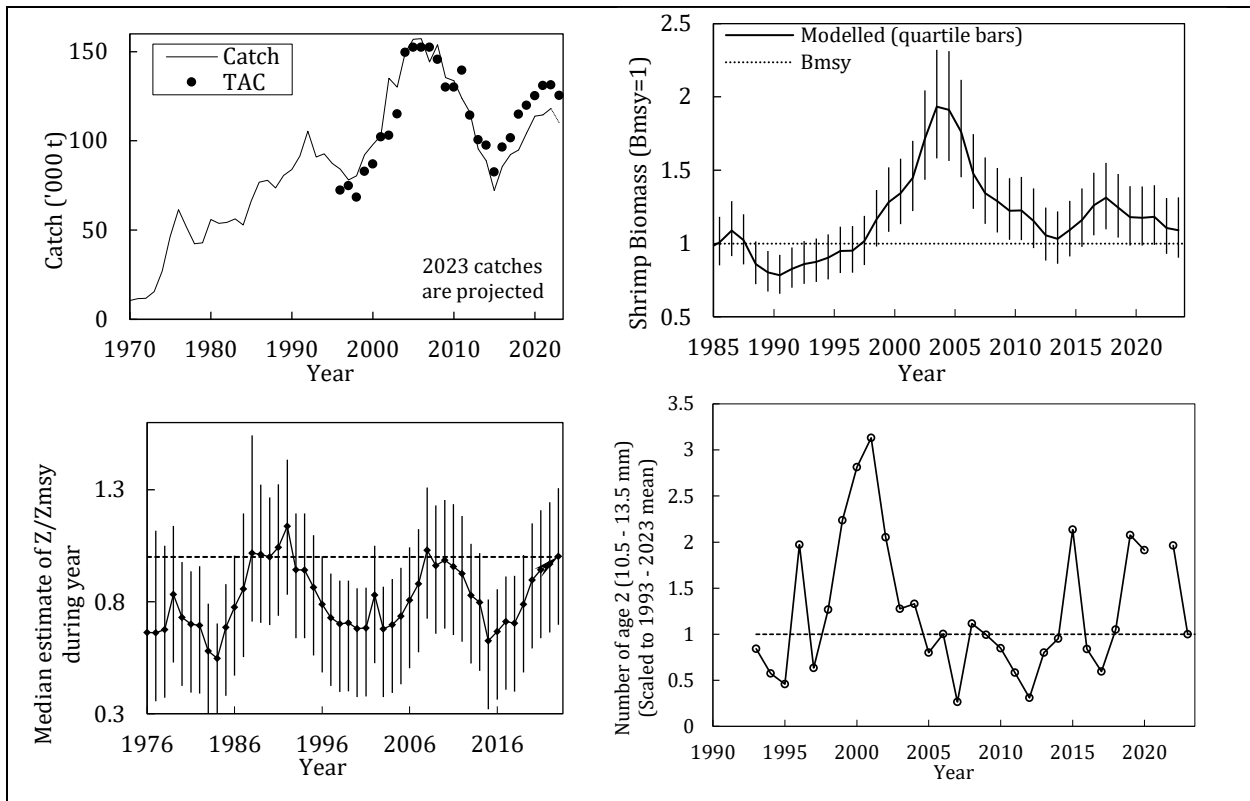
### Management unit

The stock, considered distinct from all others, is distributed throughout Subarea 1, extends into Div. 0A east of 60°30'W, and is assessed as a single stock. In 2022, more than 99% of the landings were from Greenland.

### Stock status

Biomass in 2023 is above  $B_{msy}$  and the probability of being below  $B_{lim}$  is very low (<1%). The probability of mortality in 2023 being above  $Z_{msy}$  is 50%. Recruitment (number of age-2 shrimp) in 2023 was near the time-series average.

# Appendiks



## Reference points

$B_{lim}$  has been established as 30%  $B_{msy}$ , and  $Z_{msy}$  has been set as the mortality reference point.  $B_{msy}$  and  $Z_{msy}$  are estimated directly from the assessment model.

## Projections

Predicted probabilities of transgressing precautionary reference points in 2024 – 2026 under eight catch options and subject to predation by a cod stock with an effective biomass of 17 Kt.

Risk of:	Catch option ('000 tons)							
	85	90	95	100	105	110	115	120
falling below $B_{msy}$ end 2024 (%)	38	38	38	39	39	40	41	42
falling below $B_{msy}$ end 2025 (%)	36	37	38	40	40	42	43	44
falling below $B_{msy}$ end 2026 (%)	36	37	37	41	42	43	45	46
falling below $B_{lim}$ end 2024 (%)	0	0	0	0	0	0	0	0
falling below $B_{lim}$ end 2025 (%)	0	0	0	0	0	0	0	0
falling below $B_{lim}$ end 2026 (%)	0	0	0	0	0	0	0	0
exceeding $Z_{msy}$ in 2024 (%)	26	30	35	39	44	47	51	54
exceeding $Z_{msy}$ in 2025 (%)	26	31	34	40	44	47	51	55
exceeding $Z_{msy}$ in 2026 (%)	26	30	34	40	44	48	52	56
falling below $B_{msy}$ 80% end 2024 (%)	15	15	16	16	16	16	17	18
falling below $B_{msy}$ 80% end 2025 (%)	15	16	17	19	18	19	21	22
falling below $B_{msy}$ 80% end 2026 (%)	16	17	18	20	21	22	24	25

# Appendiks

## Assessment

A Schaefer surplus-production model was used for the assessment of this stock.

The next assessment is scheduled for 2024.

### *Human impact*

Mortality related to the fishery has been documented. Other human sources (e.g. pollution, shipping, oil-industry) are un-documented.

### *Biological and Environmental Interactions*

There is no integrated summary information available on the structure, status and trends of the marine ecosystem for the area inhabited by this stock.

Cod is an important predator on shrimp. This assessment incorporates this interaction. Other predation is likely but not explicitly considered. Shrimps might be important predators on, for example, fish eggs and larvae.

### *Ecosystem sustainability of catches*

Shrimp is included in the benthivore guild. There are currently no Ecosystem Production Units defined nor Total Catch Index (TCI) information for the distribution area of this stock.

## Fishery

Shrimps are caught in a directed trawl fishery. The fishery is regulated by TAC.

Recent catches and TACs (t) have been as follows:

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Enacted TAC <sup>1</sup>	97 649	82 561	96 426	101 706	114 876	119 875	125 229	130 937	131 292	125 583
STATLANT 21	88 834	71 779	84 303	91 725	91 869	102 706	110 250	107 571	115 772	
NIPAG	88 765	72 256	85 527	92 584	94 878	104 314	113 758	114 569	118 127	110 000 <sup>2</sup>

<sup>1</sup> Sum of TACs autonomously set by Canada and Greenland.

<sup>2</sup> Projected to year end.

## Effects of the fishery on the ecosystem

Measures to reduce effects of the fishery on the ecosystem include area closures, moving rules and gear modifications to reduce damage to benthic communities and reduce bycatch.

## Special comment

The advice is subject to some uncertainty due to abnormal spatial distribution of sea ice north of 66°N in Greenland EEZ in 2023, which prevented trawling at many of the planned stations during the survey. Due to poor survey coverage in the northern survey area, it is uncertain if this year's survey results reflect the stock trajectory and status.

SC recommends that the projection table should be given in projected catch increments of no less than 5 Kt due to uncertainty in calculating risk levels.

## Source of Information

SCS Doc 13/04, FC Docs 04-18, SCR Docs. 20/053, 20/057, 22/045, 23/046, 23/047, 23/048.

# Appendiks

## Northern shrimp in Denmark Strait and off East Greenland

Advice September 2023 for 2024

### Recommendation

Catches up to 2500t are projected to result in a very low probability (less than 10%) of the stock going below Blim

### Management objectives

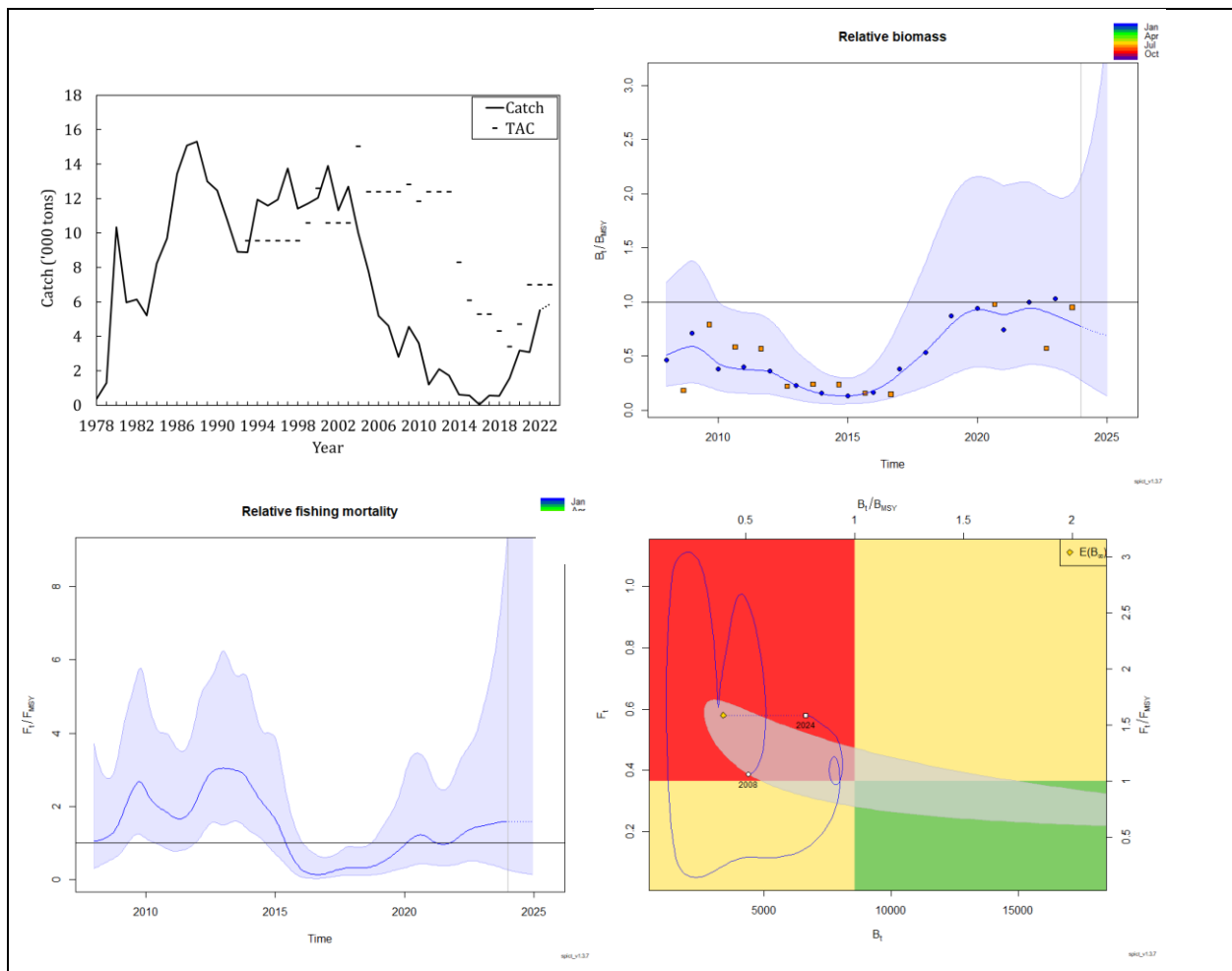
No explicit management plan or management objectives have been defined by the Government of Greenland. Advice was drafted to be consistent with the NAFO precautionary approach (FC Doc 04-12).

### Management unit

The shrimp stock is distributed off East Greenland in ICES Div. 14b and 5a and is assessed as a single stock.

### Stock status

Median biomass is below Bmsy ( $B/B_{msy} = 0.78$ ) and the probability of being below Blim is less than 5%. Fishing mortality is above Fmsy ( $F/F_{msy} = 1.59$ ). No estimates of recruitment are available.



### Reference points

Blim is defined as 30% of Bmsy. The relative reference points Bmsy and Fmsy are estimated within the SPiCT model. The current relative  $B/B_{msy}$  is 0.78 and the relative  $F/F_{msy}$  is 1.59. The probability of being below Blim is currently very low (less than 5%)

## Appendiks

### Projections

Relative reference points are estimated for six catch options for 2024.

Catch (t)	B/Bmsy	F/Fmsy	Prob B > Bmsy	Prob B < Blim	Prob F>Fmsy
1500	0.96	0.56	0.47	0.02	0.32
2000	0.90	0.77	0.43	0.03	0.42
2500	0.83	0.99	0.39	0.06	0.50
3000	0.77	1.24	0.36	0.10	0.57
3500	0.71	1.51	0.33	0.15	0.63
4000	0.64	1.81	0.31	0.20	0.68

### Assessment

The Surplus Production in Continuous Time (SPiCT) model was used for the assessment of this stock.

The next assessment is scheduled for 2024.

#### *Human impact*

Mainly fishery related mortality has been documented. Other sources (e.g. pollution, shipping, oil-industry) are considered un-documented.

#### *Biological and Environmental Interactions*

There is no integrated summary information available on the structure, status and trends of the marine ecosystem for the area inhabited by this stock. Cod is an important predator on shrimp. The cod stock has fluctuated in East Greenland waters since 2014. The impact on the shrimp biomass is unknown.

#### Ecosystem sustainability of catches

Shrimp is included in the benthivore guild. There are currently no EPU defined nor TCI information for the distribution area of this stock.

#### Fishery

Shrimp is caught in a directed trawl fishery. The fishery is regulated by TAC and bycatch reduction measures include move-on rules and sorting grids.

Recent catches and TAC (t) were as follows:

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Enacted TAC	8 300	6 100	5 300	5 300	4 300	3 384	4 750	7 000	6 850	6 850
SC Recommended TAC	2 000	2 000	2 000	2 000	2 000	2 000	3 000	3 000	3 000	2000
NIPAG catch	622	576	49	561	547	1 580	3 172	3 067	5 596	5 867 <sup>1</sup>

<sup>1</sup> To June 30

#### Effects of the fishery on the ecosystem

Measures to reduce effects of the fishery on the ecosystem include move-on rules to protect sponges and corals.

#### Source of Information

SCR Docs. 23/049, 23/050, 23/051, 21/044, FC Doc. 04-18