

5 Dab in Subarea 4 (North Sea) and Division 3.a (Skagerrak, Kattegat)

5.1 General

Dab (*Limanda limanda*) was assessed for the first time by the Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK) in 2014. Until 2013, dab was assessed by the Working Group on Assessment of New MoU Species (ICES, 2013a). This group was dissolved in 2014. Because only official landings and survey data were available at that time, dab was defined as a category 3 species according to the ICES guidelines for data limited stocks (ICES, 2012). Since 2015 dab was included in the official data call for the WGNSSK and discard estimates could be included into the dab assessment since then. In 2016 a benchmark assessment of dab was conducted by ICES. For this benchmark assessment, catch data from 2002 were requested and uploaded into the InterCatch data portal by all relevant countries (ICES, 2016). The benchmark agreed on the use of a survey-based assessment model (SURBAR; Needle, 2015) to inform stock status of North Sea dab (ICES, 2016). This model provides relative estimates of the spawning stock, recruitment, and total mortality. During the WGNSSK 2017 MSY proxy reference points were determined applying the Surplus Production Model in Continuous Time (SPiCT, Pedersen and Berg, 2017) and catch advice for dab was provided for 2017 and 2018. In 2017 the combined TAC for dab and flounder was removed (EU COM, 2017/595). North Sea dab has become a non-target species with no TAC since then and ICES has not been requested to provide advice on fishing opportunities for this stock for the most recent years. Catch data, indices and the SURBAR assessment were updated and also an updated SPiCT assessment was updated during the WGNSSK2021. In 2020, catches increased to 44 340 tonnes (compared to 40 725 tonnes in 2019). The relative SSB value decreased slightly, but is still on a comparable high level. Recruitment showed a consistently decreasing trend from 2015 to 2020. The updated results of the SPiCT assessment for dab in Subarea 4 and Division 3.a showed that the relative fishing mortality is below the reference F_{MSY} proxy and the relative biomass is above the reference B_{MSY} proxy. In conclusion the perception of the stock did not change compared to the previous year.

5.1.1 Biology and ecosystem aspects

Dab is a widespread demersal species on the Northeast Atlantic shelf and distributed from the Bay of Biscay to Iceland and Norway, including the Barents Sea and the Baltic. In the North Sea it is one of the most abundant species distributed over the whole area in depths down to 100 m, but it was also found occasionally down to depths of 150 m. The main concentration of dab can be found in the south eastern North Sea especially that of the younger age groups 1–2. Older age groups are more distributed in the central and more Northern parts of the North Sea (Figure 5.14). Generally, dab abundance decreases towards the northern parts of the North Sea. Dab feeds on a variety of small invertebrates, mainly polychaete worms, shellfish and crustaceans. Early sexual maturation was reported for dab, maturing at ages of 2 to 3 years corresponding to approximately 11 cm to 14 cm total length. Peak spawning in the south eastern North Sea occurs from February to April.

5.1.2 Stock ID and possible assessment areas

The several spawning grounds and the wide distribution of dab indicate the presence of more than one stock. Meristic data (Lozán, 1988) corroborate the hypothesis of several stocks for dab, distinguishing significantly between populations from western British waters, the North Sea and the Baltic Sea.

5.1.3 Management regulations

Dab is mainly a bycatch species in fisheries for plaice and sole. The discard rates for dab can be extremely high (~90%). No minimum landing size is defined for dab. According to EU-Regulations a precautionary TAC was given in EU waters of Division 2.a and Subarea 4 together with flounder (*Plathichthys flesus*). This combined TAC was never fully utilized. In 2017, the European Commission requested ICES to evaluate the possible effects on the stocks of dab and flounder having no TAC. ICES advised that given the current fishing patterns of the main fleets catching dab and flounder, which are the same fleets targeting plaice and sole, the risk of having no TAC for dab and flounder is considered to be low (ICES, 2017a). Therefore, the European Commission removed the combined TAC for these two stocks in 2017 (EU COM, 2017/595).

5.2 Fisheries data

5.2.1 Historical landings

Dab is a bycatch species mainly in the fisheries for plaice and sole but also in fisheries targeting demersal round fish. According to official catch statistics, annual landings of dab in ICES Subarea 4 and Division 3.a has been increasing above 10 000 tonnes since 1979 (Figure 5.1–5.3, Table 5.13). The apparent decrease in official landings in the 1980s and 1990s are due to unreported landings by the Netherlands. However, since 1999 total landings for both areas (Subarea 4 and Division 3.a) steadily decreased. This trend continued until 2017 with total official landings of 3529 tonnes. In 2020 the official landings decreased to 3976 tonnes compared to 5053 tonnes in 2019.

The main fishing gear in the North Sea is the beam trawl with mesh sizes between 80 and 100 mm. Large effort reductions took place in this fishery over the last decade (STECF, 2016). The largest part of the landings in Subarea 4 is taken by the Netherlands, followed by Denmark, the UK, and Belgium (Figure 5.2, Table 5.14). In Division 3.a, Denmark lands by far the largest amount of dab (Figure 5.3, Table 5.15). Dab is among the most discarded fish species in the North Sea. In the beam trawl fishery on plaice and sole and the otter trawl fishery on plaice up to 95% of dab catches are discarded (e.g. van Helmond *et al.*, 2012).

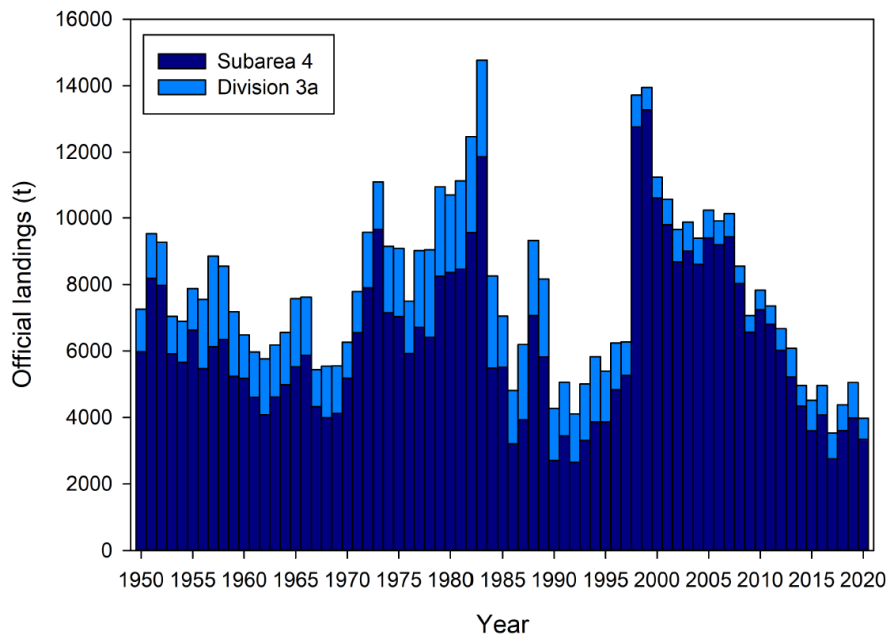


Figure 5.1. Dab in Subarea 4 and Division 3.a: Total official landings of dab in Subarea 4 and Division 3.a in 1950–2020.

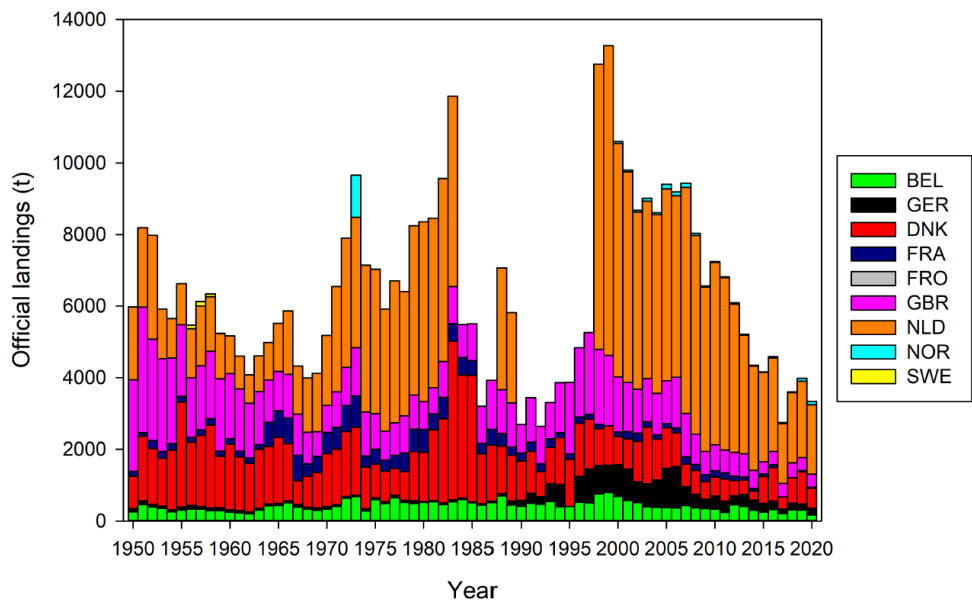


Figure 5.2. Dab in Subarea 4 and Division 3.a: Official landings of dab in Subarea 4 by country 1950 to 2020.

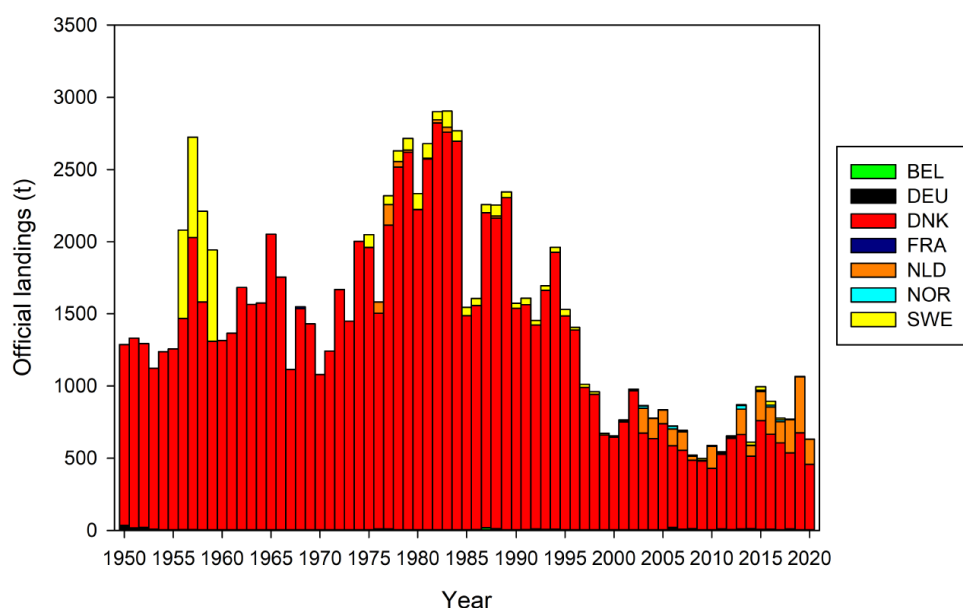


Figure 5.3. Dab in Subarea 4 and Division 3.a: Official landings of dab in Division 3.a by country 1950–2020.

5.2.2 InterCatch

For the current assessment year, dab landing and discard data from 2002–2020 were available in the InterCatch system. Discard information for 2020 was provided for only 54% (compared to 76% in 2019) of total landings in relation to weight (Figure 5.4).

In 2020, the largest catch (landings and discards) was reported by The Netherlands for the TBB_DEF_70-99_0_0_all métier (Figure 5.5 and Figure 5.6). Consequently, by far the largest catch in 2020 was taken by The Netherlands (24 034 tonnes in total) followed by Germany with 7136 tonnes. All other countries did catch less than 6000 tonnes (Figure 5.7). The total dab catch estimated with InterCatch for 2020 was 44 340 tonnes (+ 3 615 tonnes compared to 2019) from which 3808 tonnes were landings and 40 532 tonnes discards (91% of the total catch). It should be noted that not all métiers were sampled in every quarter and that the raising procedure with the InterCatch tool may not be adequate in all cases. Further, there are a number of métiers for which zero landings were reported and a discard raising for these fleets is not possible with the InterCatch tool, which is based on a discard ratio between landings and observed discards. Especially for bycatch species without economic interest zero landings do not necessarily imply zero discards. However, the Dutch TBB_DEF_70-99_0_0_all métier is by far the most important one in terms of total catch and information on discard weights was provided for every quarter for this métier.

In general, it was attempted to use the same groupings for discard raising as for the previous data years. However, this was not possible for all cases and compared to the previous year slight changes had to be made. The grouping is generally based on gear type and mesh size and where possible also by area. For the sample allocation scheme landings and discards were grouped by season. The following groupings were used for the 2020 data discard raising:

- Group 1: MIS_MIS_HC all area (3.a and 4) raised with all other métiers because no specific MIS_MIS_HC all data were available in 2020 data (some métiers excluded due to unrealistic high discard ratios).
- Group 2: passive gears area 4 raised with all passive gears area 4 and 3a (some métiers excluded due to unrealistic high discard ratios).
- Group 3: OTB_CRU_70-99_all raised with OTB_CRU_70-99_all -> remove UK fleets from rasing and created own group (group 14).
- Group 4: OTB_CRU_70-89_2_35 raised with OTB_CRU_70-89_2_35.
- Group 5: OTB_CRU_90-119 raised with OTB_CRU_90-119.
- Group 6: OTB_DEF_>120_all area 4 raised with all OTB_DEF_>120_all area 4.
- Group 7: OTB_DEF_>120_all area 3a raised with all OTB_DEF_>120_all area 3a.
- Group 8: SSC_SDN_DEF>120_all areas raised with SSC_SDN_DEF_>=120_all.
- Group 9: TBB_DEF_70-99_0_0_all raised with all TBB_DEF_70-99_0_0_all.
- Group 10: TBB_DEF_100-119_>=120 all areas raised with TBB_DEF_100-119_>=120.
- Group 11: OTB_DEF_100-119_0_0_all raised with OTB_DEF_100-119_0_0_all.
- Group 12: SSC_DEF_100-119_0_0_all (including SSC_DEF_All_0_0_All ENG) raised with OTB_DEF_100-119_0_0_all.
- Group 13: OTB_SSC_SDN_DEF_70-99_all raised with Dutch OTB_DEF_70-99_all and all TBB_DEF_70-99_0_0_all fleets.
- Group 14: OTB_CRU_70-99_all UK raised with OTB_CRU_70-99_all UK.
- Group 15: passive gears 3a raised with passive gears 3a. Excluded extreme high value of one métier (SWE) and FPO métiers.
- Group 16: all other métiers (except MIS_MIS_0_0_0_IBC) raised by all métiers.

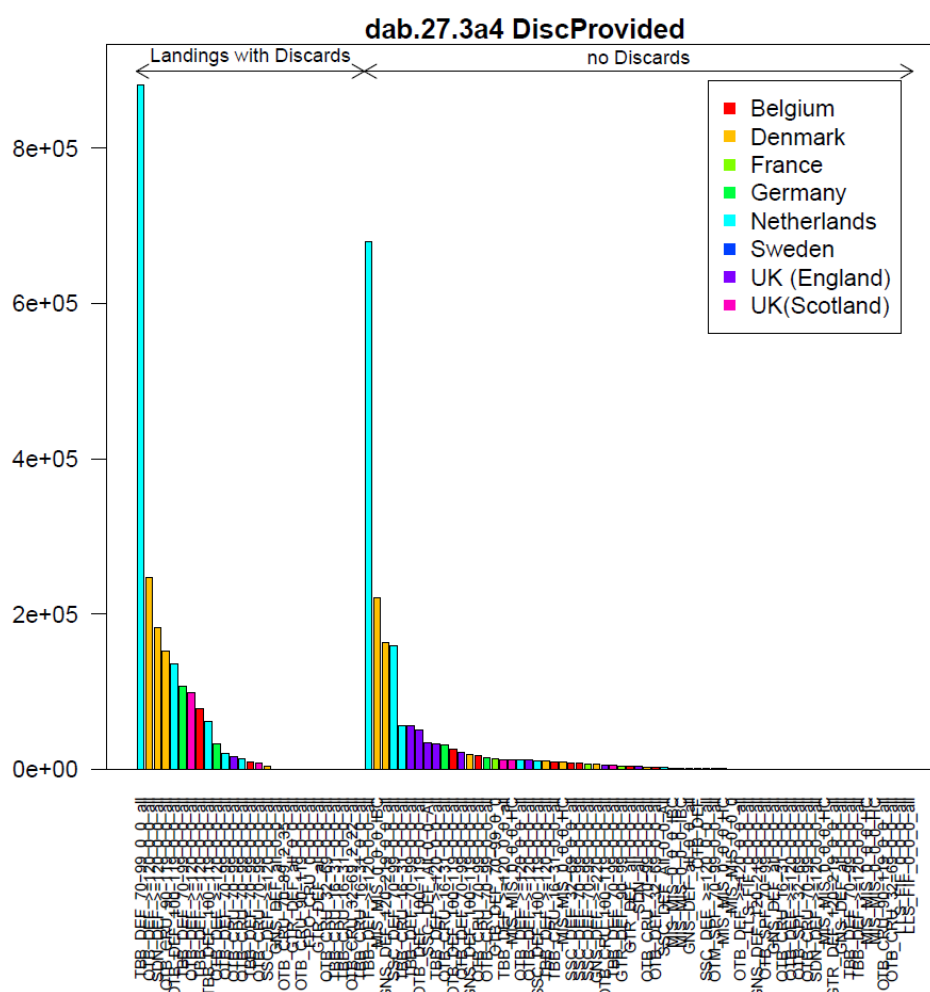


Figure 5.4. Dab in Subarea 4 and Division 3.a: Dab landings and discards (kg) provision for Subarea 4 and Division 3.a by métier and country in 2020 as uploaded into InterCatch.

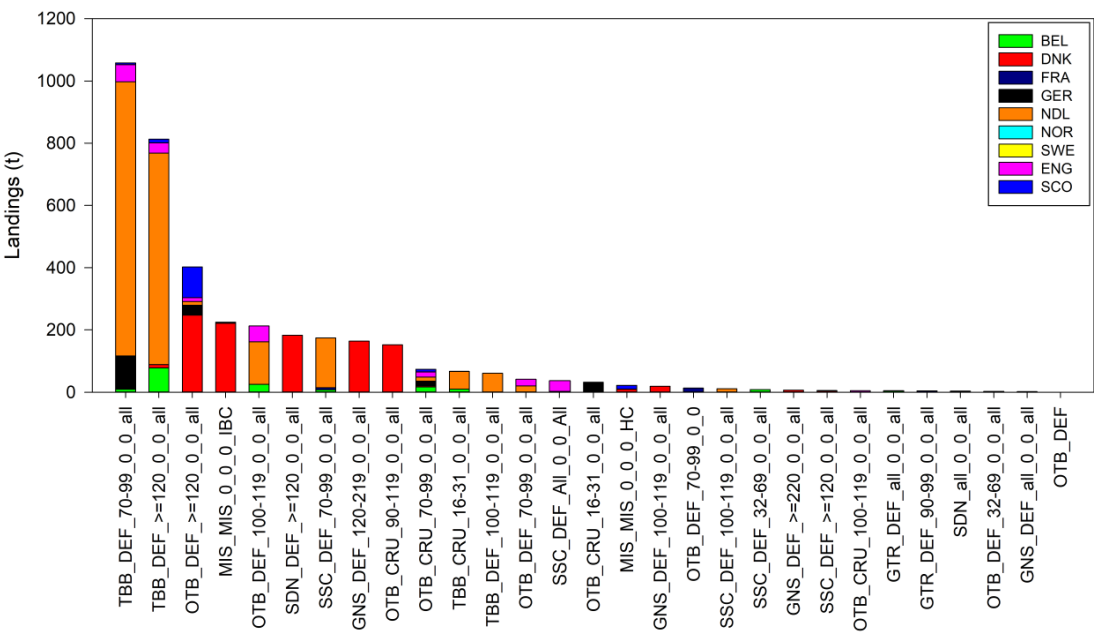


Figure 5.5. Dab in Subarea 4 and Division 3.a: Dab landings (tonnes) for Subarea 4 and Division 3.a by métier and country in 2020 as uploaded to InterCatch.

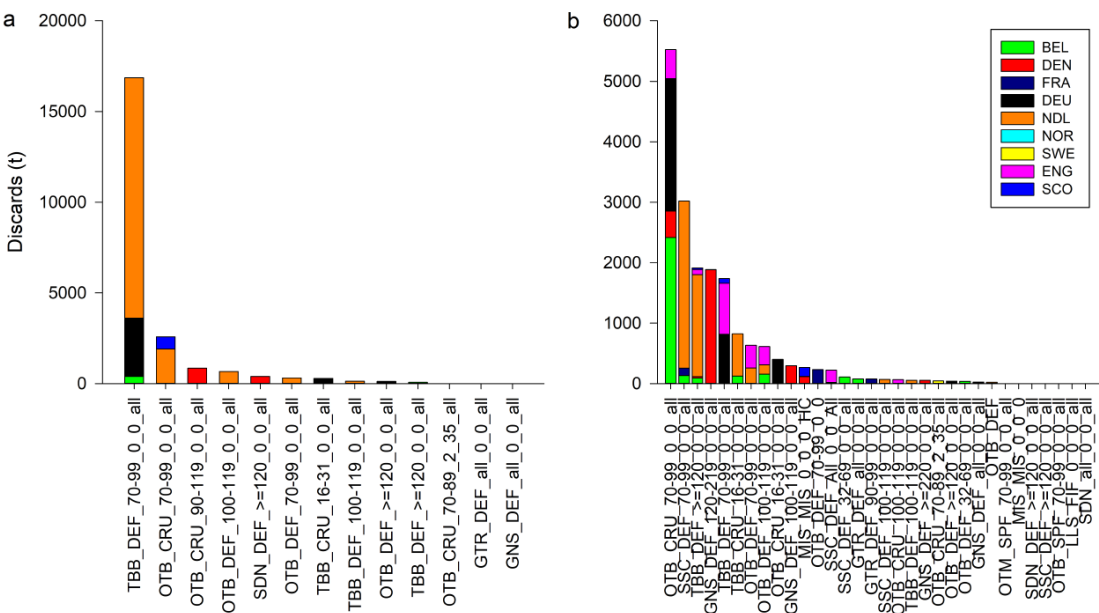


Figure 5.6. Dab in Subarea 4 and Division 3.a: Dab discards for Subarea 4 and Division 3.a by métier and country in 2020. Reported discards (a), raised discards (b).

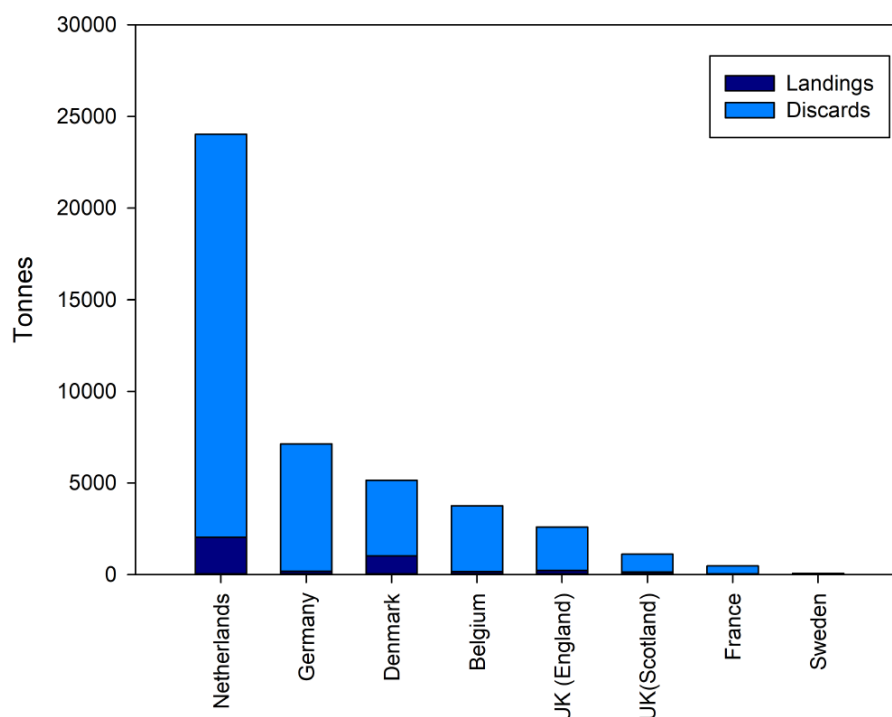


Figure 5.7. Dab in Subarea 4 and Division 3.a: Dab landings and estimated discards for Subarea 4 and Division 3.a by countries in 2020.

5.3 Survey data/recruit series

Surveys providing information on distribution, abundance and length frequency for dab in Subarea 4 and Division 3.a are the several Beam Trawl Surveys (BTS) in quarter 3 (Figure 5.8 and Figure 5.9) and the International Bottom Trawl Survey (IBTS) in quarter 1 and quarter 3 (Figure 5.10).

The longest beam trawl survey time series exist for the RV Isis covering the south eastern part of the North Sea (Figure 5.9). This index showed high dab abundance in the early years (1987–1990) followed by a sharp decline until 1995. After a second peak in abundance in 1998 the abundance declined again until 2006, and afterwards increased again to such high values as were observed for the time period 1997–1999. The increasing abundance trend from 2005/2006 onwards was also observed for the RV Tridens beam trawl survey, and since 2010 also for the RV Solea beam trawl survey. No clear trend is visible in the RV Belgica survey data. A strong decrease was observed for the RV Solea survey for the year 2015, and again for 2019. Since 2017 RV Isis does not take part any more in the BTS and RV Tridens covers the whole survey area since then. A combined index of the two vessels also displays a declining trend in dab abundance for the years 2015–2016. The three recent values from the Tridens, covering the whole area now, varies strongly but on a comparably high level.

The International Bottom Trawl Survey in quarter 1 (IBTS–Q1) showed an increasing abundance trend from 1983 to 1990 and fluctuated since then without a clear trend until 2013. From 2013 to 2015 a rather strong increase in abundance was observed, followed by a strong decrease again in 2017 and 2018 (Figure 5.10). In 2019 this index increased and dropped again in 2020. The IBTS Q3 also showed a highly variable abundance trend with a slight increase from the beginning of

the time series in 1991 until 2014 (Figure 5.10). Since 2015, this abundance index steadily decreases.

In order to estimate a mature biomass index, a length weight relationship and maturity data derived from IBTS–Q1 data was estimated in previous years to apply the DLS 3.2 method. The obtained length weight relationship and the maturity ogive (Figure 5.11) were then applied to estimate the mature biomass index in kg per hour. The mature biomass indices in kg/h (Figure 5.12) show the same trends as the IBTS abundance indices and for both quarters the decreasing trend was confirmed for recent years.

Only the beam trawl surveys provide data on age and weight for dab. During the benchmark in 2016, it was agreed to use an age-based survey index combining data from the Dutch and German beam trawl surveys taking into account a possible ship effect (i.e. gear effect; Berg *et al.*, 2014). For age group 0 the index is highly variable and does not show any trends, probably due to the low catchability of the offshore surveys to catch the 0–group. For the age groups 2–5, a decrease of the index is observed for the most recent years. The indices for older age groups are extremely variable for the most recent years. This index served as an input for the survey-based assessment model (SURBAR) to inform the stock status of North Sea dab (Figure 5.13).

The spatial distribution of dab age groups follows a clear pattern with the youngest age groups (0 and 1) located near the coast of the south eastern North Sea and the older age groups more distributed in the central North Sea (Figure 5.14).

The weight at age data show a slightly decreasing trend for all age groups from 2002 to 2015, but an increase since 2016 for the age groups 1–5 (Figure 5.15).

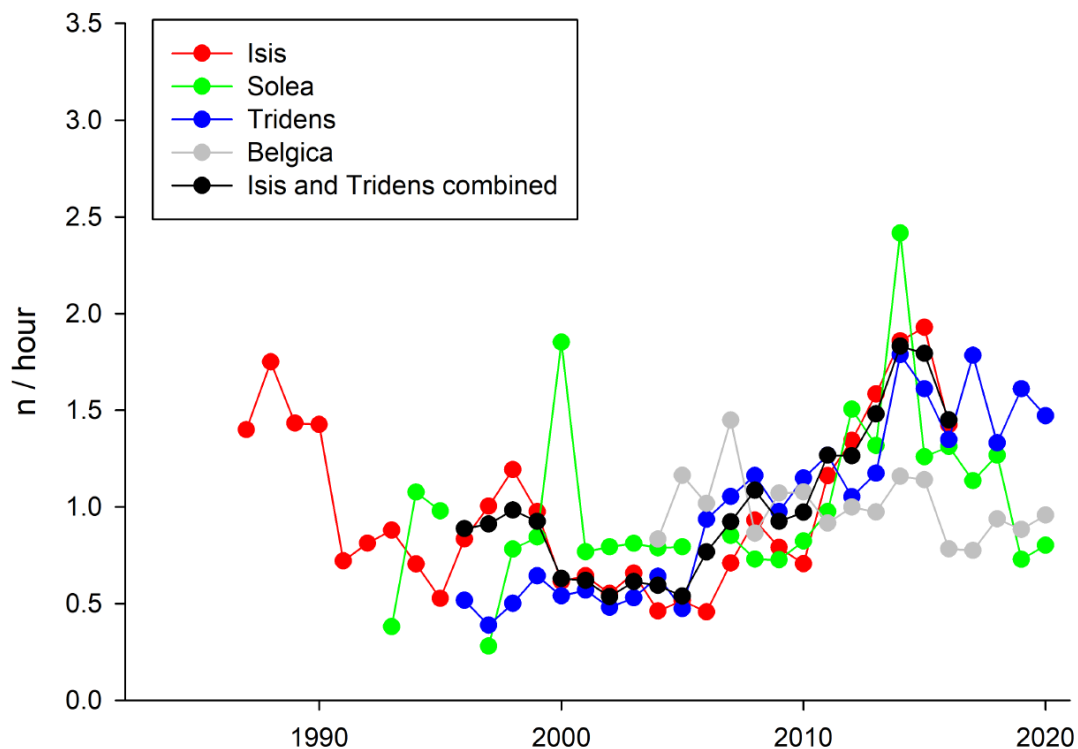


Figure 5.8. Dab in Subarea 4 and Division 3.a: Standardized dab beam trawl survey indices (n/hour) in Subarea 4.

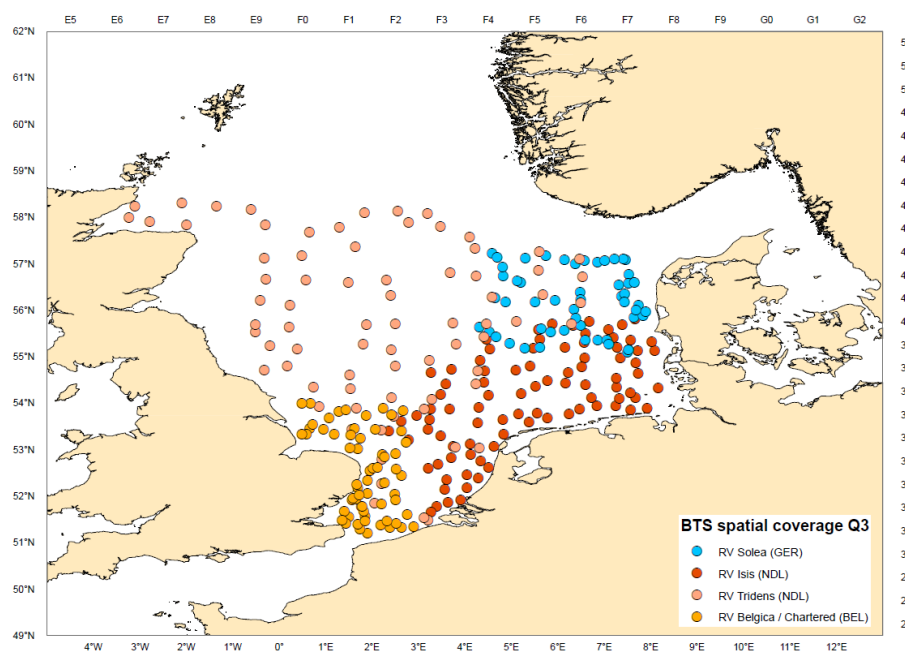


Figure 5.9. Dab in Subarea 4 and Division 3.a: Spatial coverage of the different beam trawl surveys in the North Sea. Since 2017, the survey area from RV Isis is also covered by RV Tridens.

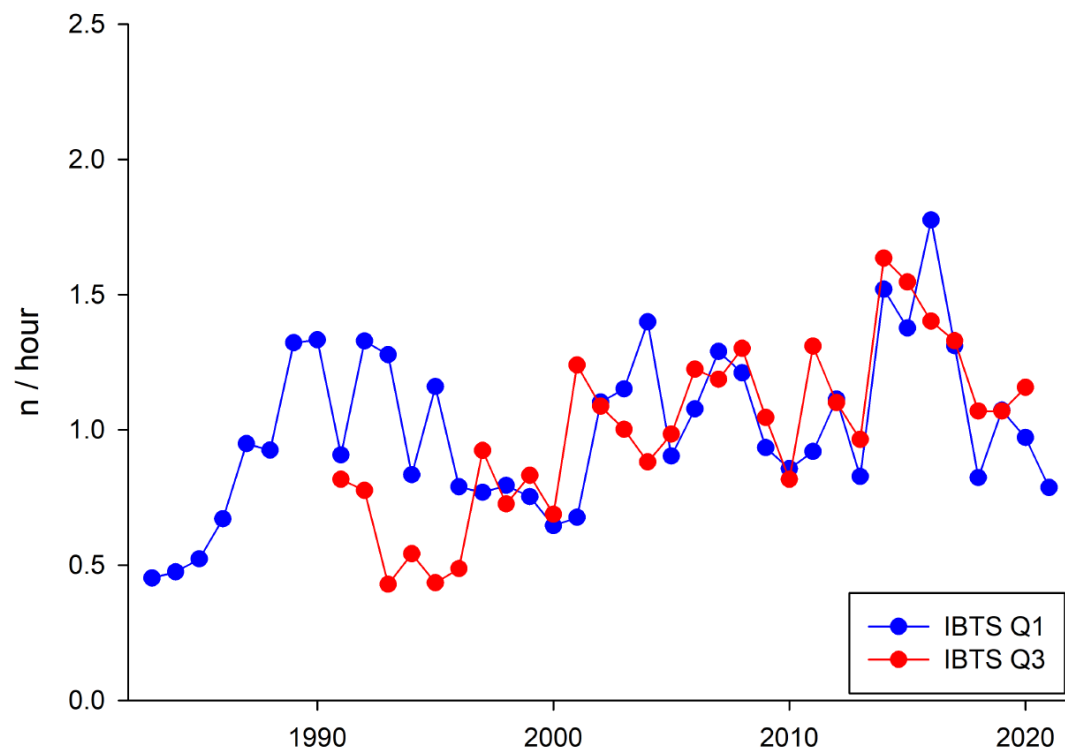


Figure 5.10. Dab in Subarea 4 and Division 3.a: Standardized dab survey indices (n/hour) from the International Bottom Trawl Survey.

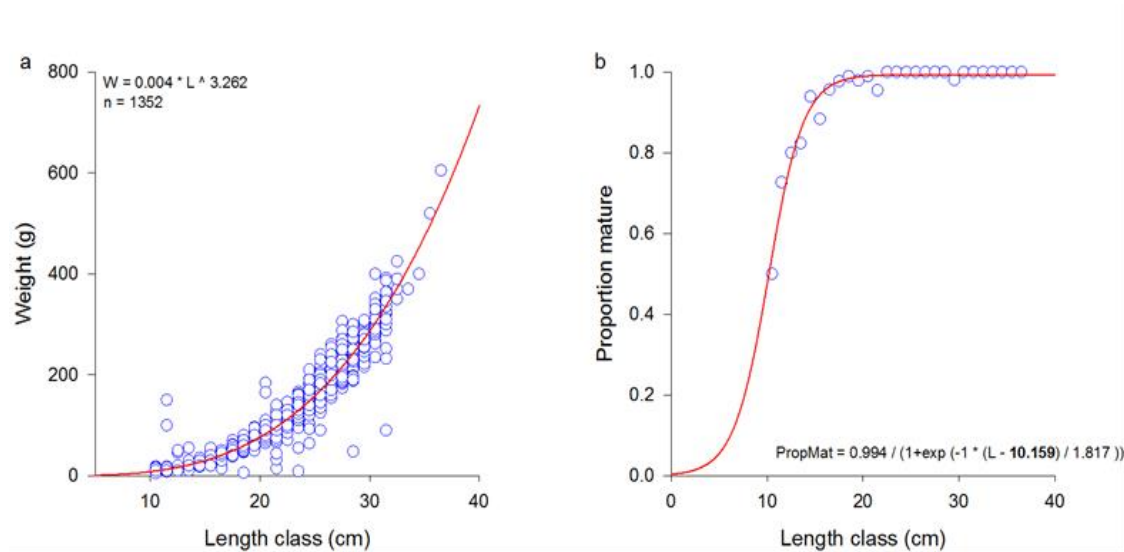


Figure 5.11. Dab in Subarea 4 and Division 3.a: Length weight relation (a) and length-based maturity ogive (b) obtained from survey data (IBTS–Q1).

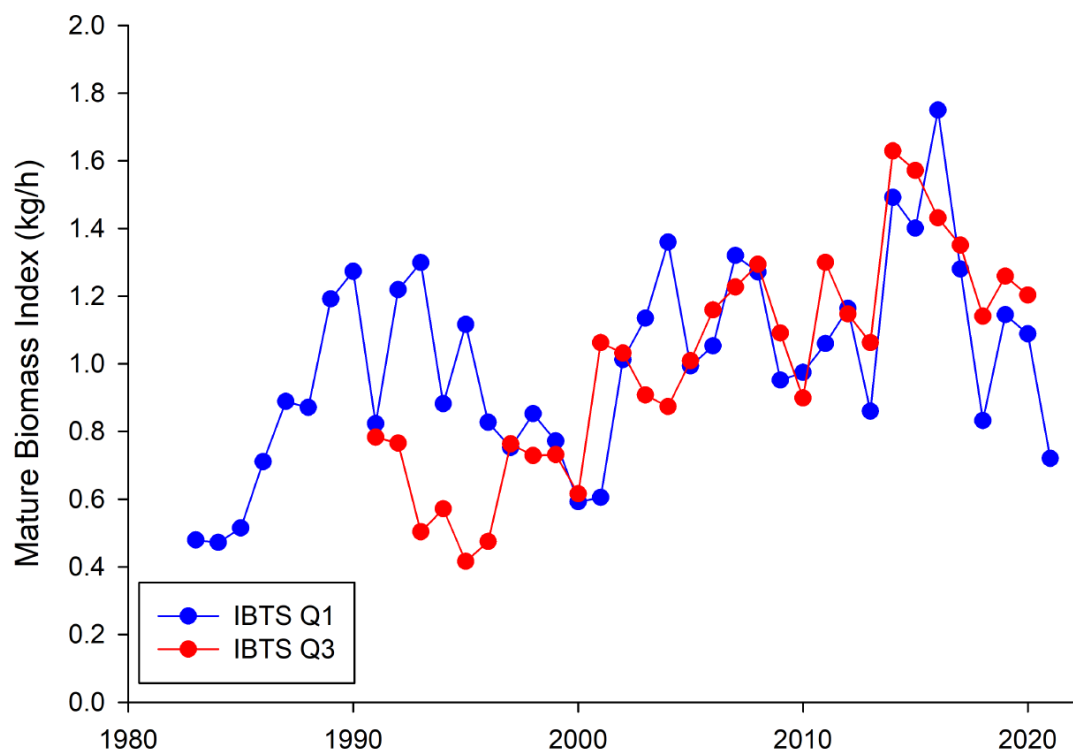


Figure 5.12. Dab in Subarea 4 and Division 3.a: Mature biomass index IBTSQ1 and IBTSQ3.

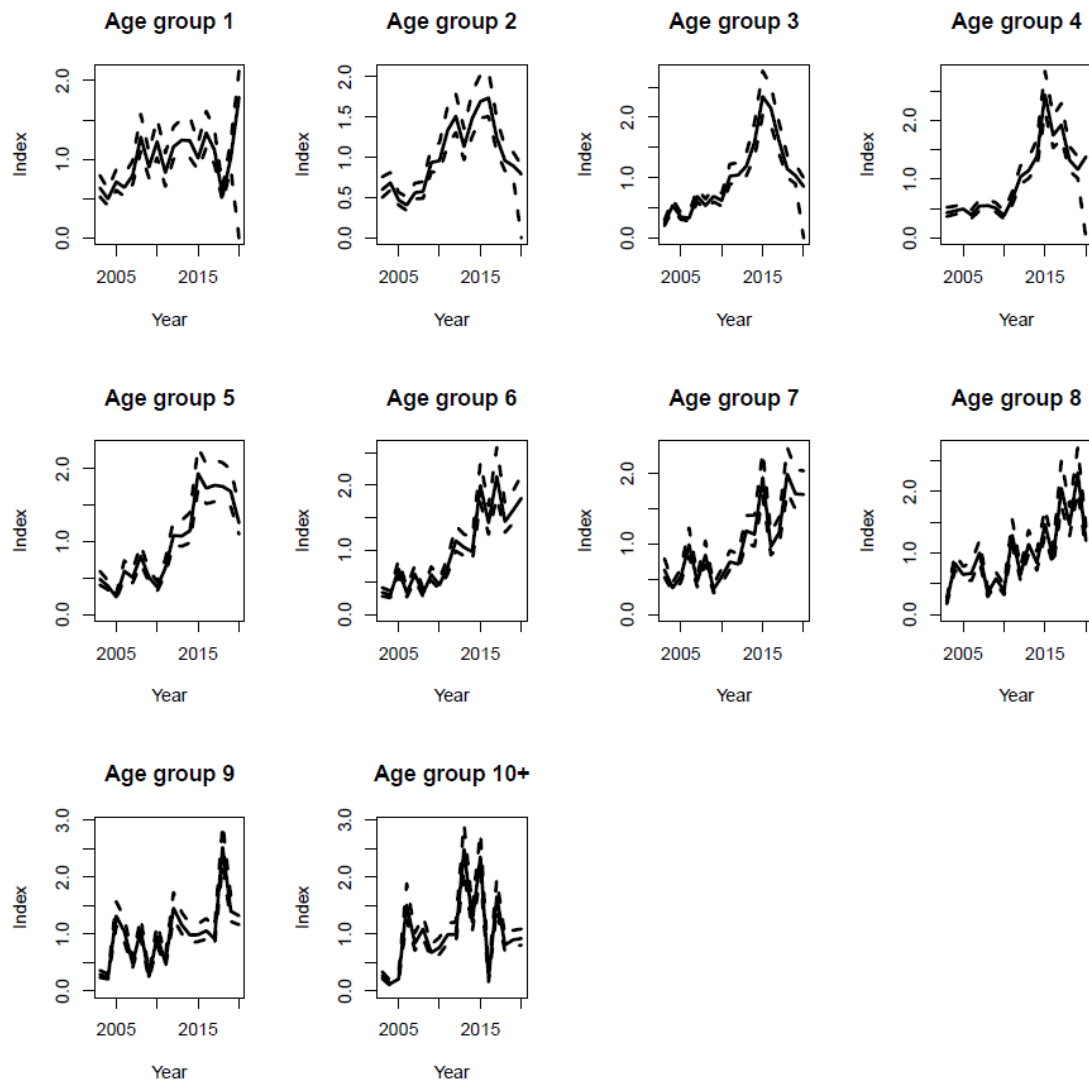


Figure 5.13. Dab in Subarea 4 and Division 3.a: Combined beam trawl index by age groups (2003–2020). Age group = age group -1.

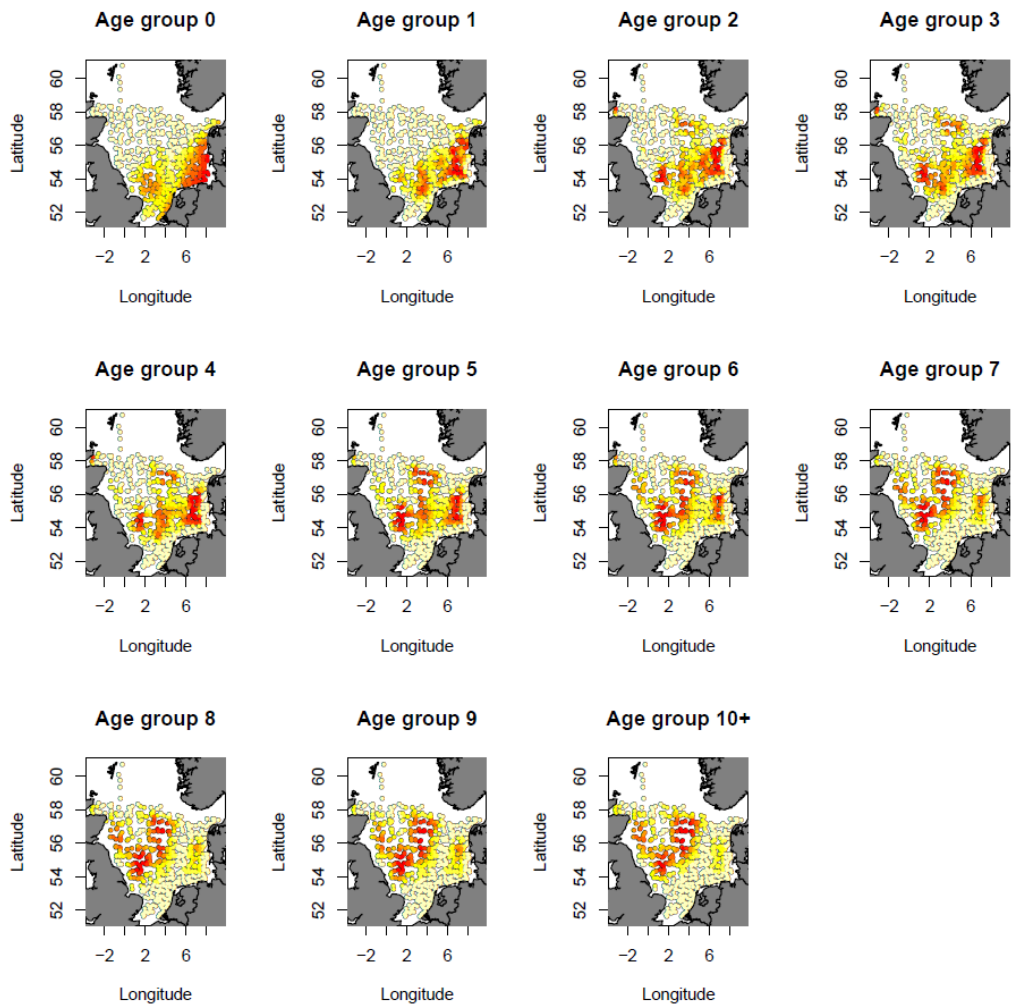


Figure 5.14. Dab in Subarea 4 and Division 3.a: Dab distribution in the North Sea by age group obtained by the Dutch and German Beam Trawl Surveys.

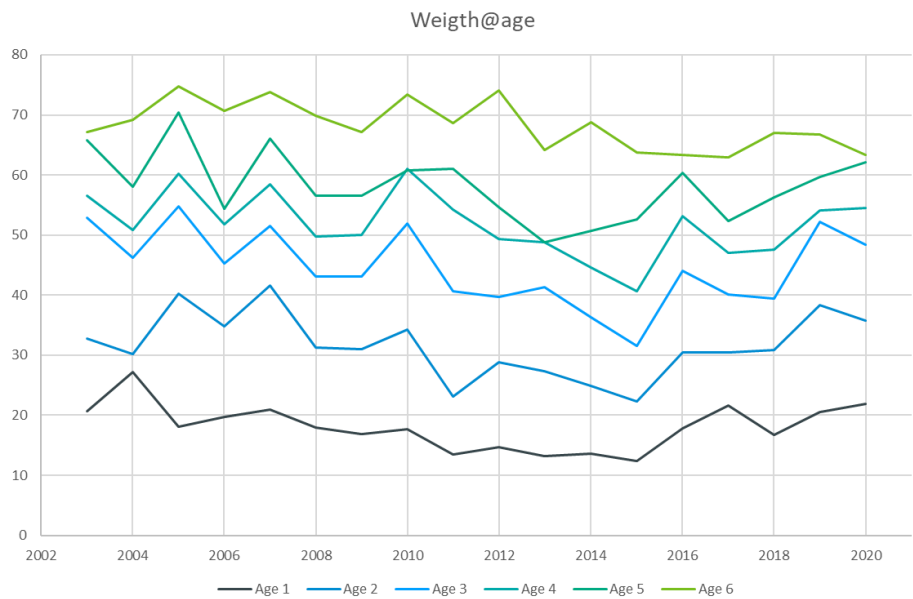


Figure. 5.15 Dab in Subarea 4 and Division 3.a: Weight at age derived from beam trawl survey data 2003–2020).

5.4 Survey Based Assessment (SURBAR)

In 2016, a benchmark assessment was carried out for dab (ICES, 2016). During this benchmark it was agreed to make use of the available data from the beam trawl surveys and to run a survey-based assessment model (SURBAR; Needle, 2015) taking the age structure of dab into account. The SURBAR results of the update assessment showed no clear trend in total mortality for the years 2003–2020 (Figure 5.16, upper left panel) while the spawning stock biomass (relative biomass) increased for the years 2003–2016 (Figure 5.16, upper right panel), but decreases since then. The total stock biomass follows the trend of the SSB. The recruitment increased by a factor of 2.6 from 2003 to 2014, but decreased since 2015 (Figure 5.16, lower right panel). No pattern was detected in the log residual pattern of the age-based survey indices (Figure 5.17). There is a strong pattern in the retrospective for total mortality (Figure 5.21).

Table 5.1. Dab in Subarea 4 and Division 3.a: Settings and input data used for the final SURBAR assessment run.

Setting/Data	Values/source
Survey index	Combined beam trawl survey index 2003–current assessment year (BTS-Isis, BTS-Tridens, German BTS). Delta GAM Method by Berg <i>et al.</i> (2014).
Ages	1–6
Lambda	3
zbar	1–6
Spawning time	0.4
Maturity ogive	Fixed ogive, age 1 = 60%, age 2 = 80%, age 3 and older 100%
Weight at age	Data from Dutch Beam Trawl Surveys (2003–current assessment year)

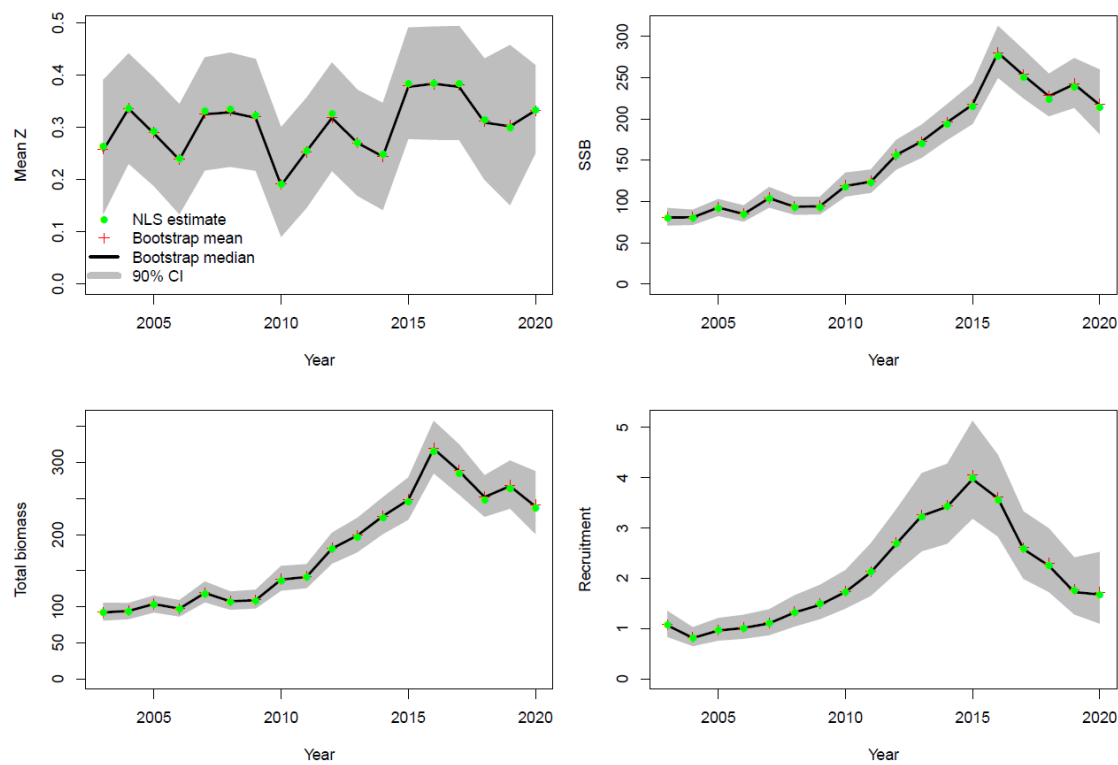


Figure 5.16. Dab in Subarea 4 and Division 3.a: SURBAR model results for dab total mortality (z), spawning stock biomass (SSB), total stock biomass (TSB) and recruitment.



Figure 5.17. Dab in Subarea 4 and Division 3.a: SURBAR model results of log residuals.

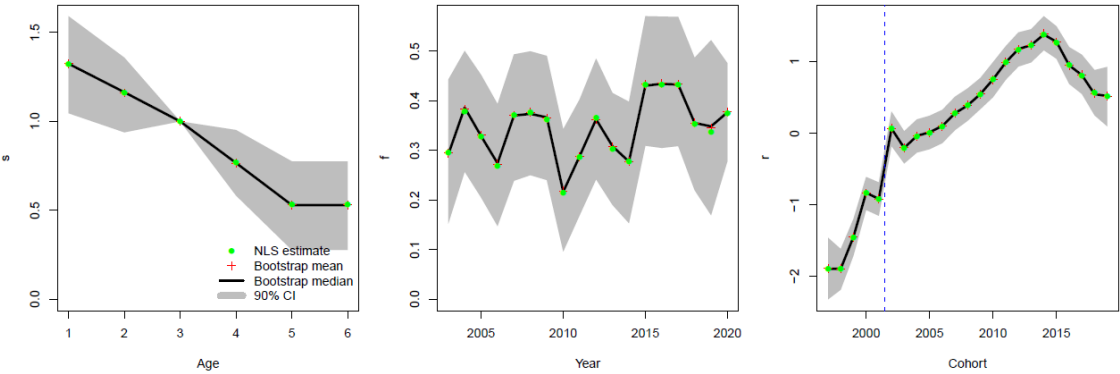


Figure 5.18. Dab in Subarea 4 and Division 3.a: SURBAR model results displaying the age, year and cohort effects.

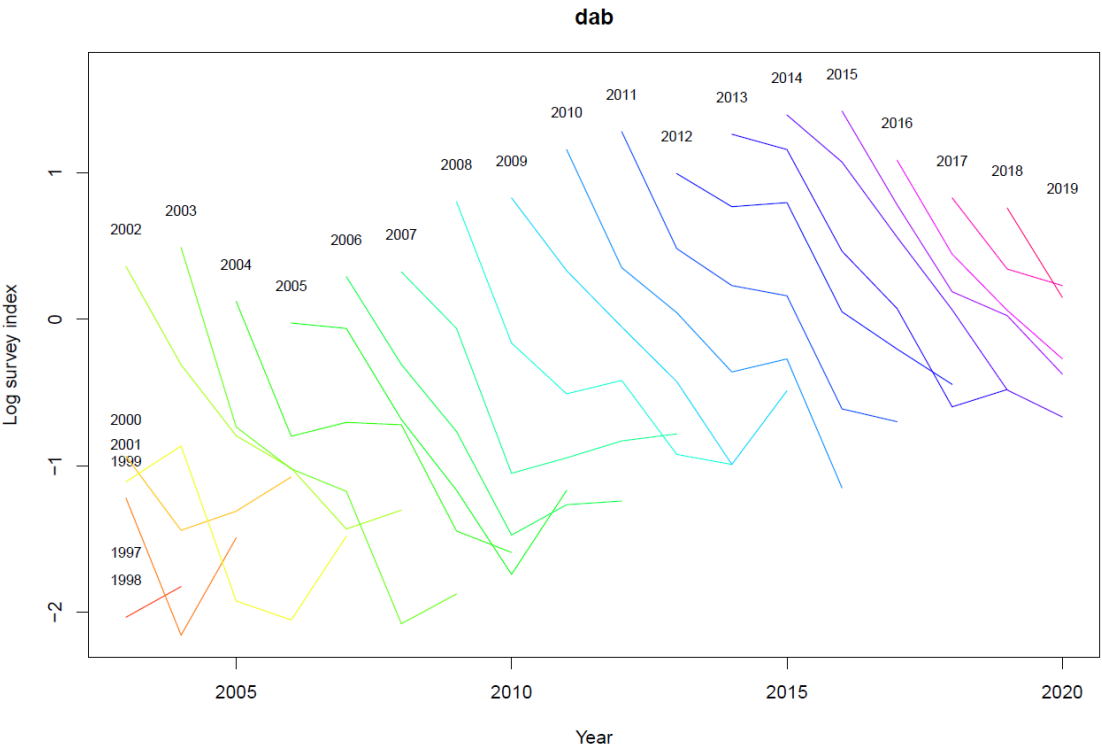


Figure 5.19. Dab in Subarea 4 and Division 3.a: SURBAR model results: catch curves.

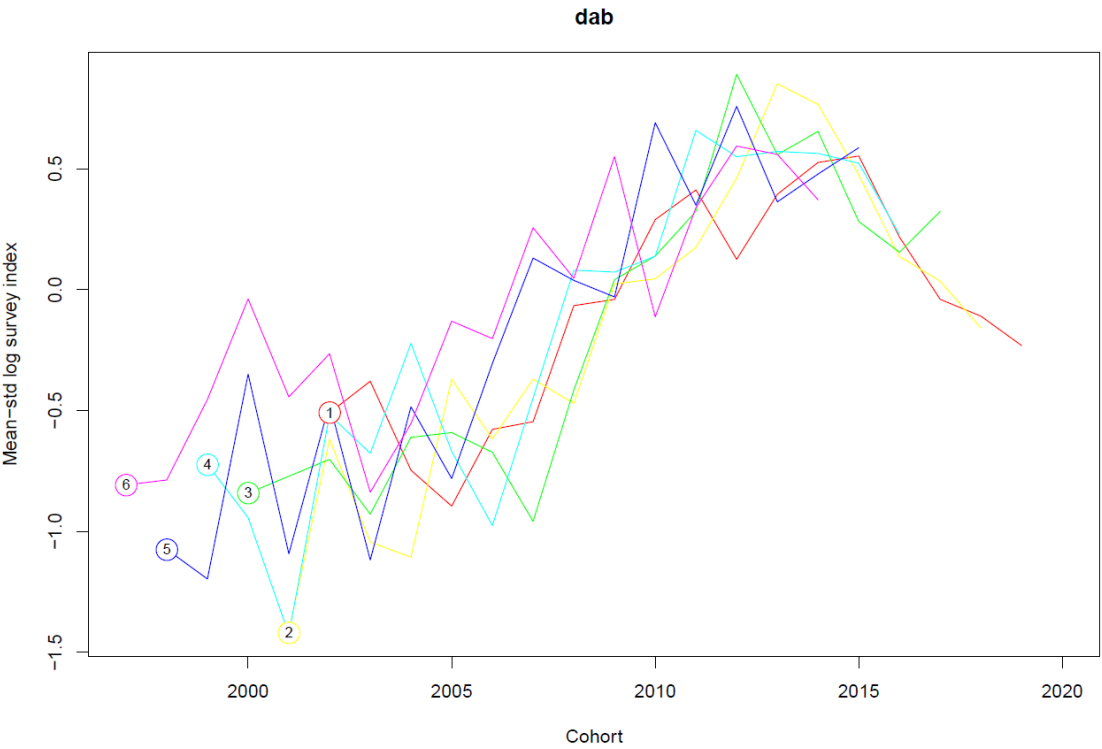


Figure 5.20. Dab in Subarea 4 and Division 3.a: SURBAR mean-standardized log survey index.

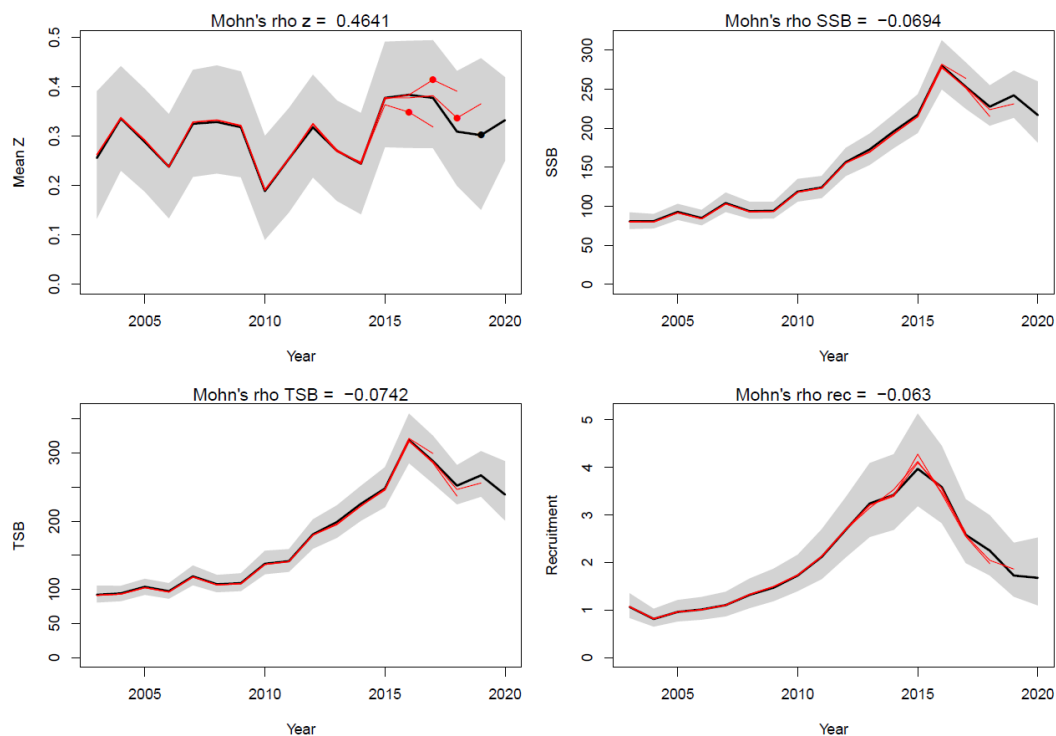


Figure 5.21. Dab in Subarea 4 and Division 3.a: SURBAR Retrospective runs with corresponding Mohn's rho values.

5.5 MSY Proxy analyses for dab in Subarea 4 and Division 3.a.

5.5.1 Dab 27.3a4 Surplus Production Model in Continuous Time (SPiCT)

In order to estimate MSY proxy reference points for dab a Surplus Production Model in Continuous Time (SPiCT; Pedersen and Berg, 2017) was applied. Three fishery independent survey time series and a catch time series (2002–2020) were used as input for the model (details of model input and settings given in Table 5.2). The survey time series were reduced by the recruits (i.e. > 12 cm or > age 1) in order to obtain a better proxy for the exploitable biomass, which is a prerequisite for any production model.

Table 5.2. Dab in Subarea 4 and Division 3.a. SPiCT settings and input data.

Setting/Data	Values/Source
Catch time series	InterCatch data 2002–2020
BTS Isis	1987–2002, >12 cm
BTS Tridens	1996–2002, >12 cm
Combined BTS (Isis, Tridens, Solea)	2003–2020, Age > 1 yr
SPiCT settings	Default from stockassessment.org, no priors

The results of the SPiCT assessment for dab in Subarea 4 and Division 3.a showed that the relative fishing mortality is below the reference F_{MSY} proxy and the relative biomass is above the

reference $B_{MSY} * 0.5$ proxy. Also the estimated uncertainty boundaries around the relative F values show that these are below the reference F_{MSY} proxy for recent years, and those estimated for the relative biomass are above the reference $B_{MSY} * 0.5$ for recent years. However, it has to be noted here that the absolute F and biomass estimates are highly uncertain and must not be used for any further analyses or conclusions. All results of the SPiCT assessment are given in figures 5.22–5.27.

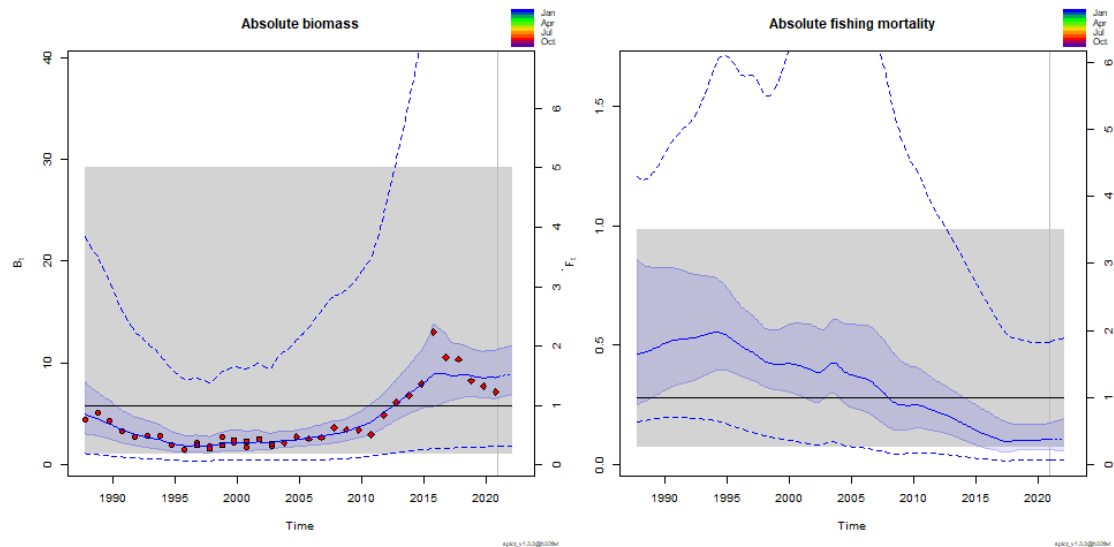


Figure 5.22. Dab in Subarea 4 and Division 3.a: SPiCT results. Absolute biomass (left panel) and absolute fishing mortality (right panel).

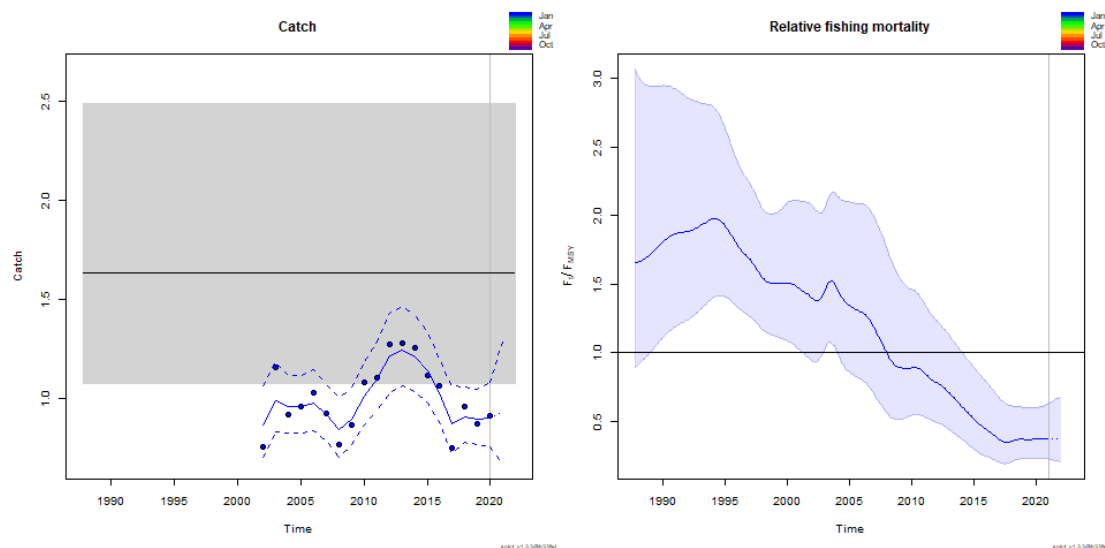


Figure 5.23. Dab in Subarea 4 and Division 3.a: SPiCT results. Catch time series (left panel) and relative fishing mortality (right panel).

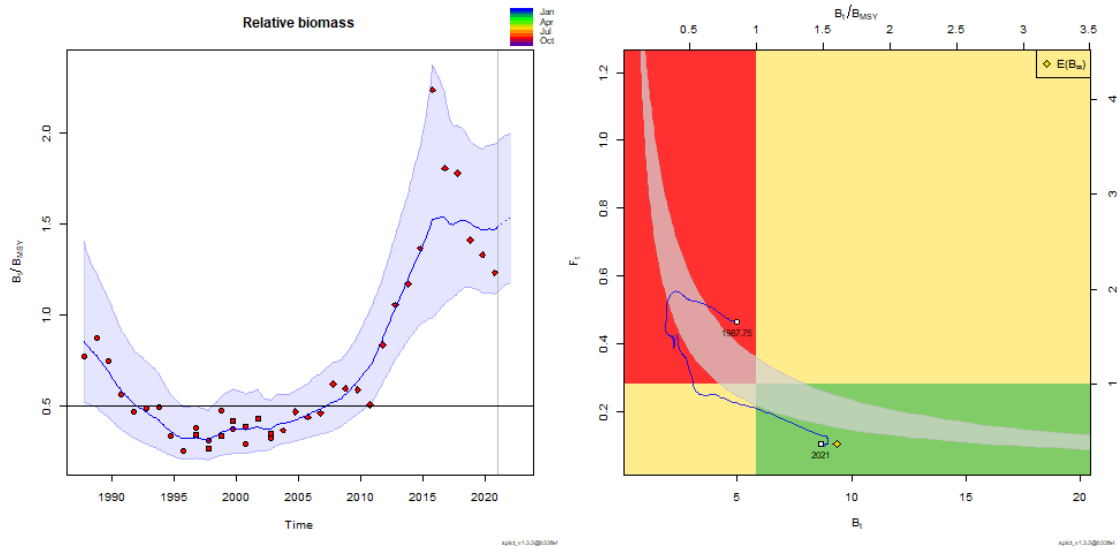


Figure 5.24. Dab in Subarea 4 and Division 3.a: SPiCT results. Relative biomass (left panel) and Kobe plot of relative fishing mortality over biomass estimate (right panel).

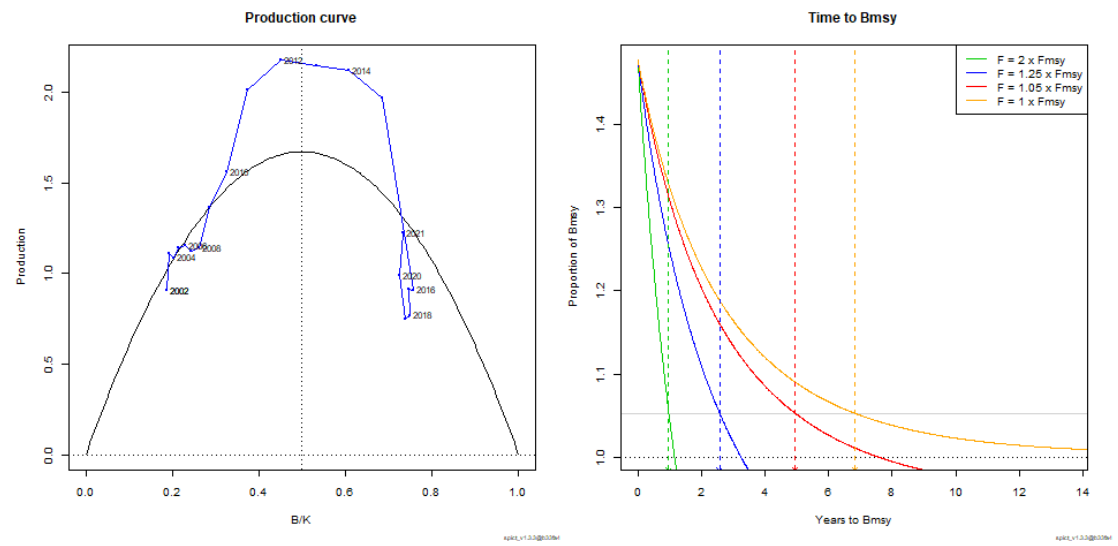


Figure 5.25. Dab in Subarea 4 and Division 3.a: SPiCT results. Production curve (left panel) and estimated time to B_{MSY} (right panel).

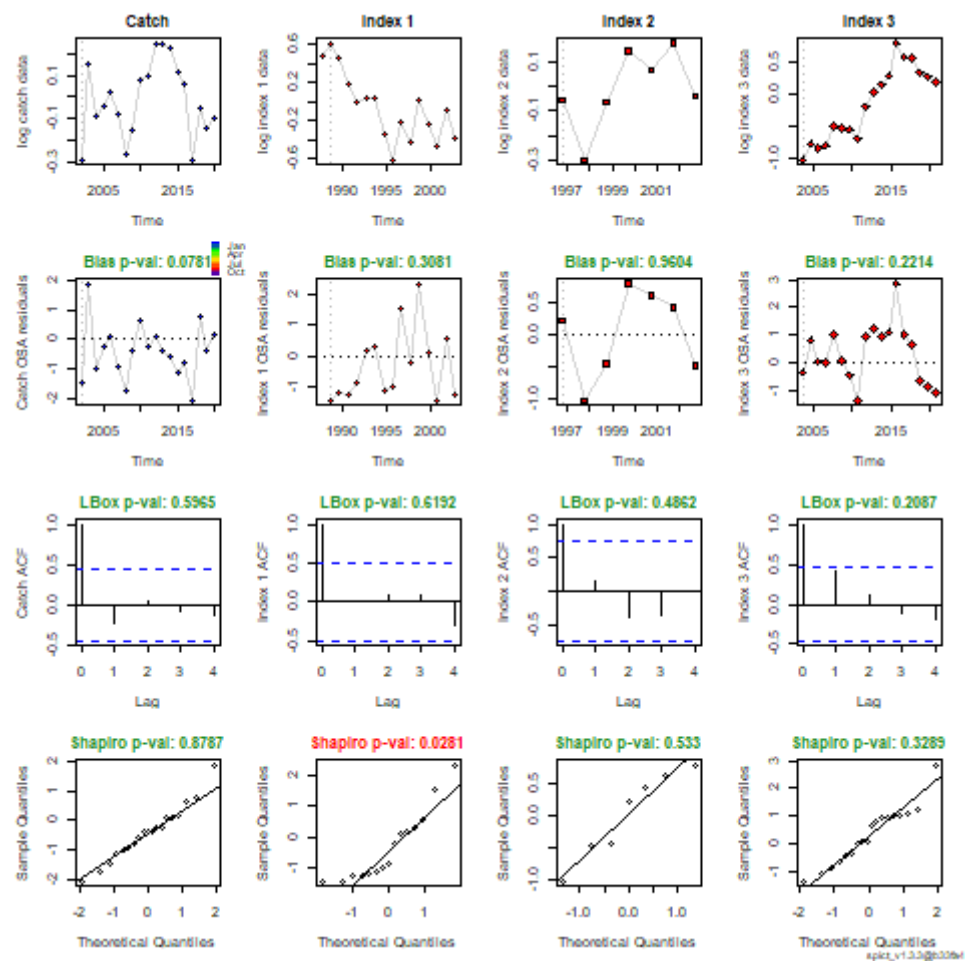


Figure 5.26. Dab in Subarea 4 and Division 3.a: SPICt diagnostics.

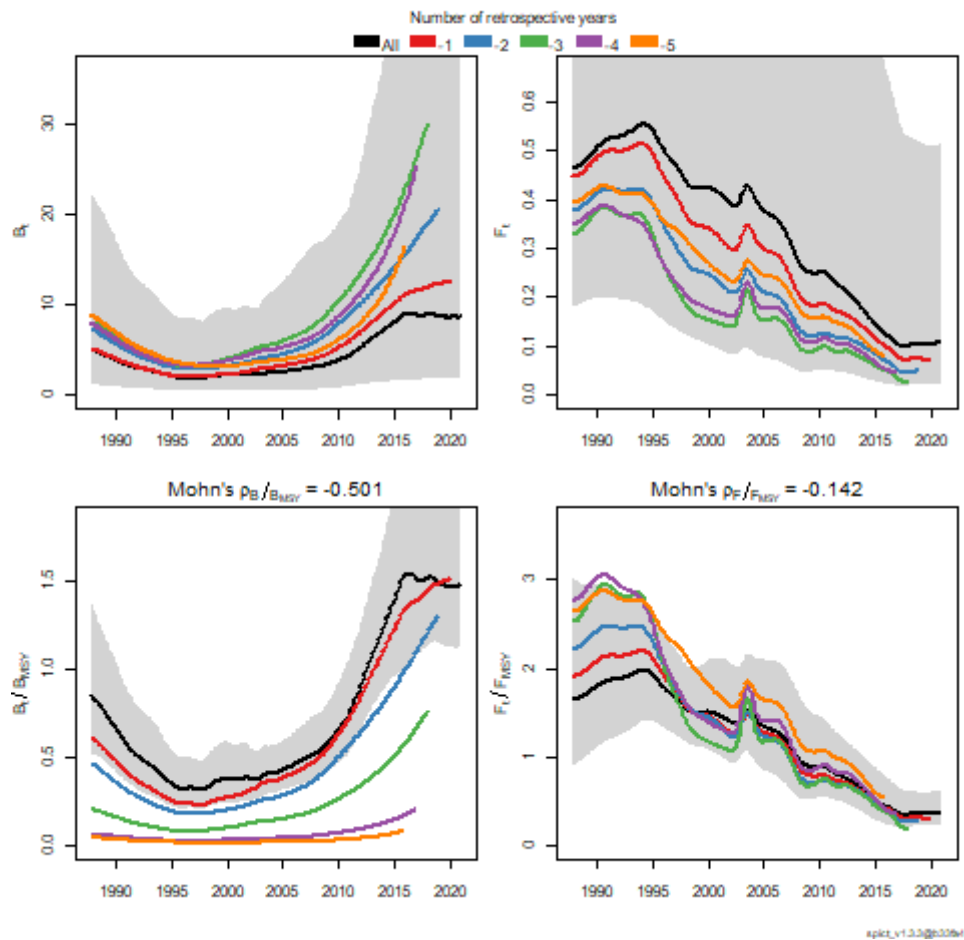


Figure 5.27. Dab in Subarea 4 and Division 3.a: SPiCT retrospective plots.

5.6 Issues list

- Métiers with zero landings but no discards reported. No raising possible for these cases. What is the possible impact on catch estimation? Are there other ways to estimate realistic discards for these métiers?
- No suitable data available for the shrimp fleets operating in coastal waters. No raising possible for these fleets. What is the possible impact on catch estimation? Is there another way to estimate the discards of these fleets?
- Investigate extending the delta-GAM index with Belgian and German BTS data (prior to 2002).
- Investigate the use of DYFS, DFS inshore surveys to estimate a recruitment index.
- Investigate which effort data are available and if these could be used as further input for the SPiCT model.

5.7 References

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Table 5.3. Official dab landings by ICES Subarea 4 and Division 3.a.

Year	Subarea 4	Division 3.a	Total
1950	5971	1287	7258
1951	8190	1332	9522
1952	7976	1294	9270
1953	5915	1123	7038
1954	5652	1237	6889
1955	6623	1257	7880
1956	5468	2081	7549
1957	6127	2724	8851
1958	6342	2210	8552
1959	5239	1943	7182
1960	5168	1314	6482
1961	4602	1367	5969
1962	4082	1683	5765
1963	4615	1565	6180
1964	4982	1575	6557
1965	5519	2052	7571
1966	5862	1755	7617
1967	4324	1115	5439
1968	3995	1548	5543
1969	4122	1430	5552
1970	5183	1079	6262
1971	6546	1242	7788
1972	7901	1669	9570
1973	9657	1449	11106
1974	7146	2003	9149
1975	7033	2049	9082
1976	5917	1583	7500
1977	6702	2318	9020
1978	6407	2630	9037
1979	8243	2716	10959
1980	8357	2333	10690
1981	8454	2679	11133
1982	9565	2902	12467
1983	11865	2906	14771
1984	5482	2769	8251
1985	5502	1545	7047
1986	3205	1608	4813
1987	3931	2258	6189
1988	7067	2254	9321

Year	Subarea 4	Division 3.a	Total
1989	5816	2346	8162
1990	2701	1574	4275
1991	3448	1609	5057
1992	2647	1454	4101
1993	3309	1695	5004
1994	3861	1961	5822
1995	3865	1530	5395
1996	4834	1405	6239
1997	5259	1012	6271
1998	12759	961	13720
1999	13276	673	13949
2000	10595	654	11249
2001	9799	765	10564
2002	8678	977	9655
2003	9008	865	9873
2004	8608	779	9387
2005	9402	836	10238
2006	9190	725	9915
2007	9434	694	10128
2008	8029	522	8551
2009	6561	498	7059
2010	7240	589	7829
2011	6824	545	7369
2012	6095	653	6748
2013	5214	871	6085
2014	4344	611	4955
2015	3595	917	4512
2016	4070	883	4953
2017	2751	788	3529
2018	3607	830	4377
2019*	3987	1066	5053
2020*	3342	634	3976

* Preliminary catch statistics

Table 5.4. Official dab landings by country in Subarea 4.

Year	BEL	DEU	DNK	FRA	FRO	GBR	NLD	NOR	SWE	Subarea 4
1950	254	92	900	139	0	2555	2031	0	0	5971
1951	462	114	1800	90	0	3503	2221	0	0	8190
1952	386	74	1562	227	0	2823	2904	0	0	7976
1953	357	58	1337	189	0	2591	1383	0	0	5915
1954	255	62	1666	177	0	2393	1099	0	0	5652
1955	305	92	2923	161	0	1993	1149	0	0	6623
1956	338	99	1766	138	0	1660	1368	0	99	5468
1957	336	73	1983	154	0	1785	1669	0	127	6127
1958	290	71	2320	175	0	1885	1517	0	84	6342
1959	285	93	1433	146	0	2011	1265	0	6	5239
1960	246	70	1833	154	0	1813	1052	0	0	5168
1961	227	67	1497	161	0	1734	916	0	0	4602
1962	205	54	1357	147	0	1524	795	0	0	4082
1963	306	40	1660	128	0	1481	1000	0	0	4615
1964	424	48	1612	672	0	1177	1049	0	0	4982
1965	432	64	1841	734	0	1099	1349	0	0	5519
1966	507	65	1589	719	0	1215	1767	0	0	5862
1967	384	77	659	716	0	1147	1341	0	0	4324
1968	334	57	861	350	0	877	1516	0	0	3995
1969	302	69	984	448	0	689	1630	0	0	4122
1970	338	71	1476	588	0	752	1958	0	0	5183
1971	409	46	1546	618	0	986	2941	0	0	6546
1972	638	46	1816	727	0	1057	3617	0	0	7901
1973	678	41	1899	873	0	1349	3638	1179	0	9657
1974	281	59	1168	310	0	1227	4101	0	0	7146
1975	600	45	944	418	0	992	4031	0	3	7033
1976	489	52	852	306	0	816	3402	0	0	5917
1977	652	70	743	371	0	907	3959	0	0	6702
1978	520	64	799	513	0	1038	3473	0	0	6407
1979	484	87	1366	630	0	951	4724	0	1	8243
1980	518	24	1376	639	0	777	5023	0	0	8357
1981	542	31	1968	447	0	737	4729	0	0	8454
1982	460	42	2356	594	0	1002	5111	0	0	9565
1983	541	49	4428	495	0	1034	5318	0	0	11865
1984	603	35	3438	486	0	920	0	0	0	5482
1985	509	24	3535	404	0	1030	0	0	0	5502
1986	445	34	1400	289	0	1036	0	0	1	3205
1987	514	36	1574	434	0	1373	0	0	0	3931
1988	697	72	1324	349	0	1221	3404	0	0	7067

Year	BEL	DEU	DNK	FRA	FRO	GBR	NLD	NOR	SWE	Subarea 4
1989	443	117	1280	223	0	1232	2521	0	0	5816
1990	416	162	1103	214	0	802	0	0	4	2701
1991	491	290	1160	258	0	1249	0	0	0	3448
1992	464	218	699	217	0	1049	0	0	0	2647
1993	548	493	1016	235	0	1017	0	0	0	3309
1994	397	626	1307	133	0	1398	0	0	0	3861
1995	410	0	1306	155	1	1993	0	0	0	3865
1996	527	718	1484	177	0	1928	0	0	0	4834
1997	507	945	1399	124	0	2284	0	0	0	5259
1998	757	796	1024	126	0	2085	7971	0	0	12759
1999	802	758	1101	0	0	1964	8651	0	0	13276
2000	684	892	785	124	0	1534	6527	49	0	10595
2001	575	878	839	206	0	1368	5886	47	0	9799
2002	516	582	1126	228	0	1224	4951	51	0	8678
2003	396	642	1580	154	0	1204	4955	77	0	9008
2004	382	767	1136	121	0	1158	4989	55	0	8608
2005	372	1105	1128	121	0	1193	5352	131	0	9402
2006	369	1149	949	130	0	1415	5071	107	0	9190
2007	436	526	634	195	0	1212	6313	118	0	9434
2008	371	375	670	161	0	847	5544	61	0	8029
2009	349	262	489	196	0	648	4588	29	0	6561
2010	337	365	523	178	0	724	5097	16	0	7240
2011	243	312	622	165	0	645	4808	29	0	6824
2012	454	252	421	126	0	665	4136	41	0	6095
2013	406	333	404	84	0	647	3314	26	0	5214
2014	304	282	253	72	0	506	2907	23	0	4347
2015	247	244	747	75	0	339	2500	10	0	4162
2016	321	244	932	75	0	372	2611	35	0	4590
2017	210	125	340	n.a.	0	379	1662	35	0	2751
2018	315	184	709	n.a.	0	417	1960	22	0	3607
2019*	309	166	897	31	0	367	2132	85	0	3987
2020*	171	188	557	25	0	368	1943	84	6	3342

* Preliminary catch statistics

Table 5.5. Official dab landings in ICES Division 3.a.

Year	Bel	Deu	Dnk	Fra	Nld	Nor	Swe	Division 3.a
1950	0	34	1253	0	0	0	0	1287
1951	0	17	1315	0	0	0	0	1332
1952	0	21	1273	0	0	0	0	1294
1953	0	9	1114	0	0	0	0	1123
1954	0	4	1233	0	0	0	0	1237
1955	0	3	1254	0	0	0	0	1257
1956	0	5	1462	0	0	0	614	2081
1957	0	5	2025	0	0	0	694	2724
1958	0	4	1578	0	0	0	628	2210
1959	0	2	1307	0	0	0	634	1943
1960	0	1	1313	0	0	0	0	1314
1961	0	0	1367	0	0	0	0	1367
1962	0	2	1681	0	0	0	0	1683
1963	0	0	1565	0	0	0	0	1565
1964	0	1	1574	0	0	0	0	1575
1965	0	1	2051	0	0	0	0	2052
1966	0	0	1755	0	0	0	0	1755
1967	0	0	1115	0	0	0	0	1115
1968	0	0	1535	13	0	0	0	1548
1969	0	0	1430	0	0	0	0	1430
1970	0	0	1079	0	0	0	0	1079
1971	0	0	1242	0	0	0	0	1242
1972	0	0	1669	0	0	0	0	1669
1973	0	0	1449	0	0	0	0	1449
1974	0	0	2003	0	0	0	0	2003
1975	0	0	1959	0	2	0	88	2049
1976	10	0	1493	0	80	0	0	1583
1977	11	0	2105	0	142	0	60	2318
1978	2	0	2515	0	39	0	74	2630
1979	3	0	2616	0	15	0	82	2716
1980	3	0	2218	0	3	0	109	2333
1981	0	0	2574	0	5	0	100	2679
1982	1	0	2823	0	22	0	56	2902
1983	1	0	2759	0	34	0	112	2906
1984	0	0	2695	0	0	0	74	2769
1985	1	0	1486	0	0	0	58	1545
1986	5	0	1551	0	0	0	52	1608
1987	19	0	2182	0	0	0	57	2258
1988	13	0	2150	0	15	0	76	2254

Year	Bel	Deu	Dnk	Fra	Nld	Nor	Swe	Division 3.a
1989	4	0	2302	0	0	0	40	2346
1990	3	0	1535	0	0	0	36	1574
1991	5	1	1556	0	0	0	47	1609
1992	10	0	1412	0	0	0	32	1454
1993	7	0	1656	0	0	0	32	1695
1994	9	0	1917	0	0	0	35	1961
1995	3	0	1482	0	0	0	45	1530
1996	0	0	1387	0	0	0	18	1405
1997	0	0	990	0	0	0	22	1012
1998	0	0	942	0	0	0	19	961
1999	0	0	661	0	0	0	12	673
2000	0	0	647	0	0	1	6	654
2001	0	0	751	0	0	7	7	765
2002	0	0	968	0	0	3	6	977
2003	0	0	674	0	173	14	4	865
2004	0	0	637	0	138	1	3	779
2005	0	0	738	0	95	0	3	836
2006	0	20	566	0	117	18	4	725
2007	0	9	547	0	126	3	9	694
2008	0	12	475	0	26	2	7	522
2009	0	4	478	0	3	1	12	498
2010	0	4	426	0	151	0	8	589
2011	0	10	517	0	0	11	7	545
2012	0	5	632	0	0	10	6	653
2013	0	11	654	0	174	26	6	871
2014	0	12	501	0	75	2	21	611
2015	0	8	752	0	203	8	24	995
2016	0	9	657	0	189	14	26	895
2017	0	3	601	0	157	14	13	788
2018	0	10	586	0	230	2	2	830
2019*	0	1	675	0	387	1	2	1066
2020*	0	1	457	0	173	0	3	634

* Preliminary catch statistics

Table 5.6. Dab in Subarea 4 and Division 3.a.: InterCatch landings, discards and total catch (2002–2020).

Year	Landings	Imported discards	Raised discards	Total discards	Total catch	% discards
2002	8588	14448	12183	26631	35219	76%
2003	9433	22152	22778	44930	54363	83%
2004	8647	18559	15714	34273	42920	80%
2005	9537	21295	13996	35291	44828	79%
2006	10236	16106	21871	37977	48214	79%
2007	9881	8936	24392	33328	43208	77%
2008	8645	14781	12598	27379	36024	76%
2009	7040	20652	12769	33421	40461	83%
2010	8279	23688	18798	42486	50765	84%
2011	7422	28227	16234	44460	51882	86%
2012	7047	33220	19412	52632	59679	88%
2013	6611	36855	16621	53476	60087	89%
2014	5047	35383	18350	53733	58780	91%
2015	5082	26468	20904	47372	52454	90%
2016	5085	29023	15788	44811	49896	90%
2017	3598	22241	9274	31515	35113	90%
2018	4233	28630	11915	40545	44792	91%
2019	5024	26330	9372	35702	40725	88%
2020	3808	22291	16575	38866	42673	91%