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02. november 2020
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Sammendrag af rådgivning for 2021 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 2021 for rejer ved Vestgrønland er på 115.000 tons. Det er en forøgelse på 5.000 t i forhold til 2020. For rejefiskeriet ved Østgrønland er rådgivningen på 3.000 tons (rådgivningen for 2020 var på 2.000 tons).

Rådgivning for 2021

Rejer

Vestgrønland	115.000 tons. Rådgivning for 2020: 110.000 tons. Total fangst forventet i 2020: ca. 117.000 tons.

Rejer

Østgrønland	3.000 tons. Rådgivning for 2020: 2.000 tons. Total fangst forventet i 2020: < 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 2021 ikke bør overstige 115.000 tons. Rådgivningen for 2020 var 110.000 tons.

Om rådgivningen

Det rådgivne fangstniveauet ved *Vestgrønland* er fastsat med udgangspunkt i, at resultaterne fra årets assessement viser, at rejebestanden er stabil.

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 2020 beregnet til at være over den biomasse, der kan sikre et optimalt bæredygtigt udbytte af rejebestanden (Figur 2). I Disko Bugt steg biomassen fra det lave 2019 niveau til tæt på gennemsnittet for de sidste 5 år. Udenskærs er biomassen stort set uændret og den samlede bestand vurderes til at være stabil.

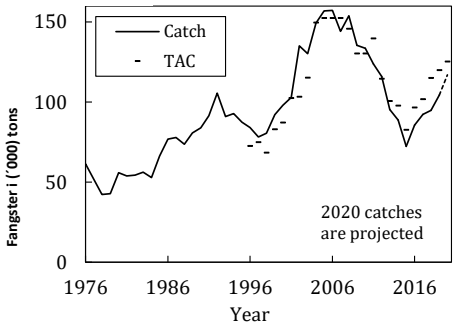
Antallet af 2-årige rejer, der forventes at komme ind i fiskeriet de næste tre til fire år, er i både 2019 og 2020 over gennemsnittet for tidsserien (Figur 4). Forekomsten af de 2-årige rejer er høj udenskærs, hvorimod antallet af 2-årige rejer i Disko Bugt er på et meget lavt niveau.

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

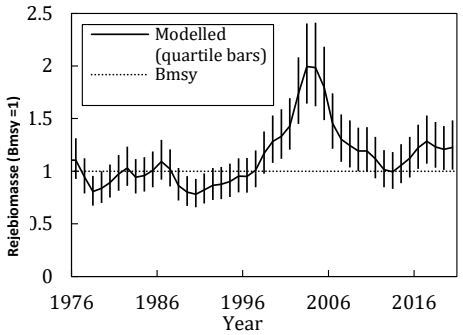
Tabel 1. Totale landinger (tons) af rejer i Vestgrønland og Canada fra 2012 til 2020

År	2012	2013	2014	2015	2016	2017	2018	2019	2020
Grønland	115.965	95.379	88.765	72.254	84.356	89.396	93.189	101.997	*115.000*[1]
Canada	12	2	0	2	1.171	3.215	1.689	2.463	2.000[1]

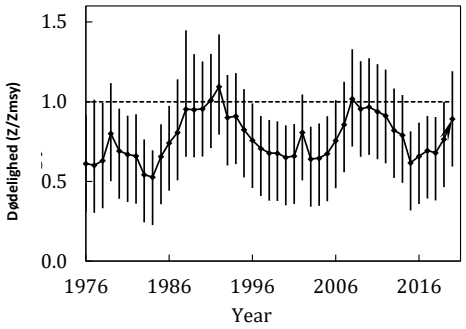
[1] forventet



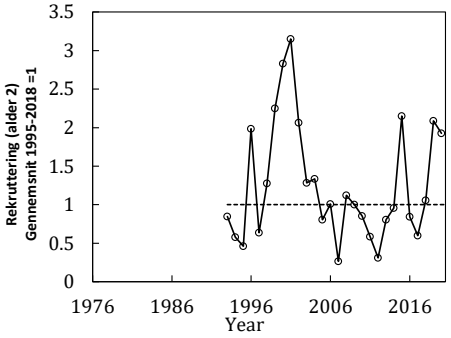
Figur 1. Samlede fangster fra 1970-2020



Figur 2. Biomasse af rejer (fra model)



Figur 3. Total dødelighed (fiskeri og torsken prædation)



Figur 4. Rekruttering (alder 2)

Det videnskabelig råd har med udgangspunkt i de af Naalakkersuisut fastsatte forvaltningskriterier for rejefiskeriet i Vestgrønland vurderet, at et fiskeri på 115.000 t i 2021 vil sikre en bæredygtig udnyttelse af bestanden. Det betyder at risikoen for at overskride en dødelighed hvor fiskeriet ikke længere er bæredygtigt (Z_{msy}) er 35% og hvor risikoen for at biomassen kommer under det laveste niveau (B_{lim}) er lav.

Rejer i Østgrønland

NAFO rådgiver, at fangsterne i 2021 ikke bør overstige 3.000 tons (rådgivningen for 2020 var på 2.000 tons). 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

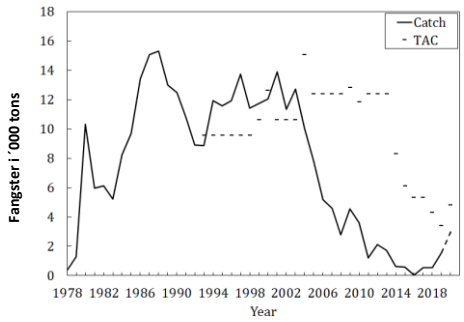
Biomassen fra de biologiske undersøgelser (surveys) i 2020 er på det højeste niveau siden starten af tidsserien fra 2008 (Figur 7). Fangstraterne i 2020 er den højeste siden begyndelsen af tidsserien fra 1986 (Figur 6), men fiskeriindsatsen har været meget lav så det er usikkert om fangstraterne afspejler bestandens status i hele området. Endvidere er både surveybiomassen og fiskeriet i 2020 koncentret til et meget begrænset geografisk område. Der er ingen rekrutterings indeks for bestanden, da kun meget få unge (juvenile) rejer fanges i surveyområdet.

I år har der for første gang været anvendt en analystisk model til vurdering af bestanden (surplus production model, SPiCT), hvilken anvender fangster og fangstrater fra det kommercielle fiskeri samt biomasse fra de biologiske undersøgelser. Modellen indikerer, at bestanden er i en god tilstand. Det blev dog vurderet at yderligere undersøgelser af modelparametrene er nødvendige inden resultaterne kan ligge til grund for fastsættelse af et anbefalet fangstniveau.

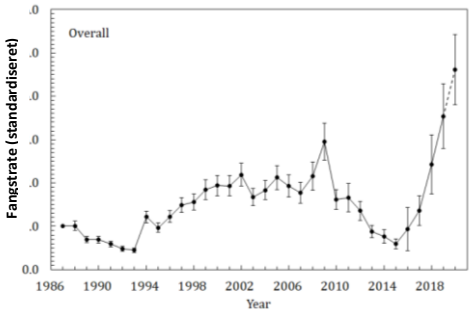
Tabel 2. Totale landinger (tons) af rejer i Østgrønland fra 2012 til 2020

År	2012	2013	2014	2015	2016	2017	2018	2019	2020
Grønland	2.109	1.717	622	576	49	561	547	1.550	2.839[1]

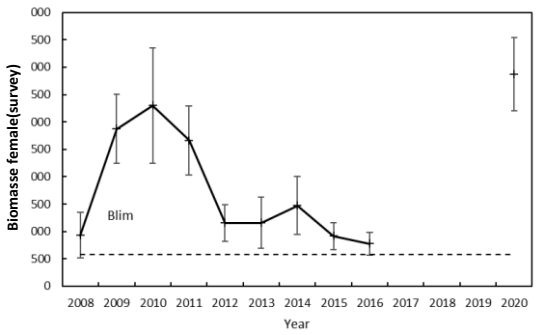
[1] forventet



Figur 5. Samlede fangster fra 1978-2020



Figur 6. Fangstrater (1986-2020)



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

Northern shrimp in Subarea 1 and Div. 0A

Advice November 2020 for 2021

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 2021 should not exceed 115 000 t.

With regard to the Canadian harvest strategy, SC notes that catches of 115 000 t in each of the years 2021 to 2023 would result in less than 35% risk of exceeding Zmsy 2021 and 2022 and exactly 35% risk of exceeding Zmsy in 2023.

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% of exceeding Zmsy(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

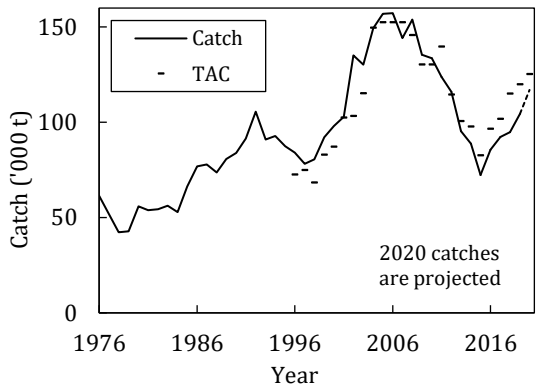
 OK

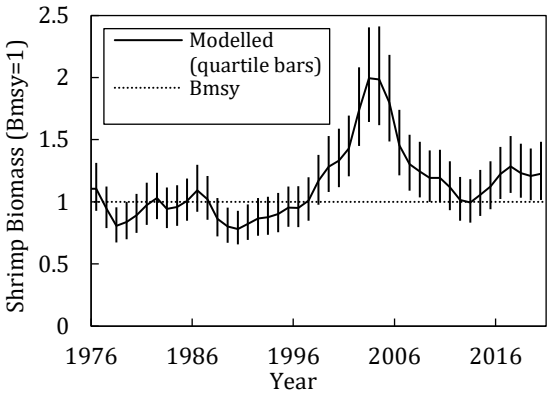
Management unit

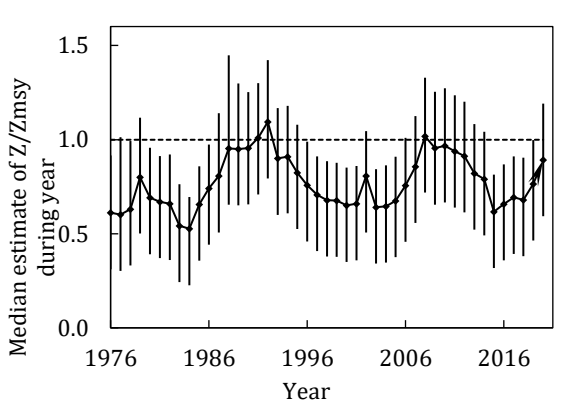
The stock, considered distinct from all others, is distributed throughout Subarea 1, extends into Div. 0A east of 60°30'W, and is assessed as a single stock. In 2019, 98% of the landings were from Greenland.

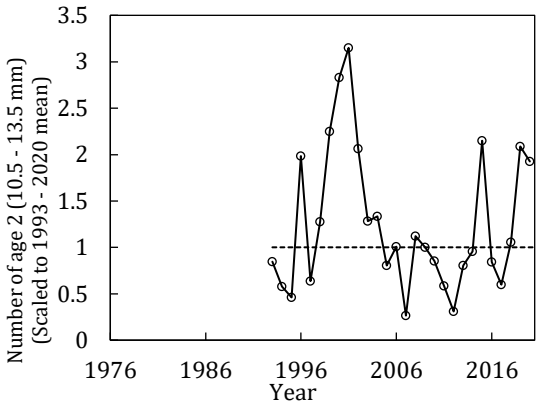
Stock status

Biomass at the end of 2020 is above B_{msy} and the probability of being below B_{lim} is very low (<1%). The probability of mortality in 2020 being above Z_{msy} is 40%. Recruitment (number of age-2 shrimp) in 2020 is 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 2021 – 2023 under eight catch options and subject to predation by a cod stock with an effective biomass of 7 Kt.

7 000 t cod	Catch option ('000 tons)							
Risk of:	95	100	105	110	115	120	125	130
falling below Bmsy end 2021 (%)	24	24	25	27	26	27	27	28
falling below Bmsy end 2022 (%)	25	25	27	28	29	29	30	31
falling below Bmsy end 2023 (%)	25	26	28	30	31	32	33	33
falling below Blim end 2021 (%)	0	0	0	0	0	0	0	0
falling below Blim end 2022 (%)	0	0	0	0	0	0	0	0
falling below Blim end 2023 (%)	0	0	0	0	0	0	0	0
exceeding Zmsy in 2021 (%)	19	22	26	30	33	37	40	44
exceeding Zmsy in 2022 (%)	19	22	27	31	34	39	42	45
exceeding Zmsy in 2023 (%)	20	23	28	32	35	39	43	46
falling below Bmsy 80% end 2021 (%)	8	8	9	9	9	9	10	9
falling below Bmsy 80% end 2022 (%)	9	10	11	11	11	12	13	13
falling below Bmsy 80% end 2023 (%)	10	10	12	12	13	14	16	17

Assessment

Advice is based on risk analysis coming from a quantitative model. The analytical assessment was run in 2020 with revised treatment of the input data (SCR Doc.20-56, 20-58) and with updated data series.

The next assessment is scheduled for 2021.

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:

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Enacted TAC[1]	139 583	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]
STATLANT 21	123 195	114 970	91 802	88 834	71 779	84 303	91 725	91 869	102 706	
NIPAG	123 989	115 977	95 381	88 765	72 256	85 527	92 584	94 878	*104 314*	*117 000*[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

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.

Source of Information SCS Doc 13/04, FC Docs 04-18, SCR Docs 20-53, 54, 55, 56, 57, 58.

Northern shrimp in Denmark Strait and off East Greenland

Advice November 2020 for 2021

Recommendation

The available information indicates the stock has increased in recent years. Scientific Council advises that fishing mortality should not increase in 2021. On this basis, the catch in 2021 should not exceed 3000 t, corresponding to the projected catch in 2020.

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} is defined. No fishing mortality reference is defined.

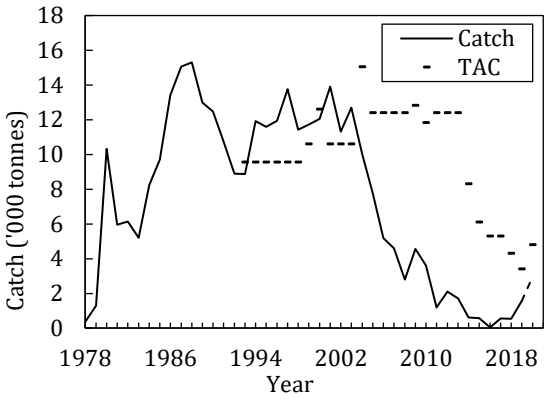
 Intermediate

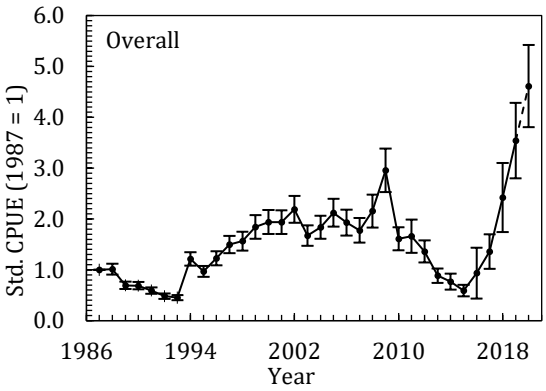
Management unit

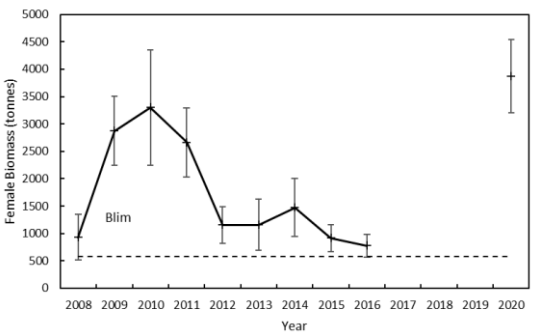
The shrimp stock is distributed off East Greenland in ICES Div. 14b and 5a and is assessed as a single population.

Stock status

The stock in 2020 is 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 2020 is also the highest since the beginning of the time series, in 1986. 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}. 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

A survey was conducted 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. The survey biomass in 2020 is concentrated in a fairly small geographical area and the recent fishing effort concentrates 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.

An analytical assessment model (surplus production model, SPiCT), using both the commercial and the survey CPUE, was investigated this year. Results can be found in the NIPAG report (SCS 20/021). The model results indicated a healthy stock status; however, the model needs to be further explored next year.

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:

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Enacted TAC	12 400	12 400	12 400	8 300	6 100	5 300	5 300	4 300	3 384	4 750
SC Recommended TAC	12 400	12 400	12 400	2 000	2 000	2 000	2 000	2 000	2 000	2 000
NIPAG	1 199	2 109	1 717	622	576	49	561	547	1 580	2 839[1]

[1] To July 2020

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. 20-059, 20-060, 20-061.