

ICES advice for North Western Waters stocks for 2021

NWWAC meeting, July 7-8 2020

WORKING GROUP 3 – ENGLISH CHANNEL

Ghislain Chouinard
ICES ACOM vice-chair



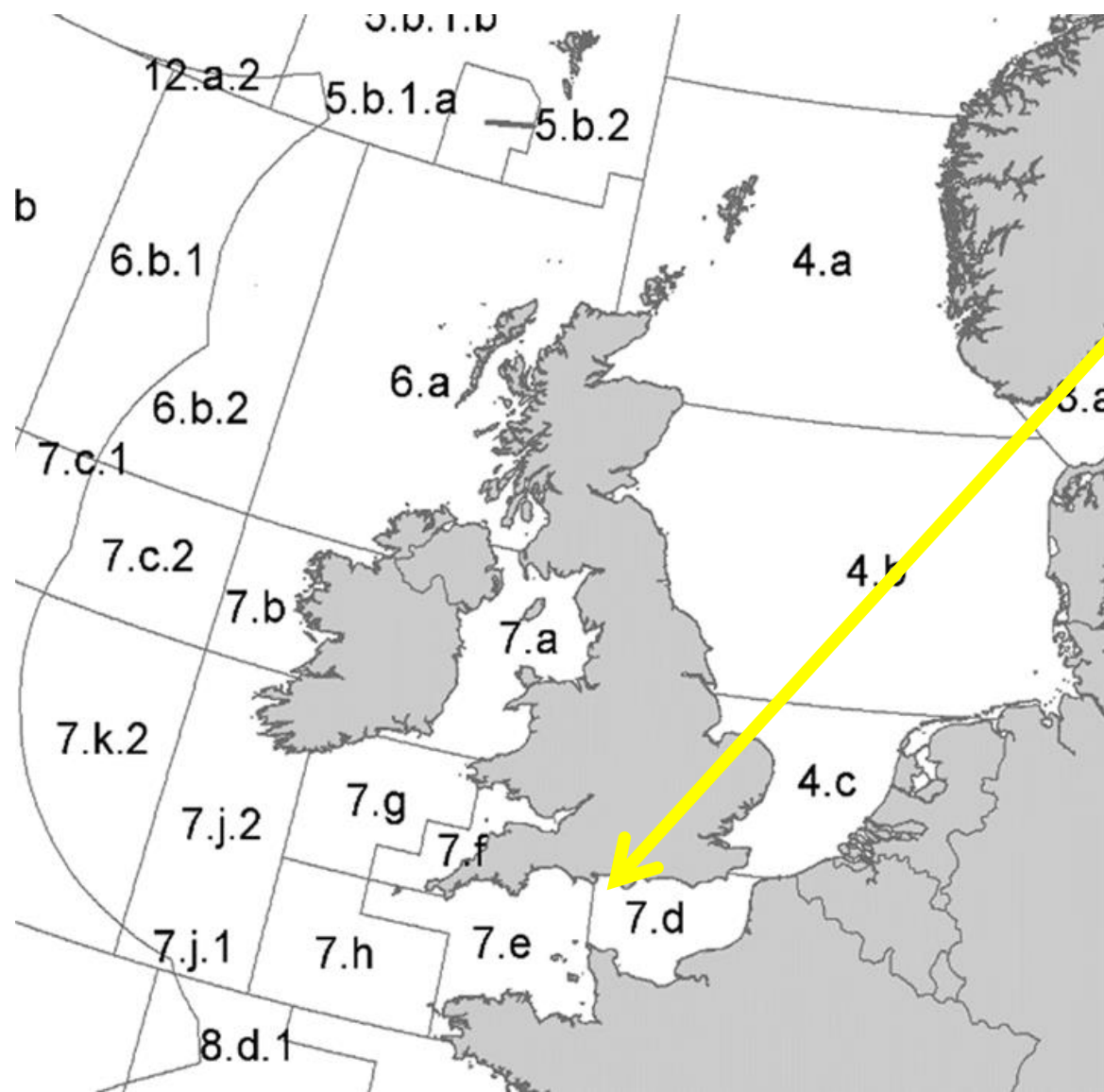
Science for sustainable seas

Image Dirk Vonten, Fotolia

Introduction – English Channel

- Includes advice released up to 30 June 2020.
- Advice rules applied by ICES in developing advice on fishing opportunities similar to previous years.
- Abbreviated advice for most stocks due to COVID-19.
- Full advice sheets for benchmarked stocks in early 2020 (sole in 7.d)
- Other advice to be released in the autumn for the following stocks:
skates and rays

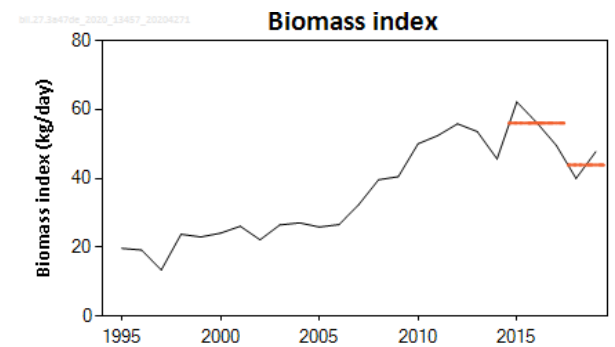
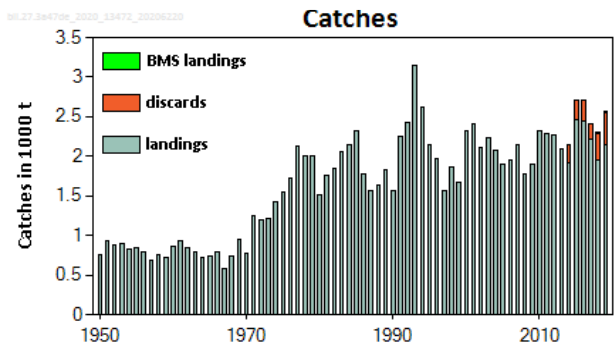
English Channel (Divisions 7.d and e)



- Brill (3a, 4, 7d)
- Cod (4, 7.d, Skagerrak)
- Lemon sole (3a,4,7d)
- Plaice (7.d)
- Plaice (7.e)
- Sea bass (4.bc, 7.a,d-h)
- Sole 7.d
- Sole (7.e)
- Whiting (4,7.d)

Brill in the North Sea, Skagerrak and Kattegat, English Channel (4, 3.a, 7.de)

Advice for 2021, PA: Catch $\leq 2\ 047$ t



		Fishing pressure			Stock size		
		2017	2018	2019	2017	2018	2019
Maximum sustainable yield	F_{MSY} proxy	✓	✓	✓ Below proxy	$MSY B_{trigger}$ proxy	✓	✓ Above trigger
Precautionary approach	F_{pa} F_{lim}	✓	✓	✓ Below possible reference points	B_{pa} B_{lim}	✓	✓ Above possible reference points
Management plan	F_{MGT}	—	—	—	B_{MGT}	—	—

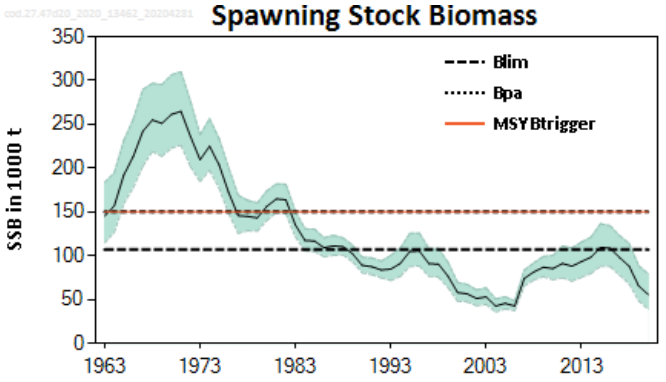
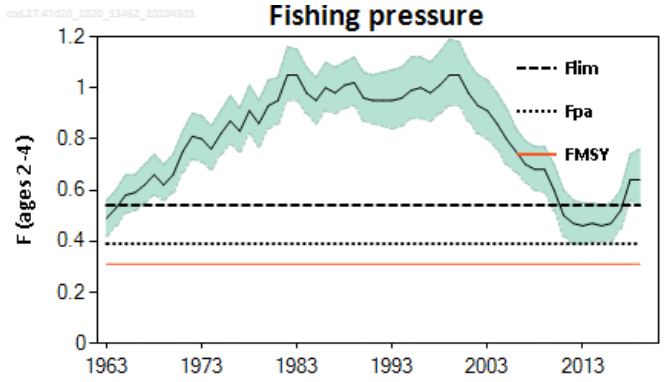
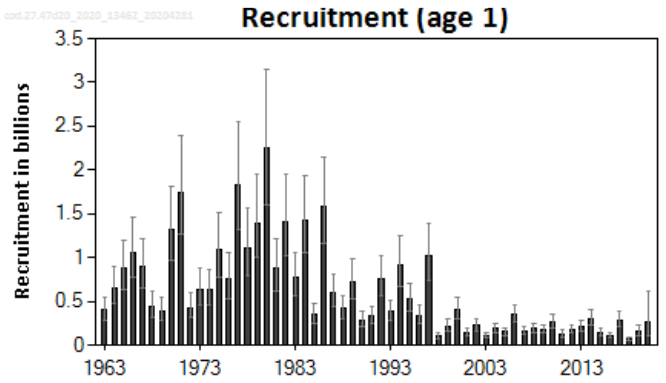
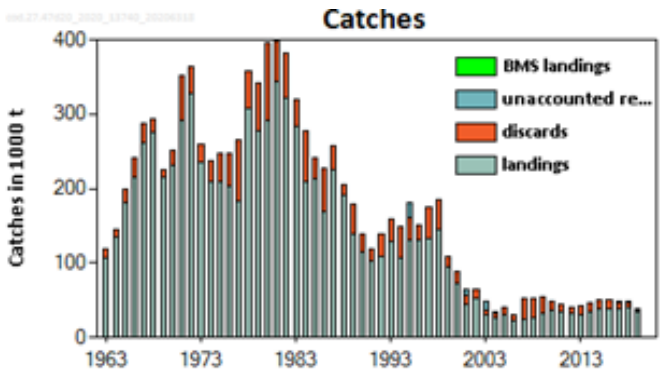
Catch (2019) = 2 564 t (15 % discards) – 747 t in 7.de

- Catches averaged about 2500 t over last 5 years.
- Biomass index (Dutch beam trawl commercial index) has been gradually increasing, decrease over last recent years but remains high.

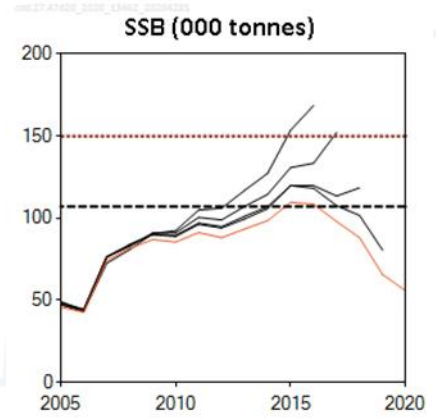
Index A (2018–2019)		$44\text{ kg} \times \text{d}^{-1}$
Index B (2015–2017)		$56\text{ kg} \times \text{d}^{-1}$
Index ratio (A/B)		0.78
Uncertainty cap	Applied	0.8
Advised catch for 2020		2559 tonnes
Discard rate (2017–2019)		13.40%
Precautionary buffer	Not applied	-
Catch advice **		2047 tonnes
Projected landings corresponding to the advice ***		1773 tonnes
% advice change ^		-20%

Cod in Subarea 4 and Divisions 7.d and subdivision 20

Advice for 2021, MSY: Catch $\leq 14\ 755$ t



- Spawning stock has decreased since 2015 and is now below B_{lim} .
- Fishing pressure has increased since 2016, and is above F_{lim} since 2018
- Recruitment remains poor.
- Downward revision of estimates.
- Benchmark planned for 2021.



	Fishing pressure			Stock size			
		2017	2018	2019	2018	2019	2020
Maximum sustainable yield	F_{MSY}	✘	✘	✘ Above	$B_{trigger}$	✘	✘ Below trigger
Precautionary approach	F_{pa}, F_{lim}	○	✘	✘ Harvested unsustainably	B_{pa}, B_{lim}	✘	✘ Reduced reproductive capacity
Management plan	F_{MGT}	—	—	— Not applicable	B_{MGT}	—	— Not applicable

Cod in Subarea 4 and Divisions 7.d and subdivision 20



Catch (2019) : 35 685 t (10 % discards); **Catch of 37 t in 7.d**

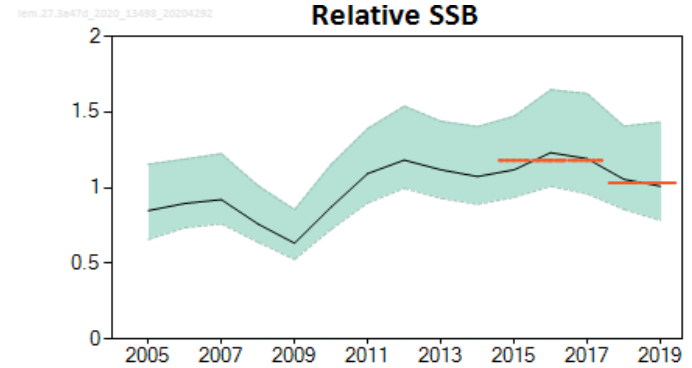
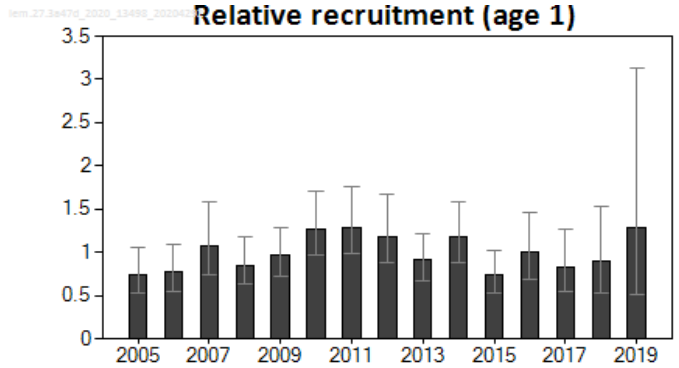
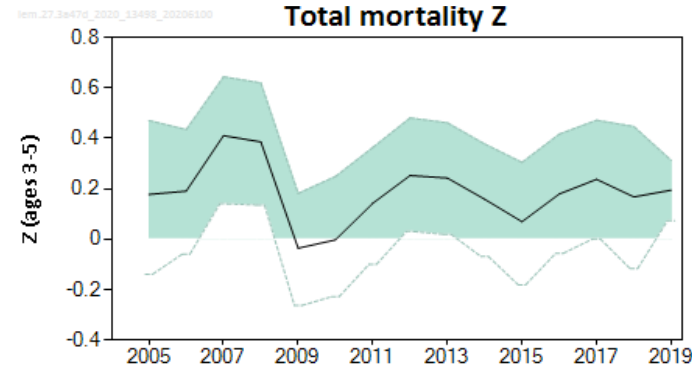
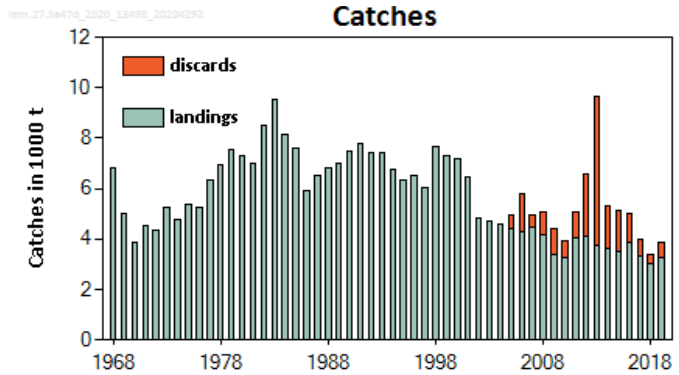
F(2020) = 0.26 (Average exploitation pattern (2017-2019) with TAC constraint;

SSB (2021)= 78 300 t < B_{lim} (107 000 t) F_{MSY} = 0.31

Basis	Total catch (2021)	Projected landings * (2021)	Projected discards ** (2021)	F _{total} (2021)	F _{Projected} landings (2021)	F _{Projected} discards (2021)	SSB (2022)	% SSB change ***	% TAC change ^	% advice change ^^
ICES advice basis										
MSY approach:										
F_{MSY} × SSB (2021) /MSY B_{trigger}	14755	12632	2123	0.162	0.136	0.026	112758	44	-16.5	7.8
Other scenarios #										
F = MAP ^^^ F _{MSY lower} × SSB (2021) /MSY B _{trigger}	9672	8291	1381	0.103	0.087	0.016	118040	51	-45	-29
F = 0	0	0	0	0	0	0	128848	65	-100	-100
F _{pa}	32411	27556	4855	0.39	0.33	0.063	93679	19.6	83	137
F _{lim}	42307	35860	6447	0.54	0.45	0.088	83289	6.4	139	210
SSB (2022) = B _{lim}	20325	17350	2975	0.23	0.192	0.037	107000	37	15	49
SSB (2022) = MSY B _{trigger} = B _{pa} ##										
TAC (2020) – 20%	14143	12113	2030	0.155	0.13	0.025	113403	45	-20	3.3
TAC (2020) – 10%	15911	13608	2303	0.175	0.147	0.028	111649	43	-10.0	16.3
TAC (2020)	17679	15102	2577	0.197	0.165	0.032	109876	40	0	29
TAC (2020) + 10%	19447	16601	2846	0.22	0.183	0.035	108059	38	10	42
TAC (2020) + 20%	21215	18099	3116	0.24	0.2	0.039	106020	35	20	55
F = F ₂₀₂₀	25375	21605	3770	0.29	0.25	0.048	101262	29	44	85
F = F _{MSY lower}	17794	15199	2595	0.198	0.166	0.032	109762	40	0.65	30
F = F _{MSY}	26611	22653	3958	0.31	0.26	0.05	99841	28	51	94

Lemon sole in the North Sea, Skagerrak and Kattegat, E-English Channel (4, 3.a, 7.d)

Advice for 2021 PA: Catch \leq 3 742 t



- Landings lower than those in late 1980's
- Biomass increased in late 2000s and relatively stable recently.
- Fishing mortality has fluctuated without trend.
- Recruitment higher in 2019

		Fishing pressure				Stock size				
		2017	2018	2019		2017	2018	2019		
Maximum sustainable yield	F_{MSY} proxy	✓	✓	✓	Below proxy	$B_{trigger}$?	?	?	Undefined
Precautionary approach	F_{pa} , F_{lim}	✓	✓	✓	Below possible reference points	B_{pa} , B_{lim}	?	?	?	Undefined
Management plan	F_{MGT}	-	-	-	-	B_{MGT}	-	-	-	Not applicable
Qualitative evaluation	-	-	-	-	-	-	→	↘	↘	Decreasing

Lemon sole in the North Sea, Skagerrak and Kattegat, E-English Channel (4, 3.a, 7.d)

Catch (2019) = 3 873 t (15% discards); **landings of 104 t in 7.d**

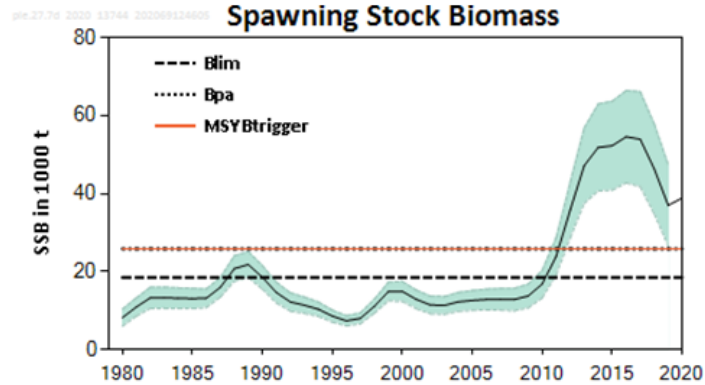
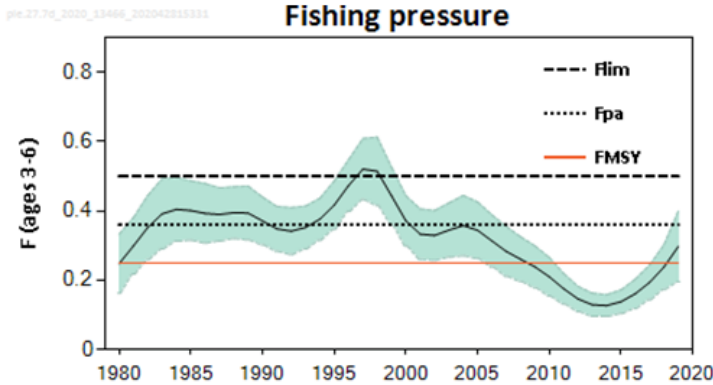
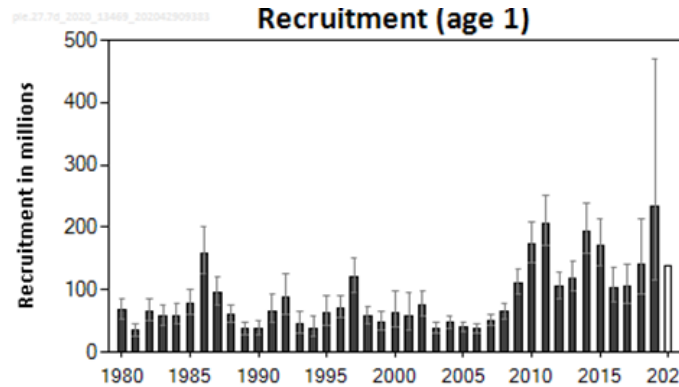
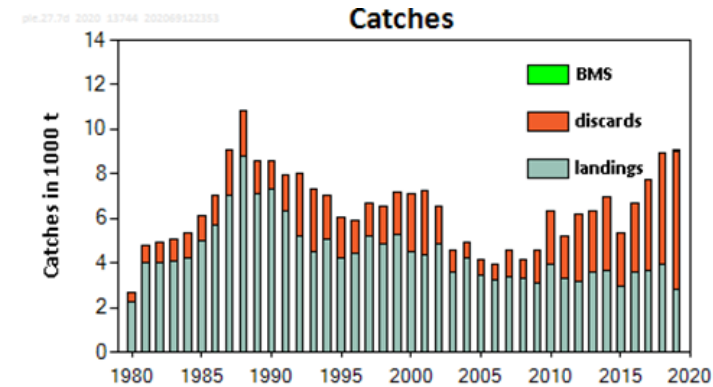


Index A (2018–2019)	1.03 (relative SSB index)
Index B (2015–2017)	1.18 (relative SSB index)
Index ratio (A/B)	0.88
Uncertainty cap	Not applied -
Advised catch for 2020	4279 tonnes
Discard rate (2017–2019)	13.90%
Precautionary buffer	Not applied (last applied in 2019) -
Catch advice **	3742 tonnes
Projected landings corresponding to the advice ***	3221 tonnes
% advice change	-12.5%

Plaice in the eastern English Channel (7.d)



Advice for 2021, EU MAP Catch: 6 066 – 11 130 t (F_{MSY} : 8 402 t)



- Part of the catches of plaice in Division 7.d are from the Western Channel and North Sea stocks.
 - 7 190 – 13 192 t when taking other stocks taken in 7.d into account
- Spawning stock has increased during 2008-2015 but has declined since 2017, well above MSY $B_{trigger}$.
- Fishing mortality has declined since the early 2000s and has been increasing. And above F_{MSY} in 2019
- Recruitment high in 2019.
- Caught in mixed fishery with sole – high discards of plaice

	Fishing pressure			Stock size		
	2017	2018	2019	2018	2019	2020
Maximum sustainable yield	F_{MSY}	✓	✓	✗ Above	$B_{trigger}$	✓ Above trigger
Precautionary approach	F_{pa}, F_{lim}	✓	✓	✓ Harvested sustainably	B_{pa}, B_{lim}	✓ Full reproductive capacity
Management plan	F_{MGT}	✓	✓	✓ Within range	B_{MGT}	✓ Above trigger

*Plaice catches in Div. 7.d in Quarter 1 from various stocks: 35% from 7.d; 15% from 7.e; 50% from N Sea

Plaice in the eastern English Channel (7.d)

Catch (2019) : 9 047 t - for the plaice 7d stock (69% discards); 10, 785 t in 7d
F(2020) = 0.30 (Average exploitation pattern (2017-2019) scaled to 2019);
SSB (2021)= 38 191 t > MSY_{Btrigger} (25 826 t) F_{MSY}= 0.25

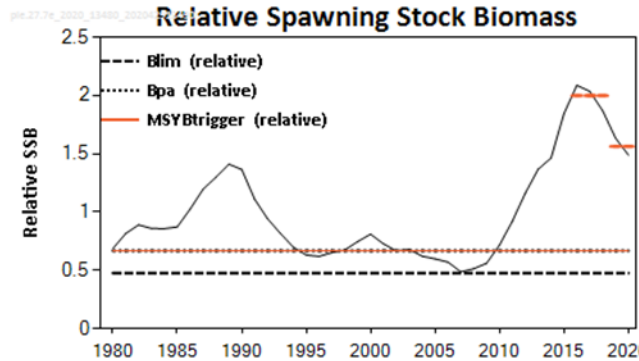
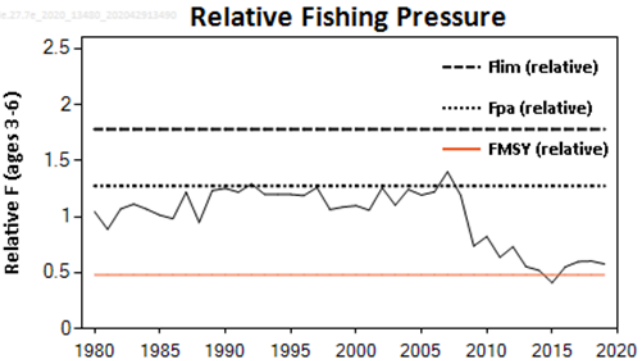
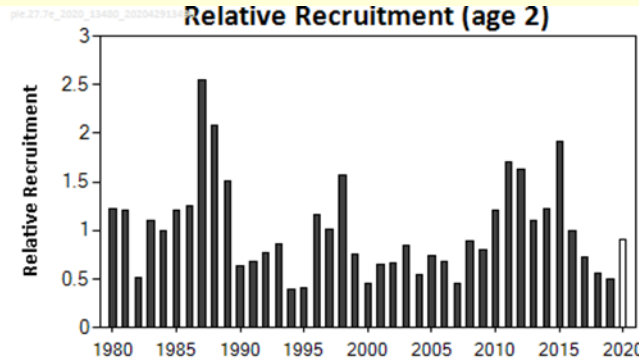
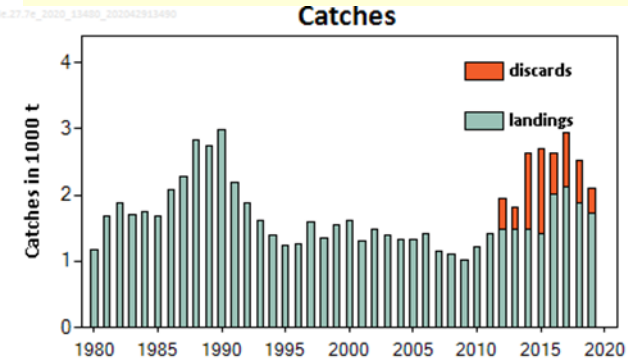
Basis	Division 7.d plaice stock										Plaice in Division 7.d #				
	Total catch (2021)^	Projected landings* (2021)	Projected discards** (2021)	F _{total} (ages 3-6) (2021)	F _{projected} landings (ages 3-6) (2021)	F _{projected} discards (ages 3-6) (2021)	SSB (2022)	% SSB change***	% change in projected catches****	% advice change \$	Total catch (2021)	Projected landings* (2021)	Projected discards** (2021)	% change in projected catches ^^	% advice change ##
ICES advice basis															
EU MAP ^{^^^} : F _{MSY}	8402	3424	4978	0.25	0.088	0.162	39205	2.7	-7.1	-7.4	9959	4059	5900	-7.7	-6.8
F= MAP F _{MSY lower}	6066	2470	3596	0.175	0.062	0.113	41913	9.7	-33	-7.3 ^{\$\$}	7190	2928	4263	-33	-6.7
F= MAP F _{MSY upper}	11130	4540	6589	0.344	0.121	0.223	36088	-5.5	23	-7.5 ^{\$\$}	13192	5382	7811	22	-6.9
Other scenarios															
MSY approach: F _{MSY}	8402	3424	4978	0.25	0.088	0.162	39205	2.7	-7.1	-7.4	9959	4059	5900	-7.7	-6.8
F = 0	0	0	0	0	0	0	49099	29	-100	-100	0	0	0	-100	-100
F _{pa}	11573	4722	6851	0.36	0.127	0.233	35586	-6.8	28	28	13718	5597	8121	27	28
F _{lim}	15216	6214	9002	0.5	0.177	0.323	31521	-17.5	68	68	18036	7366	10670	67	69
SSB (2022) = B _{lim}	27772	11341	16430	1.15	0.407	0.745	18447	-52	207	206	32918	13443	19475	205	208
SSB (2022) = B _{pa}	20495	8377	12118	0.736	0.26	0.476	25826	-32	127	126	24293	9930	14364	125	127
SSB (2022) = MSY B _{trigger}	20495	8377	12118	0.736	0.26	0.476	25826	-32	127	126	24293	9930	14364	125	127
F = F ₂₀₂₀	9803	3997	5806	0.297	0.105	0.192	37597	-1.55	8.4	8	11620	4738	6882	7.7	8.7

Advice for plaice in Division 7.d is for the stock, it takes into account catches of 7.e and North Sea stocks in 7.d

Plaice in the western English Channel (7.e)

Advice for 2021, PA: Catch $\leq 2\,177$ t (stock)

Catch of plaice in Div. 7.e* $\leq 1\,961$ t



- Assessment indicative of trends: discards not in assessment, but taken into account when producing advice.
- Spawning stock has increased since 2008, at high level but decline in last few years
- F declined substantially after 2007 but increased again since 2015 and is currently above F_{MSY} .
- Recruitment has been fluctuating without trend, lower in recent years.

	Fishing pressure				Stock size					
	2017	2018	2019		2018	2019	2020			
Maximum sustainable yield	F_{MSY}	✗	✗	✗	Above proxy	$MSY B_{trigger}$	✓	✓	✓	Above proxy
Precautionary approach	F_{pa}, F_{lim}	✓	✓	✓	Harvested sustainably	B_{pa}, B_{lim}	✓	✓	✓	Full reproductive capacity
Management plan	F_{MGT}	?	?	?	Undefined	B_{MGT}	✓	✓	✓	Above trigger

*Plaice catches in Div. 7.d in Quarter 1 from various stocks: 35% from 7.d; 15% from 7.e; 50% from N Sea

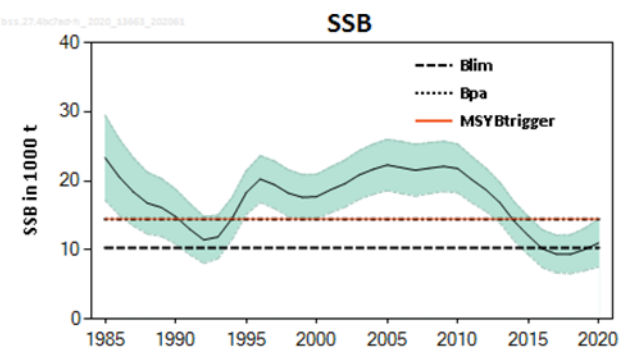
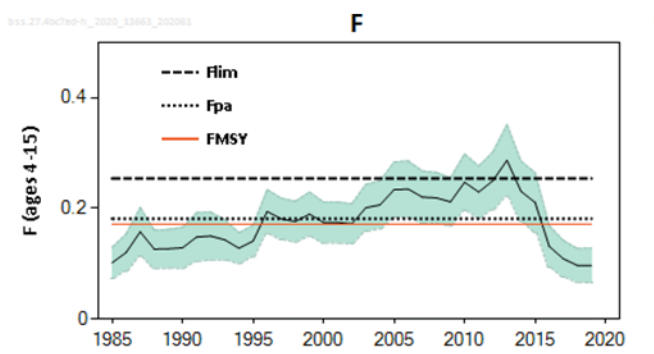
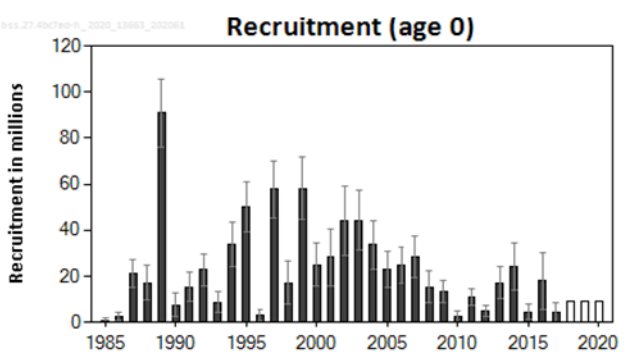
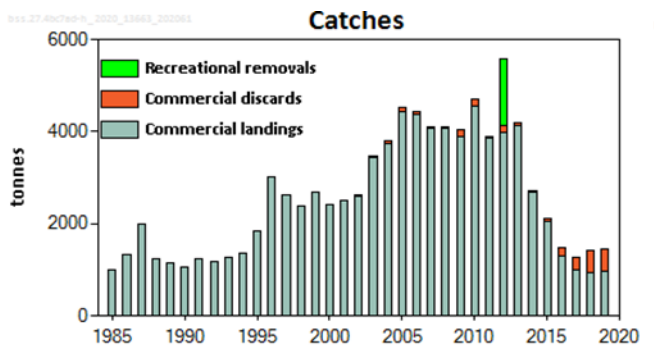
Plaice in the western English Channel (7.e)

Catch (2019) : 2 091 t (17% discards)

Division 7.e plaice stock	
Index A (2019–2020)	1.56
Index B (2016–2018)	2
Index ratio (A/B)	0.78
Uncertainty cap	Applied 0.8
Advised catch for 2020 issued in 2019	2721 tonnes
Discard rate (2012–2019)	0.28
Precautionary buffer	Not applied (Last applied in 2019) -
Catch advice **	2177 tonnes
Projected landings corresponding to advice ***	1560 tonnes
% advice change (plaice Division 7.e stock) ^	-20
Plaice in Division 7.e	
Proportion of Division 7.e stock landings caught in Division 7.e (2003–2019)	0.9
Catch of plaice in Division 7.e corresponding to the advice for the stock	1961 tonnes
Projected landings of plaice in Division 7.e corresponding to the advice for the stock	1405 tonnes

Note: Part of the advised catch is assumed to be taken in 7.d in Quarter 1

Advice for 2021; EU MAP: Catch: 1 680 – 2 000 t ($F_{MSY} = 2\ 000\ t$)



- Spawning stock slightly above B_{lim} in 2020.
- Fishing pressure is below F_{MSY} .
- Recruitment poor except for 2013-2014 and 2016

	Fishing pressure			Stock size						
	2017	2018	2019	2018	2019	2020				
Maximum sustainable yield	F_{MSY}	✓	✓	✓	Below	$MSY\ B_{trigger}$	✗	✗	✗	Below trigger
Precautionary approach	F_{pa}, F_{lim}	✓	✓	✓	Harvested sustainably	B_{pa}, B_{lim}	✗	✗	⚠	Increased risk
Management plan	F_{MGT}	✓	✓	✓	Below the range	B_{MGT}	✗	✗	✗	Below trigger

Sea bass in divisions 4.b–c, 7.a, and 7.d–h

Catch 2019: 1 709 t (972 t commercial, 464 t discards and 273 t recreational)

F (2020)= 0.11 (F_{sq} for commercial fishery and full compliance in recreational)

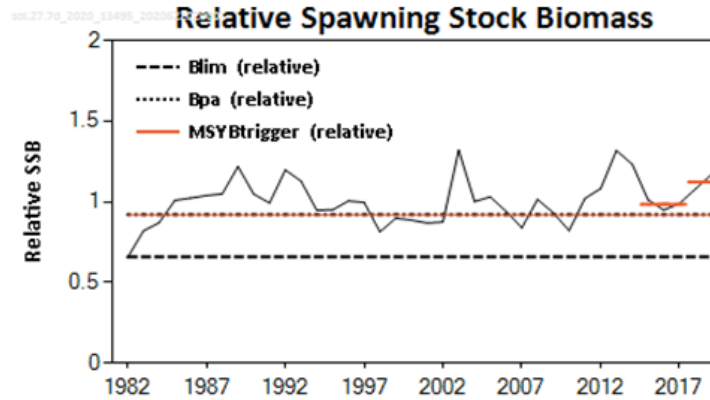
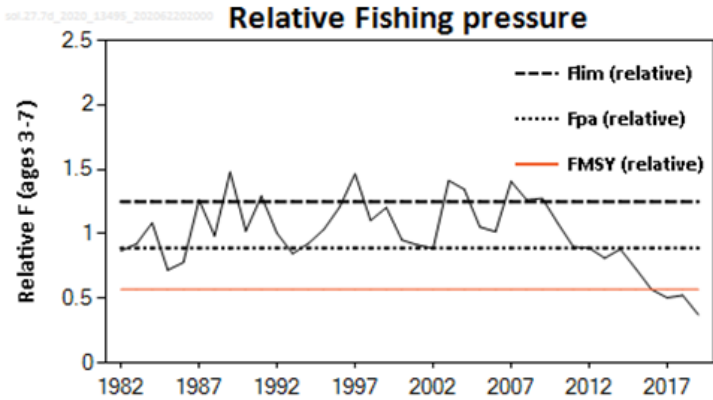
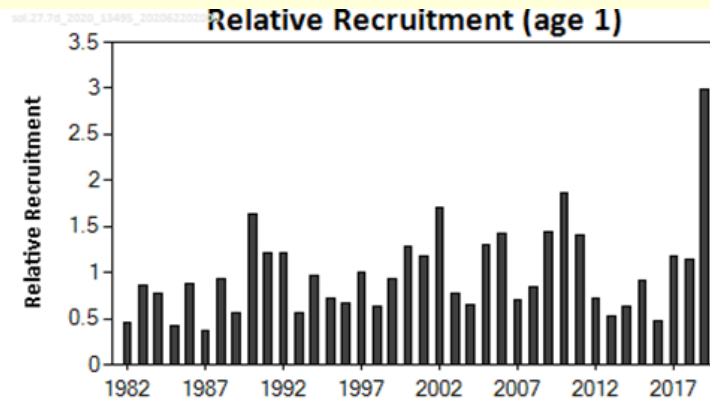
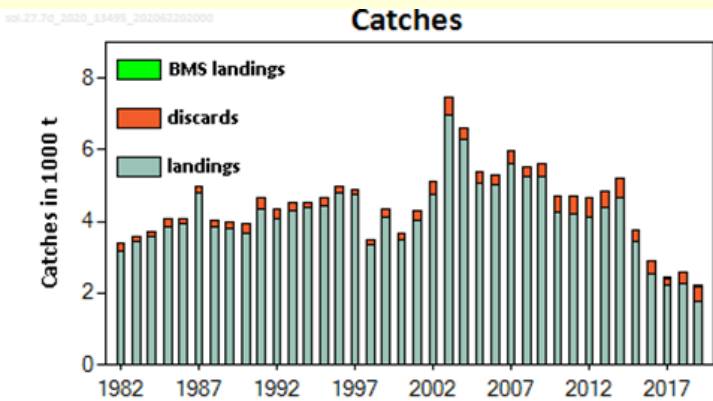
SSB(2021) = 11 451 t > B_{lim} 10 313 t but < MSY B_{trigger} = 14 439 t F_{MSY} = 0.1713



Basis	Total catch* (2021)	Commercial landings (2021)	Commercial discards (2021)	Recreational removals (2021)	F _{total} (2021)	F _{commercial} landings (2021)	F _{commercial} discards (2021)	F _{recreational} removals (2021)	SSB (2022)	% SSB change **	% advice change ***
ICES advice basis											
EU MAP [#] : F _{MSY} × SSB ₂₀₂₁ / MSY B _{trigger}	2000	1353	121	526	0.136	0.095	0.0047	0.037	11209	-2.1	2.8
EU MAP [#] : F _{MSY upper} × SSB ₂₀₂₁ / MSY B _{trigger}	2000	1353	121	526	0.136	0.095	0.0047	0.037	11209	-2.1	2.8 [^]
EU MAP [#] : F _{MSY lower} × SSB ₂₀₂₁ / MSY B _{trigger}	1680	1137	101	442	0.113	0.079	0.0039	0.03	11472	0.18	2.8 [^]
Other scenarios											
MSY approach: F _{MSY} × SSB ₂₀₂₁ / MSY B _{trigger}	2000	1353	121	526	0.136	0.095	0.0047	0.037	11209	-2.1	2.8
F = F _{MSY}	2478	1676	151	651	0.171	0.119	0.0059	0.046	10817	-5.5	27
F = 0	0	0	0	0	0	0	0	0	12864	12.3	-100
F _{pa}	2613	1767	159	687	0.182	0.127	0.0062	0.049	10706	-6.5	34
F _{lim}	3530	2384	217	928	0.254	0.177	0.0087	0.068	9957	-13.0	81
SSB ₂₀₂₂ = B _{lim}	3093	2091	190	813	0.219	0.152	0.0075	0.059	10313	-9.9	59
SSB ₂₀₂₂ = B _{pa} ^{^^}											
SSB ₂₀₂₂ = MSY B _{trigger} ^{^^}											
F = F ₂₀₂₀	1635	1107	99	430	0.11	0.077	0.0038	0.029	11510	0.52	-16.0

Sole in the eastern English Channel (7.d)

Advice for 2021: MSY: Catch : 3 248 t



- Benchmarked in 2020, remains an assessment used as indicative of trend due to data issues.
- Spawning stock above MSY B_{trigger} since 2010.
- Fishing pressure declining and below F_{MSY} since 2016.
- Recruitment estimate in 2019 is highest in time-series.

	Fishing pressure			Stock size				
		2017	2018	2019		2017	2018	2019
Maximum sustainable yield	F _{MSY} proxy	✓	✓	✓ Below proxy	MSY B _{trigger} proxy	✓	✓	✓ Above proxy
Precautionary approach	F _{pa} , F _{lim}	✓	✓	✓ Harvested sustainably	B _{pa} , B _{lim}	✓	✓	✓ Full reproductive capacity
Management plan	F _{MGT}	✓	✓	✓ Below proxy	B _{MGT}	✓	✓	✓ Above proxy

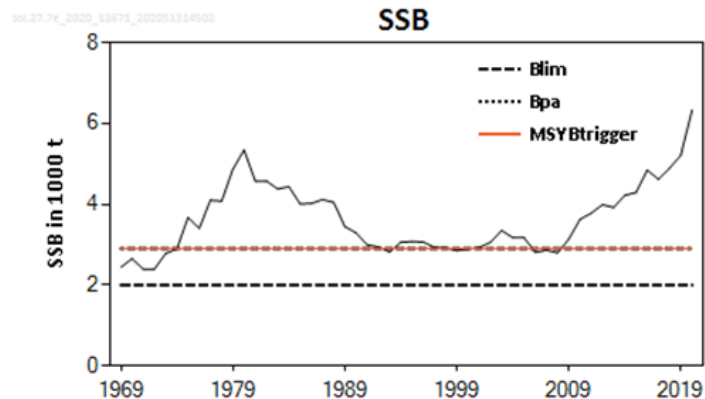
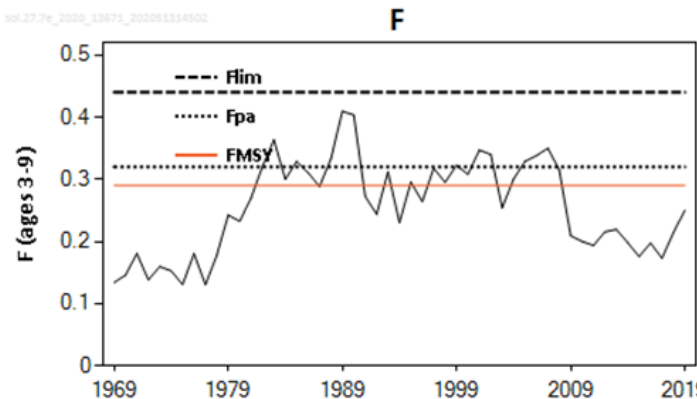
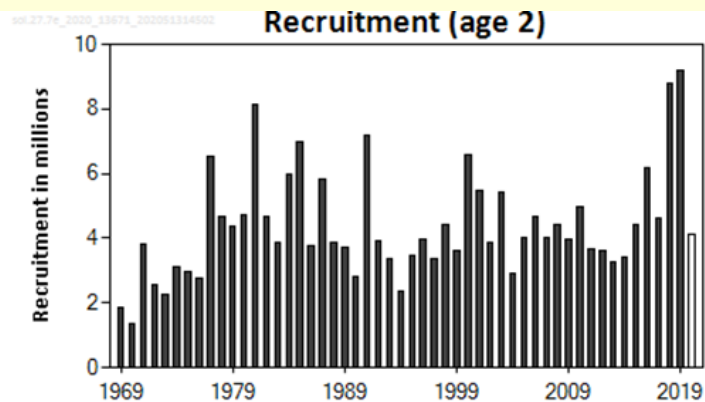
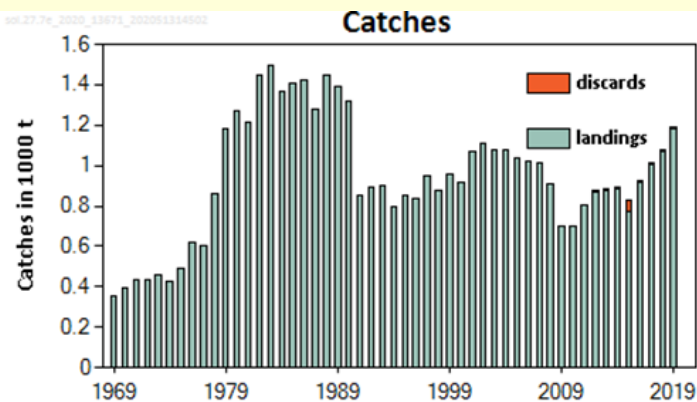
Sole in the eastern English Channel (7.d)

Catch (2019) : 2 200 t (19 % discards)

Index A (2018–2019)		1.12
Index B (2015–2017)		0.98
Index ratio (A/B)		1.14
Uncertainty cap	Not applied	-
Advised catch for 2020		2846 tonnes
Discard rate (2017–2019)		12.70%
Precautionary buffer	Not applied	-
Catch advice **		3248 tonnes
Projected landings corresponding to the advice ***		2834 tonnes
% advice change ^		14.10%

Sole in the western English Channel (7.e)

Advice for 2021: EU MAP: Catch :1 141 TO 2 197 t (F_{MSY} :1 925 t)



- Spawning-stock biomass (SSB) has been above $B_{trigger}$ since 2009.
- Fishing mortality (F) has been below F_{MSY} since 2009.
- Recruitment has been variable but above average recruitment in 2018-2019.

	Fishing pressure			Stock size						
		2017	2018	2019	2018	2019	2020			
Maximum sustainable yield	F_{MSY}	✓	✓	✓	Below	$B_{trigger}$	✓	✓	✓	Above trigger
Precautionary approach	F_{pa}, F_{lim}	✓	✓	✓	Harvested sustainably	B_{pa}, B_{lim}	✓	✓	✓	Full reproductive capacity
Management plan	F_{MGT}	✓	✓	✓	Within the range	B_{MGT}	✓	✓	✓	Above trigger

Sole in the western English Channel (7.e)

Catch (2019) : 1 189 t (<1 % discards)

$F(2020) = 0.23$ (Recent average fishing pressure (2017-2019) scaled to TAC);

$SSB(2021) = 6\,589\text{t} > MSY_{B_{trigger}} (2\,900\text{t})$ $F_{MSY} = 0.29$

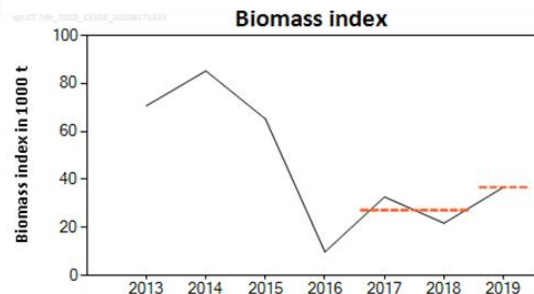
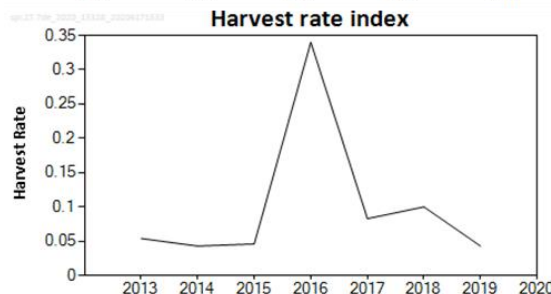
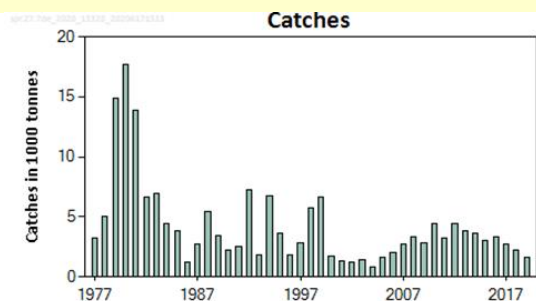


Basis	Total catch * (2021)	Projected landings (2021)	Projected discards (2021)	$F_{\text{projected}}$ landings (2021)	SSB (2022)	% SSB change **	% TAC change ^	% advice change ^^
ICES advice basis								
EU MAP ^^: F_{MSY}	1925	1918	7	0.29	5895	-10.5	30	30
$F = MAP F_{MSY \text{ lower}}$	1141	1137	4	0.16	6663	1.13	-23	30 #
$F = MAP F_{MSY \text{ upper}}$	2197	2189	9	0.34	5630	-14.6	49	30 #
Other scenarios								
$F = 0$	0	0	0	0	7785	18.2	-100	-100
F_{pa}	2090	2082	8	0.32	5734	-13.0	41	41
F_{lim}	2699	2688	10	0.44	5141	-22	83	83
$SSB_{2022} = B_{lim}$	5976	5953	23	1.62	2000	-70	304	304
Rollover TAC	1478	1472	6	0.21	6333	-4	0	0
$SSB_{2022} = B_{pa} = MSY B_{trigger}$	5022	5002	19	1.12	2900	-56	240	240
$F = F_{2020}$	1414	1408	5	0.2	6006	-2.9	-4.3	-4.3

Sprat in subdivisions 7.d-e

Advice for 2021, PA: Catch $\leq 1\ 446$ t

Catch (2019) = 1 573 t



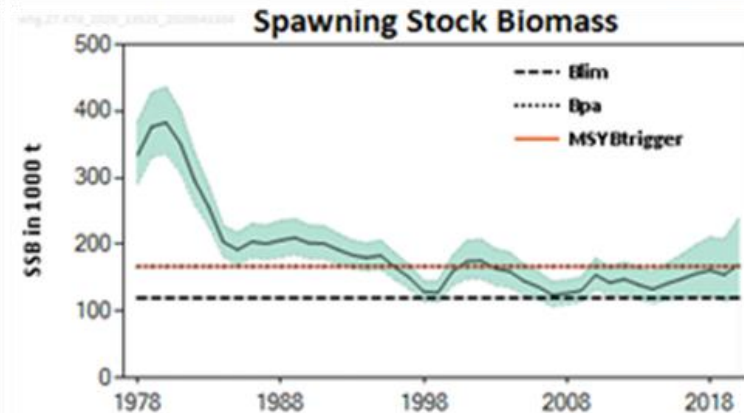
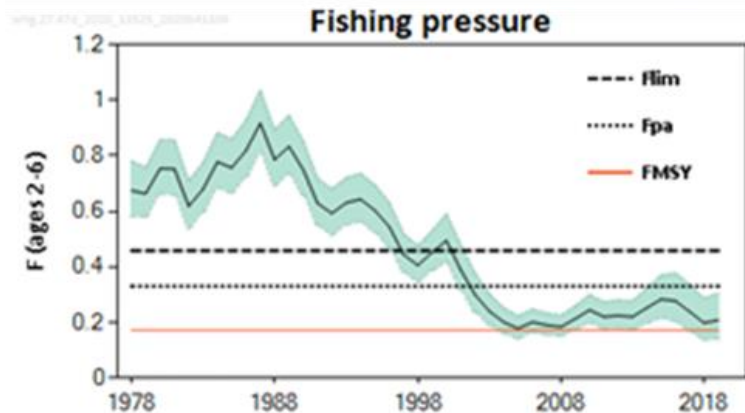
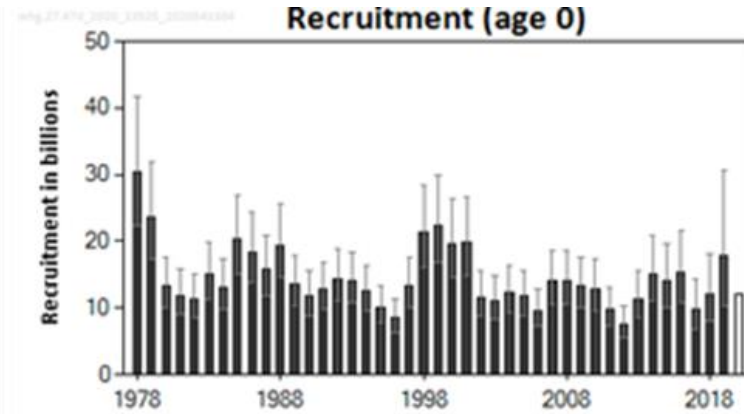
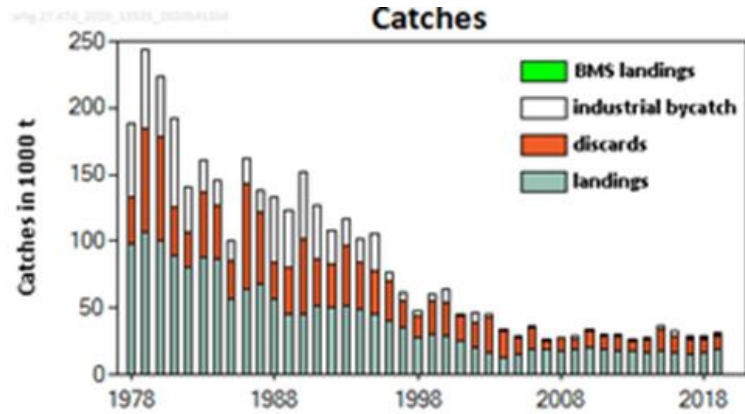
	Fishing pressure			Stock size						
		2017	2018	2019	2017	2018	2019			
Maximum sustainable yield	F_{MSY}	?	?	?	Undefined	$MSY B_{trigger}$?	?	?	Undefined
Precautionary approach	$F_{pa} F_{lim}$?	?	?	Undefined	$B_{pa} B_{lim}$?	?	?	Undefined
Management plan	F_{MGT}	-	-	-	Not applicable	B_{MGT}	-	-	-	Not applicable
Qualitative evaluation	-	↘	↗	↘	Decreasing	-	↗	↘	↗	Increasing

Index A (2019)		36789 tonnes
Index B (2017–2018)		27261 tonnes
Index ratio (A/B)		1.35
Uncertainty cap	Applied	1.2
Advised catch for 2020 (issued in 2019)		1506 tonnes
Discard rate		Negligible
Precautionary buffer	Applied	0.8
Catch advice for 2021 **		1446 tonnes
% advice change ***		-4%

- Acoustic survey does not cover the entire distribution
- Short-lived species - Category 3 assessment using 1 over 2.
- Increase in biomass index.
- Some catch advice reduction due to application of precautionary buffer.

Whiting in the North Sea and eastern English Channel (4 and 7.d)

Advice for 2021, MSY: Catch $\leq 26\ 304$ t



- About 20% of the catches taken in the Eastern Channel area.
- Spawning stock near MSY $B_{trigger}$.
- Fishing pressure remains above F_{MSY} .
- Recruitment variable, above average in the last year.

	Fishing pressure			Stock size			
		2017	2018	2019	2018	2019	2020
Maximum sustainable yield	F_{MSY}	✘	✘	✘ Above	$B_{trigger}$	✘	✘ Above trigger
Precautionary approach	F_{pa}, F_{lim}	✔	✔	✔ Harvested sustainably	B_{pa}, B_{lim}	○	○ Full reproductive capacity
Management plan	F_{MGT}	—	—	— Not applicable	B_{MGT}	—	— Not applicable

Whiting in the North Sea and eastern English Channel (4 and 7.d)

Catch (2019): 31 216 t (34% discards) ; Catch of 5 591 t in 7.d
F (2020)=0.199 (Average exploitation pattern(2017-2019), scaled to 2019;
SB(2021) = 180 kt > MSY_{Btrigger} 167 kt F_{MSY}=0.172



Basis	Total catch 2021	Total projected landings 2021 *	Total projected discards 2021 **	Total IBC 2021 **	HCF catch 4+7.d 2021	Total F (ages 2-6) 2021 +	F (projected landings, ages 2-6) 2021	F (projected discards, ages 2-6) 2021	F (IBC, ages 2-6) 2021 ++	SSB 2022	% SSB change ^	% advice change ^^
ICES advice basis												
MSY approach: F = F_{MSY}	26304	14487	9584	2233	24071	0.172	0.111	0.045	0.0156	185094	2.7	19.1
Other scenarios												
F = MAP ^{##} F _{MSY upper} [#]	26304	14487	9584	2233	24071	0.172	0.111	0.045	0.0156	185094	2.7	19.1
F = MAP ^{##} F _{MSY lower}	24279	13275	8758	2246	22033	0.158	0.101	0.041	0.0156	186532	3.5	9.9
F ₂₀₂₁ = 0 (IBC only)	2376	0	0	2376	0	0.0156	0	0	0.0156	202269	12.3	-89
F ₂₀₂₁ = F ₂₀₂₀	31512	17603	11707	2202	29310	0.21	0.137	0.056	0.0156	181394	0.69	43
Rollover TAC	23154	12600	8301	2252	20902	0.15	0.096	0.039	0.0156	187333	4	4.9
15% TAC decrease (27.4 only)	20038	10735	7031	2271	17767	0.129	0.081	0.033	0.0156	189547	5.2	-9.3
15% TAC increase (27.4 only)	26271	14466	9572	2234	24037	0.172	0.111	0.045	0.0156	185119	2.8	19
0.75 × F ₂₀₂₀ ⁺⁺⁺	24573	13451	8878	2244	22329	0.16	0.103	0.042	0.0156	186324	3.4	11.3
1.25 × F ₂₀₂₀ ⁺⁺⁺	38498	21782	14556	2160	36338	0.26	0.171	0.069	0.0156	176432	-2.1	74
F _{pa}	49161	28162	18903	2096	47065	0.33	0.22	0.091	0.0156	168858	-6.3	122
F _{lim}	67677	39240	26452	1985	65693	0.46	0.31	0.128	0.0156	155705	-13.6	210
SSB (2022) = B _{pa} = MSY B _{trigger}	52144	29946	20119	2078	50065	0.35	0.24	0.097	0.0156	166708	-7.4	136
SSB (2022) = B _{lim}	117801	69230	46888	1684	116118	0.8	0.56	0.23	0.0156	119970	-33	430

SUMMARY

Stock	Exploitation	State of stock	Advice 2021	Advice 2020	Catch 2019	TAC 2020
Brill 4 ,7.d and 3.a	✓	✓	2047	2559	2564	6498
Cod 4, 7.d, 20	X	X	14755	13686	35685	17679
Lemon sole 4 ,7.d and 3.a	✓	?	3742	4279	3873	6785
Plaice 7.d	X	✓	8402 (6066-11130)	9073 (6545-12029)	9047	9154
Plaice 7.e	X	✓	2177	2721	2091	9154
Sea bass 4.b–c, 7.a, and 7.d–h	✓	X	2000 (1680-2000)	1946 (1634-1946)	1709	-
Sole 7.d	✓	✓	3248	2846	2200	2797
Sole 7.e	✓	✓	1925 (1141-2197)	1478 (878-1685)	1189	1478
Sprat 7.d-e	?	?	1446	1506	1573	1506
Whiting 4, 7.d	X	✓	26304	22082	31216	28021

Colours indicate that the value for the Advice for 2021 is either above (green) or below (red) the Advice for 2020. For TAC 2020 in blue, area or species differ from the advice.



**Thank you
for your
attention!**



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