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04. november 2021
J.nr. 20.00-11

Sammendrag af rådgivning for 2022 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 fangstmængde i 2022 for rejer ved Vestgrønland er på 115.000 tons. Det er samme rådgivning som i 2021. For rejefiskeriet ved Østgrønland er rådgivningen på 3.000 tons og ligeledes uændret i forhold til 2021.

Rådgivning for 2022

Rejer

Vestgrønland	115.000 tons. Rådgivning for 2021: 115.000 tons. Total fangst forventet i 2021: ca. 108.000 tons.

Rejer

Østgrønland	3.000 tons. Rådgivning for 2021: 3.000 tons. Total fangst forventet i 2021: < 3.000 tons.

Den officielle rådgivning, som Departementet for Fiskeri modtager en kopi af, vil være tilgængelig på NAFO's hjemmeside (www.nafo.int) senere på året. Dette gælder også de af Grønlands Naturinstitut udarbejdet baggrundsdokumenter til nærværende rådgivning. 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 2022 ikke bør overstige 115.000 tons, hvilket er samme rådgivning som for 2021.

Om rådgivningen

Det rådgivne fangstniveau ved *Vestgrønland* er fastsat med udgangspunkt i, at resultaterne fra årets bestandsvurdering viser, at rejebestanden er stabil. GN skal gøre opmærksom på, at rådgivningen i år er behæftet med større usikkerhed. Dette skyldes manglende biologiske undersøgelser i indeværende år som følge af forsinkelsen i levering af GNs nye undersøgelsesskib *r/v Tarajoq*.

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 har været stabil og er i slutningen af 2021 beregnet til at være over den biomasse, der kan sikre et optimalt bæredygtigt udbytte af rejebestanden (Figur 2).

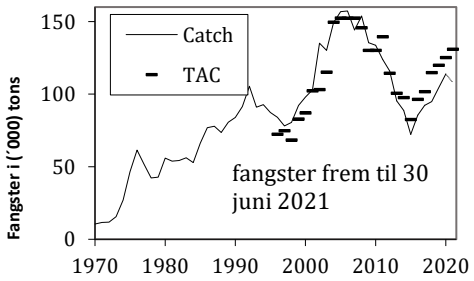
Antallet af 2-årige rejer, der forventes at komme ind i fiskeriet de næste inden for de næste 3 år, var i både 2019 og 2020 over gennemsnittet for tidsserien (Figur 4). Forekomsten af de 2-årige rejer i 2020 var høj udenskærs, hvorimod antallet af 2-årige rejer i Disko Bugt var på et meget lavt niveau.

Den totale dødelighed (Figur 3) falder i perioden efter 2014 kortvarigt, men stiger igen frem til 2020 til et niveau tæt på Z_{msy}.

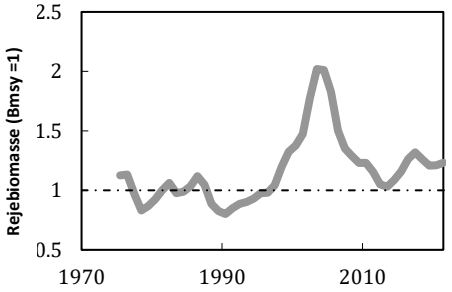
Tabel 1. Totale landinger (tons) af rejer i Vestgrønland og Canada fra 2013 til 2021

År	2013	2014	2015	2016	2017	2018	2019	2020	2021
Grønland	95.379	88.765	72.254	84.356	89.396	93.189	101.997	113.117	*108.000*[1]
Canada	2	0	2	1.171	3.215	1.689	2.463	751	100[1]

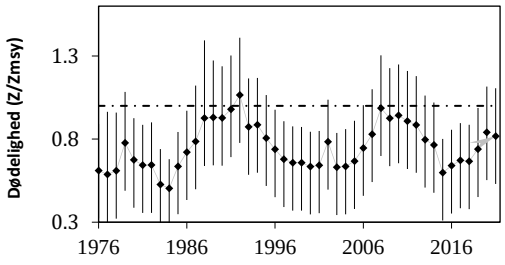
[1] forventet



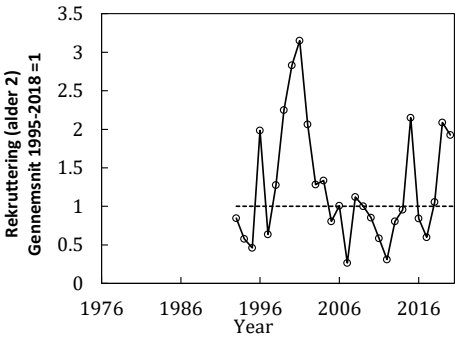
Figur 1. Samlede fangster fra 1970-2021



Figur 2. Biomasse af rejer (fra model)



Figur 3. Total dødelighed (fiskeri og torsken prædation)



Figur 4. Rekruttering (alder 2)

Det videnskabelige råd har med udgangspunkt i de af Naalakkersuisut fastsatte forvaltningskriterier for rejefiskeriet i Vestgrønland vurderet, at et fiskeri på 115.000 t i 2022 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 hvor risikoen for at biomassen kommer under det laveste niveau (B_{lim}) er lav.

Rejer i Østgrønland

NAFO rådgiver, at fangsterne i 2022 ikke bør overstige 3.000 tons, hvilket er uændret i forhold til 2021. Tilgængelige data viser, at bestanden har været i bedring i de senere år. Data fra både fiskeri og biologiske undersøgelser viser, at bestanden kun findes i et meget begrænset område og der er derfor usikkerhed omkring status af bestanden.

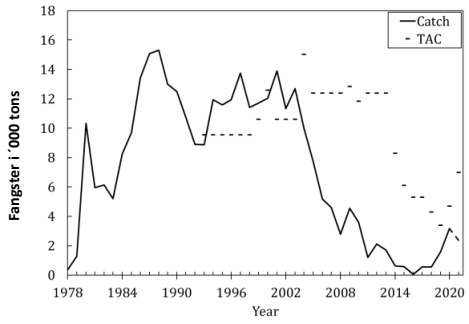
Om rådgivningen

Biomassen fra de biologiske undersøgelser (surveys) i 2020 er på det højeste niveau siden starten af tidsserien fra 2008 (Figur 7). Fangstraterne var i 2020 den højeste siden begyndelsen af tidsserien fra 1986 (Figur 6), men er faldet en anelse i 2021. Fiskeriindsatsen har været meget lav så det er usikkert om fangstraterne afspejler bestandens status i hele området. Endvidere var survey biomassen i 2020 samt fiskeriet i 2020 og 2021 koncentreret til et meget begrænset geografisk område. Der er ingen rekrutteringsindeks for bestanden, da kun meget få unge (juvenile) rejer fanges i surveyområdet.

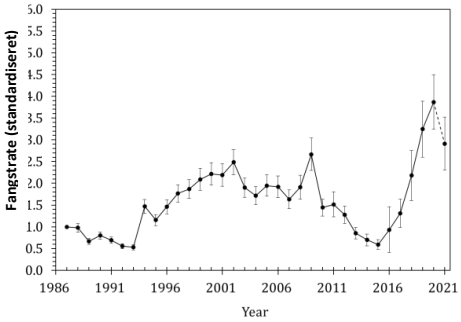
Tabel 2. Totale landinger (tons) af rejer i Østgrønland fra 2013 til 2021

År	2013	2014	2015	2016	2017	2018	2019	2020	2021
Grønland	1.717	622	576	49	561	547	1.550	3.172	2.370[1]

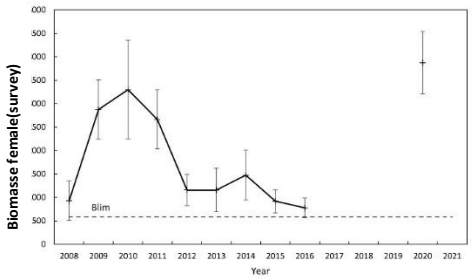
[1] forventet



Figur 5. Samlede fangster fra 1978-2021



Figur 6. Fangstrater (1987-2021)(fra model).



Figur 7. Biomasse (hunner) fra survey (2008–16+2020)

Northern shrimp in Subarea 1 and Div. 0A

Advice November 2021 for 2022

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 1%), Scientific Council advises that catches in 2022 should not exceed 115 000 t.

With regard to the Canadian harvest strategy, Scientific Council notes that catches of 115 000 t in 2022 would result in less than 35% risk of exceeding Zmsy in 2022, and a 35% risk of exceeding Zmsy in 2023 and 2024, assuming catches at the same level as in 2022.

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 1%). Canada has a harvest strategy with the objective to maintain the stock in the Healthy Zone (>80% of Bmsy); when the biomass is above 80% of Bmsy, the risk of being above Zmsy should be less than 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***
Apply Precautionary Approach		Stock status is both estimated and forecast relative to precautionary reference points

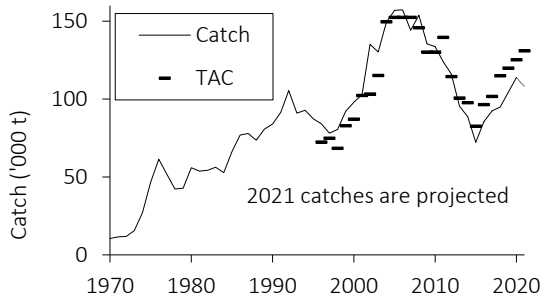
 OK

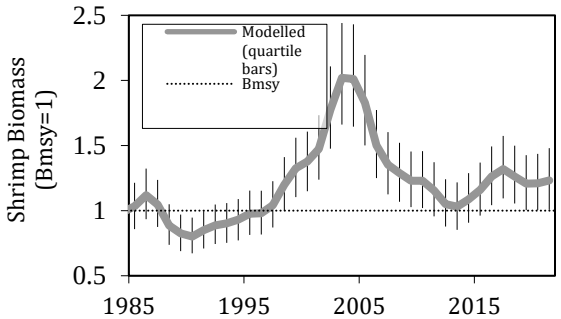
Management unit

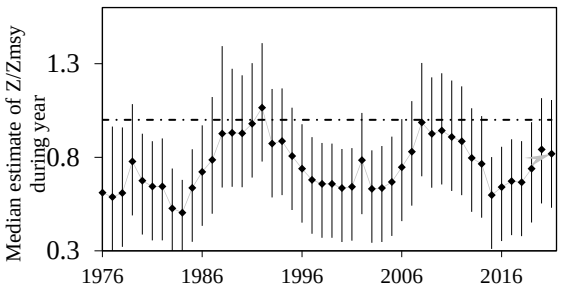
The stock, considered distinct from all others, is distributed throughout Subarea 1, extends into Div. 0A east of 60°30'W, and is assessed as a single stock. In 2020, more that 99% of the landings were from Greenland.

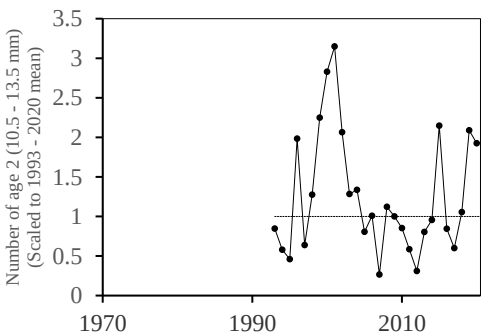
Stock status

Biomass at the end of 2021 is above B_{msy} and the probability of being below B_{lim} is very low (<1%). The probability of mortality in 2021 being above Z_{msy} is 33%. Recruitment (number of age-2 shrimp) in 2020 was above average.









Reference points

B_{lim} has been established as 30% B_{msy}, and Z_{msy} (fishery and cod predation) has been set as the mortality reference point (FC Doc. 04-18). B_{msy} and Z_{msy} are estimated directly from the assessment model.

Projections

Predicted probabilities of transgressing precautionary reference points in 2022 – 2024 under eight catch options and subject to predation by a cod stock with an effective biomass of 6 Kt.

6 000 t cod	Catch option ('000 tons)							
Risk of:	95	100	105	110	115	120	125	130
Bmsy < B 2022 (%)	26	26	26	26	28	27	27	27
Bmsy < B 2023 (%)	26	27	27	27	29	30	30	30
Bmsy < B 2024 (%)	26	28	28	29	30	32	32	34
Blim < B 2022 (%)	0	0	0	0	0	0	0	0
Blim < B 2023 (%)	0	0	0	0	0	0	0	0
Blim < B 2024 (%)	0	0	0	0	0	0	0	0
exceeding Zmsy in 2022 (%)	20	23	26	30	33	37	40	43
exceeding Zmsy in 2023 (%)	21	24	27	31	35	38	41	44
exceeding Zmsy in 2024 (%)	21	25	28	31	35	38	42	45
B < Bmsy 80% 2022 (%)	9	10	10	10	10	11	10	11
B < Bmsy 80% 2023 (%)	10	11	11	11	13	13	13	14
B < Bmsy 80% 2024 (%)	11	12	12	13	14	16	16	16

Assessment

Advice is based on risk analysis coming from a quantitative model. The analytical assessment was run in 2021 with revised treatment of the input data (SCR Doc. 20-53, 20-57, 21-40, 21-42) and with updated data series.

The next assessment is scheduled for 2022.

Human impact

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

Biological and Environmental Interactions

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.

Fishery

Shrimps are caught in a directed trawl fishery. Bycatch of fish in the shrimp fishery is around 1% by weight. The fishery is regulated by TAC.

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

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Enacted TAC[1]	114 425	100 596[1]	97 649[1]	82 561[1]	96 426[1]	101 706[1]	114 876[1]	119 875[1]	125 229[1]	130 937[1]
STATLANT 21	114 970	91 802	88 834	71 779	84 303	91 725	91 869	102 706	110 229	
NIPAG	115 977	95 381	88 765	72 256	85 527	92 584	94 878	*104 314*	113 868	*108 000*[2]

[1] Sum of TACs autonomously set by Canada and Greenland.

[2] 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

No survey has been conducted in the assessment area in 2021, due to delay of the new Greenlandic research ship.

From 1993 to 2010 the Greenlandic survey in the Canadian area (SFA1) was conducted annually. In that period, average biomass in that area was 2% of the total biomass estimated in Subarea 1 and Div. 0A. Since 2011, due to ice cover, there has only been sporadic information from the Greenlandic survey in the Canadian area (SFA1). The area was surveyed only in 2013 and 2017. In 2013, the biomass in that area (SFA1) was less than 1% of the total estimated biomass in Subarea 1 and Div. 0A, whereas it was about 2% in 2017.

SC recommend that the catch table should be given in increments of no less than 5t due to uncertainty in calculating risk levels.

Source of Information SCS Doc 13/04, FC Docs 04-18, SCR Docs 20-53, 20-57, 21-40, 41, 42,

Northern shrimp in Denmark Strait and off East Greenland

Advice November 2021 for 2022

Recommendation

There is uncertainty about the current stock status, however there is no indication of any change from last year's assessment in 2020. Therefore Scientific Council reiterates its advice that the catch in 2022 should not exceed 3000 t.

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).

Objective	*Status*	*Comment/consideration*
Apply Precautionary Approach		B_{lim} defined. No fishing mortality reference is defined.

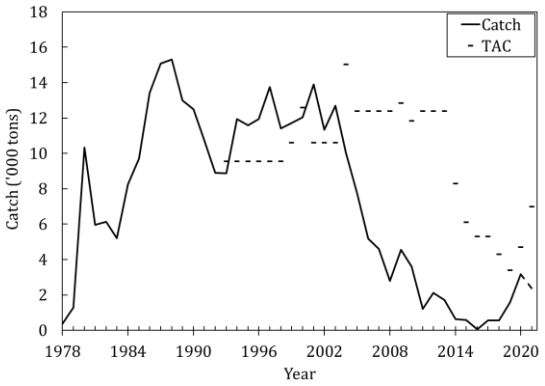
 Intermediate

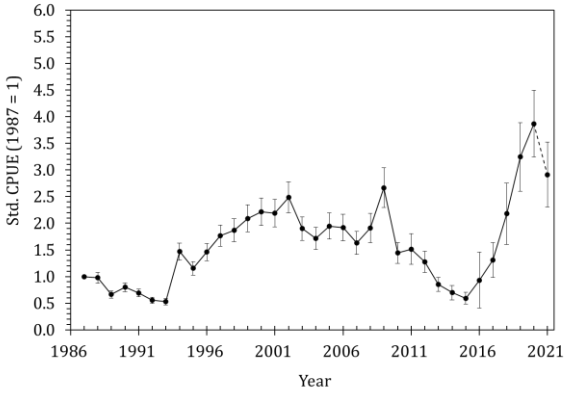
Management unit

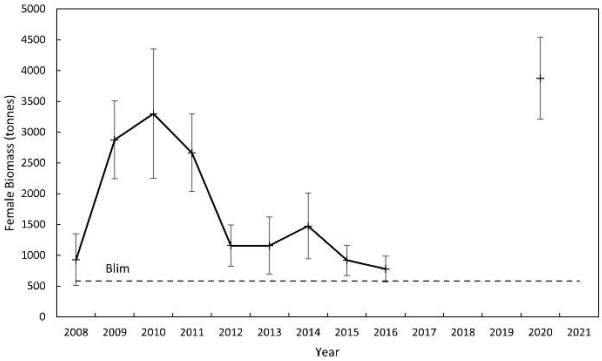
The shrimp stock is distributed off East Greenland in ICES Div. 14b and 5a and is assessed as a single population.

Stock status

There was no survey in 2021 nor in 2017 to 2019. The stock in 2020 was at a high level. The survey biomass in 2020 is the highest observed since the beginning of the survey, in 2008. The commercial CPUE in 2021 has decreased compared to 2020 but remains at a high level. There is no recruitment index available for this stock, few juvenile shrimps are caught in the survey area.







Reference points

Scientific Council considers that 15% of the maximum survey female biomass provides a proxy for B_{lim} (FC Doc. 04-12). The record high survey biomass found in 2020 results in B_{lim} = 580 t.

Projections

Quantitative assessment of risk at various catch options is not possible for this stock currently.

Assessment

There was no survey in 2021. The most recent survey was in 2020 after three years with no survey data. The survey biomass was the highest since the survey started in 2008. The standardized commercial CPUE has increased since 2015 and was at a historical high level in 2020, it has since dropped slightly in 2021. In 2021 the fisheries started late due to a delay in licences, this may have impacted the fishing pattern. The survey biomass in 2020 is concentrated in a fairly small geographical area and the recent fishing effort is concentrated in the same general area. Recent fishing effort has been relatively low, so this CPUE may not reflect stock status for the entire stock distribution area.

A comprehensive sensitivity analyses of the surplus production model (SPiCT) was performed as recommended by NIPAG 2021 (SCR Doc 21/044). However, the SPiCT model was not applicable as a preliminary assessment tool this year but encourage future development of this modeling approach.

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

Biological and Environmental Interactions
Cod is an important predator on shrimp. The cod stock has generally been decreasing in East Greenland waters since 2014.

Fishery

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

Recent catches and TAC (t) were as follows:

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Enacted TAC	12 400	12 400	8 300	6 100	5 300	5 300	4 300	3 384	4 750	7 000
SC Recommended TAC	12 400	12 400	2 000	2 000	2 000	2 000	2 000	2 000	3 000	3 000
NIPAG	2 109	1 717	622	576	49	561	547	1 580	3 172	2 370[1]

[1] To June 30th 2021

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 Doc. 21-043, 21-044, 20-060.