



## Rejerådgivning for 2017

Nuuk 26. september 2016

Journal: 20.00-11/2016

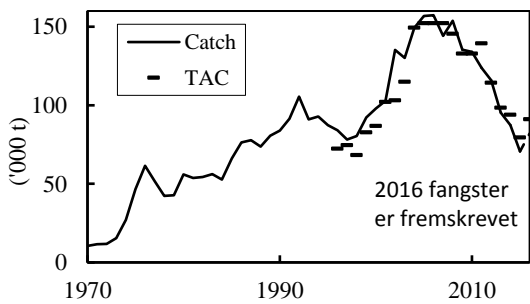
### Den biologiske rådgivning om fiskeri på rejebestandene ved Vest- og Østgrønland for 2017

NAFO/ICES anbefaler, at fangsterne i 2017 i **Vestgrønland** ikke overstiger 90.000 tons, hvilket er samme rådgivning som for 2016.

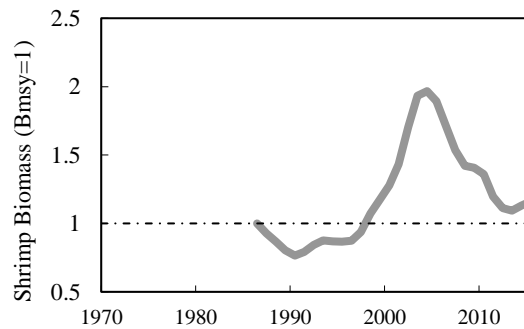
Rådgivningen om fiskeriet efter rejer i **Østgrønland** er 2.000 tons i 2017 og er uændret i forhold til 2016.

Fangstniveauet for **Vestgrønland** i 2017 er fastsat med udgangspunkt i

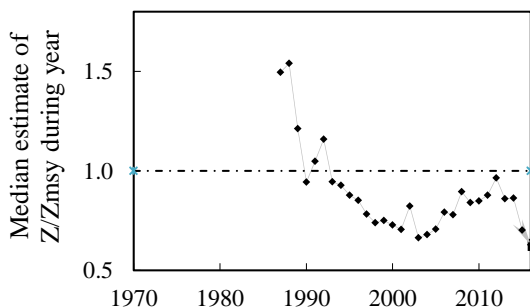
- at rejebestanden i 2016 er beregnet til at være på samme niveau som i 2015
- at der er en relativt lav risiko for, at biomassen kommer under og den totale dødelighed kommer over det optimale niveau
- at antallet af 2-årige rejer, der kommer ind i fiskeriet om to år, nogenlunde svarer til gennemsnittet i de sidste 20 år
- at antallet af 3-4 årige rejer, der kommer ind i fiskeriet i 2017 er på et lavt niveau; der forventes derfor få nye rejer i fiskeriet i 2017
- at mængden af torsk, der forventes at gøre et indhug i rejebestanden (= den effektive torskebiomasse), er væsentlig mindre end i 2016 end i 2014-15.



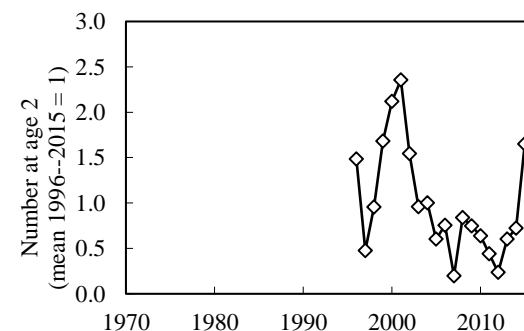
Figur 1. Vest. Totale fangster ('000 tons)



Figur 2. Vest. Biomasseudvikling fra model



Figur 3. Vest. Den samlede dødelighed af rejer



Figur 4. Vest. Antal af 2-årige i bestanden fra de biologiske undersøgelser 1994-2015.

## **RÅDGIVNINGEN om rejefiskeri i Vestgrønland** (den engelske tekst af rådgivningen findes i bilag 1 nedenfor)

De samlede **fangster** steg frem til 2008 til 150.000 tons og er siden faldet i takt med faldende kvotestørrelser. Fangster i 2016 forventes at ligge på 82.000 tons (Figur 1).

Trawlernes **gennemsnitsfangst pr. time** (fangstrate (CPUE)), er en indikation af bestandens status, som et indirekte udtryk for tætheden af rejer. Fangstraten i 2016 er på samme niveau som i 2015. Fiskeflåden har igennem flere år koncentreret indsatsen mod nord, og fiskeriet foregår i dag hovedsageligt i området nord for Store Hellefiskebanke og i Disko Bugt.

Naturinstituttets reje-undersøgelser viser, at **biomassen** i 2016 er omkring de sidste 5 års gennemsnit.

Antallet af **små rejer**, der er på vej ind i det kommende fiskeri i 2017, ligger på et lavt niveau i forhold til de sidste 11 års observationer. Andelen af **hunner** i bestanden er høj, og andelen af **hanner** er lav. Det kan betyde, at der på længere sigt kommer relativt få rejer ind i fiskeriet.

Biomassen af **torsk** i 2016 er på et lavt niveau, og som i de foregående år er torskebiomassen koncentreret i de sydlige områder, hvor der er relativt få rejer. Samlet antages det, at den mængde rejer, der spises af torsk, er på samme niveau som gennemsnittet af de seneste 3 år. Det svarer til en effektiv torskebiomasse på 35.000 t per år.

Naturinstituttet og det videnskabelige råd benytter en matematisk **model** i sin vurdering af rejebestanden. Modellen beregner forudsigelser for bestandens udvikling for årene 2017, 2018 og 2019 ved 8 forskellige fangstniveauer og forskellige niveauer af den mængde rejer, torsken spiser (effektive torskebiomasse).

Beregningsmodellen i 2016 inkluderer som i tidligere år, indeks fra det kommercielle rejefiskeri, rejebiomasse-indeks fra de biologiske undersøgelser og biomassen af torsk i rejeområderne (den mængde torsk der spiser rejer).

Andre faktorer, som påvirker rejebestanden, indgår på nuværende tidspunkt ikke i modellen. Rejer indgår i en kompliceret fødekæde, hvor torsken kun er én af faktorerne, og rejebestanden påvirkes af en lang række ukendte biologiske, kemiske og fysiske forhold i havet – f.eks. ændringer i havets temperatur. Naturinstituttets biologer arbejder på at blotlægge de vigtigste af disse faktorer, således at der kan tages højde for dem i fremtidige videnskabelige rådgivninger.

**Modellen viser**, at rejebestanden i slutningen af 2016 sandsynligvis vil være lidt (11%) over den optimale størrelse (biomasse,  $B_{msy}$ ) og vil kunne bære et fiskeri på 90.000 tons i 2017. Det videnskabelige råd anbefaler derfor, at fangster i 2017 ikke overstiger 90.000 tons<sup>1</sup> (rådgivningens engelske tekst findes i bilag 1).

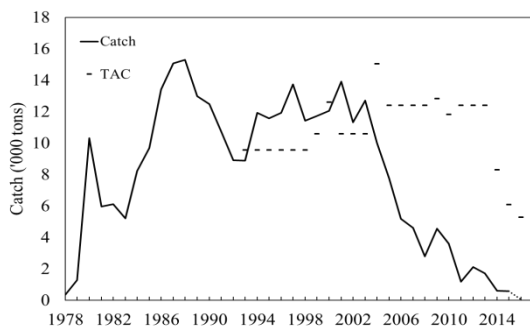
Kvoteændringer er i de senere år foretaget i trin ( $\pm 12\frac{1}{2}\%$  jfr. forvaltningsplanen), og ændringer bør følge samme model.

---

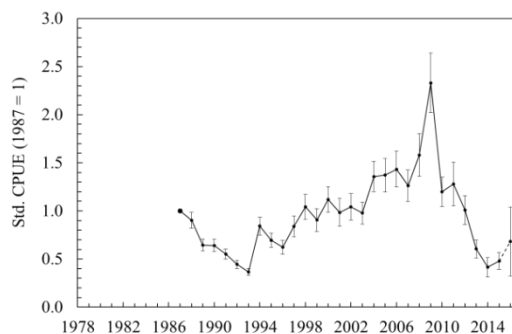
<sup>1</sup> Ved et fiskeri på 90.000 tons vil der være en risiko på under 35 % for at fjerne så meget af bestanden, at den ikke længere kan holde sig på et niveau svarende til den optimale biomasse ( $B_{msy}$ ) eller højere.

## RÅDGIVNINGEN om rejefiskeri i Østgrønland (den engelske tekst af rådgivningen findes i bilag 2 nedenfor)

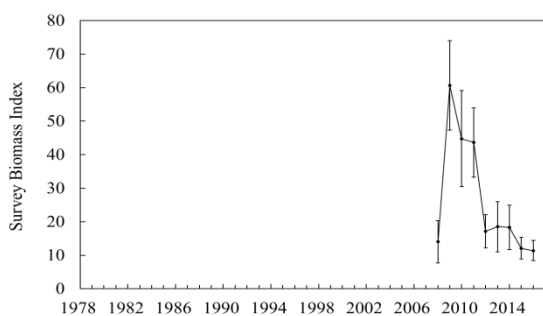
Rådgivningen om fiskeri efter rejer ved Østgrønland for 2017 er uændret på 2.000 tons. Naturinstituttets undersøgelser og data fra fiskeriet viser, at bestanden fortsat er relativt lille på trods af faldende fangstmængder i de senere år.



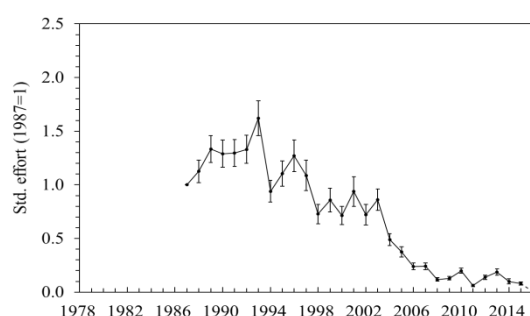
Figur 1. Fangster i Østgrønland



Figur 2. Fangstrater i Østgrønland



Figur 3. Biomasse fra survey



Figur 4. Fiskeridødelighed (indeks)

### Om rådgivningen

Rådgivningen om rejer er formuleret på det seneste møde under NAFO/ICES, som er afholdt i Bergen 07–14 september 2016. Grønlands Naturinstitut har skrevet og fremlagt 8 dokumenter, der tilsammen danner baggrunden for rådgivningen. Status for andre rejebestande i Nordatlanten blev endvidere vurderet på samme møde, og den samlede rapport indeholder status og rådgivning om rejer på Flemish Cap og Grand Bank samt status for bestandene af rejer i Barentshavet og Skagerrak. På mødet deltog i alt 17 forskere fra Canada, EU, Norge og fra Grønland. Fra Grønland deltog forsker AnnDorte Burmeister, forsker Nanette Hammeken Arboe og seniorforsker Michael Kingsley. Den officielle rådgivning findes på NAFOs ([www.NAFO.int](http://www.NAFO.int)) hjemmeside. Den engelske rapport over rådgivningen fra NAFO består af mere end 100 sider, som Departement for Fiskeri modtager en kopi af.

Grønlands Naturinstitut vil snarest invitere forvalterne, rejefiskerne og Erhvervet til en grundig gennemgang af baggrunden for rådgivningen, herunder besvarelse af spørgsmål og udveksling af viden.

Med venlig hilsen

Helle Siegstad, Afdelingschef

# Bilag 1: Northern Shrimp in Subarea 1 and Div. 0A

## Northern Shrimp in Subarea 1 and Div. 0A: Advice September 2016 for 2017

### Recommendation

Previous work has shown that a maintained mortality risk of 35% is low enough to keep stock levels safely at or above  $B_{msy}$ . A catch of 90 000 t in 2017 would entail an estimated mortality risk below 35%. Scientific Council therefore advises that catches in 2017 should not exceed 90 000 t.

### Management Objectives

Scientific Council is aware of the Greenland management plan for shrimp and of general management objectives specified in the Greenland Fisheries Act; however the contents of these have not been conveyed to the Council. Canada requested Scientific Council to provide advice on this stock within the context of the NAFO Precautionary Approach Framework (SCS Doc. 13/04). Advice is based on risk analysis coming from a quantitative model, and on qualitative evaluation of biomass and stock-composition indices.

Objective	Status	Comment/consideration
Apply Precautionary Approach	●	Stock status is both estimated and forecast relative to precautionary reference points

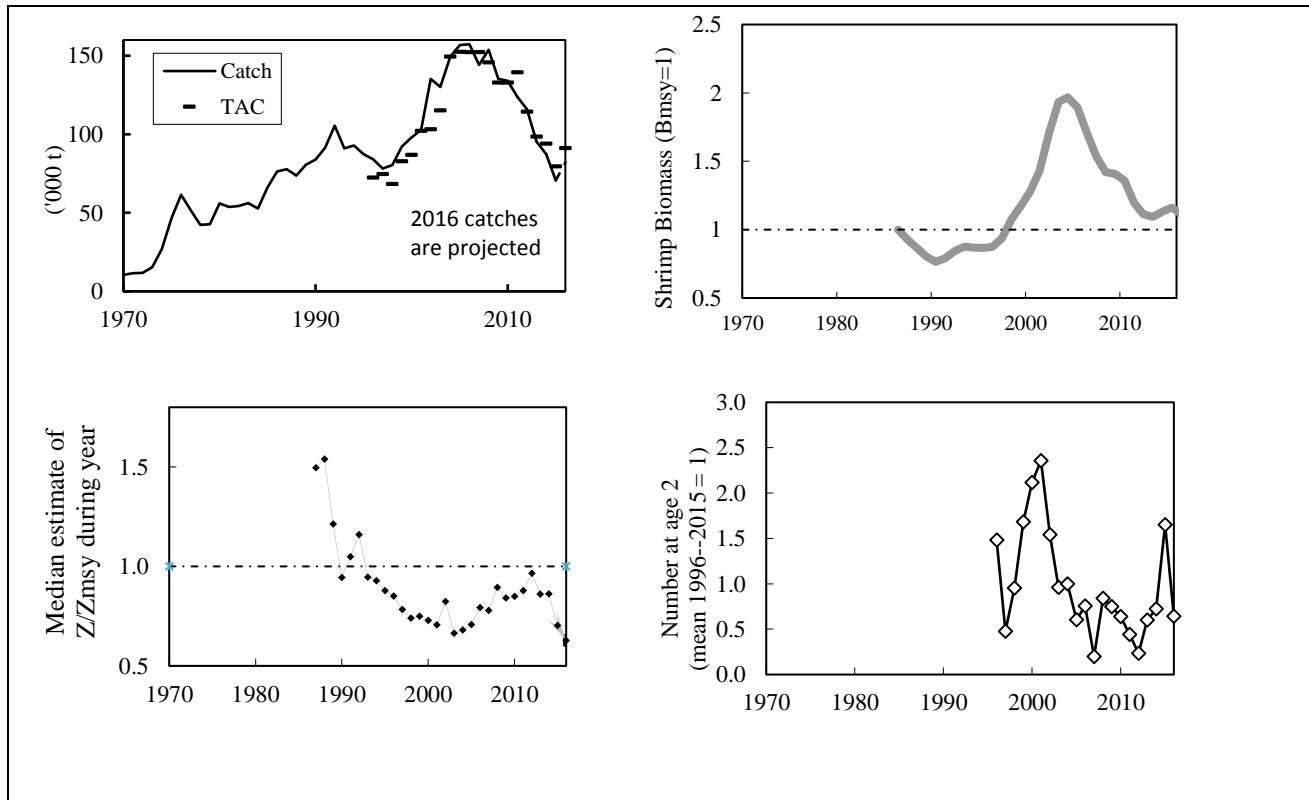
● OK

### 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.

### Stock status

The stock is estimated to be 11% above  $B_{msy}$  and the risk of being below  $B_{lim}$  in 2016 is very low (<1%). Recruitment to the fishable biomass in 2017 is expected to be poor.



### Reference points

$B_{lim}$  is 30% of  $B_{msy}$  and the limit reference point for mortality is  $Z_{msy}$  (FC Doc. 04/18).

## Projections

Predicted probabilities of transgressing precautionary reference points in 2017 – 2019 under eight catch options and subject to predation by a cod stock with an effective biomass of 35 Kt.

35 000 t cod Risk of:	Catch option ('000 tons)							
	60	70	75	80	85	90	95	100
falling below Bmsy end 2017 (%)	32.6	33.2	34.2	34.8	35.4	35.0	35.4	36.5
falling below Bmsy end 2018 (%)	30.1	30.9	32.1	33.6	34.7	35.9	36.3	36.5
falling below Bmsy end 2019 (%)	28.0	29.6	31.1	32.4	34.1	35.2	36.5	37.6
falling below Blim end 2017 (%)	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0
falling below Blim end 2018 (%)	0.0	0.0	0.1	0.2	0.1	0.2	0.1	0.2
falling below Blim end 2019 (%)	0.1	0.1	0.2	0.3	0.3	0.4	0.3	0.4
exceeding Zmsy in 2017 (%)	15.9	20.1	23.0	25.8	28.7	32.0	35.2	38.9
exceeding Zmsy in 2018 (%)	16.3	20.1	22.9	26.1	28.9	31.9	36.1	39.7
exceeding Zmsy in 2019 (%)	16.4	20.1	23.0	26.0	29.6	32.9	36.2	39.4

## Assessment

The analytical assessment was run with the same basic model as in 2011–2015; minor changes in the coding (A duplication of the uncertainty applied to the estimable predation was removed; which reduces the margin for uncertainty applied in calculating future TACs) are described in SCR Doc. 16/47; and with updated data series. The next assessment is scheduled for 2017.

### 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 shrimps. 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:

	2008	2009	2010	2011	2012	2013	2014	2015	2016
Enacted TAC <sup>1</sup>	145 717	132 987	132 987	139 583	114 425	98 596	94 140	79 561	93 426
STATLANT 21	148 550	133 990	129 179	123 195	114 970	91 802	88 834	70 091	-
NIPAG	153 707	135 369	133 985	123 853	115 943	95 288	87 358	70 650	82 000 <sup>2</sup>

<sup>1</sup> sum of TACs autonomously set by Canada and Greenland; <sup>2</sup> provisional—projected to year end.

## Effects of the fishery on the ecosystem

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

**Special comments** In 2016 the cod biomass density estimated by research trawl survey in West Greenland was about one-seventh of its value in 2015 and the index of its overlap with the shrimp stock also dropped to an 'effective cod biomass' of about 3 Kt, compared with values of 50–60 Kt in 2014–15. In choosing the value for the effective cod stock biomass, it was considered unlikely that the low level of 2016 would be maintained in the prediction period. Therefore, an effective cod biomass near the mean of the most recent three years, i.e. 35 Kt, was used as a basis for the forecasting of trajectories. In the recent past, TAC changes have been implemented in steps of limited size. Increases should follow a similar method. An increase in the TAC enacted for Greenland waters in 2015 was limited by a catch-smoothing rule.

**Source of Information** SCS Doc 13/04, FC Docs 04/18, SCR Docs 16/41, 42, 43, 44, 47

## Bilag 2: Northern Shrimp in Denmark Strait and off East Greenland

Advice September 2016 for 2017

### Recommendation

In 2016 the stock remains at a low level, comparable to previous years, and catches should not exceed 2 000 t.

### Management objectives

Scientific Council is aware of general management objectives specified in the Greenland Fisheries Act; however, the contents of these have not been conveyed to the Council.

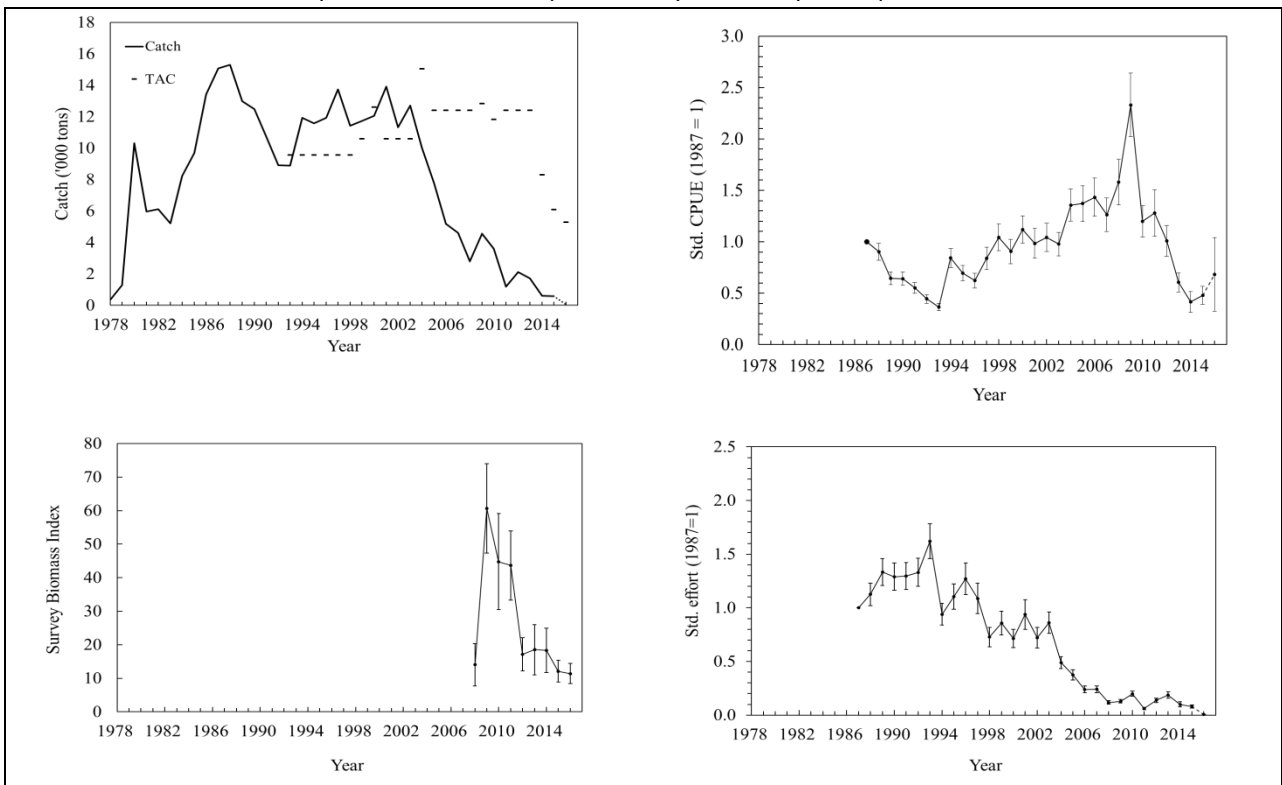
Advice is based on qualitative evaluation of biomass indices in relation to historic levels.

### Management unit

The shrimp stock is distributed off East Greenland in ICES Div. XIVb and Va and is assessed as a single population

### Stock status

The stock size remains at a very low level in 2016 despite several years of very low exploitation rates.



### Reference points

No reference points have been established for this stock

### Projections

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

### Assessment

No analytical assessment is available. Evaluation of stock status is based upon interpretation of commercial fishery and research survey data.

### 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 been increasing in East Greenland waters in recent years.

**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 were as follows:

	2009	2010	2011	2012	2013	2014	2015	2016
Enacted TAC	12835	11835	12400	12400	12400	8300	6100	5300
SC Recommended TAC	12400	12400	12400	12400	12400	2000	2000	2000
NIPAG	4555	3602	1199	2109	1717	622	576	49 <sup>1</sup>

<sup>1</sup> To July 2016

**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. 16/045, 16/046