

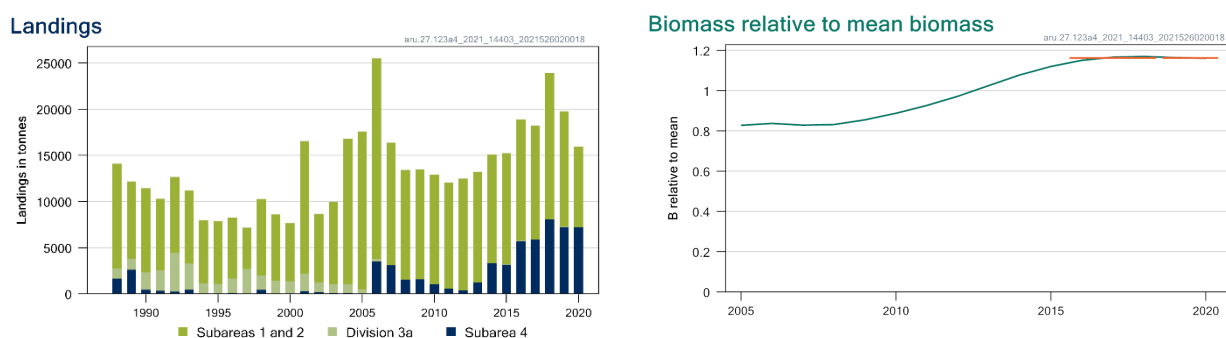
## Greater silver smelt (*Argentina silus*) in subareas 1, 2, and 4, and in Division 3.a (Northeast Arctic, North Sea, Skagerrak, and Kattegat)

### ICES advice on fishing opportunities

ICES advises that when the precautionary approach is applied, catches should be no more than 10 271 tonnes in each of the years 2022 and 2023.

### Stock development over time

Fishing pressure on the stock is below  $F_{MSY}$  (Figure 2); No reference points for stock size have been defined for this stock.



**Figure 1** Greater silver smelt in subareas 1, 2, and 4, and in Division 3.a. Summary of the stock assessment. Left: total landings in tonnes by area. Right: relative biomass (biomass/mean) index from SPiCT. The horizontal orange lines indicate the average of the most recent two years and the previous three years.

### Catch scenarios

ICES framework for category 3 stocks was applied (ICES, 2012). The relative biomass trend derived from the SPiCT model was used as the index for the stock development. The advice is based on the ratio of the mean of the last two index values (index A) and the mean of the three preceding values (index B), multiplied by the recent (2020–2021) advised catch. The index is estimated to have increased by less than 20% and thus the uncertainty cap was not applied. The precautionary buffer was applied in 2019 and was thus not considered again. Discarding is considered negligible.

**Table 1** Greater silver smelt in subareas 1, 2, and 4, and in Division 3.a. The basis for the catch scenarios <sup>^</sup>.

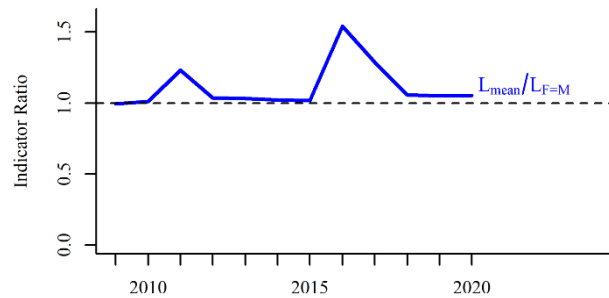
Index A (2019–2020)		1.162
Index B (2016–2018)		1.162
Index ratio (A/B)		1.00
Uncertainty cap	Not applied	
Advised catch for 2020 and 2021 (issued in 2019)		10 270
Discard rate	Negligible	
Precautionary buffer	Not applied	
Catch advice *		10 271
% Advice change **		0.01%

<sup>^</sup> The figures in the table are rounded. Calculations were done with unrounded inputs, and computed values may not match exactly when calculated using the rounded figures in the table.

\* [Advice for 2020–2021] × [index ratio].

\*\* Advice value for 2022 and 2023 relative to advice value for 2020 and 2021.

The catch advice has increased marginally because of a very slight change in the biomass trend.



**Figure 2** Greater silver smelt in subareas 1, 2, and 4, and in Division 3.a. Index ratio of the average length relative to the expected length when fishing mortality equals natural mortality ( $L_{mean}/L_{F=M}$ ) from the length-based indicator method used for the evaluation of the exploitation status (ICES, 2021). The exploitation status is below the  $F_{MSY proxy}$  when the index ratio value is higher than 1.

### Basis of the advice

**Table 2** Greater silver smelt in subareas 1, 2, and 4, and in Division 3.a. The basis of the advice.

Advice basis	Precautionary approach
Management plan	ICES is not aware of any agreed precautionary management plan for greater silver smelt in these areas

### Quality of the assessment

At the benchmark in 2020 (ICES, 2021c), a SPiCT assessment was examined but was not considered representative of the absolute level of biomass. However, the relative biomass output from SPiCT was considered indicative of stock trends and used as the basis for the advice.

In 2020, the Norwegian Sea continental slope survey coverage was affected by the COVID-19 disruptions, but this is considered to have had a minor effect on the assessment.

### Issues relevant for the advice

While all landings in Subarea 4 are treated as greater silver smelt, samples from the fisheries indicate that around 10% of the catches may be lesser silver smelt (*Argentina sphyraena*). ICES does not advise on the latter species.

Bycatch of greater silver smelt in the industrial fisheries in Subarea 4 and Division 3.a has been increasing rapidly since 2012, and now almost half of the total catches of this stock are taken as bycatch in these industrial fisheries. Managers should be aware that this ICES advice relates to all catches from this stock.

This stock is classified as Category 4 in the NEAFC categorization of deep-sea species/stocks. This implies that fisheries are primarily restricted to coastal state Exclusive Economic Zones (EEZs) and therefore management measures are not taken by NEAFC unless complementary to coastal state conservation and management measures (NEAFC, 2016).

## Reference points

**Table 3** Greater silver smelt in subareas 1, 2, and 4, and in Division 3.a. Reference points, values, and their technical basis.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger\_proxy}$	Not defined		
	$F_{MSY\_proxy}$	$\frac{L_{mean}}{L_{F=M}} = 1$	Relative value from LBI analysis, assuming $M/K = 1.5$ . $L_{F=M}$ is based on $L_c$ (length at 50% of modal abundance), which varies each year	(ICES, 2021c)
Precautionary approach	$B_{lim}$	Not defined		
	$B_{pa}$	Not defined		
	$F_{lim}$	Not defined		
	$F_{pa}$	Not defined		
Management plan	$SSB_{mgt}$	Not defined		
	$F_{mgt}$	Not defined		

## Basis of the assessment

**Table 4** Greater silver smelt in subareas 1, 2, and 4, and in Division 3.a. Basis of the assessment and advice.

ICES stock data category	3 ( <a href="#">ICES, 2021a</a> )
Assessment type	Biomass trends-based assessment (ICES, 2021b)
Input data	Biomass estimates from SPiCT using an acoustic index from the Norwegian Sea continental slope deep-sea fish cruise in spring survey in Subarea 2 (G5678)
Discards and bycatch	Discarding is considered to be negligible
Indicators	Length-based indicator
Other information	This stock was last benchmarked in 2020 (ICES, 2021c)
Working group	Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources ( <a href="#">WGDEEP</a> )

## History of the advice, catch, and management

**Table 5** Greater silver smelt in subareas 1, 2, and 4, and in Division 3.a. ICES advice, official landings and TACs. All weights are in tonnes.

Year	ICES advice*	Catch corresponding to advice	TAC EU in subareas 1 and 2	TAC EU in subareas 3 and 4	TAC Norway in subareas 1 and 2	Official landings
2003	No fisheries unless data collection on (by)catch; no expansion unless proven to be sustainable	-	-	1566		9969
2004	Biennial	-	-	1566		16817
2005	No fisheries unless accompanied by programmes to collect data on both target and bycatch fish	-	116	5310		17595
2006	Biennial	-	116	5310		25496
2007	The fishery should not be allowed to expand unless it can be shown that it is sustainable	-	116	5311	12000	16374
2008	Biennial	-	116	5311	12000	13424
2009	Same advice as in 2007	-	116	5311	12000	13495
2010	Biennial	-	111	5099	12000	12898
2011	The fishery should not be allowed to expand, and a reduction in catches should be considered	-	103	4691	12000	12064
2012	No new advice, same as in 2011		95	4316	12000	12485
2013	Reduce catches by 10%		90	4316	12000	13229
2014	No new advice, same as in 2013		90	4316	12000	15069
2015	No new advice, same as in 2013		90	1028	13047	15236

Year	ICES advice*	Catch corresponding to advice	TAC EU in subareas 1 and 2	TAC EU in subareas 3 and 4	TAC Norway in subareas 1 and 2	Official landings
2016	Precautionary approach with application of PA buffer	13047	90	1028	13047	18917
2017	Same as in 2016	13047	90	1028	13047	18223
2018	Precautionary approach with application of PA buffer	≤ 15656	90	1234	13770	23902
2019	Same as in 2018	≤ 15656	90	1234	13770	19777
2020	Precautionary approach	≤ 10270	90	1234	9033	15920
2021	Same as 2020	≤ 10270	**	**	9033	
2022	Precautionary approach	≤ 10271				
2023	Precautionary approach, same as in 2022	≤ 10271				

\* Until 2014 the advice was combined for subareas 1, 2, 4, 6, 7, 8, 9, 10, 12, and 14, and divisions 3.a and 5.b.

\*\* TACs were not agreed at the time of publication.

### History of the catch and landings

There are no reported catches in the NEAFC Regulatory Area.

**Table 6** Greater silver smelt in subareas 1, 2, and 4, and in Division 3.a. Catch distribution by fleet in 2020 as estimated by ICES.

Catch (2020)	Landings		Discards
	Trawl for human consumption 55%	Trawl bycatch 45%	
16 020 tonnes	15 920 tonnes		100 tonnes

**Table 7** Greater silver smelt in subareas 1, 2, and 4, and in Division 3.a. History of commercial landings and discards; the ICES estimated values are presented by area. All weights are in tonnes.

Year	Landings subareas 1 and 2	Landings Division 3.a	Landings Subarea 4	Total landings	Discards in subareas 3 and 4**
1988	11351	1089	1656	14096	
1989	8390	1174	2612	12176	
1990	9120	1882	439	11441	
1991	7741	2221	333	10295	
1992	8234	4198	236	12668	
1993	7913	2830	445	11188	
1994	6807	1108	38	7953	
1995	6775	1061	21	7857	
1996	6604	1548	111	8263	
1997	4463	2700	2	7165	
1998	8261	1589	427	10277	
1999	7163	1422	11	8596	
2000	6293	1316	45	7654	
2001	14369	1918	262	16549	
2002	7407	1098	167	8672	
2003	8937	960	72	9969	
2004	15796	911	110	16817	
2005	17093	470	32	17595	
2006	21685	324	3487	25496	
2007	13273	0	3101	16374	
2008	11876	0	1548	13424	
2009	11929	0	1566	13495	
2010	11854	0	1044	12898	
2011	11476	0	588	12064	
2012	12134	0	351	12485	
2013	11978	0	1251	13229	

Year	Landings subareas 1 and 2	Landings Division 3.a	Landings Subarea 4	Total landings	Discards in subareas 3 and 4**
2014	11752	3	3314	15069	7
2015	12049	23	3164	15236	
2016	13122	102	5693	18917	
2017	12322	4	5896	18223	389
2018	15832	4	8067	23902	44
2019	12501	66	7210	19777	105
2020*	8705	0	7215	15920	100

\* Preliminary.

\*\* Discard data is not available prior to 2014.

### Summary of the assessment

**Table 8** Greater silver smelt in subareas 1, 2, and 4, and in Division 3.a. Assessment summary from SPiCT biomass index. Biomass relative to mean biomass.

Year	Relative biomass SPiCT (Biomass/mean biomass)	Landings (tonnes)
1988		14096
1989		12176
1990		11441
1991		10295
1992		12668
1993		11188
1994		7953
1995		7857
1996		8263
1997		7165
1998		10277
1999		8596
2000		7654
2001		16549
2002		8672
2003		9969
2004		16817
2005	0.83	17595
2006	0.84	25496
2007	0.83	16374
2008	0.83	13424
2009	0.86	13495
2010	0.89	12898
2011	0.93	12064
2012	0.97	12485
2013	1.03	13229
2014	1.08	15069
2015	1.12	15236
2016	1.15	18917
2017	1.17	18223
2018	1.17	23902
2019	1.16	19777
2020	1.16	15920

## Sources and references

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[Download the stock assessment data and figures.](#)

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