

## 9. Fish biodiversity

### 9.1 Fish biodiversity in the pelagic compartment

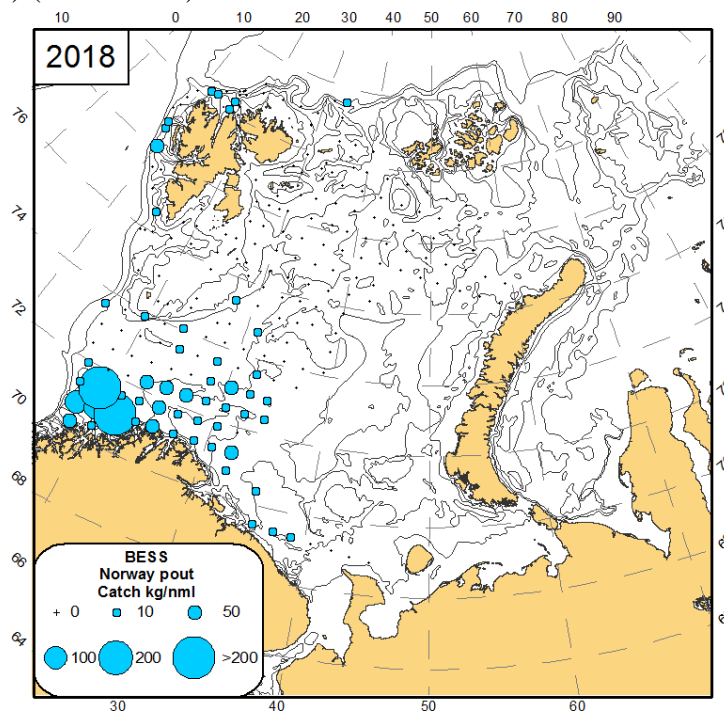
### 9.2 Fish biodiversity in the demersal compartment

by T. Prokhorova, E. Johannesen, A. Dolgov and R. Wienerroither

Figures by P. Krivosheya

**Norway pout (*Trisopterus esmarkii*).** Despite of poor coverage of the Russian Zone, the estimation of distribution, abundance and biomass of Norway pout in August-October 2018 is quite reliable since this species traditionally distributes in the south-western Barents Sea. Only a very small part of the population can distribute in the south-eastern part, which wasn't investigated in 2018.

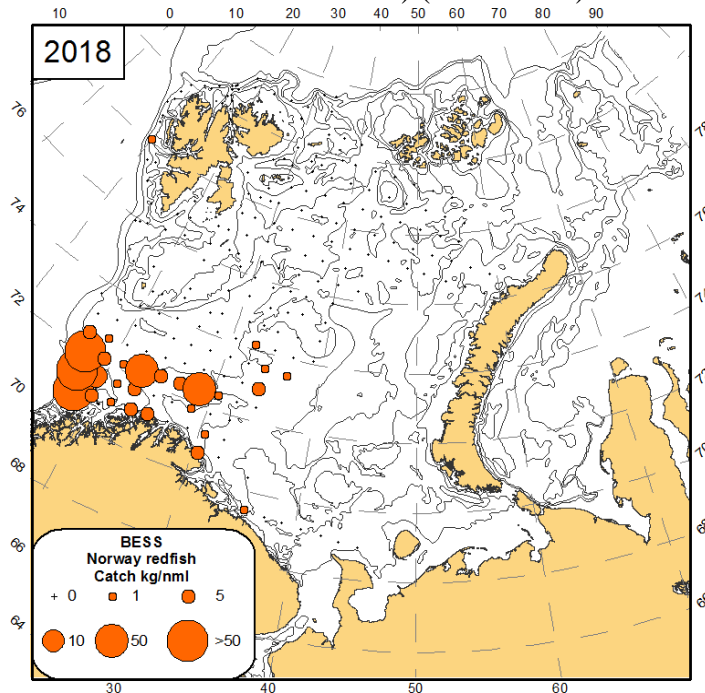
The distribution of Norway pout in 2018 was similar to last year (Fig. 9.2.1). Main concentrations were found in the south-western part of the Barents Sea along the Norwegian coast. The maximum catch and the average catch of Norway pout (303.2 kg/nautical mile and 3.57 kg/nautical mile respectively) in 2018 were higher than in 2017 (142.7 kg/nautical mile and 1.3 kg/nautical mile). Total biomass of Norway pout (50800 tonnes) and total abundance (1687.2 million individuals) was higher in 2018 than in 2017 (21600 tonnes, and 1260.6 million individuals) (Table 9.2.1).



**Figure 9.2.1** Distribution of Norway pout (*Trisopterus esmarkii*), August-October 2018

**Norway redfish (*Sebastes viviparus*).** As the previous species, to the estimation of distribution, abundance and biomass of Norway redfish in August-October 2018 are reliable. This species traditionally distributes also in the south-western part of the Barents Sea. Only a very small part of the population can distribute in the south-eastern part, which wasn't investigated in 2018.

In 2017 Norway redfish were mainly observed in the south-western area of the survey along the Norwegian coast, similar to 2017 (Fig. 9.2.2). The maximum catch of Norway redfish in 2018 was 481.9 kg/nautical mile with average of 3.33 kg/nautical mile, and it is higher than in 2017 (156.5 kg/nautical mile and 0.7 kg/nautical mile respectively). Total abundance and biomass indices in 2018 (202.9 million individuals and 25300 tonnes) were higher than in 2017 (133.7 million individuals and 14300 tonnes) (Table 9.2.1).

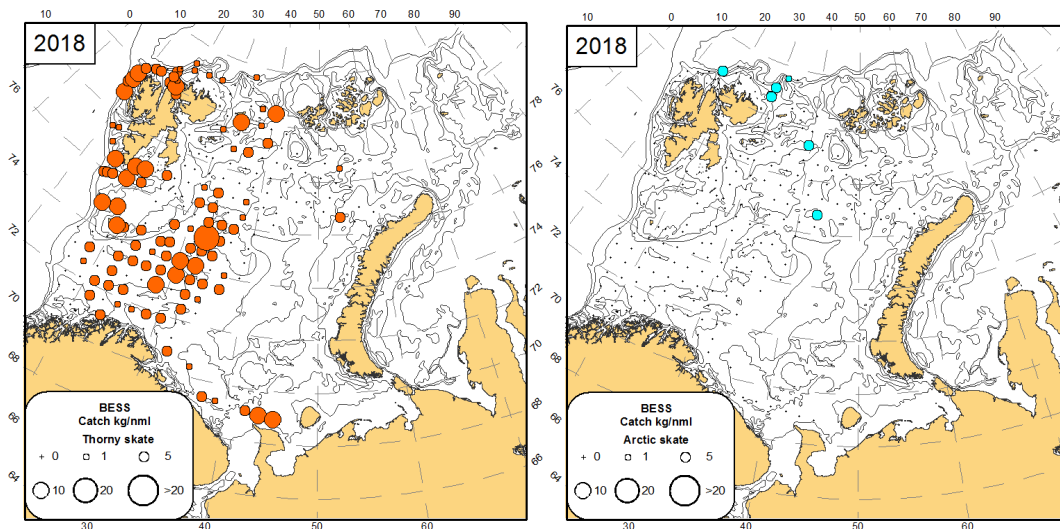


**Figure 9.2.2** Distribution of Norway redfish (*Sebastes viviparus*), August-October 2018

**Thorny skate (*Amblyraja radiata*) and Arctic skate (*Amblyraja hyperborea*)** were selected as indicator species to study how ecologically similar fishes from different zoogeographic groups respond to changes of their environment. Thorny skate belongs to the mainly boreal zoogeographic group and are widely distributed in the Barents Sea except the most north-eastern areas, while Arctic skate belongs to the Arctic zoogeographic group and are distributed in the cold water of the northern area.

Due to poor coverage of the Russian Zone by BESS in 2018 it is impossible to estimate distribution, abundance and biomass of skates. So, only maps of distribution on the observed area are present in the Report, without comparison to previous years.

Thorny skate was widely distributed in the Norwegian Zone, from the southwest to the northwest where warm Atlantic and Coastal Waters dominate (Figure 9.2.3). Arctic skate was observed on the small number of stations in the northern part of observed area (Figure 9.2.3).



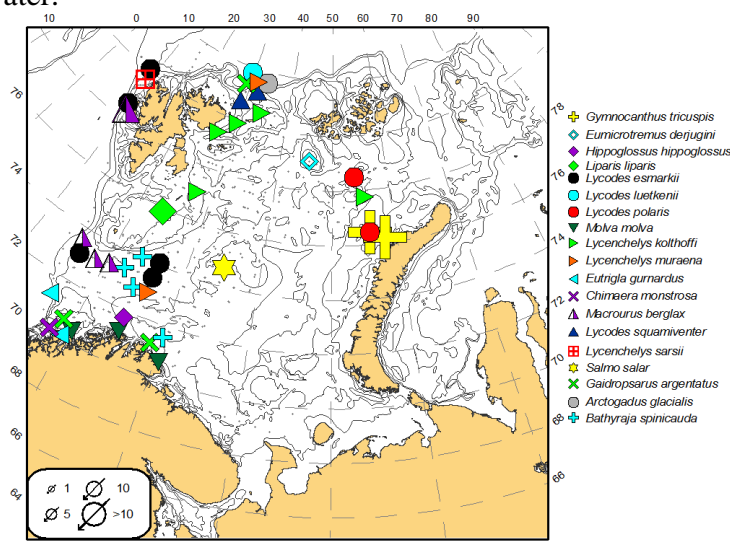
**Figure 9.2.3** Distribution of thorny skate (*Amblyraja radiata*) (land Arctic skate (*Amblyraja hyperborea*), August-October 2018

### 9.3 Uncommon or rare species

by T. Prokhorova, E. Johannesen, A. Dolgov and R. Wienerroither  
 Figures by P. Krivosheya

Rare or uncommon species are either species that are not caught at the Barents Sea ecosystem survey every year, or caught most years but in low numbers and with limited occurrence. Most of these species usually occur in areas adjacent to the Barents Sea and were therefore found mainly along the border of the surveyed area.

Some uncommon species were observed in the Barents Sea during the ecosystem survey in 2018 (Figure 9.3.1). E.g. Atlantic salmon *Salmo salar* is anadromous and sporadically found in the Barents Sea. Arctic cod *Arctogadus glacialis* and Lutken’s eelpout *Lycodes luetkenii* are distributed in the Arctic polar basin. Roughhead grenadier *Macrourus berglax* is found in deeper, Atlantic Water.



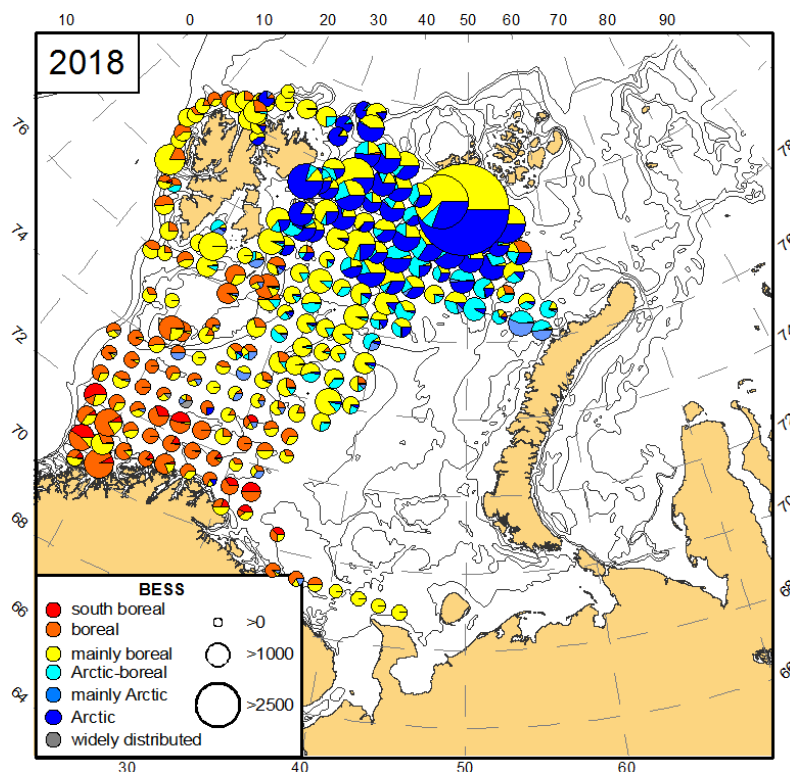
**Figure 9.3.1** Distribution of species which are rare in the Barents Sea and which were found in the survey area in 2018. Size of symbol corresponds to abundance (individuals per nautical mile, both bottom and pelagic trawls were used)

9.4 Zoogeographic groups

by T. Prokhorova, E. Johannesen, A. Dolgov and R. Wienerroither  
 Figures by P. Krivosheya

During the 2018 ecosystem survey 83 fish species from 28 families were recorded in the catches, and some taxa were only recorded at genus or family level (Appendix 2). We observed fewer number of species compared to previous years due to poor coverage of the Russian Zone. All recorded species belonged to the 7 zoogeographic groups: **widely distributed, south boreal, boreal, mainly boreal, Arctic-boreal, mainly Arctic and Arctic** as defined by Andriashev and Chernova (1994). Mecklenburg et al. (2018) in the recent “Marine Fishes of the Arctic Region” reclassified some of the species and geographical categorisation comprises six groups: **widely distributed, boreal, mainly boreal, Arctic-boreal, mainly Arctic and Arctic**. We use Andriashev and Chernova classification here due to the lack of comparative studies of the old and new classification applied to the Barents Sea. Only bottom trawl data were used, and only non-commercial species were included into the analysis, both demersal (including benthopelagic) and pelagic (neritopelagic, epipelagic, bathypelagic) species were included (Andriashev and Chernova, 1994, Parin, 1968, 1988).

Due to poor coverage of the Russian Zone by BESS in 2018 it is impossible to estimate distribution, abundance and biomass of each zoogeographic group species. So, a only map of the distribution from the observed area is presented in the Report, without comparison to previous years (Figure 9.4.1).



**Figure 9.4.1** Distribution of non-commercial fish species from different zoogeographic groups during the ecosystem survey 2018. The size of circle corresponds to abundance (individuals per nautical mile, only bottom trawl stations were used, both pelagic and demersal species are included)

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**Table 9.2.1** Total abundance (N, million individuals) and biomass (B, thousand tonnes) of Norway pout and Norway redfish in the Barents Sea in August-October 2006-2018 (not including 0-group).

Table 9.2.1

Year	Species			
	Norway pout		Norway redfish	
	N	B	N	B
2006	1838	32	219	19
2007	2065	61	64	10
2008	3579	97	24	4
2009	3841	131	17	2
2010	3530	103	26	2
2011	5976	68	83	9
2012	3089	105	114	12
2013	2267	40	233	25
2014	1254	37	105	6
2015	943	33	168	20
2016	797	28	125	13
2017	1260.6	21.6	133.7	14.3
2018	1687.2 ↑	50.8 ↑	202.9 ↑	25.3 ↑