2 Blue whiting in Northeast Atlantic and adjacent waters

Micromesistius poutassou in subareas 1–9, 12, and 14 (whb.27.1-91214)

Blue whiting (*Micromesistius poutassou*) is a small pelagic gadoid that is widely distributed in the eastern part of the North Atlantic. The highest concentrations are found along the edge of the continental shelf in areas west of the British Isles and on the Rockall Bank plateau, where it occurs in large schools at depths ranging between 300 and 600 metres and is also present in almost all other management areas between the Barents Sea and the Strait of Gibraltar and west to the Irminger Sea. Blue whiting reaches maturity at 2–7 years of age. Adults undertake long annual migrations between the feeding and spawning grounds. Most of the spawning takes place between March and April, along the shelf edge and banks west of the British Isles. Juveniles are abundant in many areas, with the main nursery area believed to be the Norwegian Sea. See the Stock Annex for further details on stock biology.

2.1 ICES advice in 2024

Fishing pressure (F) on the stock has been estimated above F_{MSY} since 2014 and spawning-stock size (SSB) is estimated above MSY $B_{trigger}$ since 1997. ICES advises that when the long-term management strategy agreed by Norway, the European Union, the Faroe Islands, Iceland, and the United Kingdom is applied, catches in 2025 should be no more than 1 447 054 tonnes.

2.2 The fishery in 2024

The total catch of blue whiting in 2024 was 1 797 260 tonnes. As in previous years, the main fishery on blue whiting targeted spawning and post-spawning fish (Figures 2.2.1-2). Around 87% of the catches were taken in the first two quarters, with the majority taken along the slopes of the Western European shelf and around the Faroes. Smaller quantities were taken in the Norwegian Sea, in the Norwegian Trench, in the Rockall Trough and along the coast of Spain and Portugal.

The fishery in the second half of the year only accounted for around 13% of the total catches. It was mainly in the Norwegian Sea, on the Iceland-Faroe Ridge and between Scotland and the Faroes, with smaller amounts in the Norwegian Trench, in the Celtic Sea and along the coast of Portugal and Spain (Figures 2.2.1-2).

The multinational fleet targeting blue whiting in 2024 consisted of several types of vessels from 15 countries, with Faroe Islands, Norway, Iceland and Russia taking 75% of the catches. The bulk of the catch is caught by large pelagic trawlers, some with the capacity to process or freeze on board. The remainder is caught by Refrigerated Sea Water (RSW) vessels.

2.3 Input to the assessment

At the Inter-Benchmark Protocol on Blue Whiting, IBPBLW (ICES, 2016a), it was decided to use preliminary within the year, quarter 1 and quarter 2, catch-at-age data in the assessment to get additional information to the within year IBWSS survey estimates. In recent years, 85-90% of the total annual catches of the age 3+ fish have been taken in the first half of the year, which makes

it reasonable to estimate the total annual catch-at-age from reported first semester (Q1 & Q2) data and expected total catches for the remainder of the year. The catch data sections in this report contain a comprehensive description of the 2024 data as reported to ICES and a brief description of the 2025 (1st semester) preliminary catch data.

2.3.1 Officially reported catch data

Official catches in 2024 were estimated as 1 797 260 tonnes based on data provided by WGWIDE members (Table 2.3.1.1). Data provided as catch by rectangle represented 96% of the total WG catch in 2024.

In 2024, the majority of catches were caught on the spawning grounds with largest contribution from ICES divisions 27.5.b, 27.7.c, 27.6.a, 27.7.k, 27.6.b and 27.2.a (Figure 2.3.1.1; Tables 2.3.1.2, 2.3.1.3), caught respectively in quarter 1 and quarter 2 (Figure 2.3.1.3). In the first two quarters, catches are taken over a broad area, with the highest catches in 27.5.b, 27.7.c, 27.6.a and 27.7.k, while later in the year catches are mainly taken in division 27.5.b, 27.6.a, 27.5.a, 27.2.a and in the North Sea (27.4.a) (Figures 2.3.1.6 and 2.3.1.7 and Table 2.3.1.3). The spatial and temporal distributions of catches in 2023 are similar to previous years (Figures 2.3.1.2, 2.3.1.3, 2.3.1.4; and Table 2.3.1.4 and Figure 1.10.7 in Section 1). The majority of the blue whiting catch was caught by five nations - Faroe Islands, Iceland, Norway, Russia, Denmark and the UK (Scotland) respectively (Figure 2.3.1.5).

Discards of blue whiting are small. Most of the blue whiting caught in directed fisheries are used for reduction to fish meal and fish oil. However, some discarding occurs in the fisheries for human consumption and as bycatch in fisheries targeting other species.

Reports on discarding from fisheries which catch blue whiting were available from the Netherlands for the years 2002—2007 and 2012—2014. A study carried out to examine discarding in the Dutch fleet found that blue whiting made a minor contribution to the total pelagic discards.

The blue whiting discards data provided by Portuguese vessels operating with bottom otter trawl within the Portuguese portions of ICES Division 27.9.a are available since 2004. The discards data are from two fisheries: the crustacean fishery and the demersal fishery. The blue whiting estimates of discards in the crustacean fishery for the period of 2004–2011 ranged between 23% and 40% (in weight). For the same period the frequency of occurrence in the demersal fishery was around zero for most of the years, in the years where it was significant (2004, 2006, 2010) discards ranged between 43% and 38% (in weight). In 2024, discards were 29% of the total catches for blue whiting along the Portuguese coast (Table 2.3.1.5). The total catch from Portugal is less than of one percent the total international catches.

Information on discards has been available for Spanish fleets since 2006. Blue whiting is a bycatch in several bottom-trawl mixed fisheries. The estimates of discards in these mixed fisheries in 2006 ranged between 23% and 99% (in weight) as most of the catch is discarded and only the catch of the last day may be retained for marketing fresh. The catch rates of blue whiting in these fisheries are, however, low. In the directed fishery for blue whiting for human consumption with pair trawls, discards were estimated to be 7% (in weight) in 2024 (Table 2.3.1.5). Spanish catches are around 2% of the international catches.

In general, discards are assumed to be small in the blue whiting directed fishery. Discards data contributed to final catches of the following countries: Denmark, Ireland, Portugal, Spain and Sweden. The total discards constituted 0.23% of the total catches, 3 162 tonnes. The largest fishing nations, Faroe Islands, Norway, Iceland and Russia do not have discards on blue whiting.

The total estimated catches (tonnes) inside and outside the NEAFC regulatory area by country were reported in Table 2.3.1.6. The catches inside the NEAFC RA represent 30% of the total catches of blue whiting in 2024.

2.3.1.1 Sampling intensity

In 2024, 77% of catches were covered by the sampling program. In 2024, 2 153 length samples and 2 051 age samples were collected from the fisheries with 139 929 fish measured and 18 524 aged (Table 2.3.1.1.1 and Table 2.3.1.1.2). Sampling intensity for blue whiting with detailed information on catch, the proportion of catch covered by the sampling program, the number of samples, number of fish measured, and number of fish aged per year from 2000 to 2024 is given in Table 2.3.1.1.1. Sampling intensity per country, quarter and ICES division for 2023 is listed in Tables 2.3.1.1.2, 2.3.1.1.3 and 2.3.1.1.4. The most intensive sampling, considering the age samples and the number of aged fish, took place in areas 27.2.a, 27.4.a, 27.5.b, 27.6.a, 27.7.c, 27.7.k, 27.8.c and 27.9.a (Figure 2.3.1.1.1). No sampling was carried out by France, Greenland, Poland, Sweden and the UK (Northern Ireland) which together represents 5% of the total catches. The sampled and estimated catch-at-age data are shown in Figure 2.3.1.1.1.

Sampling intensity for age and weight of blue whiting are made in proportion to landings according to CR 1639/2001 and apply to EU member states. The Fisheries Regulation 1639/2001, requires EU Member States to take a minimum of one sample for every 1000 tonnes landed in their country. Various national sampling programs are in force.

2.3.1.2 Age compositions

As an example of an age-length key from sampled catches in 2024, data from ICES area 27.6.a is presented by quarter and country (Figure 2.3.1.2.1). The mean length (mm) by age reveals that age classifications do present some differences between countries. The major differences in mean length-at-age are observed in older ages, higher than age 9.

The catch-at-age numbers reveal a higher proportion of age 3 and 4 individuals in quarters 1 and 2, which corresponds to the 2020 and 2021 annual cohorts, when a higher recruitment was observed (Figure 2.3.1.2.2).

The ICES InterCatch program was used to calculate the total international catch-at-age, and to document how it was done.

2.3.2 Preliminary 2025 catch data (Quarters 1 and 2)

The preliminary catches for 2025 as reported by the WGWIDE members are presented in Table 2.3.2.1.

The spatial distribution of these 2025 preliminary catches is similar to the distribution in 2024 with the majority of catches taken in division 27.5.b, 27.7.k, 27.6.a and 27.7.c (Figure 2.3.2.1 and Table 2.3.2.2).

Sampling intensity for blue whiting from the preliminary catches by area with detailed information on the number of samples, number of fish measured, and number of fish aged is presented in Table 2.3.2.2.

WGWIDE estimated the expected total catch for 2025 from the sum of declared national quotas, corrected for expected national uptake and transfer of these quotas (Table 2.3.2.3).

For the period 2016 to 2024, preliminary and final catch estimates are similar with maximum deviation in 2024 when the final catch was 4.5% lower than the preliminary catch (Table 2.3.2.4). Age compositions (Figure 2.3.2.2) are also similar between preliminary and final catch data except for some years and ages considering strong year classes, for example age 1 in 2021 and 2022

(i.e. the strong 2020 and 2021 year classes) and age 7 in 2021, age 8 in 2022 and age 9 in 2023 (i.e. the strong 2014 year class). There is no clear pattern in the deviations; it is both the catch at age for young and older fish that change between preliminary and final data.

The estimation of catch at age and mean weight at age followed the method described in the Stock Annex.

2.3.3 Catch-at-age

The catch in numbers-at-age from 1981 to 2025 are presented in Table 2.3.3.1 and catch proportions at age are shown in Figure 2.3.3.1. Strong year classes that dominated the catches can be clearly seen in the early 1980s, 1990, the late 1990s and early 2000's. More recently, the propagation of the large 2014 year class is also evident and the recently emerged strong year classes of 2020 and 2021.

Catch curves for the international catch-at-age dataset (Figure 2.3.3.2) indicate a consistent decline in catch number by cohort in years with rather high landings (and probably similar high effort). The catch curves for year classes 2011-2017 show a consistent decline in the stock numbers with an estimated total mortality (Z=F+M) around 0.6-0.7 for the ages fully recruited to the fisheries. With an assumed natural mortality (M=0.2), the assessment F around 0.4-0.5 fits well to the Z values estimated from the catch curves.

2.3.4 Weight at age

Table 2.3.4.1 and Figure 2.3.4.1 show the mean weight-at-age for the total catch during 1981-2025 used in the stock assessment. Mean weight at ages 3-9 has generally decreased in the period 2010-2018, followed by an increase again up to 2021, after which mean weight decreases again for especially the lower ages (1-5).

The weight-at-age for the stock is assumed the same as the weight-at-age for the catch.

2.3.5 Maturity and natural mortality

Blue whiting natural mortality and proportion of maturation-at-age are shown in Table 2.3.5.1. See the Stock Annex for further details.

2.3.6 Fisheries independent data

Data from the International Blue Whiting spawning stock survey are used by the stock as-sessment model, while recruitment indices from several other surveys are used to qualitatively adjust the most recent recruitment estimate by the assessment model and to guide the recruitments used in the forecast.

2.3.6.1 International Blue Whiting spawning stock survey

The Stock Annex gives an overview of the surveys available for the blue whiting. The International Blue Whiting Spawning Stock Survey (IBWSS) is the only survey used as input to the assessment model.

The full time series of IBWSS was recalculated in summer 2020, using the same software (StoX; Johnsen et al., 2019) and method as previously applied. The values are presented in Table 2.3.6.1.1 and Figure 2.3.6.1.1 A.

The survey time-series (2004-2025) show variable internal consistency ranging from 0.24 to 0.83 (Figure 2.3.6.1.1 B) The overall internal consistency for age-disaggregated year classes was slightly reduced compared to last year. There is a high internal consistency for the younger ages (1-5 years) and older ages (7-9 years) with correlation between 0.7 and 0.82, but poor ($0.4 < r < 0.5$) between ages 5 to 7. This may indicate age reading problems for this group of ages.

The distribution of acoustic backscattering densities for blue whiting for the period 2020-2025 is shown in Figure 2.3.6.1.2. The abundance estimate of blue whiting for IBWSS are presented in Table 2.3.6.1.1. The survey in 2025 was impacted by bad weather. Fishing vessels also experienced trouble finding blue whiting on the acoustic equipment and found blue whiting to be much more scattered throughout the water layer over large distances compared to years before.

Length and age distributions for the period 2020 to 2025 are given in Figure 2.3.6.1.3.

Survey indices, (ages 1-8 years 2004-2025) as applied in the stock assessment are shown in Table 2.3.6.1.1.

2.3.6.2 Other surveys

The Stock Annex provides information and time-series from surveys covering parts of the stock area. A brief survey description and survey results are provided below.

The International ecosystem survey in the Nordic Seas (IESNS) in May which is aimed at observing the pelagic ecosystem with a particular focus on Norwegian spring-spawning herring and blue whiting (mainly immature fish) in the Norwegian Sea (Table 2.3.6.2.1).

Norwegian bottom-trawl survey in the Barents Sea (BS-NoRu-Q1(Btr)) in February-March where blue whiting are regularly caught as a bycatch species. This survey gives the first reliable indication of year class strength of blue whiting. The 1-group in this survey is defined as less than 19 cm (Table 2.3.6.2.2).

Icelandic bottom-trawl survey on the shelf and slope area around Iceland. Blue whiting is caught as a bycatch species and 1-group is defined as less than 22 cm in March (Table 2.3.6.2.3).

Faroese bottom-trawl survey on the Faroe plateau in spring where blue whiting is caught as bycatch species. The 1-group in this survey is defined as equal or less than 23 cm in March (Table 2.3.6.2.4).

The International Survey in Nordic Seas and adjacent waters in July-August (IESSNS). Blue whiting has been considered a main target species in this survey since 2016 and as such methods were changed to ensure there was sampling for blue whiting. This was a recommendation from WGWIDE 2015 to try to have one more time-series for blue whiting. Data for the survey are not used yet, due to the short time series. However, results from this survey are also presented to the working group and a strong signal of one-year olds were seen in 2025.

2.4 Stock assessment

The IBWSS survey is the only survey used by the SAM assessment. The survey was cancelled in 2020 due to the COVID-19 pandemic, but conducted in 2021-2025.

The presented assessment in this report follows the recommendations from the Inter-Benchmark Protocol of Blue (ICES, 2016a) to use the SAM model. The configuration of the SAM model was kept unchanged in this year's assessment.

At WGWIDE in 2021 the time period for estimating recruitment for the short term forecast was changed from the full time series (minus the terminal year) to the more recent period since 1996 (minus the terminal year). This approach was again followed by WGWIDE 2025.

2.4.1 2025 stock assessment

For a model such as SAM, Berg and Nielsen (2016) pointed out that the so-called "One Step Ahead" (OSA) residuals should be used for diagnostic purposes. The OSA residuals (Figure 2.4.1.1) show a quite random distribution of residuals. There seems to be a year class effect showing in the catch residuals starting in the early 2000s up to the mid 2010s. The IBWSS residuals for 2025 are negative for most ages.

The estimated parameters from the SAM model from this year's assessment and those from assessments conducted since 2021 are shown in Table 2.4.1.1. There are no abrupt changes in the estimated parameters over the time-series presented. The lowest observation noises, and therefore the largest weight in the assessment model, have in all years been from catches at ages 3-8, which constitute the largest proportion of the catch. The observation noise of age 1 (i.e. recruitment) in the IBWSS has decreased over the years, likely due to the increase in length of the time series.

The process error residuals ("Joint sample residuals") (Figure 2.4.1.2) are reasonably well randomly distributed. Process noise within SAM is implemented as a "process mortality, Z"; these deviations in mortalities are shown in Figure 2.4.1.3. The deviations in mortality (plus or minus mortality) seem fairly randomly distributed without very pronounced clusters (as also seen in Figure 2.4.1.2).

The correlation matrix between ages for the catches and survey indices (Figure 2.4.1.4) shows a modest observation correlation for the younger ages and a stronger correlation for the older ages. This difference is more distinct for catches, probably because it includes older ages (1-10+) than the survey data (ages 1-8). The correlation matrix this year is very similar to last year's assessment (Figure 2.4.1.4).

Figure 2.4.1.5 presents the exploitation pattern for the whole time-series. There are no abrupt changes in the exploitation pattern from 2010 to 2025, even though the landings in 2011 were just 19% of the landings in 2010, which might have given a change in the exploitation pattern. The plateau in selection at age 6 and older seen since mid-2000s seems more realistic than the more linear selection estimated for the beginning of the time series. The estimated stable exploitation pattern might be influenced by the use of correlated random walks for F at age with a high estimated correlation coefficient (Rho = 0.94, Table 2.4.1.1).

The retrospective analysis is shown for the last 5 years in Figure 2.4.1.6, with the previous years within the 95% confidence interval of the current assessment. However, recent peels (2022-2024) show large deviations from the SSB and F estimates of the current assessment, indicating a large upscaling in F and downscaling in SSB. Additionally, they show a much higher recruitment in 2021 and 2022 (i.e. the strong 2020 and 2021 year classes). Mohn's rho by year and as the average value over the last five years are presented in (Table 2.4.1.2). The annual value is particularly high for recruitment for the 2021 peel (-0.296), but lower for the other peels, such that the average Mohn's rho for recruitment becomes -0.057 (compared to -0.211 last year). The Mohn's rho values for SSB are high and positive for the 2022-2024 peels, with an overall mean Mohn'r rho of 0.128, indicating a tendency to overestimate SSB in the assessment, largely driven by the most recent peel that estimates SSB to be markedly lower for these years. The Mohn's rho values for F are all negative, with some high values in the 2022 and 2024 peel and a mean value of -0.107. This suggests that the assessment tends to underestimate fishing mortality.

Stock summary results with added 95% confidence limits (Figure 2.4.1.7 and Table 2.4.1.3) show a decrease in fishing mortality in the period 2004—2011, followed by a steep increase in F up to 2015 and fluctuating hereafter around 0.40-0.46 (above F_{MSY} at 0.32) until 2022. F increased again above 0.5 in 2023 and 2024. In 2025, F is estimated to increase further to 0.675, which is the highest

value in the time series. Recruitment (age 1) was high in 2015, followed by a series of lower recruitment in 2017-2020. The recruitment in both 2021 (60.1 billion) and 2022 (62.4 billion) is estimated to be historically high. Recruitment in 2025 is estimated to be 16.9 billion, which is lower than the 2023 and 2024 recruitment estimates. After a period of decrease since 2016, SSB has been increasing again since 2022. In 2025, SSB is estimated to decrease again compared to 2024 from 5.7 to 4.5 million tonnes.

2.4.1.1 Leave-out runs and further diagnostics

To further explore the observed retrospective patterns a series of leave-out runs was conducted, consisting of leaving out: (1) the IBWSS time series from 2010-2025, (2) the IBWSS values for 2025 and (3) the catch-at age values for 2025. Ideally, for the first leave-out run, the entire IBWSS from 2004 onwards is excluded, making the model entirely driven by the catch, but this was not possible with the 'stockassessment' R package for SAM. Alternatively, only the first few years of the time series (2004-2009) were kept, which are considered to have little influence on the model. The IBWSS leave-out run resulted in very similar estimates of SSB and recruitment compared to the current assessment, while F was downscaled in 2024 and 2025 (Figure 2.4.1.1.1). The second leave-out run, leaving out the 2025 IBWSS values while keeping all other years of the survey time series, shows a pronounced upscaling of SSB and downscaling of F in the most recent years, as well as an upscaling of recruitment at age 1 in 2021 and 2022 (i.e. the strong 2020 and 2021 year classes; Figure 2.4.1.1.2). The third leave-out run, leaving out the catch value for 2025 only, resulted in very similar estimated for SSB, F and recruitment (Figure 2.4.1.1.3).

The leave-out runs indicate that the current assessment is strongly catch-driven, as leaving out (most of) the IBWSS survey (first run) does not lead to much change. However, excluding only the 2025 survey index (second run), has a considerable impact on SSB, F and recruitment, while leaving out the 2025 catches (third run) has not, suggesting that the addition of the 2025 survey index has a pronounced influence on the model. Interestingly, the 2025 survey suggests a strong decrease in stock abundance compared to 2024 (Figure 2.3.6.1.1), yet leaving out the 2025 survey index values does not undo the decrease in SSB from 2024 to 2025, but rather leads to an overall downscaling of SSB (Figure 2.4.1.1.2).

A similar mechanism seems to be at play when leaving out the 2015 survey index values (Figure 2.4.1.1.4). In 2015, the IBWSS indicated stock abundance to be low, while the index strongly increased again in 2016 (Figure 2.3.6.1.1). Although this is an opposite trend of what is observed for 2024-2025, leaving out the 2015 survey index values, also leads to a re-scaling of SSB and F in recent years, as well as of recruitment at age 1 in 2021 and 2022 (with opposite patterns as for when the 2025 survey index was excluded). Hence, individual survey index years like 2015 and 2025 cause the model to 'ignore' the survey data in other years and to become mostly catch-driven. The model has a strong tendency to follow the catch data and resembles selection patterns close to traditional VPA models. Only when survey data is substantially different from catch data, will the SAM model deviate from the VPA characteristics and follow the survey rather than the catch data.

A closer look at the how the model fits to the observed catches and survey index values by cohort shows that the 2025 assessment does not fit well to the high survey index values of the strong year classes of 2020 and 2021 (first appearing in the assessment in 2021 and 2022 as age 1; Figure 2.4.1.1.5). Notably, the 2025 assessment model underfits the high index values in 2023 compared to the 2024 peel. A similar fitting problem is not observed for the catch data (Figure 2.4.1.1.6). A comparison of how the 2025 assessment and its 2024 peel evaluate cohort strength shows that the 2025 model downscales the entire 2020 and 2021 year classes (Figure 2.4.1.1.7). This likely explains the overall downscaling of SSB in recent years and of recruitment in 2021 and 2022 by the 2025 assessment.

2.4.2 Alternative model runs

During WGWIDE 2023 an alternative configuration of the Blue Whiting SAM assessment was prepared (available at stockassessment.org; BW2023_freeFRW). In this assessment, the number of parameters to estimate for the F-random walks was increased to allow estimation of these random walks for ages 1-3 separately from ages 4-10. At the same time, the imposed correlation structure in the catch-at-age data was turned off. The results are very similar to the final accepted model and show only minor differences when it comes to fitting catch-at-age. The overall negative log-likelihood was larger under the alternative configuration. The alternative configuration had no impact on the retrospective pattern either. See WGWIDE 2023 for more details.

2.5 Final assessment

Following the recommendations from Inter-Benchmark Protocol on Blue Whiting (ICES, 2016a) the SAM model is used for the final assessment. The model settings can be found in the Stock Annex.

Input data are catch numbers-at-age (Table 2.3.3.1), mean weight-at-age in the stock and in the catch (Table 2.3.4.1) and natural mortality and proportion mature in Table 2.3.5.1. Applied survey data are presented in Table 2.3.6.1.1.

The model was run for the period 1981—2024, with catch data up to 2024 and preliminary catch data for the first half-year (Q1 and Q2) of 2025 raised to expected annual catches, and survey data (IBWSS) from March-April, 2004–2025. SSB 1st January in 2026 is estimated from survivors and estimated recruits (for 2026 estimated outside the model, see short-term forecast section). 11% of age group 1 is assumed mature, thus recruitment influences the size of SSB. The key results are presented in Tables 2.5.1, 2.5.2 and 2.5.3 and summarized in Table 2.4.1.3 and Figure 2.4.1.7. Residuals of the model fit are shown in Figures 2.4.1.1 and 2.4.1.2.

2.6 State of the Stock

Fishing pressure (2024) on the stock is above F_{MSY} and F_{pa}; spawning-stock size (2025) is above MSY $B_{trigger}$, B_{pa} and B_{lim}.

F is estimated to be 0.675 in 2024, the highest value in the time series years. F has been above F_{MSY} and F_{pa} (0.32) since 2014. SSB has increased from 2021 (3.7 million tonnes) to a close to historical high in 2024 (5.7 million tonnes). SSB has been above MSY $B_{trigger}$ since 1997.

Recruitment (age 1) in 2022 is estimated to be the highest value in the time series, closely followed by 2021. Recruitment in 2023 (19.4 billion), 2024 (18.8 billion) and 2025 (16.9 billion) are estimated to be below the 1996-2024 geometric mean (22.1 billion).

2.7 Biological reference points

In the spring of 2016, the Inter-Benchmark Protocol on Blue Whiting (IBPBLW) (ICES, 2016a) delegated the task of re-evaluating biological reference points of the stock to the ICES Workshop on Blue Whiting Long Term Management Strategy Evaluation (WKBWMSE) (ICES 2016b). During the WGWIDE meeting 2017, WKBWMSE concluded to keep B_{lim} and B_{pa} unchanged but revised F_{lim}, F_{pa}, and F_{MSY}.

ICES made in 2021 the decision to use F_{p05} as the value for F_{pa}. F_{p05} was estimated by WKBWMSE (ICES 2016b), where it was concluded that the EQSIM simulations showed that $F_{p0.05}$ (0.32) is less than the F_{MSY} in the constant F simulations, so F_{MSY} was set to this lower value.

ICES decided in September 2024 to follow the recommendation from WKNEWREF to not use F_{lim} as reference point anymore, so this point is not used to assess F against in this year's assessment.

The table below summarises the currently used reference points.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY $B_{trigger}$	2.25 million t	B_{pa}	ICES (2013a, 2013b, 2016b)
	F_{MSY}	0.32	Stochastic simulations with segmented regression stock–recruitment relationship	ICES (2016b)
Precautionary approach	B_{lim}	1.50 million t	Approximately B_{loss}	ICES (2013a, 2013b, 2016b)
	B_{pa}	2.25 million t	B_{lim} exp(1.645 × σ), with σ = 0.246	ICES (2013a, 2013b, 2016b)
	F_{pa}	0.32	Fp05; the F that leads to SSB ≥ Blim with 95% probability	ICES (2016b) and WGWIDE 2021

2.8 Short-term forecast

2.8.1 Recruitment estimates

The benchmark WKPELA in February 2012 concluded that the available survey indices should be used in a qualitative way to estimate recruitment, rather than using them in a strict quantitative model framework. WGWIDE has followed this recommendation and investigated several survey time-series indices with the potential to give quantitative or semi-quantitative information of blue whiting recruitment. The investigated survey series were standardized by dividing with their mean and are shown in Figure 2.8.1.1.

The International Ecosystem Survey in the Nordic Seas (IESNS) only partially covers the known distribution of recruitment from this stock. The 1–group (2024 year class) index from the survey in 2025 was above the median and the 2–group (2023 year class) was below the median of the historical range.

The 1-group (2024 year class) from The International Blue Whiting Spawning Stock Survey (IBWSS) was below the median in the time series and the 2–group (2023 year class) was above the median in the time series (Table 2.3.6.1.1).

The Norwegian bottom-trawl survey in the Barents Sea (BS-NoRu-Q1(Btr)) in February-March 2025, showed that 1-group blue whiting was abowe the median in the time series (Table 2.3.6.2.2). This index should be used as a presence/absence index, in the way that when blue whiting is present in the Barents Sea, this is usually a sign of a strong year class, as all known strong year classes have been strong also in the Barents Sea.

The 1-group estimate in 2025 (2024 year class) from the Icelandic bottom-trawl survey showed a strong increase and was the second highest in the time-series.

The 1-group estimate in 2025 (2024 year class) from the Faroese Plateau spring bottom-trawl survey showed a higher value than previous years and was well above the median in the time-series. This is the only survey which doesn't pick up a strong signal from the 2020 and 2021 year classes.

In conclusion, the indices from available survey time-series indicate that the 2024 year class estimated from surveys are stronger than the previous two and above the median. This is not seen in the SAM assessment. It was therefore decided to use the geometric mean for this year class (slightly higher than the SAM estimate) and the SAM estimates of the 2023 year class for the short term forecast.

No information is available for the 2025 and 2026 year classes and the geometric mean of the time-series from 1996-2024 was used for these year classes (22 billion at age 1 in 2025) (Table 2.8.2.1.2).

As described in the Stock Annex, WGWIDE decided in 2021 to change from using the geo-metric mean of the full time-series (since 1981) to use a shorter time-series (since 1996) for the calculations recruitment.

2.8.2 Short-term forecast

As decided at WGWIDE 2014, a deterministic version of the SAM forecast was applied. Details about specific implementation can be found in the Stock Annex.

2.8.2.1 Input

Table 2.8.2.1.1 lists the input data for the short-term predictions. Mean weight at age in the stock and mean weight in the catch are the same, and are calculated as three-year averages (2023—2025) in accordance with the 2019 updated Stock Annex. Selection (exploitation pattern) is based on F in the most recent year. The proportion mature for this stock is assumed constant over the years and values are as used by the assessment.

Recruitment (age 1) in 2025 are assumed as the long-term average from the period with both high and low recruitments (geometric mean of the time-series since 1996, minus the terminal year, 1996-2024), as additional survey information conflicted with the estimate from SAM (see Section 2.8.1). Recruitment in 2026 and 2027 are assumed as the long-term average (1996-2024) as well.

As the assessment uses preliminary catches for 2025 an estimate of stock size is available for the 1st of January 2026. The normal use of an "intermediate year" calculation is not relevant in this case and F in the "intermediate year" (2025) is as estimated by the assessment model. Catches in 2025 are based on the preliminary catches based on declared national quotas and expected national uptake for 2025. Intermediate year assumptions are summarised in Table 2.8.2.1.2.

2.8.2.2 Output

A range of predicted catch and SSB options from the deterministic short-term forecast used for advice are presented in Table 2.8.2.2.1.

Following the ICES MSY framework for the target F from the Long-Term Management Strategy (LTMS) implies fishing mortality to be at F_{MSY} = 0.32 which will give a TAC in 2026 at 851 344 tonnes. This corresponds to a 41% decrease compared to the ICES advice last year, and a 51.4% decrease compared to the preliminary estimate of catches in 2025 (1 751 013 tonnes).

SSB in 2027 is predicted to increase by 5.3% to 3 838 995 tonnes, if the advised catches are taken.

2.8.2.3 Comparison of input with last year's forecast

Table 2.8.2.3.1 compares the estimated stock numbers at age from the assessments made by WGWIDE 2025 and WGWIDE 2024 for the last five years (2021-2025). Table 2.8.2.3.2 shows the same comparison for the product between stock numbers and weight at age. The ratios of the stock numbers as well as the stock numbers times weight from the two assessments are quite stable and close to one for 2021-2023. The current assessment provides lower estimates for several ages groups in 2024 and 2025. Notably, the current assessment provides lower estimates in all years for the strong 2020 and 2021 year classes, with ratios as low as 0.66 and 0.61 for age 4 and 5 in 2025 (Table 2.8.2.3.2).

The ratios for age 8 and 10 in 2025 are also particularly low. This is likely an effect of using the final instead of the preliminary catches for 2024 in the current assessment (see also Figure 2.3.2.2). The contribution to catches from these ages is however very low.

The ratios for age 1 in 2024 and age 2 in 2025 (i.e. the 2023 year class) are above 1, with the highest ratios for when stock numbers are multiplied by the weight. This is because of recruitment in 2024 (age 1) was estimated to be 16.7 billion in the previous assessment and 18.8 billion in the current assessment, with also subsequent higher values for this year class as age 2 in 2025.

The mean weight-at-age used in the forecast in this year's assessment (average of weight at age for 2023-2025) is very similar for most age groups compared to last year's forecast (average weight from 2022-2024 ; Figure 2.8.2.3.1). This year's mean weight-at-age used is slightly higher for age 7 and 9.

Selectivity at age is almost the same in this year's and the previous year's assessment (Figure 2.4.1.5).

Table 2.8.2.3.3 shows the intermediate year assumptions and recruitments for the current and previous assessment. The main differences in input to the forecasts at WGWIDE 2024 and WGWIDE 2025 are the smaller SSB at the start of the TAC year and the higher F in the terminal year for the 2025 WGWIDE forecast. This is due to the change in the model's perception of the stock size (downscaled) and fishing mortality (upscaled).

2.9 Comparison with previous assessment and forecast

Comparison of the assessments made in 2024 and 2023 (Figure 2.9.1) shows a large revision of the historical values of F and SSB in recent years and for recruitment in 2021 and 2022. The spawning-stock size in 2024 and 2025 is in the current assessment estimated to be 5.7 million and 4.5 million tonnes, respectively, compared to 6.8 million and 6.0 million tonnes in the 2024 assessment (change of -16 and -25%). Fishing mortality in 2023 and 2024 is estimated to be 0.54 and 0.6, respectively, compared to 0.50 and 0.51 in the 2024 assessment (change of +9 and +17%). Recruitment in 2021 and 2022 is estimated to be 60.2 billion and 62.4 billion, respectively, compared to 68.2 billion and 74.1 billion in the 2024 assessment (change of -12 and -16%).

The effect on recruitment, SSB and F of the final vs. preliminary catch data from 2024 used in the WGWIDE 2024 assessment are limited (Figure 2.9.2), with the most pronounced change being a slight reduction in F in 2023 and 2024. Hence, the downscaling of SSB and upscaling of F in recent years as observed in this year's assessment (Figure 2.9.1) is likely due to the addition of a new year of data rather than of having the final 2024 catch data included.

The assessment has a tendency to underestimate recruitment for the strong 2020 and 2021 year classes, as seen in both the analytical retrospective plot (Figure 2.4.1.6) and the ICES historical retrospective plot (Figure 2.9.3). This is linked to the previously explained tendency of the model

(see section 2.4.1.1) to 'ignore' the survey data and rely mostly on the catches in years where a survey index value is very different from a previous value, causing the model to poorly fit these values and to downscale the overall cohort strength of particular year classes involved.

2.10 Quality considerations

Based on the confidence interval produced by the assessment model SAM there is a moderate to high uncertainty of the absolute estimate of F and SSB and the recruiting year classes (Figure 2.4.1.7). The retrospective analysis (Figure 2.4.1.6) shows a tendency to underestimate F and overestimate SSB, and underestimate the recruitment estimates of the strong 2020 and 2021 year classes. The current assessment has made a considerable change in the perception of the stock in terms of lower cohort strength of the 2020 and 2021 year classes and subsequent overall lower SSB in recent year. These revisions are caused by the low survey index (IBWSS) value in 2025, which indicated a 34% decline in total stock abundance. The addition of this new survey index value that is lower than previous years forces the assessment model to underfit the high survey index values of the 2020 and 2021 year classes, leading to the overall downscaling of the spawning-stock size.

The survey index (IBWSS) indicated a low recruitment for 2025 (2024 year class). The model used for the current assessment subsequently estimated recruitment in 2025 to be 16.9 billion, which is lower than the recruitment estimates for 2023 (19.4 billion) and 2024 (18.8 billion), and the long-term geometric mean (22.1 billion; 1996-2024). This was however not corroborated by other surveys not used in the assessment that point towards a higher recruitment in 2025 compared to 2023 and 2024 (Figure 2.8.1.1). It was therefore decided to replace the recruitment estimate of the assessment model for 2025 with the long-term geometric mean.

There are several sources of uncertainty: age reading, stock identity, survey indices and the use of preliminary catch data. As there is only one survey (IBWSS) that covers the spawning stock, the quality of the survey influences the assessment result considerably. The Inter-Benchmark Protocol on Blue Whiting (IBPBLW 2016) introduced a configuration of the SAM model that includes the use of estimated correlation for catch and survey observations. This handles the "year effects" in the survey observation in a better way than assuming an uncorrelated variance structure as usually applied in assessment models. However, biased survey indices will still give a biased stock estimate with the new SAM configuration. The estimated correlation for catch at age observations might correspond to the age reading discrepancy as also estimated from the inter-calibration exercise. The use of additional survey data may be beneficial, especially in years without IBWSS data.

Utilization of preliminary catch data provides the assessment with information for the most recent year in addition to the survey information. This should give a less biased assessment, as potentially biased survey data in the final year are supplemented by additional catch data. The final catch weight was 4.5% lower than the preliminary data for 2024. The differences for the full time series (2016-2024) seem randomly distributed across the range of -9 to 5%, (Table 2.3.2.4).

2.11 Management considerations

The assessment this year provides a higher estimate of F(2024) and lower estimate of SSB(2025) compared to last year's estimates. The 2022 year class size is estimated lower than last year, while the 2023 year class size is estimated to be higher. The 2024 year class is estimated to be lower than both the 2022 and 2023 year classes, but other surveys not included in the assessment indicate a good year class. However, these year classes are still small compared to the previous historically high year classes of 2020 and 2021.

SSB at the beginning of 2026 (3.6 million tonnes) is estimated considerably lower than SSB in 2025 (4.5 million tonnes). SSB is a good proxy for fishable stock, so this decline in SSB contributes to the smaller TAC advice this year.

The 2020 and 2021 year classes are large and are expected to contribute significantly to the yield in 2025 (62%) and to the yield in 2026 (55%). The 2022-2024 year classes are however small such that SSB will decline by 3.4% (relative to the SSB in 2025). If the LTMS is used as basis for TAC, SSB in 2027 will increase by 5.3% relative to 2026, but decrease by 18.1% if the catches in 2026 will be the same as in 2025 (Table 2.8.2.2.1)

The SSB is estimated around 4.5 million tonnes in 2025, which is twice the B_{msy} and thrice the B_{lim} (2 250 000 tonnes and 1 500 000 tonnes, respectively). Blue whiting was by IUCN in 2014 evaluated as a species of least concern (https://www.iucnredlist.org/) and it is neither found on OSPAR's list of threatened and declining species (https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats/fish) nor on the HELCOM Red List (https://helcom.fi/baltic-sea-trends/biodiversity/red-list-of-baltic-species/red-list-of-fish-and-lamprey-species/). Thus ICES has not identified any conservation aspects.

2.12 Ecosystem considerations

Blue whiting is one of the most abundant pelagic and mesopelagic fish stocks in the Northeast Atlantic, SSB estimated from 1.4 - 6.9 million tonnes during the period from 1981 to 2020 (ICES, 2023). The stock is widely distributed and highly migratory. Its distribution range is approximately from 30 °N to 80 °N latitude and from the coast of Europe to Greenland, into the Barents Sea and Mediterranean Sea (Trenkel *et al*., 2014). Spawning is in the spring and mostly occurs on the shelf and banks west of Ireland and Scotland. The major summer feeding area is in the Norwegian Sea. Blue whiting is most frequently observed at 100-600 m depth (Heino and Godo, 2002). Their most important prey are euphausiids, amphipods and copepods (Pinnegar *et al*., 2015, Bachiller *et al*., 2016) and they are prey for piscivorous fish (Dolgov *et al*., 2010) and cetaceans (Hátún *et al*., 2009a). Blue whiting is an important species in the NE Atlantic and it´s best documented ecosystem interactions are listed below:

(a) Stock productivity - recruitment: blue whiting population dynamic is driven by large annual variability in recruitment (at age 1 in the assessment model) which is not linked to spawning stock size (ICES, 2020). Changes in recruitment have been correlated to changes in the North Atlantic subpolar gyre between strong and weak states (Hátún *et al*., 2009a,b). Two hypotheses have been suggested to explain a causal relationship between low gyre index and high recruitment (Payne *et al*., 2012). One suggests changes in marine climate where weak gyre results in increased flow of warm subtropical waters and increased abundance of important prey for juvenile blue whiting on their nursing grounds west of Ireland and Scotland. The other suggests increasing predation of mackerel on blue whiting larvae during years of weak index, but neither has been proven right (Payne *et al*., 2012). Other large scale oceanographic processes like wind stress curl, at the spawning grounds, appears to influence recruitment and provides forecast power for assessment (Cappelli, et al., 2025). The mechanism of how wind stress curl influences recruitment remains poorly understood.

(b) Changes in distribution: blue whiting spawning distribution varies between years. It has been linked to the North Atlantic subpolar gyre as a strong gyre (cold and fresh water masses on the Rockall Plateau) shrinks the spawning area compared to a weak gyre (increasing saline and warm waters at Rockall) which expands the spawning area northward and westward into Rockall Plateau (Hátún *et al.,* 2009a,b; Miesner and Payne, 2018). Salinity appears specifically to impact spawning location of blue whiting (Miesner and Payne, 2018).

(c) It is still disputed whether there are one or two blue whiting populations in the Northeast Atlantic (Keating *et al*., 2014; Pointin and Payne, 2014; ICES, 2016c; Mahé *et al*., 2016). Currently blue whiting is considered a single population for management purposes. Resent review of population structure indicates that blue whiting might be a complex metapopulation composed of resident and migratory subpopulations (Lee et. al, 2025).

(d) Trophic interactions in the Norwegian Sea: there appears to be limited prey competition between blue whiting and the two other abundant pelagic species, Norwegian spring-spawning herring and Atlantic mackerel, as studies show limited dietary overlap between blue whiting and the two other species (Bachiller *et al*., 2016; Pinnegar *et al*., 2015). Limited prey competition between blue whiting and mackerel can be explained by limited vertical spatial overlap, mackerel mostly feed in the surface layer and blue whiting deeper in the water column (Utne *et al*., 2012). Where distribution of blue whiting and herring overlap (Utne *et al*., 2012) they appear to feed on different species, herring mainly feed on copepods and blue whiting mainly on euphausiids and amphipods, although juvenile blue whiting feed on copepods (Bachiller *et al*., 2016; Pinnegar et al., 2015).

An extensive overview of ecosystem considerations relevant for blue whiting can be found in the Stock Annex.

2.13 Regulations and their effects

A long-term management strategy for blue whiting is agreed by the European Union, the Faroe Islands, Iceland, Norway, and UK. However, there is no agreement between the Coastal States on a comprehensive share arrangement of the blue whiting TAC. WGWIDE estimates the total expected catch for 2025 to be 1 751 013 tonnes (Table 2.3.2.3), whereas ICES advised that when the agreed long-term management strategy is applied, catches in 2025 should be no more than 1 447 054 tonnes. The Coastal States agreed to set the TAC for 2025 according to the ICES advice. However, since they could not agree on a sharing arrangement, the resulting expected catch in 2025 is estimated to exceed the TAC by 21%.

2.13.1 Management plans and evaluations

The Coastal States noted in their consultations in October 2023 that the agreed long-term management strategy dated 27 October 2016, was regarded by ICES to be precautionary (Anon 2023).

The catch advice does however not take into account consistent deviations from the long-term management strategy as evident from the sum of unilateral quotas in recent years. During the evaluation of the management strategy (ICES, 2016b), the implementation error in the form of a consistent overshoot of the TAC was not included. Therefore, the current implementation of the long-term management strategy may no longer be precautionary. See section 1.8 for a comparison of historic advice, TAC and catch.

2.14 References

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2.15 Figures

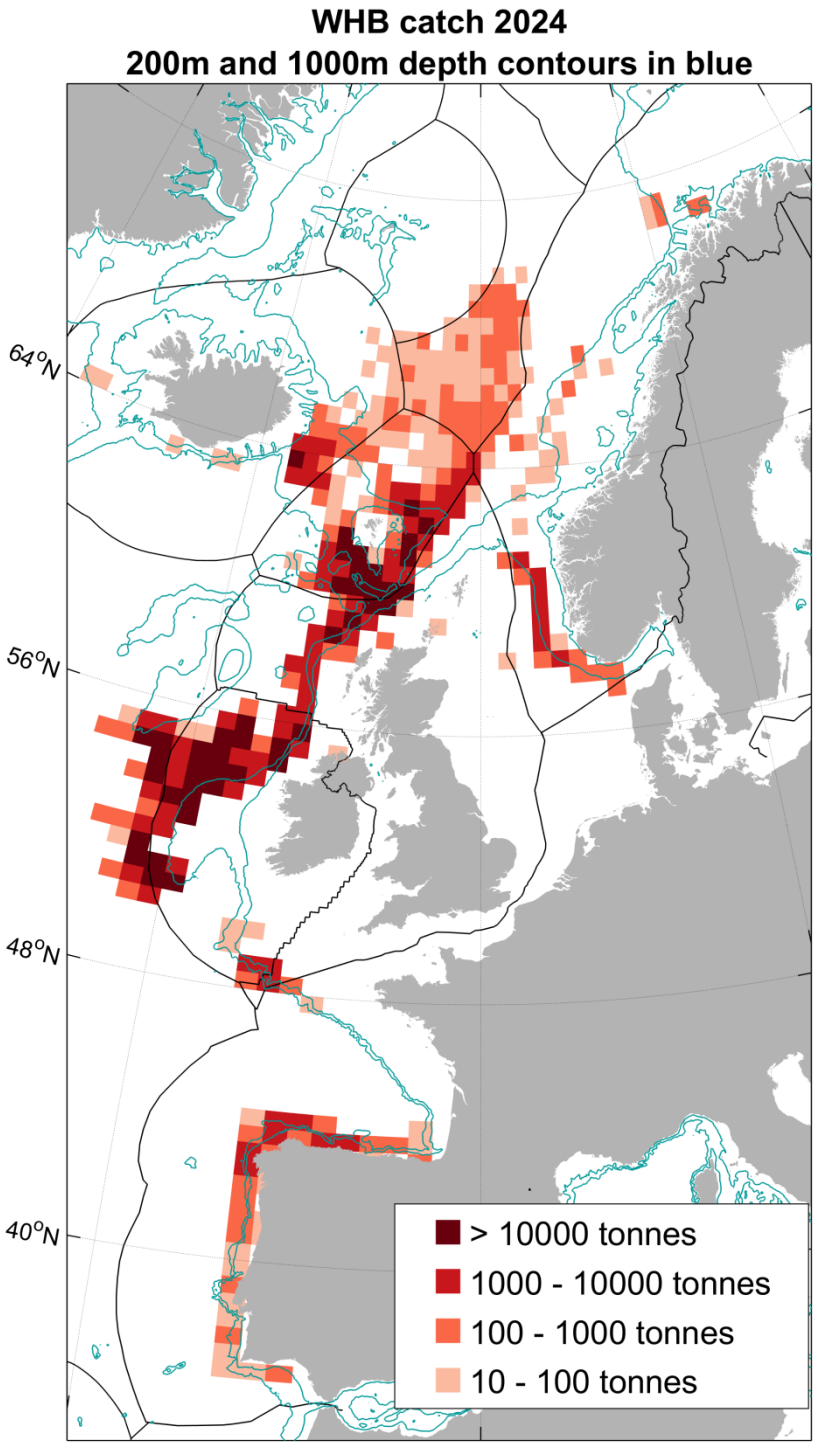


Figure 2.2.1. Blue whiting catches in 2024. The catches on the map constitute 96% of the ICES estimated catches. The 200 m and 1000 m depth contours are indicated in blue.

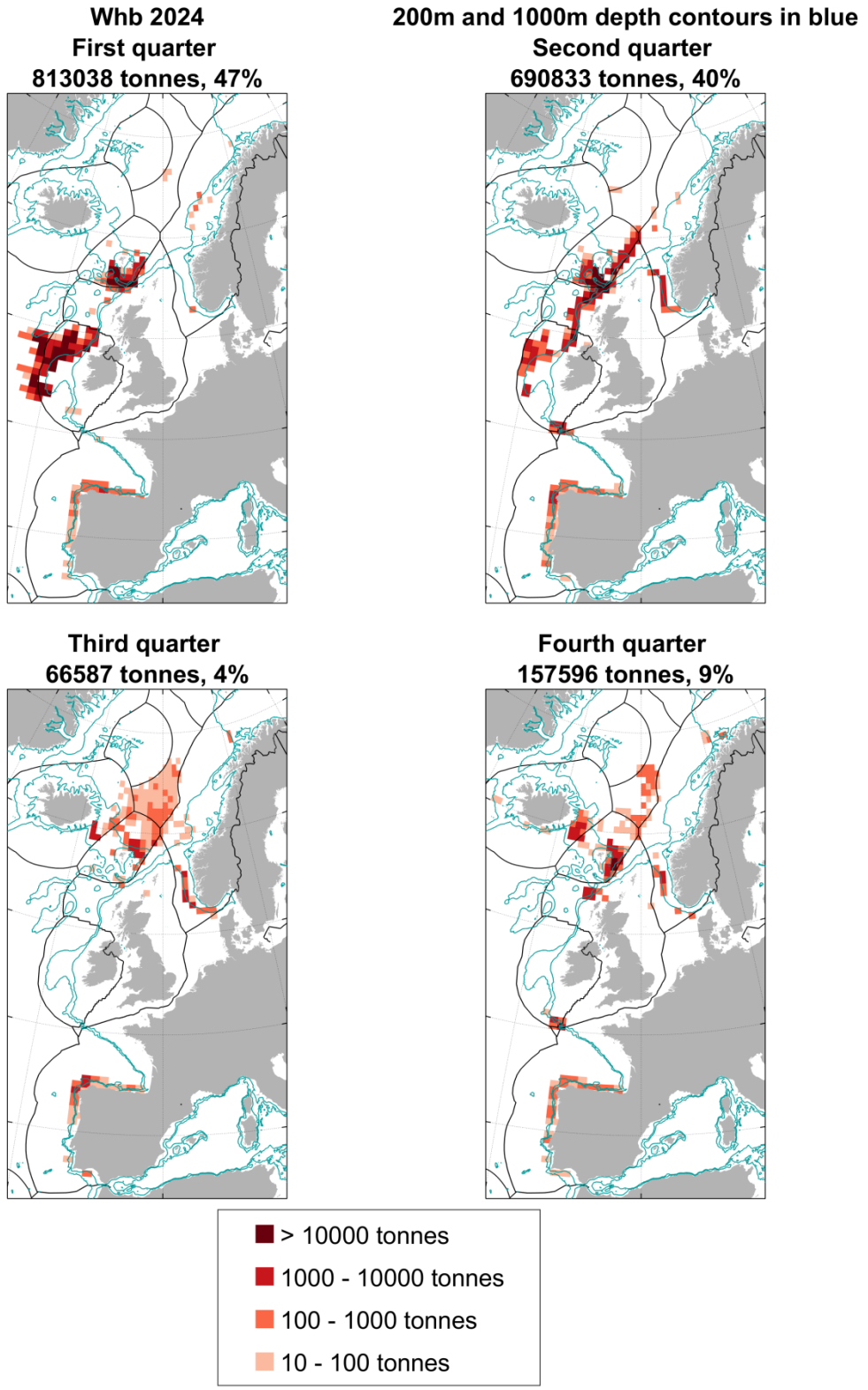


Figure 2.2.2. Blue whiting catches per quarter 2024. The catches on the map constitute 96% of the ICES estimated catches. The 200 m and 1000 m depth contours are indicated in blue.

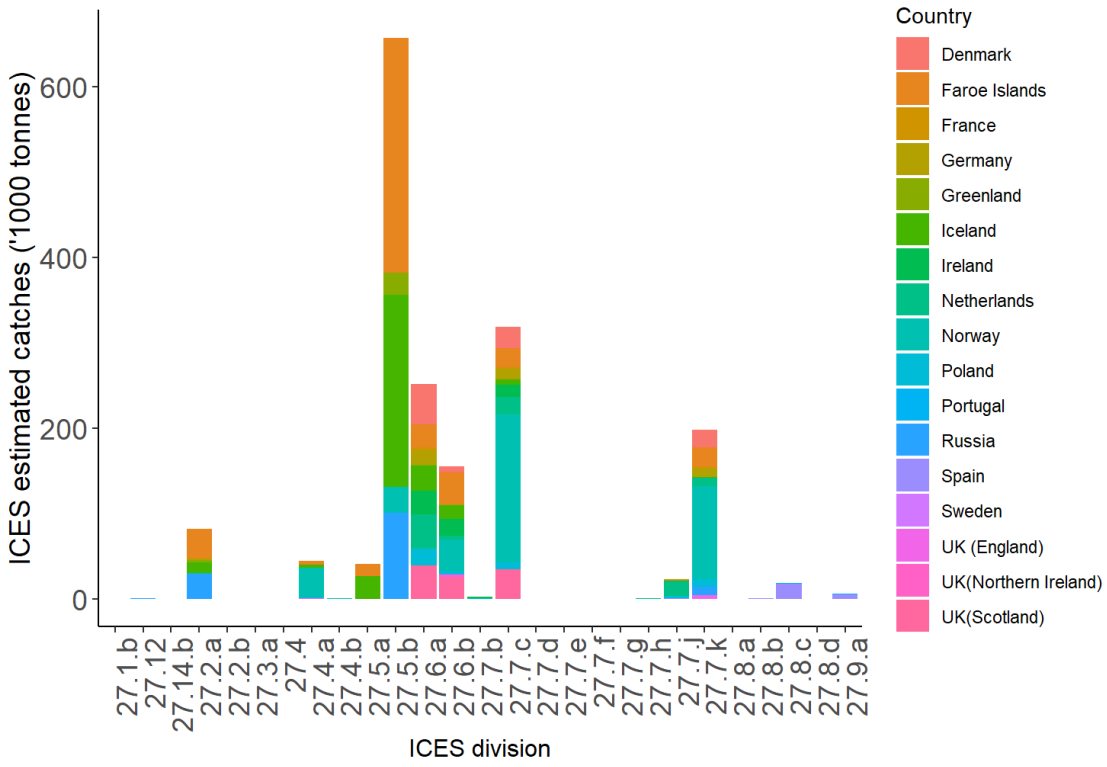
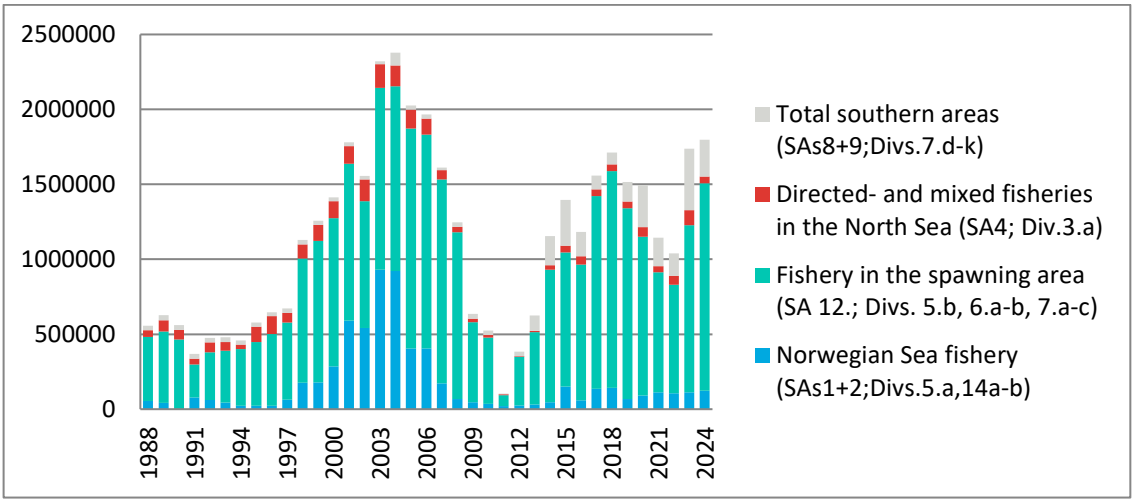


Figure 2.3.1.1. Blue whiting. ICES estimated catches ('1000 tonnes) in 2024 by ICES division and country.

A



B

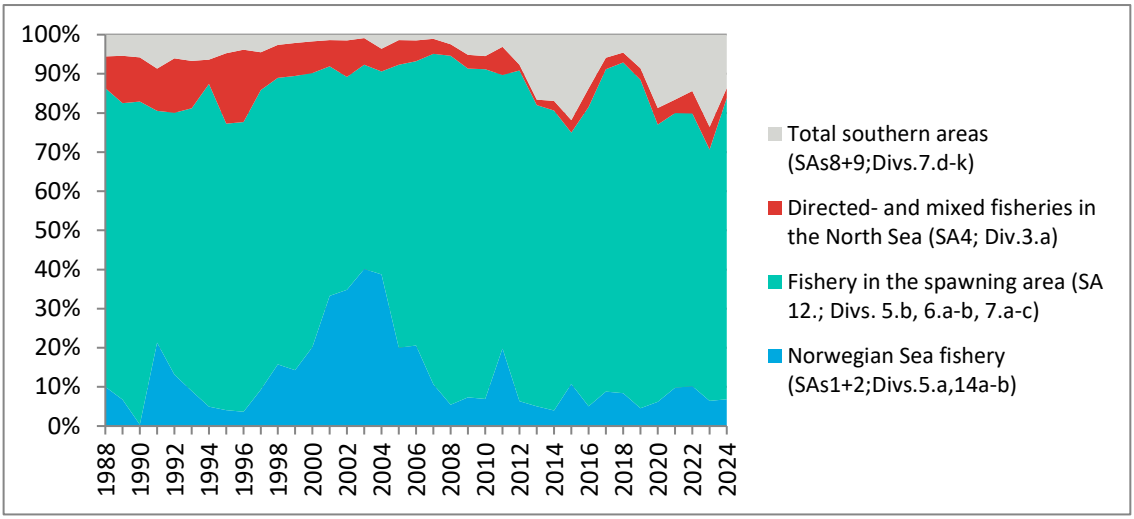


Figure 2.3.1.2. Blue whiting.(A) ICES estimated catches (tonnes) of blue whiting by fishery subareas from 1988-2024 and (B) the percentage contribution to the overall catch by fishery subarea over the same period.

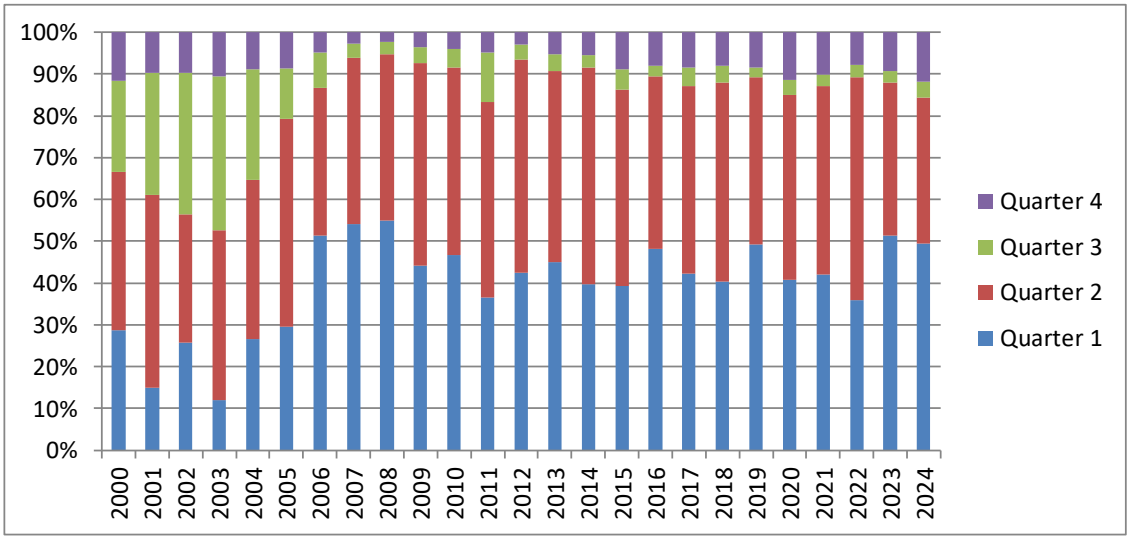


Figure 2.3.1.3. Blue whiting. Distribution of 2024 ICES estimated catches (in percentage) by quarter.

Figure 2.3.1.4. Blue whiting. Distribution of 2024 ICES estimated catches (in percentage) by ICES division area.

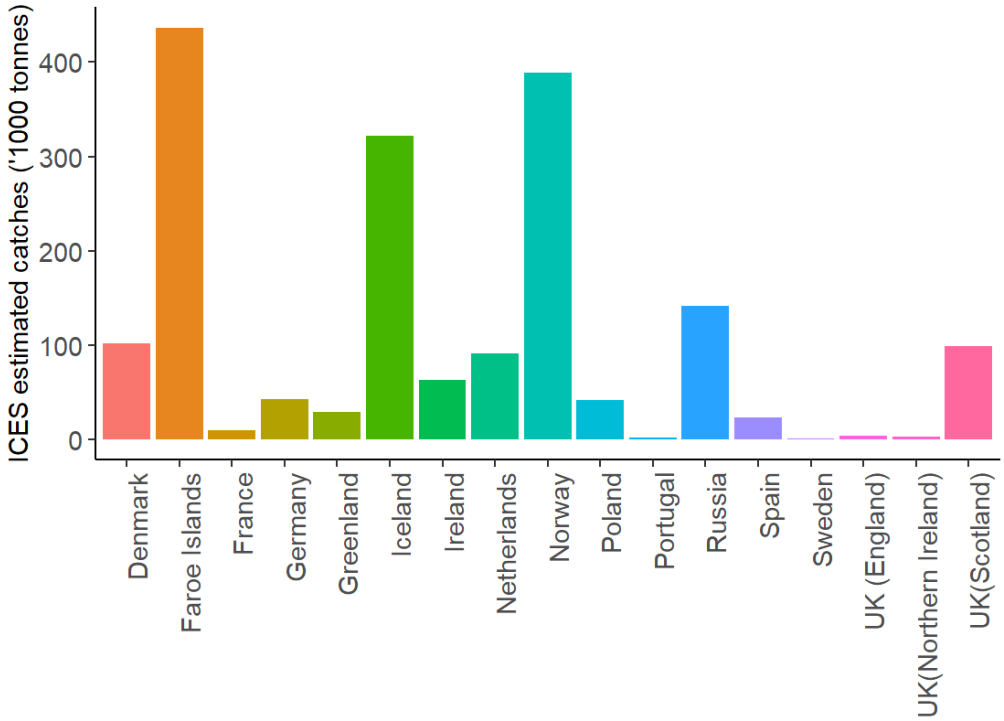


Figure 2.3.1.5. Blue whiting. ICES estimated catches ('1000 tonnes) in 2024 by country.

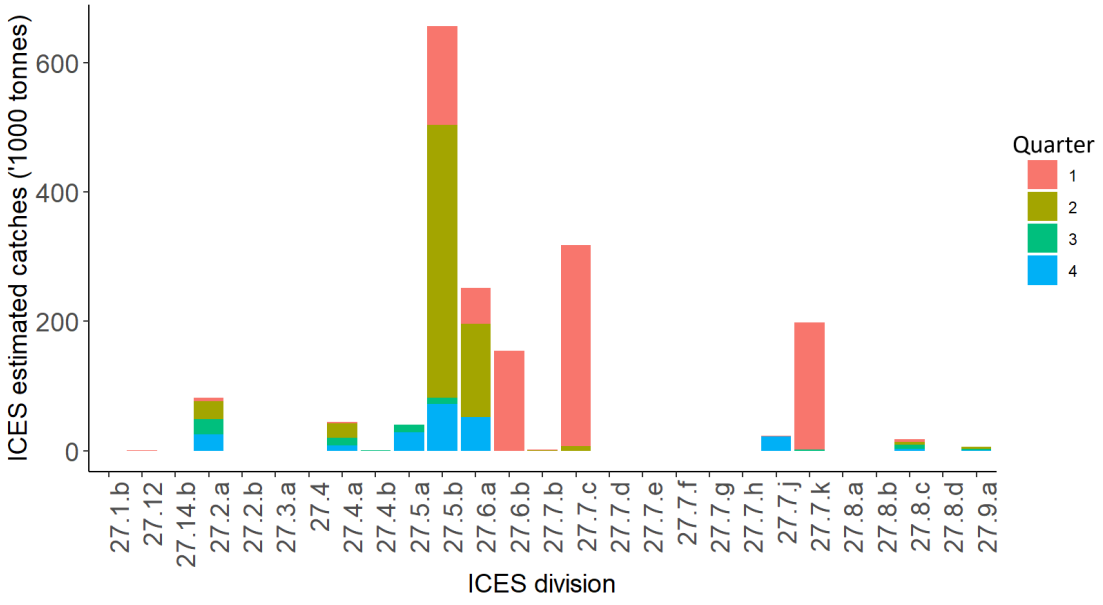


Figure 2.3.1.6. Blue whiting. Distribution of 2024 ICES estimated catches ('1000 tonnes) by ICES division and by quarter.

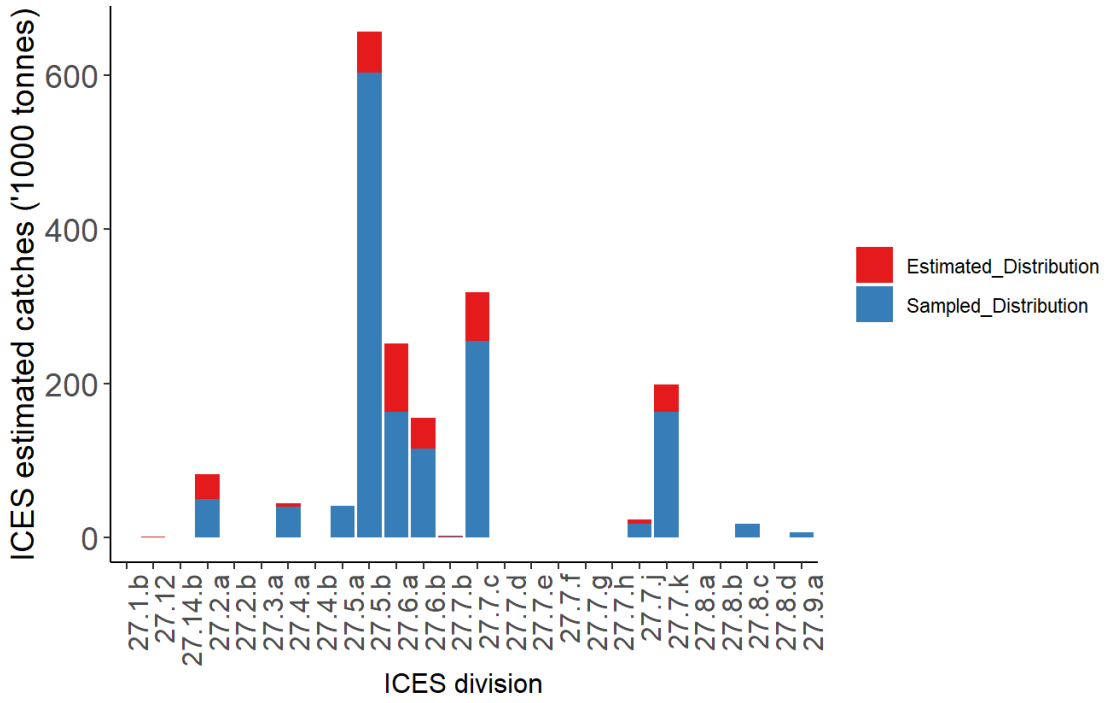


Figure 2.3.1.1.1. Blue whiting. 2024 ICES catches ('1000 tonnes) based on sampled or estimated distribution by ICES division.

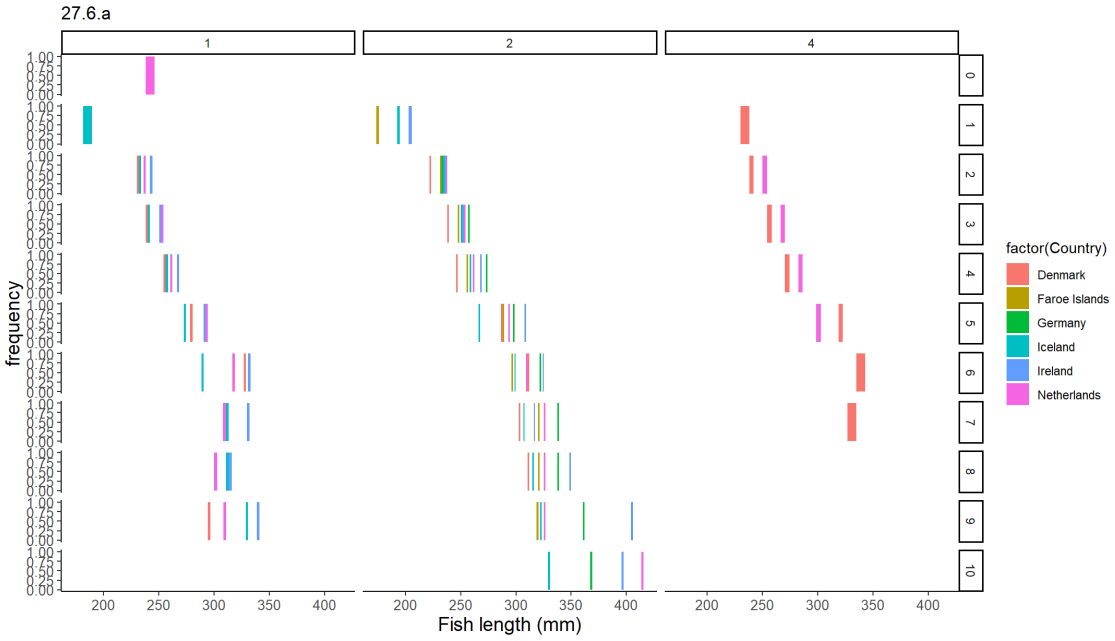


Figure 2.3.1.2.1. Blue whiting. Mean length (mm) by age (0-10 year), by quarter (1,2,4), by country for ICES division area 27.6.a. These data only comprises the 2023 ICES catch-at-age sampled estimates for ICES division 27.6.a.

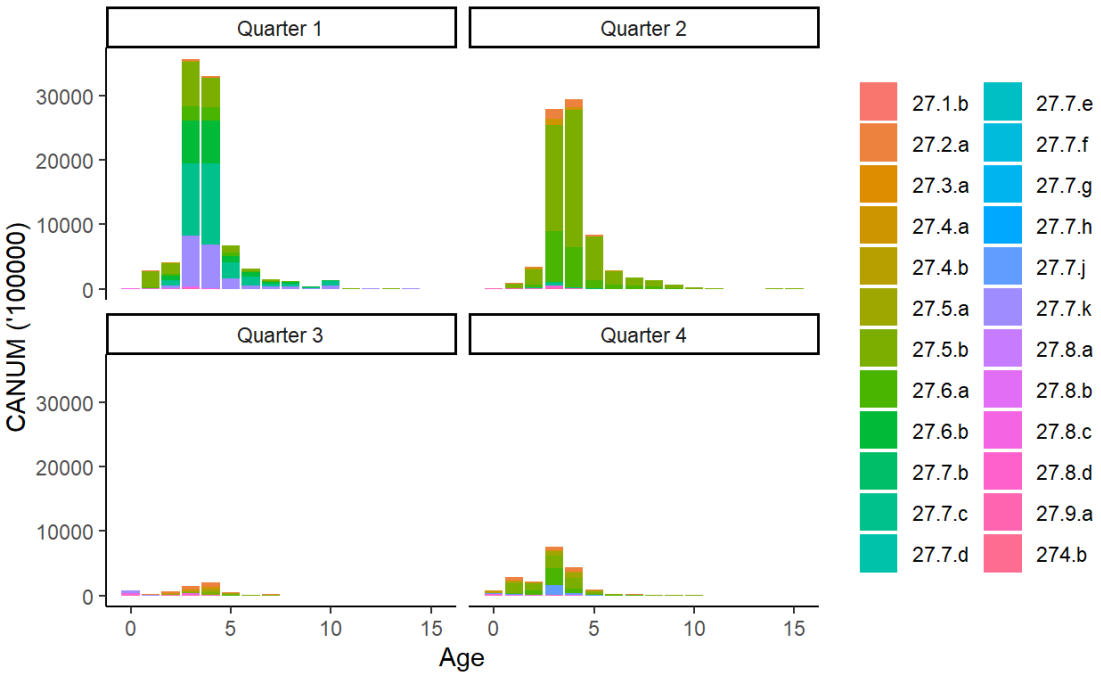


Figure 2.3.1.2.2. Blue whiting. Catch-at-age numbers (CANUM) distribution by quarter and ICES division for 2024.

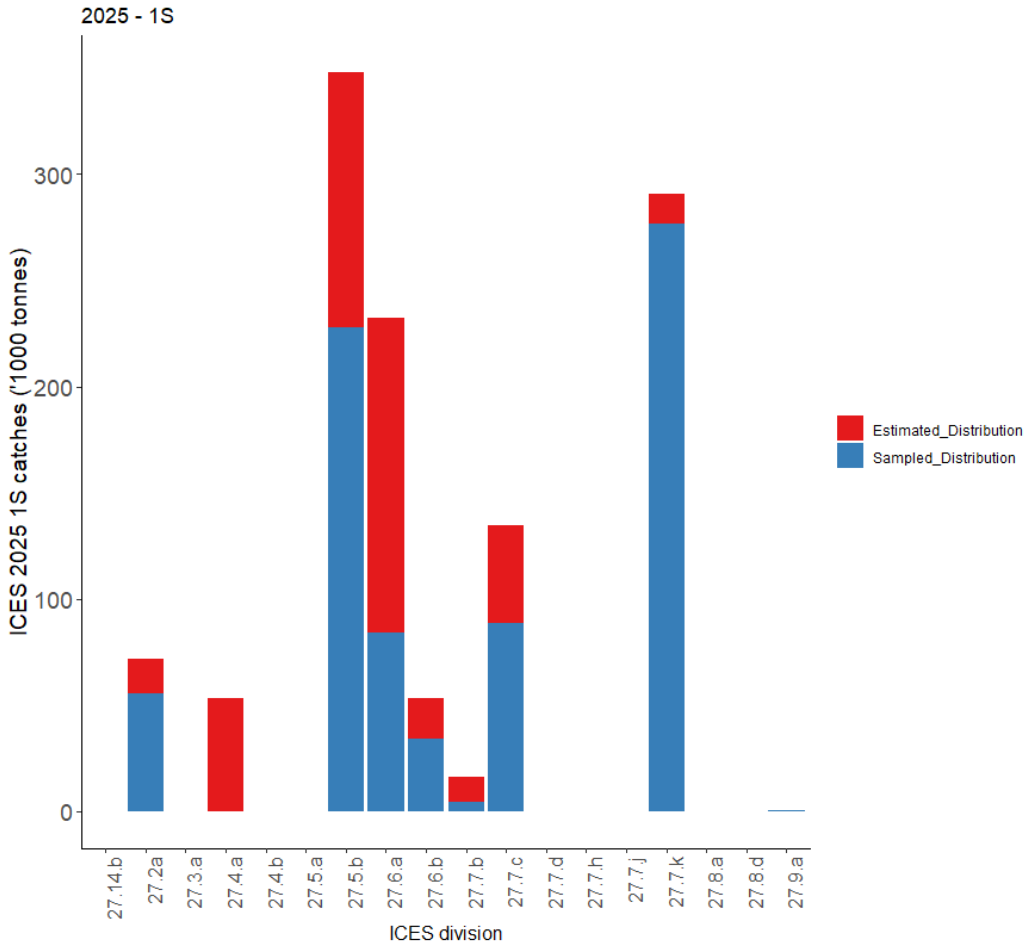


Figure 2.3.2.1. Blue whiting. 2025 ICES preliminary catches ('1000 tonnes) (Quarter 1 + Quarter 2) based on sampled or estimated distribution by ICES division.

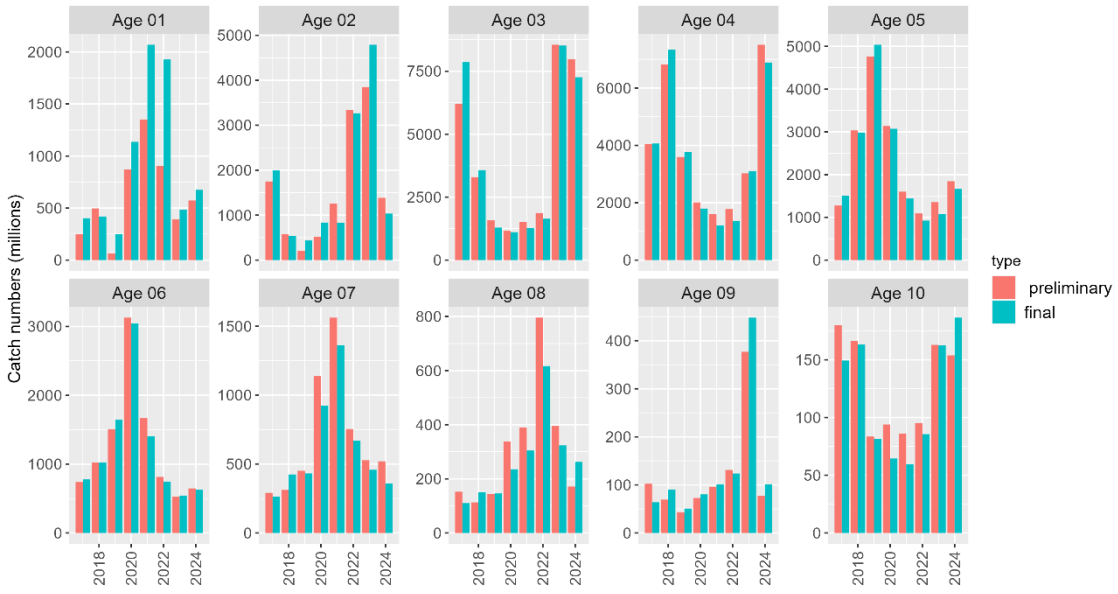


Figure 2.3.2.2 Preliminary and final estimates of catch at age number by age and year (2017-2024).

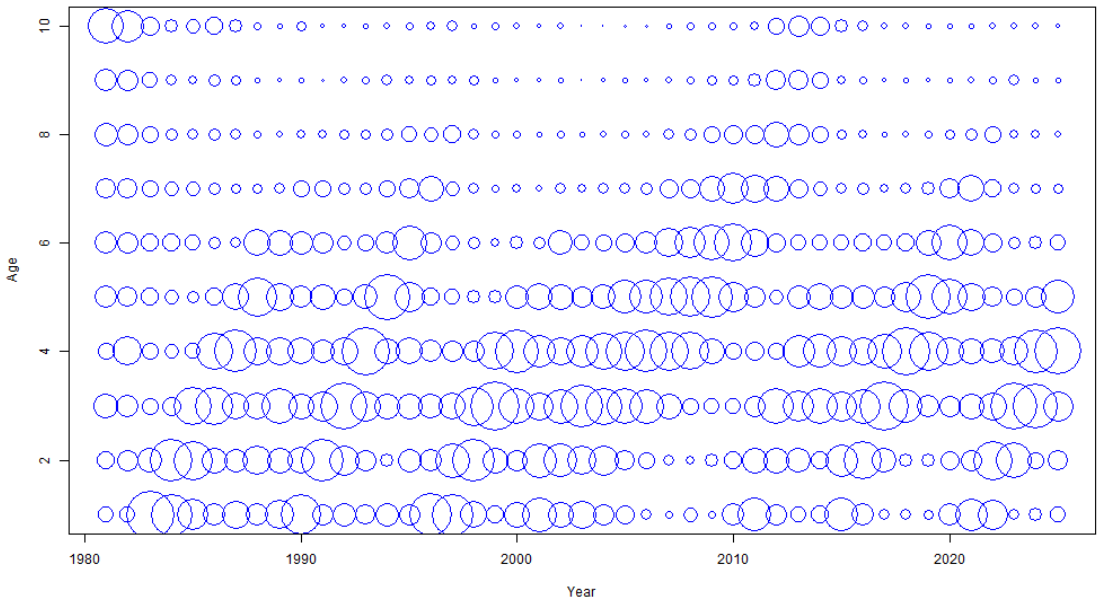


Figure 2.3.3.1. Blue whiting. Catch proportion at age, 1981-2025. Preliminary values for 2025 have been used.

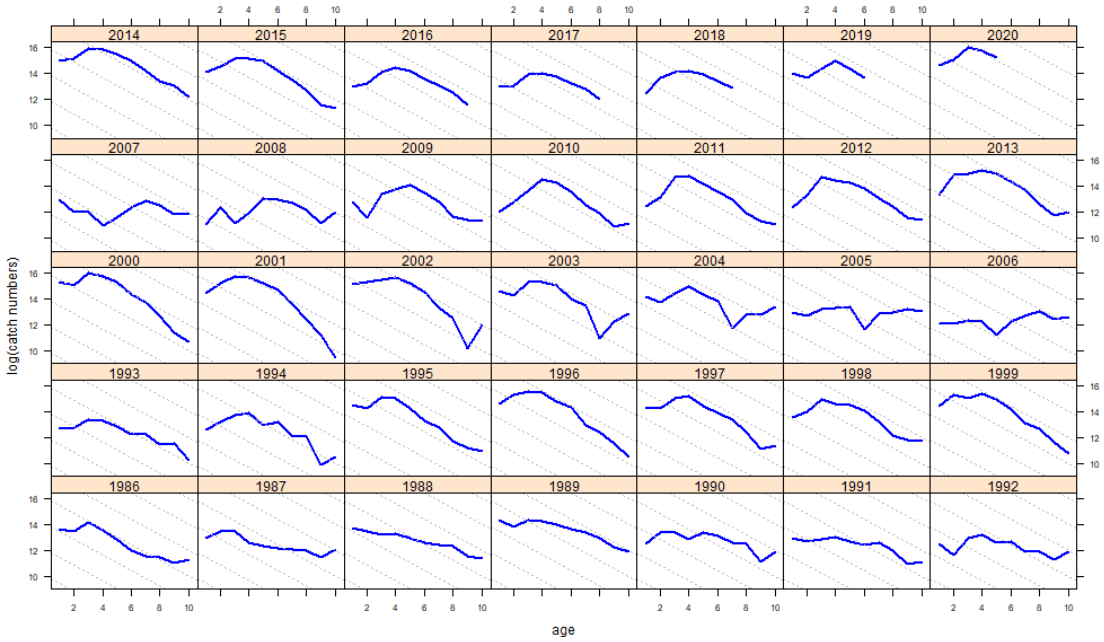


Figure 2.3.3.2. Blue whiting. Age disaggregated catch (numbers) plotted on log scale. The labels for each panel indicate year classes. The grey dotted lines correspond to *Z*=0.6. Preliminary catch-at-age data for 2025 have been used.

Figure 2.3.4.1. Blue whiting. Mean catch (and stock) weight (kg) at age by year. Preliminary values for 2025 have been used

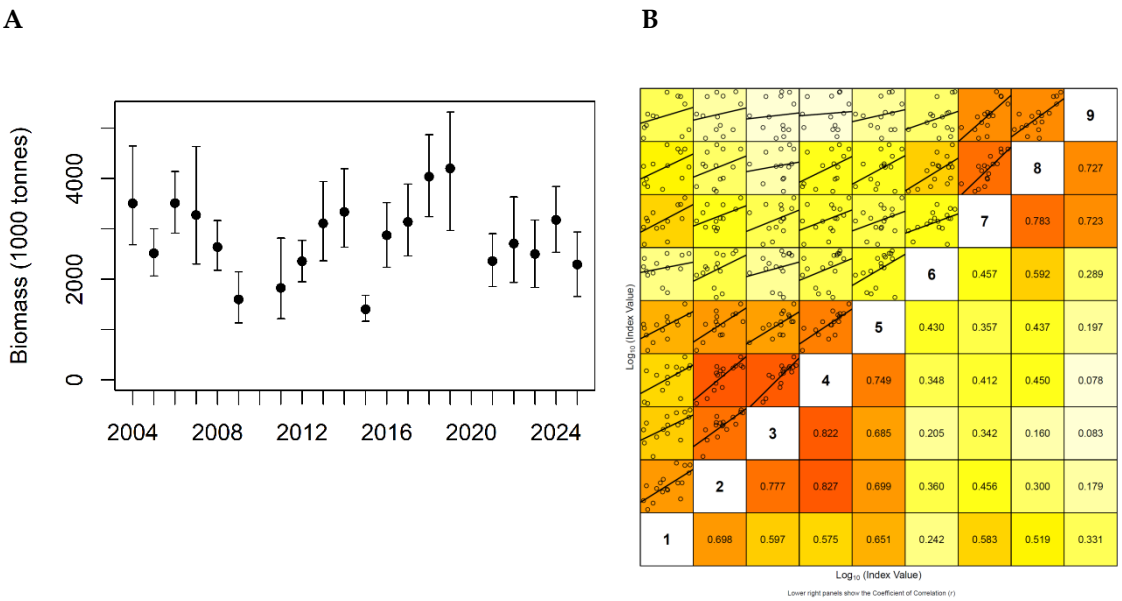
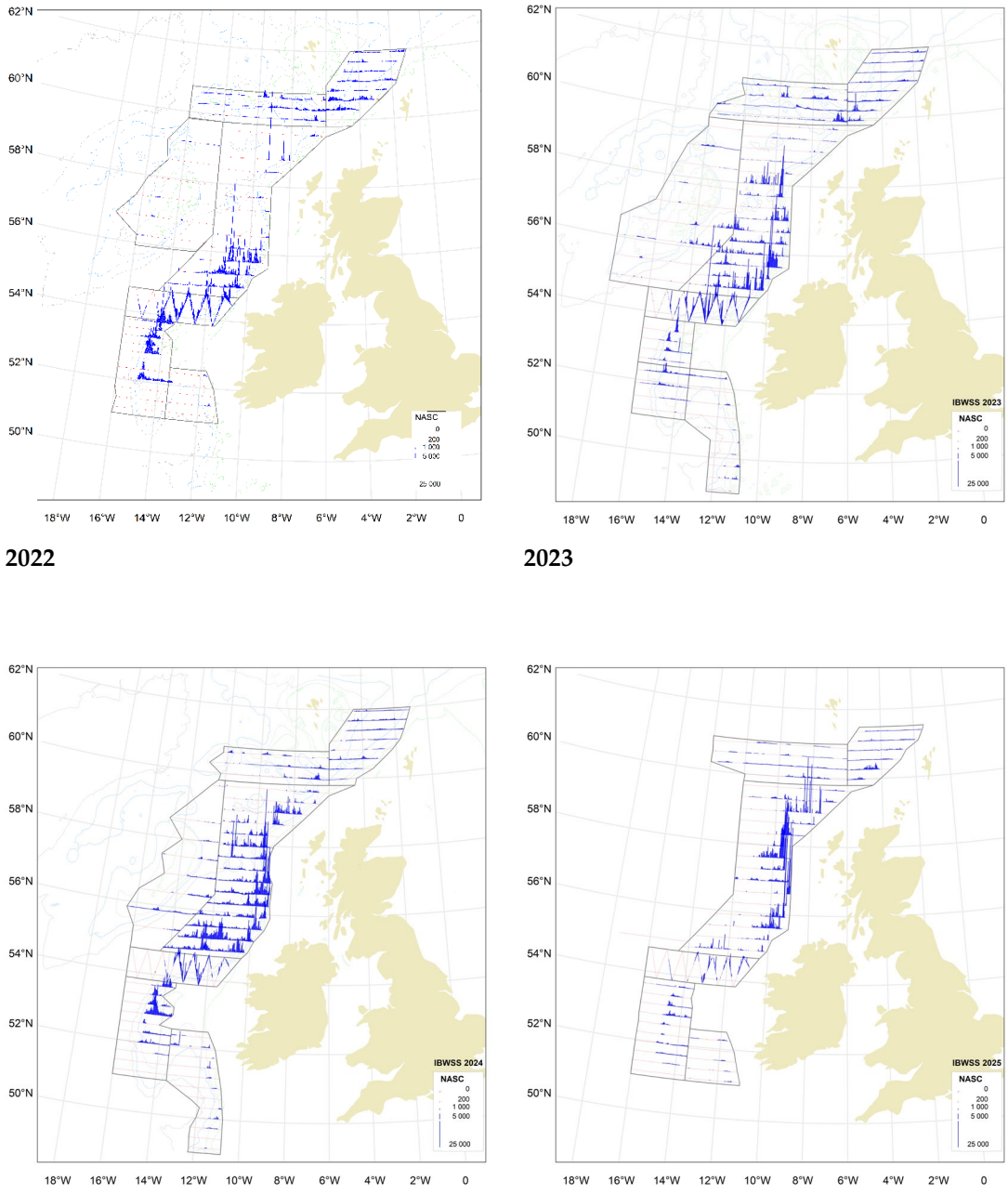


Figure 2.3.6.1.1. Blue whiting. (A) Estimate of total biomass from the International blue whiting spawning stock survey. The black dots and error bands are StoX estimates with 90 % confidence intervals. (B) Internal consistency within the International blue whiting spawning stock survey. The upper left part of the plots shows the relationship between log index-at-age within a cohort. Linear regression line shows the best fit to the log-transformed indices. The lower-right part of the plots shows the correlation coefficient (r) for the two ages plotted in that panel. The background colour of each panel is determined by the r value, where red equates to r=1 and white to r<0.



2022 **2023**

2024 **2025**

Figure 2.3.6.1.2. Blue whiting. NASC distribution of the blue whiting stock in the area to the west of the British Isles, spring 2022 (upper panel) to 2025 (lower panel).

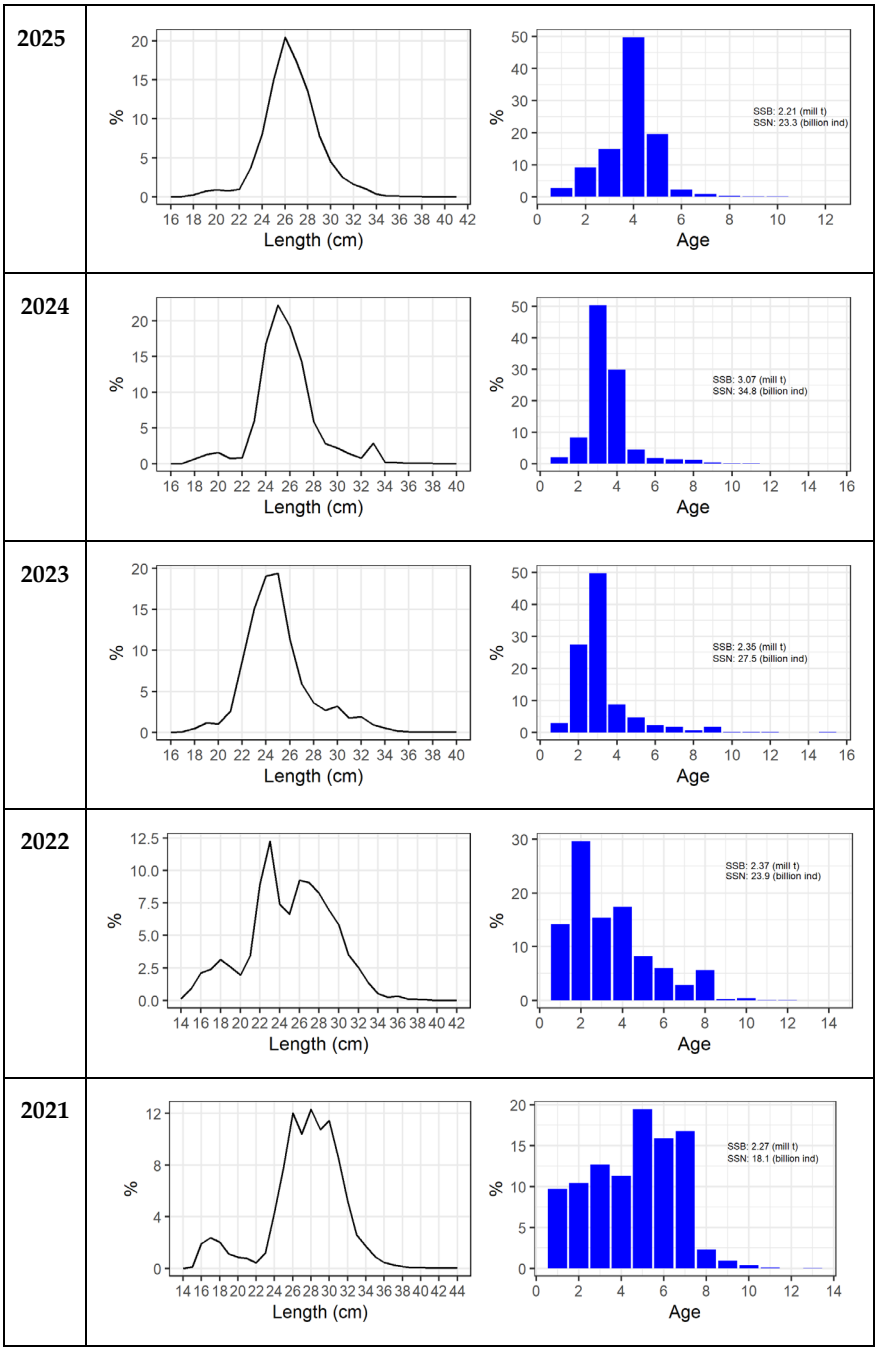


Figure 2.3.6.1.3. Blue whiting. Length (line) and age (bars) distribution of the blue whiting stock in the area to the west of the British Isles, spring 2021 (lower panel) to 2025 (upper panel). Spawning-stock biomass and numbers are given.

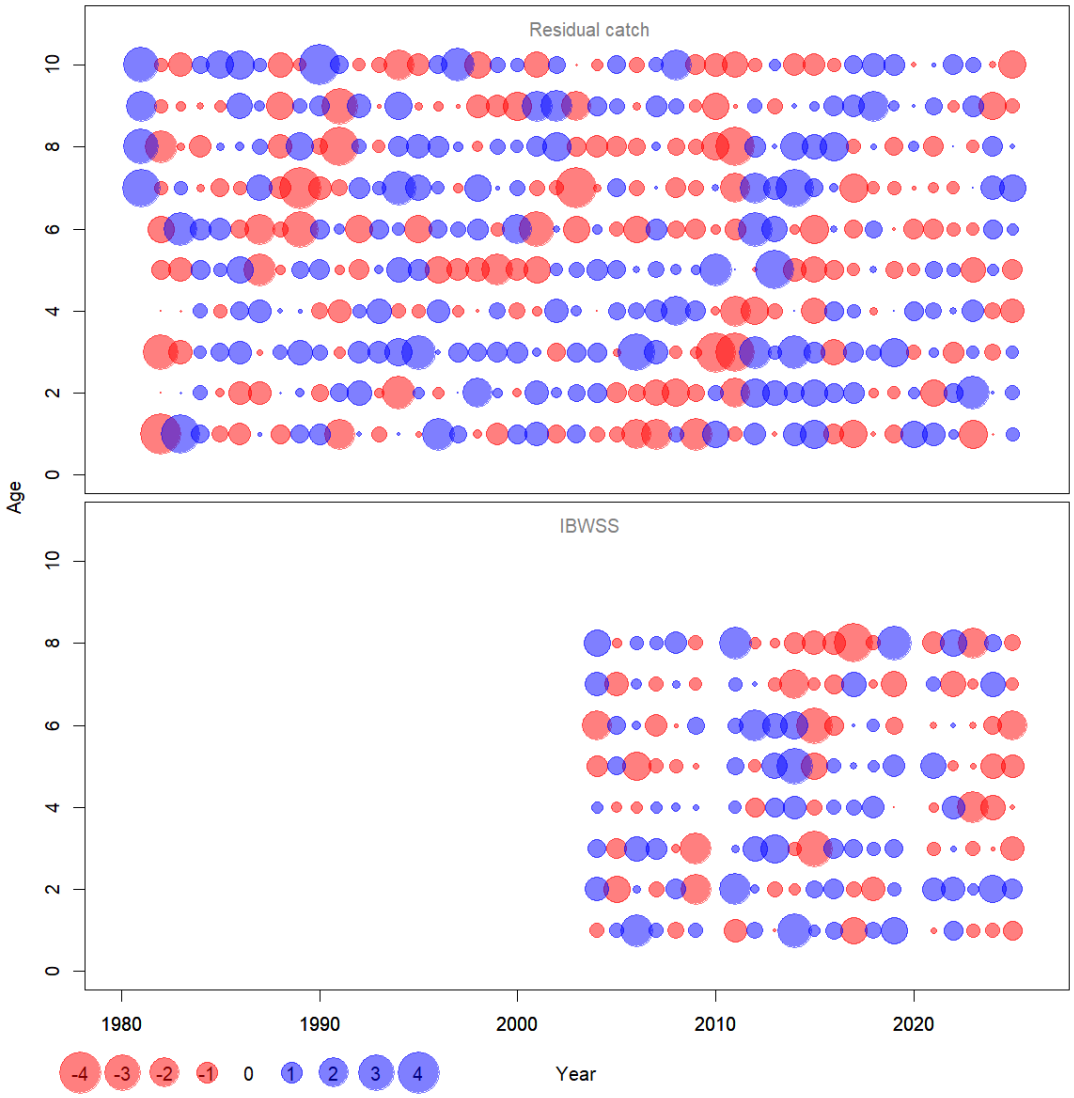


Figure 2.4.1.1. Blue Whiting. OSA (One Step Ahead) residuals (see Berg and Nielsen, 2016) from catch-at-age and the IBWSS survey 2004-2025 (no survey in 2010 and 2020). Red (lighter) bubbles show that the observed value is less than the expected value. Preliminary catch data for 2025 have been used. Catch residuals for ages 1- 7 in 1981 could not be estimated.

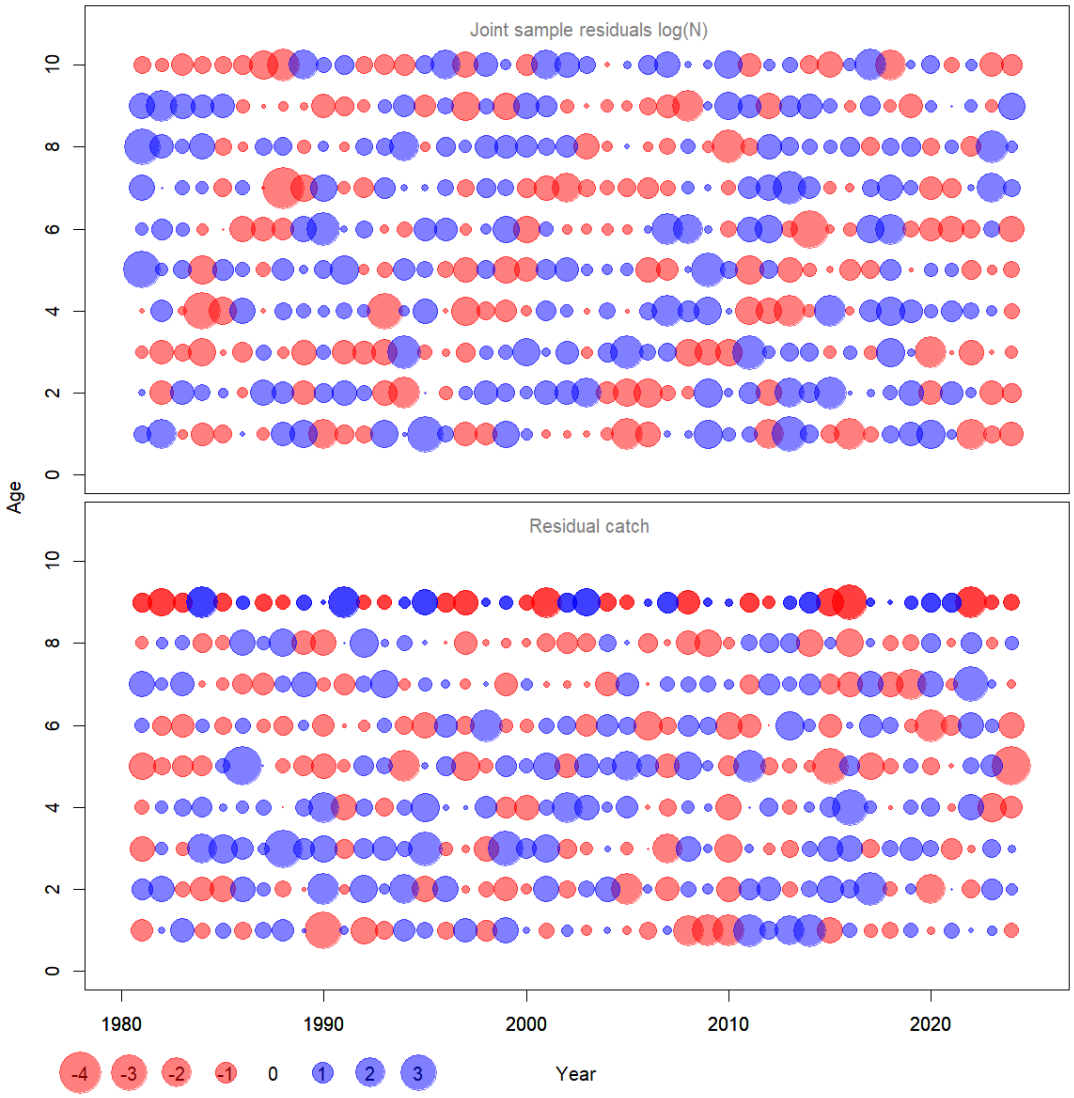


Figure 2.4.1.2 Blue whiting. Joint sample residuals (Process errors) for stock number and F at age. Red (lighter) bubbles show that the observed value is less than the expected value. Preliminary catch data for 2025 have been used.

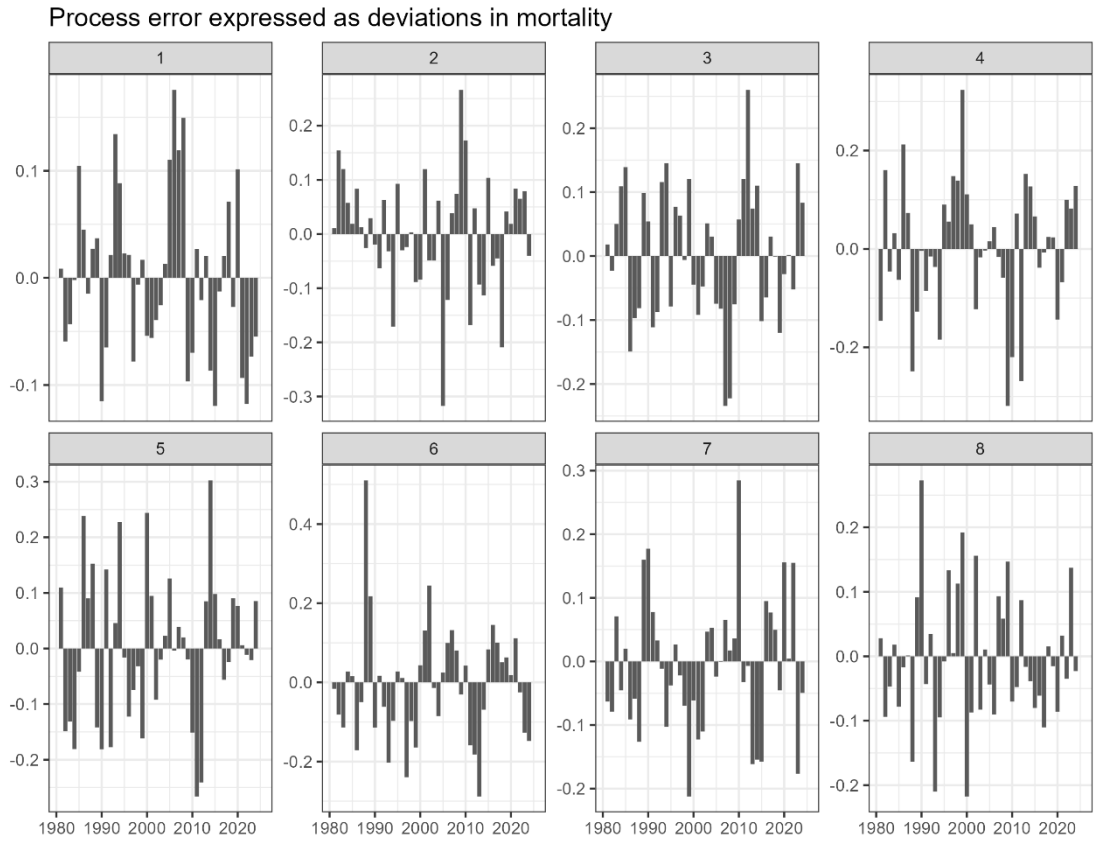


Figure 2.4.1.3. Blue whiting. Process errors expressed as deviation in instantaneous mortality at age by age and year.

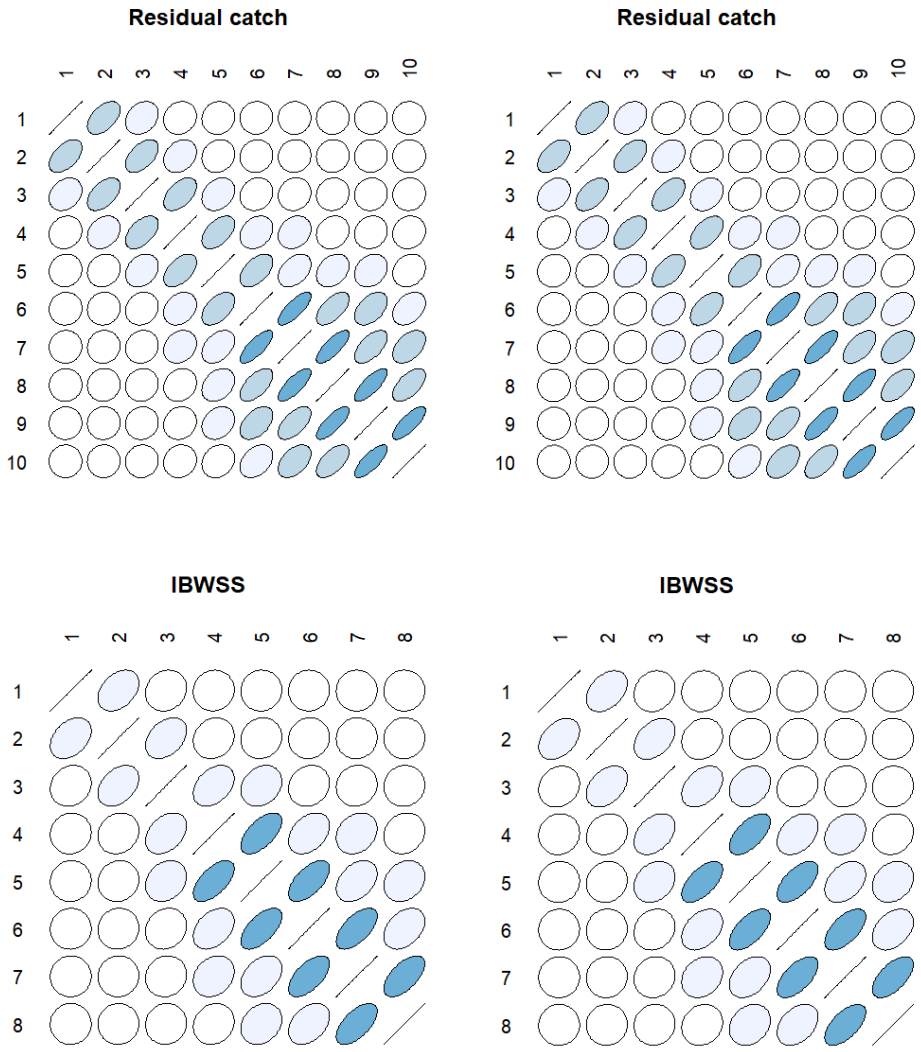


Figure 2.4.1.4. Blue whiting. The correlation matrix between ages for the catches and survey index of this year's assessment (WGWIDE 2025; left) and last year's assessment (WGWIDE 2024; right). Each ellipse represents the level curve of a bivariate normal distribution with the corresponding correlation. Hence, the sign of a correlation corresponds to the sign of the slope of the major ellipse axis. Increasingly darker shading is used for increasingly larger absolute correlations, while uncorrelated pairs of ages are depicted as circles with no shading. Preliminary catch data for 2025 have been used in this year's assessment.

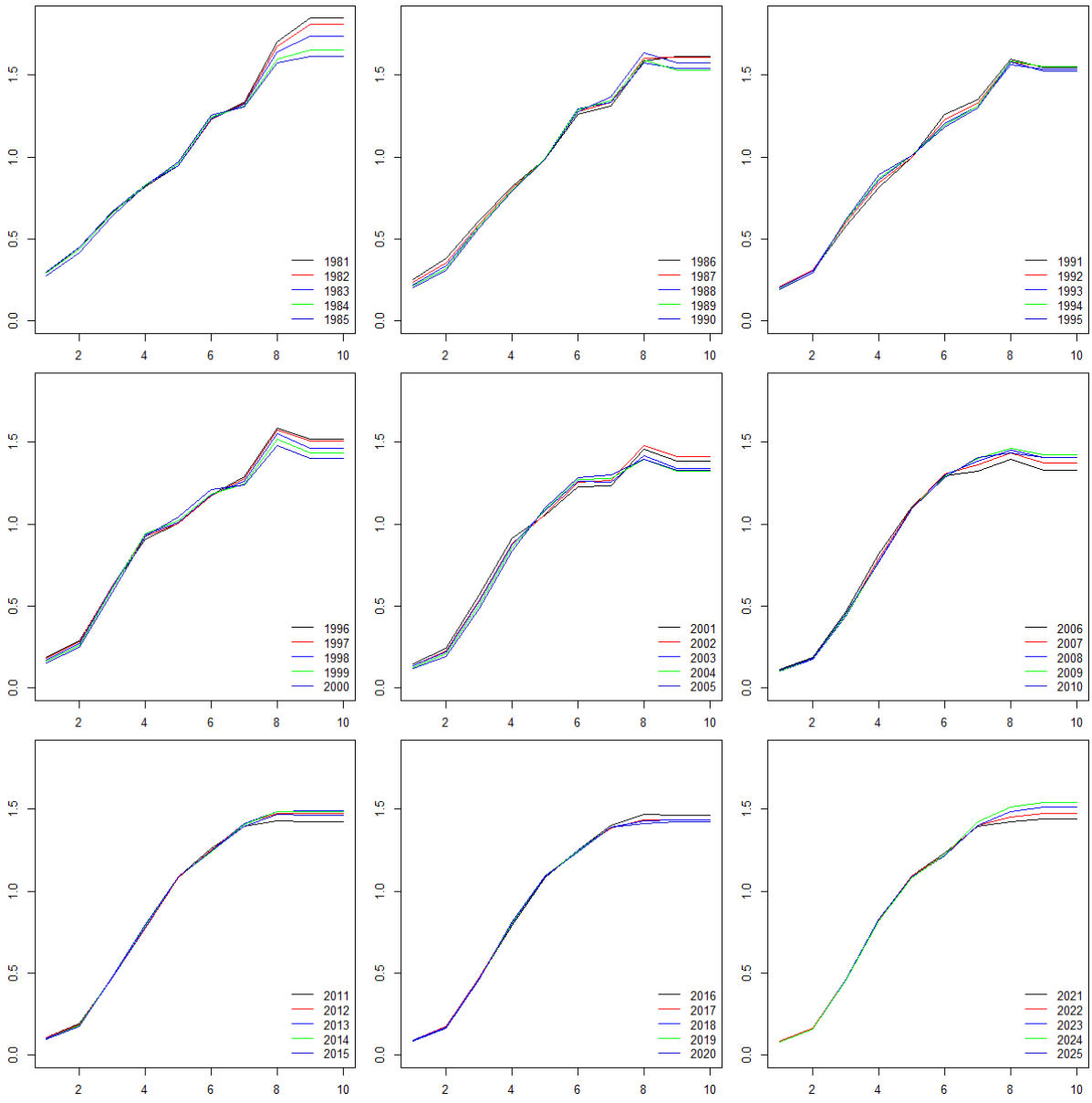


Figure 2.4.1.5. Blue whiting. Exploitation pattern by 5-years' time blocks. Preliminary catch data for 2025 have been used.

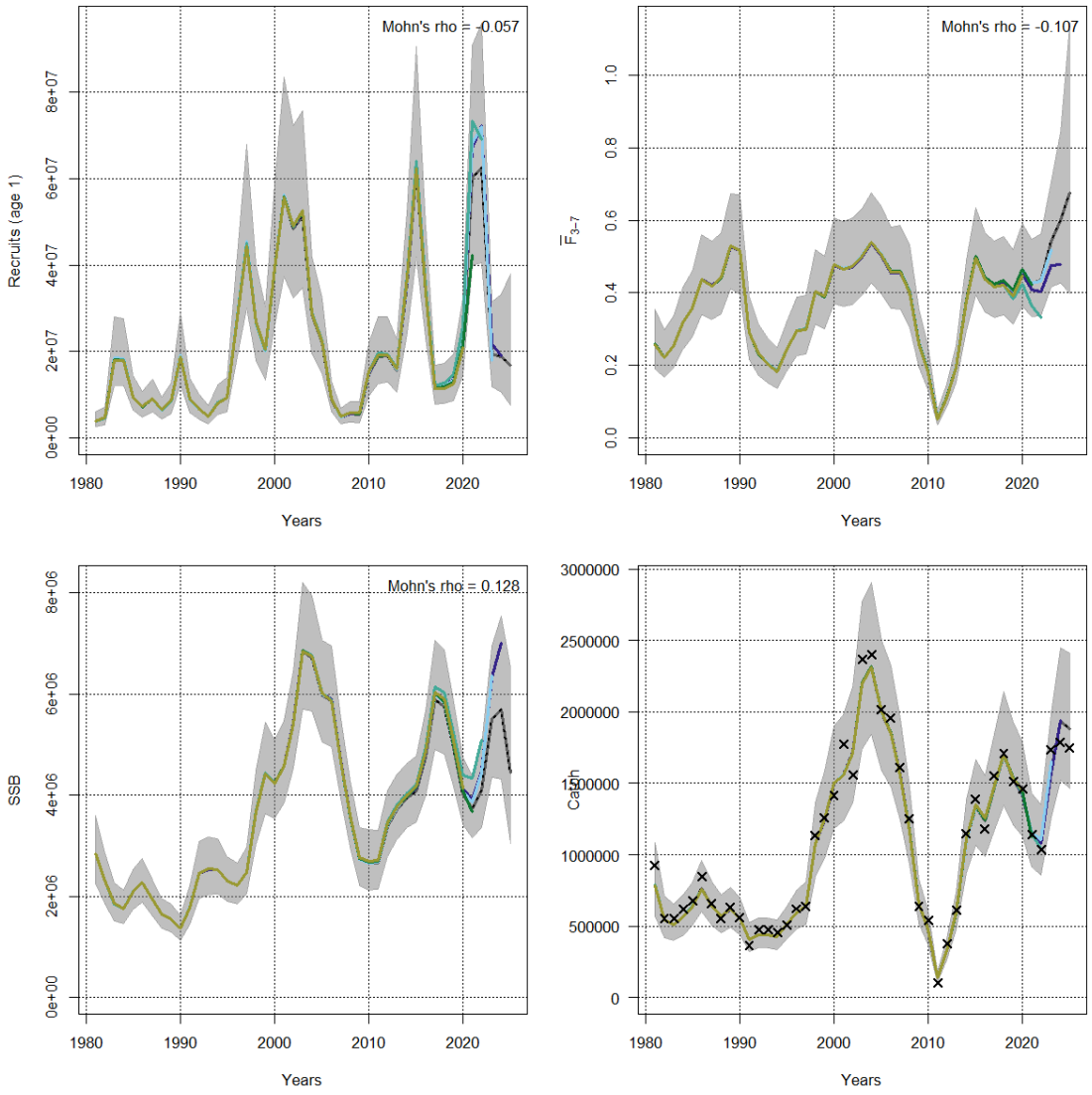


Figure 2.4.1.6. Blue whiting. Retrospective analysis of recruitment (age 1), F, SSB (tonnes) and total catch using the SAM model. The 95% confidence interval is shown for the most recent assessment.

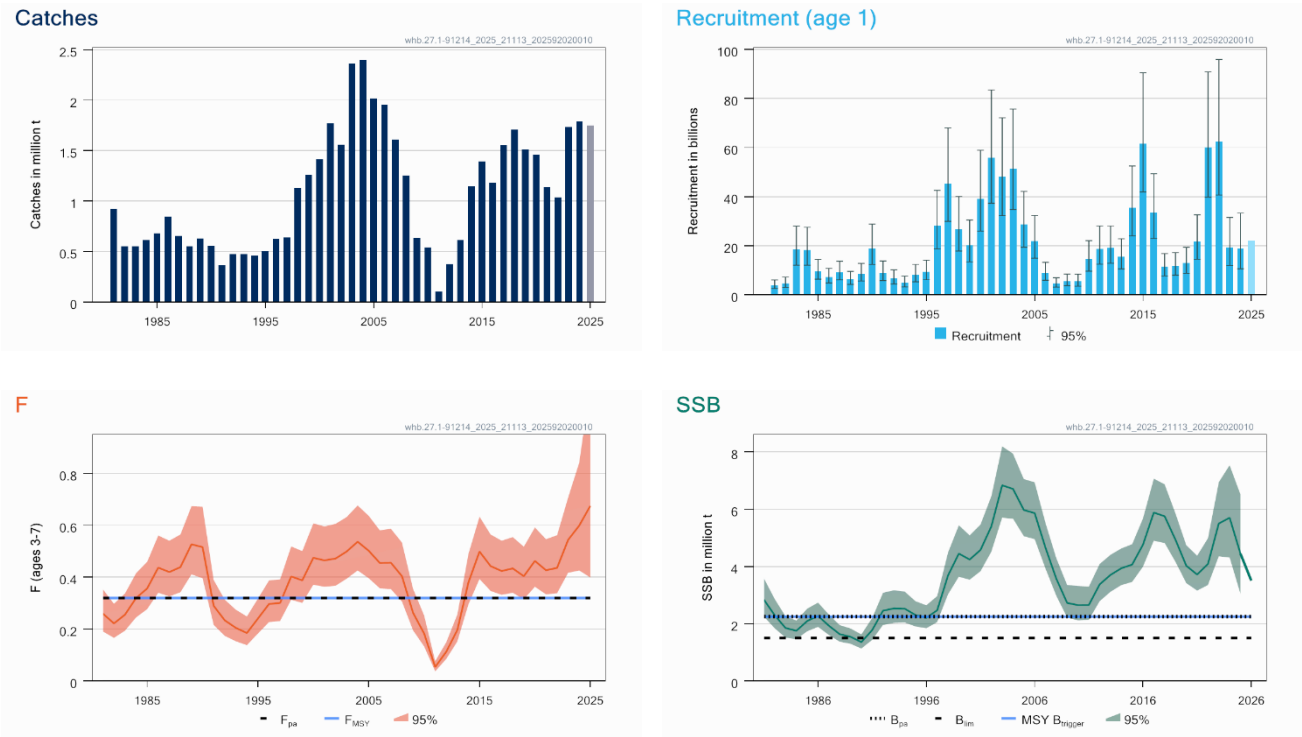


Figure 2.4.1.7. Blue whiting. SAM final run: total catches, recruitment (age 1), F and SSB. The graphs show the median value and the 95% confidence interval. Catches for 2025 are preliminary (shaded). The estimated recruitment for 2025 (shaded) has been replaced here by the long-term geometric mean (1996-2024) that is used in the forecast.

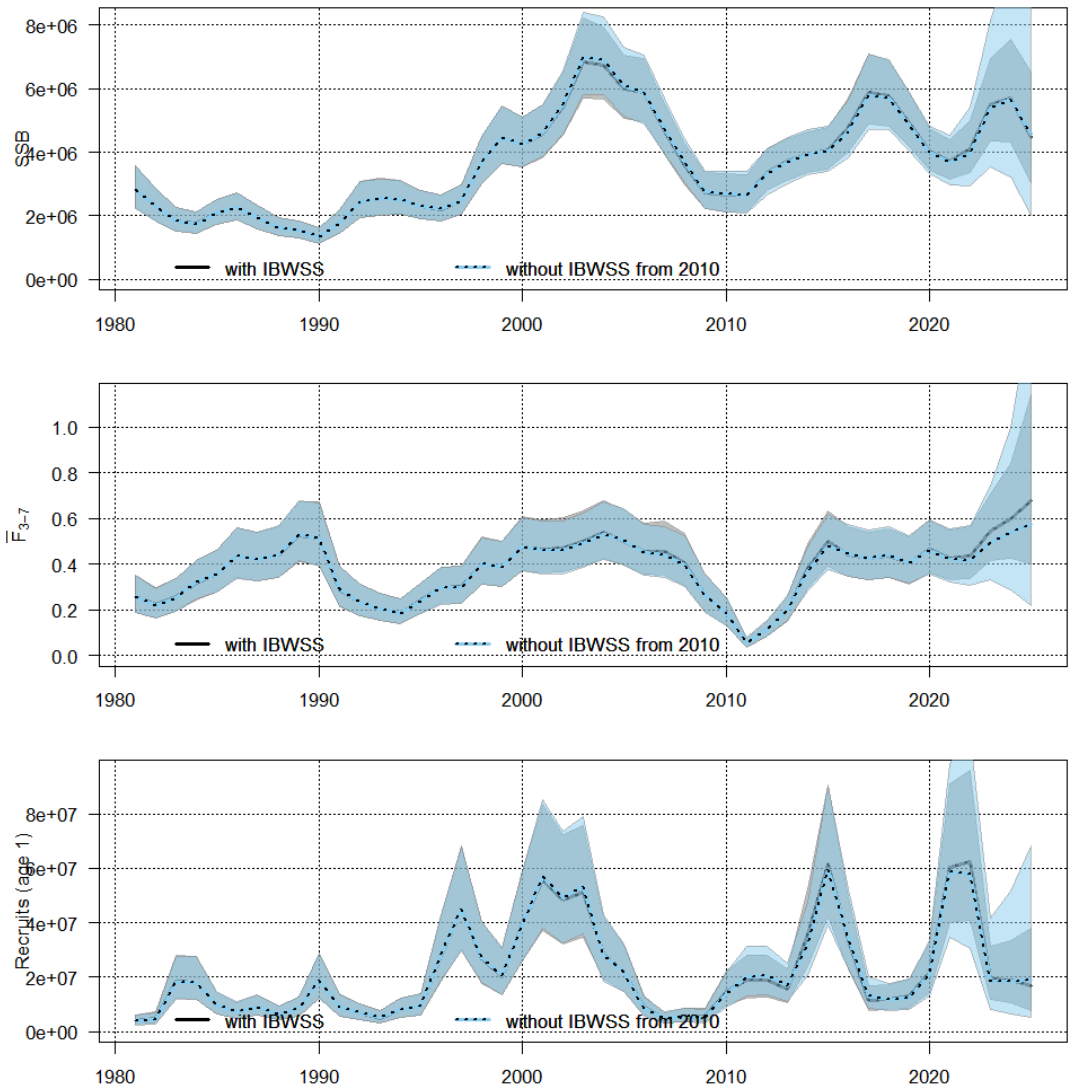


Figure 2.4.1.1.1 Blue whiting. Comparison of the estimated SSB, F_{bar} (age 3-7) and recruitment (age 1) of the complete 2025 assessment (black line and grey shaded confidence intervals) and the 2025 assessment where the IBWSS index has been excluded from 2010 onwards (blue dashed line and blue shaded confidence intervals).

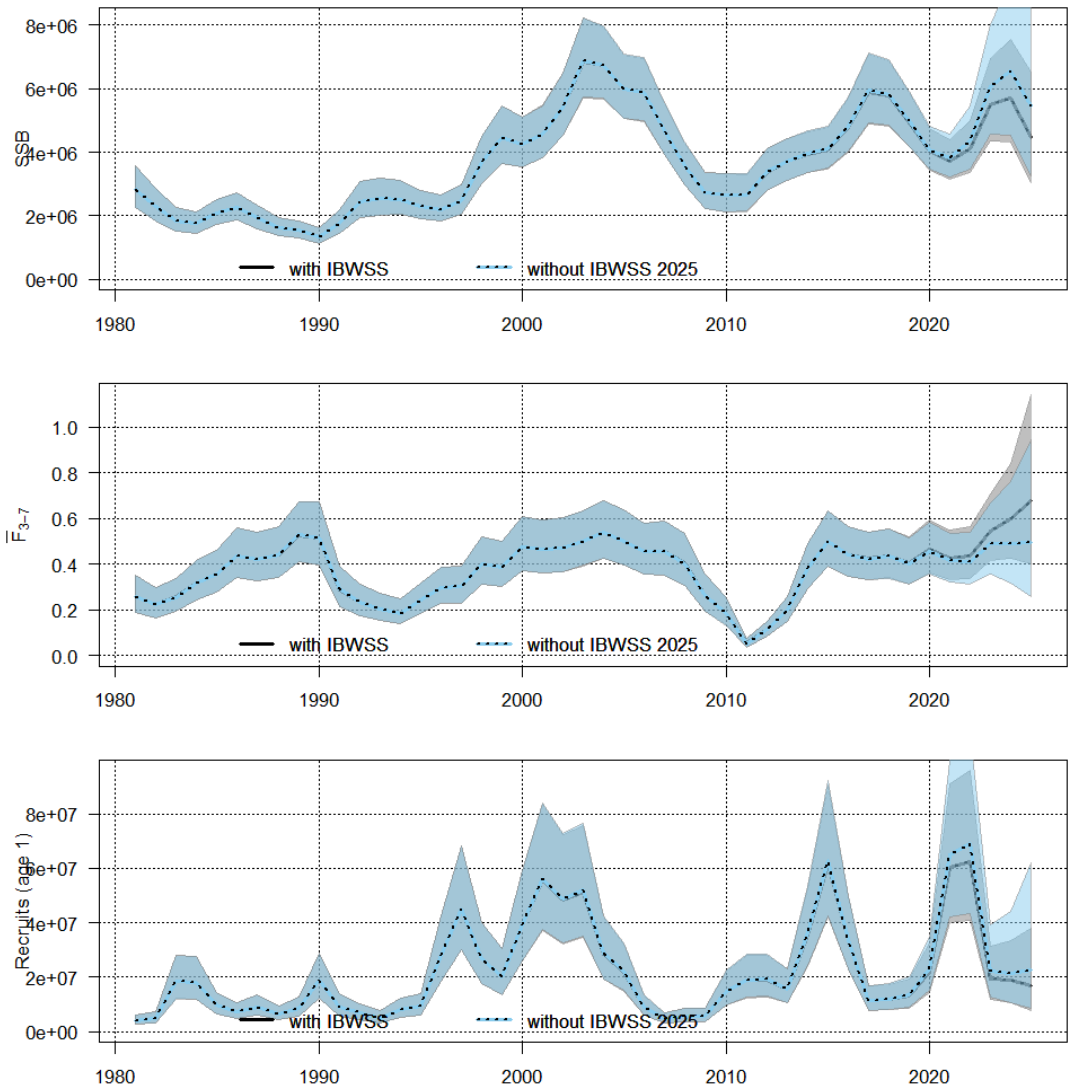


Figure 2.4.1.1.2 Blue whiting. Comparison of the estimated SSB, F_{bar} (age 3-7) and recruitment (age 1) of the complete 2025 assessment (black line and grey shaded confidence intervals) and the 2025 assessment where the IBWSS index values for 2025 have been excluded (blue dashed line and blue shaded confidence intervals).

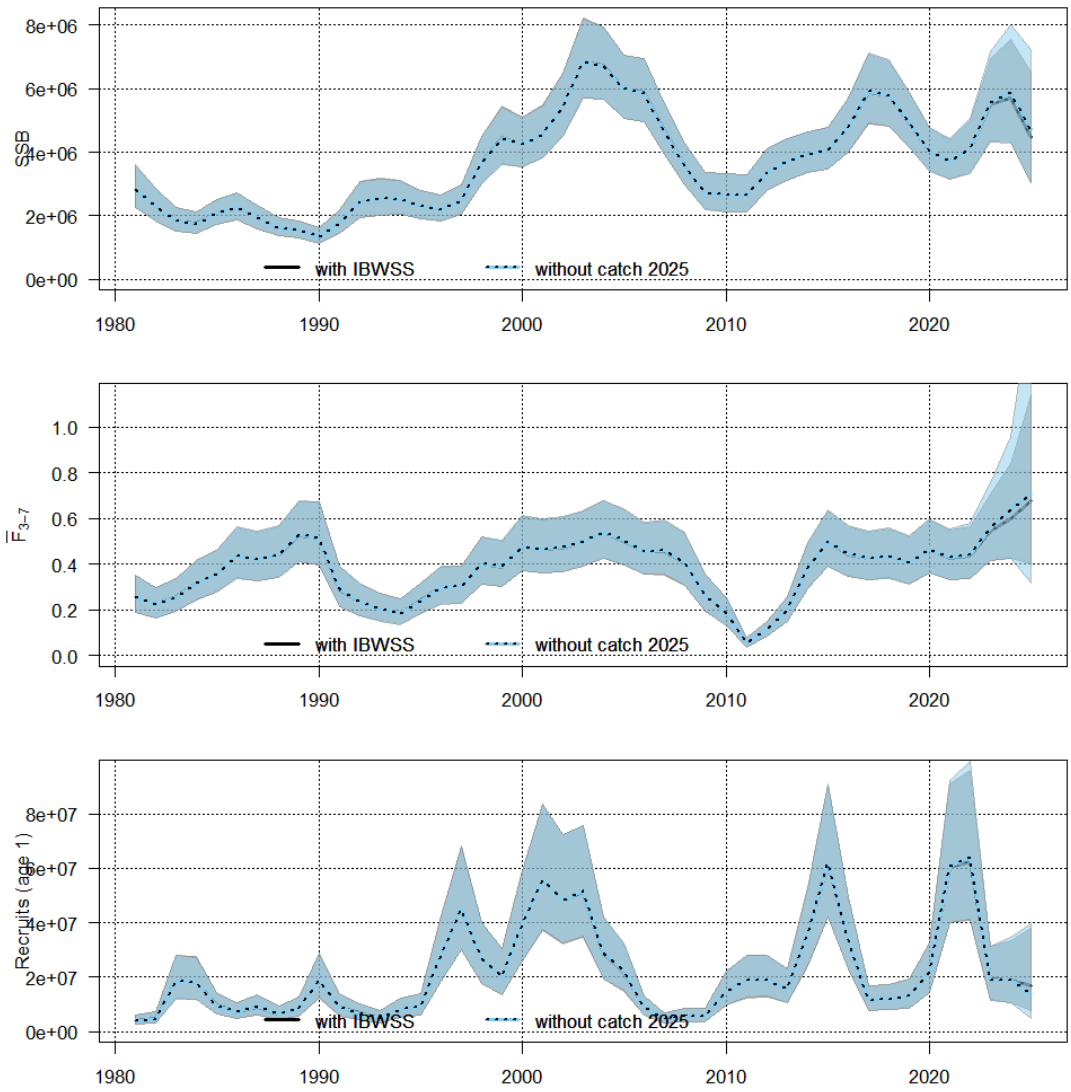


Figure 2.4.1.1.3 Blue whiting. Comparison of the estimated SSB, F_{bar} (age 3-7) and recruitment (age 1) of the complete 2025 assessment (black line and grey shaded confidence intervals) and the 2025 assessment where the catch-at-age values for 2025 have been excluded (blue dashed line and blue shaded confidence intervals).

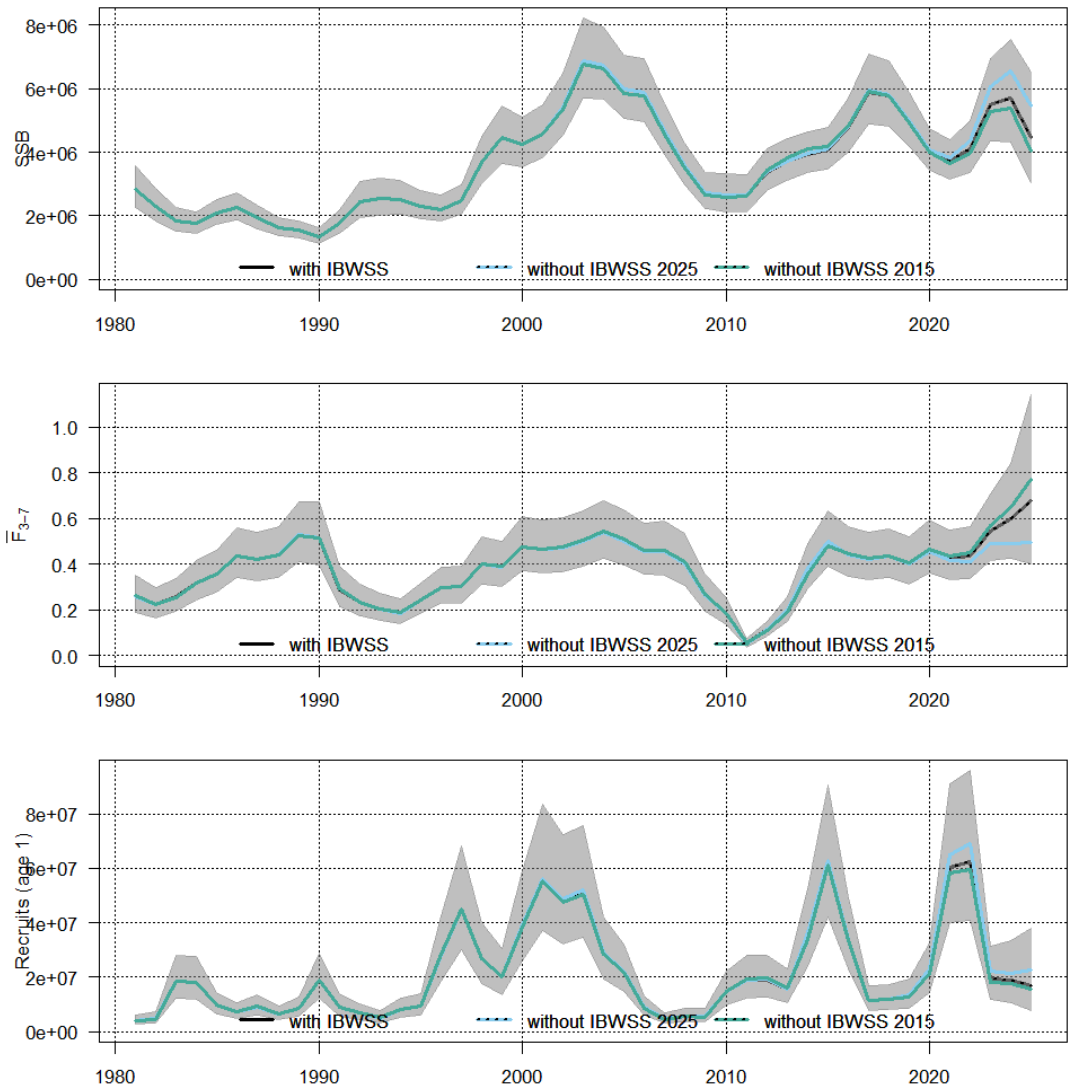


Figure 2.4.1.1.4 Blue whiting. Comparison of the estimated SSB, F_{bar} (age 3-7) and recruitment (age 1) of the complete 2025 assessment (black line and grey shaded confidence intervals), the 2025 assessment where the IBWSS survey index values for 2025 have been excluded (blue line) and the 2025 assessment where the IBWSS survey index values for 2015 have been excluded (green line).

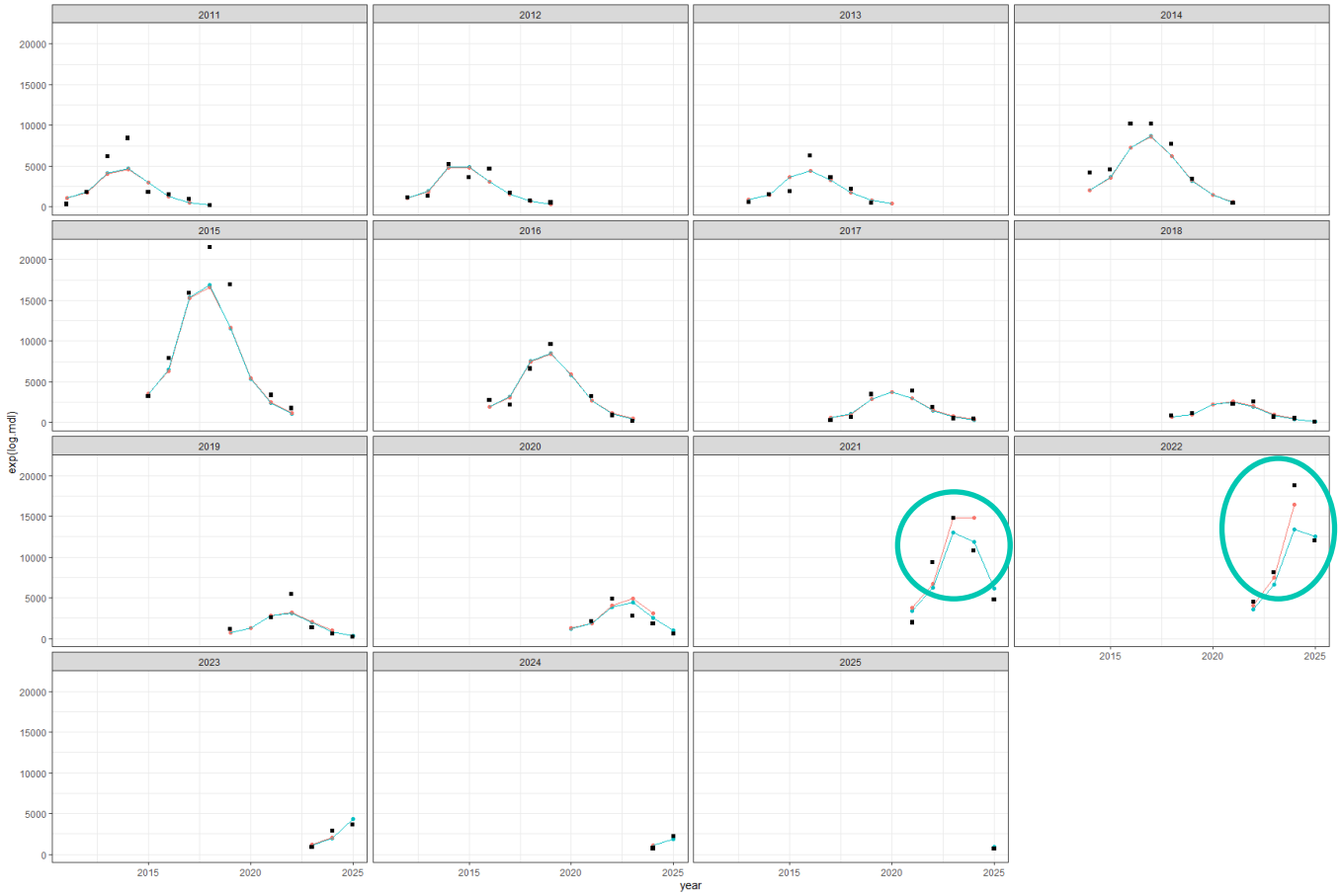


Figure 2.4.1.1.5 Blue whiting. Observed IBWSS survey index values (black dots) and model fits through observations for the 2025 assessment (blue line) and the 2024 peel (red line) by cohort as they appeared in the assessment as age 1. The blue-green circles highlight the large difference between the model fit for the strong 2020 and 2021 year classes.

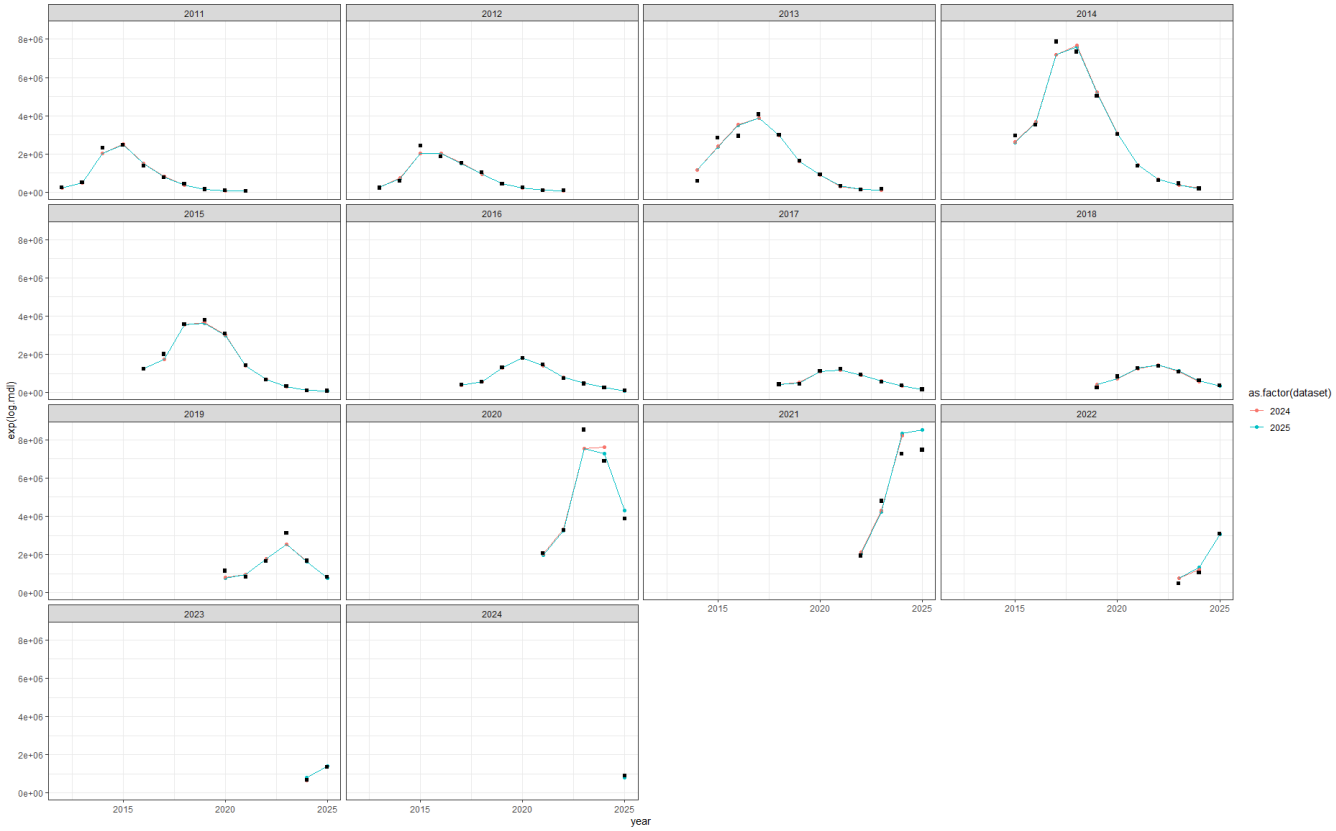


Figure 2.4.1.1.6 Blue whiting. Observed catch-at-age values (black dots) and model fits through observations for the 2025 assessment (blue line) and the 2024 peel (red line) by cohort as they appeared in the assessment as age 1.

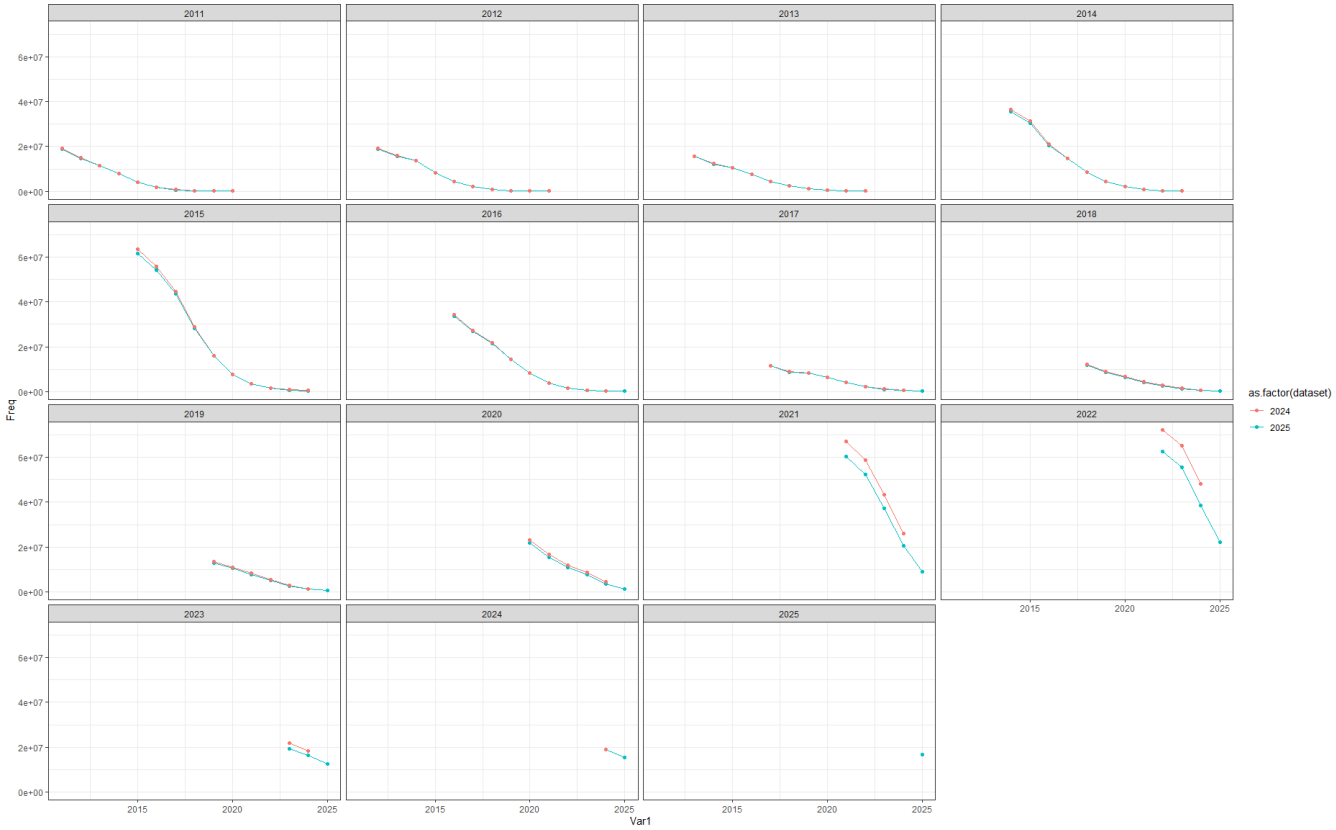


Figure 2.4.1.1.7 Blue whiting. Estimated cohort strength presented as numbers-at-age by the 2025 assessment (blue line) and the 2024 peel (red line) by cohort as they appeared in the assessment as age 1.

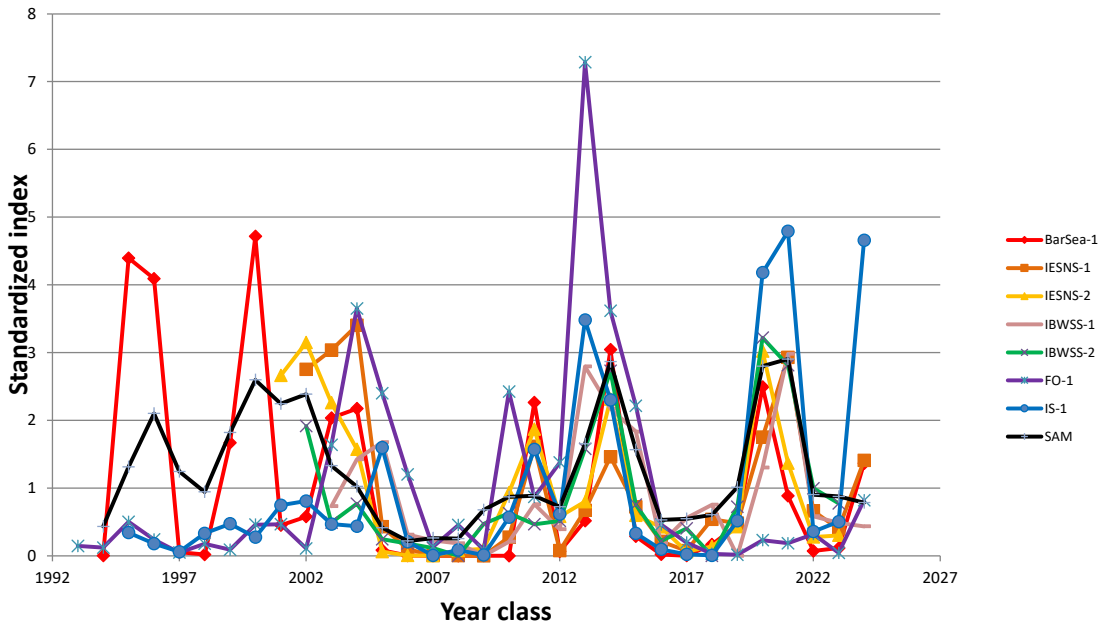


Figure 2.8.1.1. Blue whiting young fish indices from five different surveys and recruitment index from the assessment, standardized by dividing each series by their mean. BarSea - Norwegian bottom-trawl survey in the Barents Sea, IESNS: International Ecosystem Survey in the Nordic Seas in May (1 and 2 is the age groups), IBWSS (Not updated in 2020): International Blue Whiting Spawning Stock survey (1 and 2 is the age groups), FO: the Faroese bottom-trawl surveys in spring, IS: the Icelandic bottom-trawl survey in spring, SAM: recruits from the assessment.

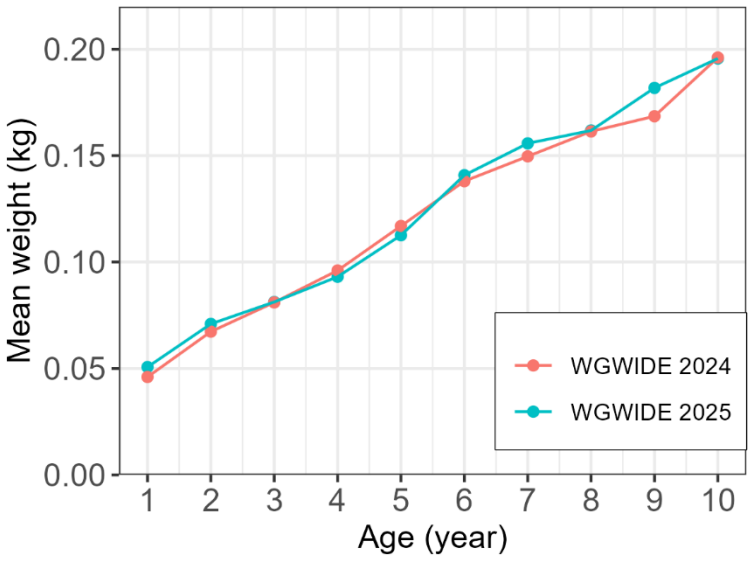


Figure 2.8.2.3.1. Blue whiting. Mean weight at age used in the forecast of current and last year's assessment. The mean is taken as the last three years of each assessment, including the terminal year. Weight-at-age values of the terminal year are based on preliminary catch data.

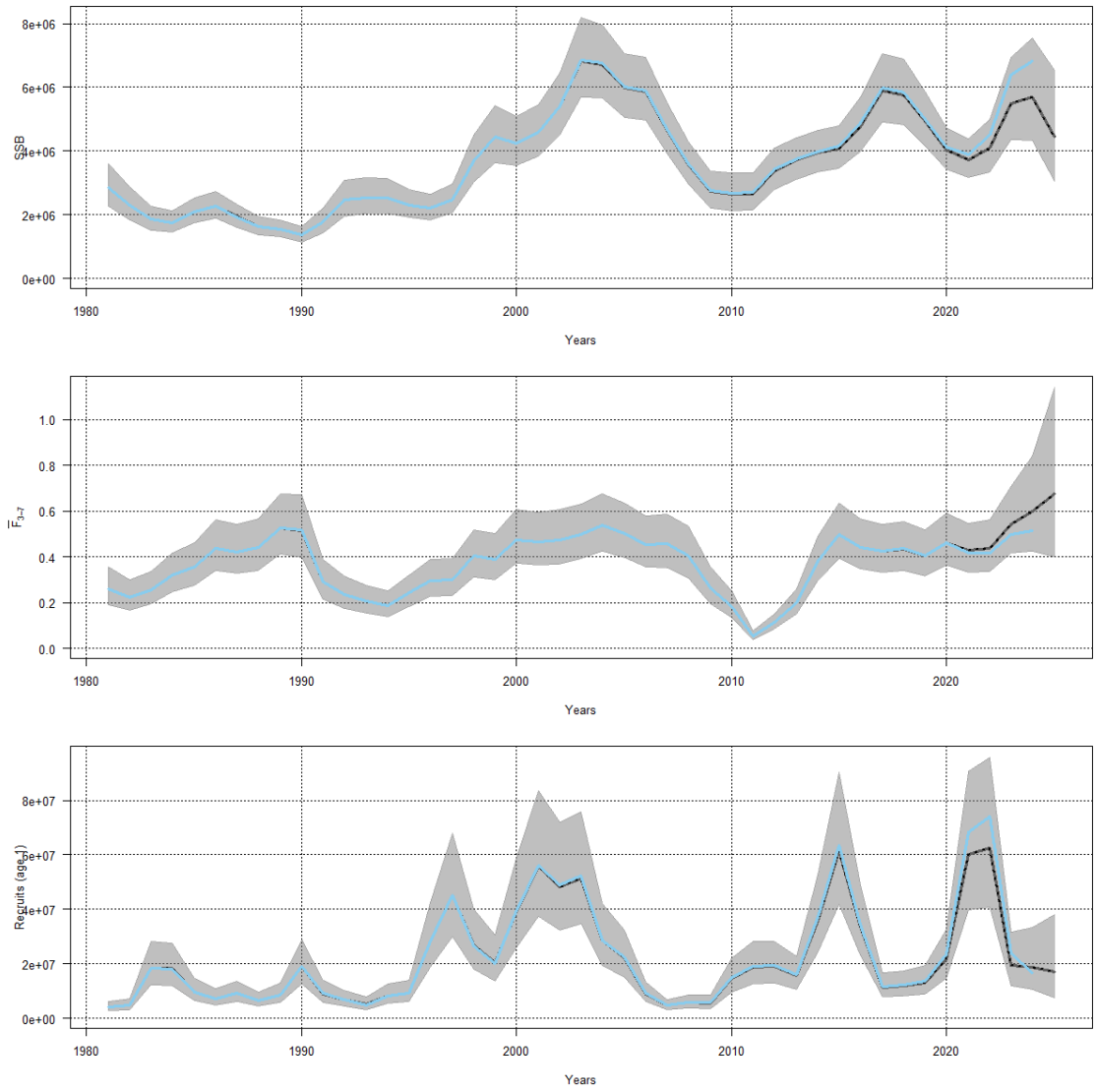


Figure 2.9.1. Blue whiting. SAM final run: Comparison of the 2024 (blue line) and 2025 (black line and grey shaded 95% confidence interval) stock assessments. Preliminary catch data for the terminal year have been used in both assessments.

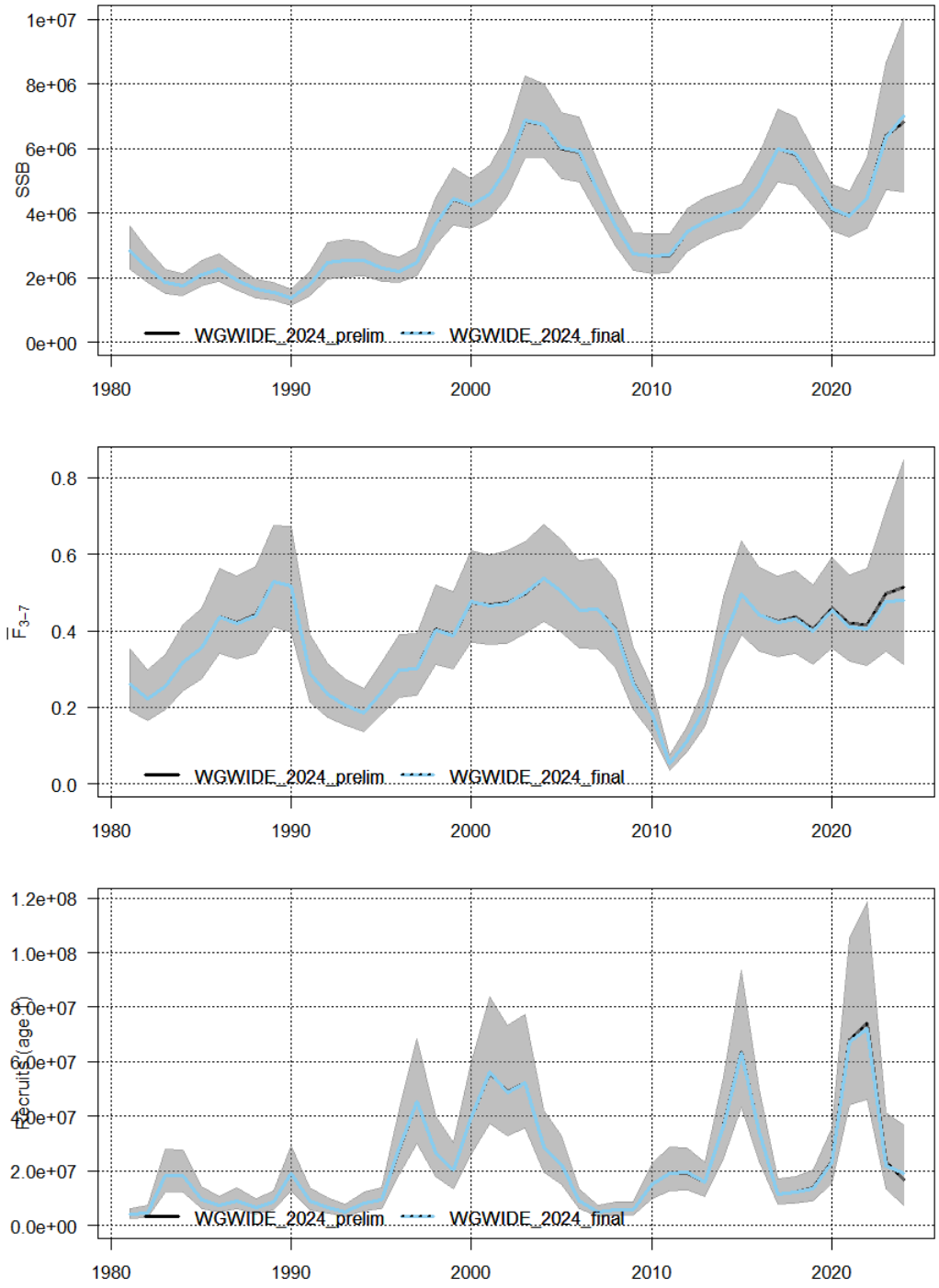


Figure 2.9.2. Blue whiting. Comparison of assessment runs with the configuration from WGWIDE 2024 with preliminary data for 2024 (black line and grey-shaded 95% confidence interval) and the WGWIDE 2024 assessment with final data for 2024 (blue line).

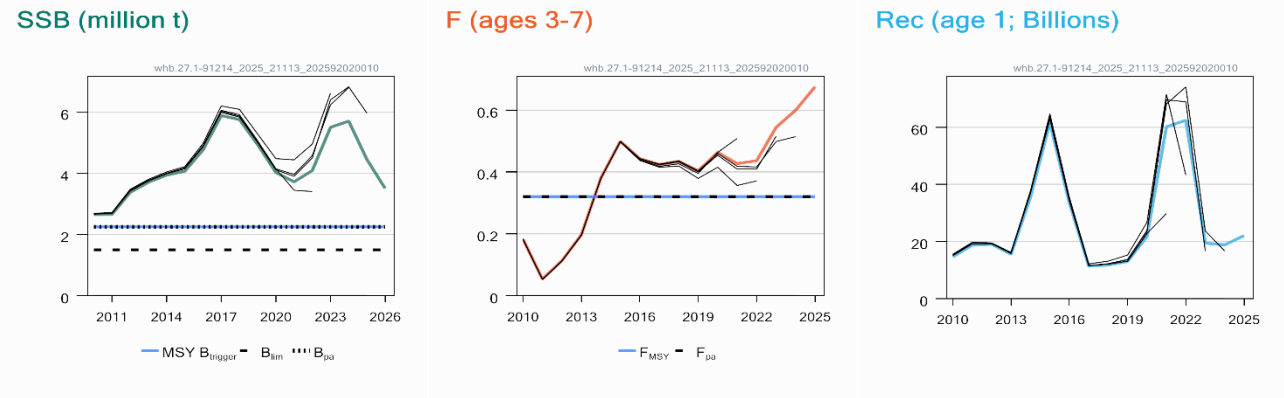


Figure 2.9.3. Blue whiting. Comparison of the 2021 - 2025 assessments (historical retrospective).

2.16 Tables

Table 2.3.1.1. Blue whiting. ICES estimated catches (tonnes) by country for the period 1988–2023.

Country	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	2003	2004	2005	2006	2007	2008
Denmark	18 941	26 630	27 052	15 538	34 356	41 053	20 456	12 439	52 101	26 270	61 523	82 935	89 500	41 450	54 663	48 659	18 134
Estonia					6 156	1 033	4 342	7 754	10 982	5 678	6 320		**				
Faroe Islands	79 831	75 083	48 686	10 563	13 436	16 506	24 342	26 009	24 671	28 546	71 218	329 895	322 322	266 799	321 013	317 859	225 003
France		2 191				1 195		720	6 442	12 446	7 984	14 149		8 046	18 009	16 638	11 723
Germany	5 546	5 417	1 699	349	1 332	100	2	6 313	6 876	4 724	17 969	22 803	15 293	22 823	36 437	34 404	25 259
Iceland		4 977						369	302	10 464	68 681	501 493	379 643	265 516	309 508	236 538	159 307
Ireland	4 646	2 014			781		3	222	1 709	25 785	45 635	22 580	75 393	73 488	54 910	31 132	22 852
Japan					918	1 742	2 574										
Latvia					10 742	10 626	2 582										
Lithuania						2 046									4 635	9 812	5 338
Netherlands	800	2 078	7 750	17 369	11 036	18 482	21 076	26 775	17 669	24 469	27 957	48 303	95 311	147 783	102 711	79 875	78 684
Norway	233 314	301 342	310 938	137 610	181 622	211 489	229 643	339 837	394 950	347 311	560 568	834 540	957 684	738 490	642 451	539 587	418 289
Poland	10																
Portugal	5 979	3 557	2 864	2 813	4 928	1 236	1 350	2 285	3 561	2 439	1 900	2 651	3 937	5 190	5 323	3 897	4 220
Spain	24 847	30 108	29 490	29 180	23 794	31 020	28 118	25 379	21 538	27 683	27 490	13 825	15 612	17 643	15 173	13 557	14 342
Sweden **	1 229	3 062	1 503	1 000	2 058	2 867	3 675	13 000	4 000	4 568	9 299	65 532	19 083	2 960	101	467	4
UK (England + Wales)***													2 593	7 356	10 035	12 926	14 147
UK (Northern Ireland)																	
UK (Scotland)	5 183	8 056	6 019	3 876	6 867	2 284	4 470	10 583	14 326	33 398	92 383	27 382	57 028	104 539	72 106	43 540	38 150
USSR / Russia *	177 521	162 932	125 609	151 226	177 000	139 000	116 781	107 220	86 855	118 656	130 042	355 319	346 762	332 226	329 100	236 369	225 163
Greenland**																	
Unallocated																	
TOTAL	557 847	627 447	561 610	369 524	475 026	480 679	459 414	578 905	645 982	672 437	1 128 969	2 321 406	2 380 161	2 034 309	1 976 176	1 625 259	1 260 615

*** From 1992 only Russia.**

**** Estimates from Sweden and Greenland: are not included in the Catch at Age Number.**

**** Estonia (2004): Reported to the EU but not to the ICES WGNPBW. (Landings of 19,467 tonnes).**

*** From 2012.

Table 2.3.1.1. (continued). Blue whiting. ICES estimated catches (tonnes) by country for the period 1988–2024.

Country	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Denmark	248	140	165	340	2167	35256	45178	39395	60868	87348	68716	58997	40321	45644	87119	101521
Estonia											0					
Faroe Islands	58354	49979	16405	43290	85768	224700	282502	282416	356501	349838	336569	343372	202415	217401	394198	436591
France	8831	7839	4337	9799	8978	10410	9659	10345	13369	16784	16095	13769	14612	14202	16989	9194
Germany	5044	9108	278	6239	11418	24487	24107	20025	45555	47708	38244	42362	35327	21667	38718	42127
Iceland	120202	87942	5887	63056	104918	182879	214870	186914	228934	292944	268356	243725	190146	191813	292853	321572
Ireland	8776	8324	1195	7557	13205	21466	24785	27657	43238	49903	38836	40135	39514	28972	54396	63293
Lithuania						4717		1129	5300			9543	21183	13149	32600	19532++
Netherlands	35686	33762	4595	26526	51635	38524	56397	58148	81156	121864	75020	62309	62017	63249	84637	91085
Norway	225995	194317	20539	118832	196246	399520	489439	310412	399363	438426	351429	354033	233968	194973	390850	388951
Poland									15889	12152	27185	47616	26077	20948	28276	41645
Portugal	2043	1482	603	1955	2056	2150	2547	2586	2046	2497	3481	2819	2522	2784	3202	1737
Spain	20637	12891	2416	6726	15274	32065	29206	31952	28920	24718	22782	23676	25509	26310	32870	23015
Sweden	3	50	1	4	199	2	32	42	90	16**	54	25	40	20	377	772
UK (England + Wales)	6176	2475	27	1590	4100	11	131	1374+	3447	1864	4062	7458	8783	7482	7521	3876
UK (Northern Ireland)					1232	2205	1119			4508	2899	2958			5299	3088
UK (Scotland)	173	5496	1331	6305	8166	24630	30508	37173	64724	66682	54040	41344	65085	42903	87332	98619
Russia	149650	112553	45841	88303	120674	152256	185763	173655	188449	170892	188006	181496	133605^	128002	153830	141241
Greenland					2133				20212	23333	19753	19611	20190	19218	26031	28934
Unallocated				3499									22137			
TOTAL	**641818**	**526357**	**103620**	**384021**	**628169**	**1155279**	**1396244**	**1181850**	**1558061**	**1711461**	**1515527**	**1495248**	**1143450**	**1038736**	**1737098**	**1816792**
															Total IC	**1797260**

** only landings (2018).

+ data updated in 2018.

++ 2024 data not available in InterCatch (IC).

^ Russia 2021 preliminary data (Q1+Q2) submitted to WGWIDE 2021.

Table 2.3.1.2. Blue whiting. ICES estimated catches (tonnes) by country and ICES division for 2024. Data submitted to InterCatch.

ICES Division	Denmark	Faroe Islands	France	Germany	Greenland	Iceland	Ireland	Netherlands	Norway	Poland	Portugal	Russia	Spain	Sweden	UK (England)	UK(Northern Ireland)	UK(Scotland)	Total
27.1.b													0.08006					**0**
27.2.a	124	34479		2388	1919	12609		18	1513			28743		1			15	**81810**
27.2.b												1	0.08007					**1**
27.3.a	0								79					4				**83**
27.4																	53	**53**
27.4.a	10	4753	0			3454		0	35045			464		759			13	**44498**
27.4.b	3								219					7	0			**229**
27.5.a		14327				26152												**40479**
27.5.b	452	274257			26265	224901		9	30719			100244						**656847**
27.6.a	47905	26428	3861	16962	750	29577	27213	39681	1740	18986			0				38739	**251841**
27.6.b	6924	36935	458	331		16702	19689	4506	37198	2636		994				3088	25125	**154585**
27.7.b			0				1470			596			9.773					**2076**
27.7.c	25333	21954	2281	11729		6876	14095	20595	172941	7809		135	43.416				34675	**318466**
27.7.d															0			**0**
27.7.e			0												0			**0**
27.7.f															1			**1**
27.7.g													10.941					**11**
27.7.h			0					179					7.392					**186**
27.7.j	2		1899				826.121	16955		3007			189.557		13			**22892**
27.7.k	20742	23458	692	10716		1274	0.35	9141	109499	8609		10130	4.096		3862			**198127**
27.8.a	26		0							1			36.8823					**64**
27.8.b			3										156.146					**159**
27.8.c			0								47		17953.6					**18001**
27.8.d													6.62789					**7**
27.9.a											1690		4596.5					**6286**
27.12												530						**530**
27.14.b						27												**27**
Total	**101521**	**436591**	**9194**	**42127**	**28934**	**321572**	**63293**	**91085**	**388951**	**41645**	**1737**	**141241**	**23015**	**772**	**3876**	**3088**	**98619**	**1797260**

Table 2.3.1.3. Blue whiting. ICES estimated catches (tonnes) by quarter and ICES division for 2024. Data submitted to InterCatch.

ICES area	Quarter 1	Quarter 2	Quarter 3	Quarter 4	2024	Total
27.1.b			0			**0**
27.2.a	4810	27699	24398	24904		**81810**
27.2.b		0	0	1		**1**
27.3.a	0	2	81	0		**83**
27.4					53	**53**
27.4.a	2583	21492	12023	8401		**44498**
27.4.b	0	0	67	163		**229**
27.5.a		7	12228	28244		**40479**
27.5.b	153015	421657	9792	72382		**656847**
27.6.a	56000	143570	162	51990	119	**251841**
27.6.b	154582				3	**154585**
27.7.b	1558	517	0			**2076**
27.7.c	311622	6841	4			**318466**
27.7.d	0	0		0		**0**
27.7.e	0	0		0		**0**
27.7.f			1			**1**
27.7.g	3	6	3			**11**
27.7.h	4	3	1	179		**186**
27.7.j	276	347	39	22230		**22892**
27.7.k	196850	3	1274	0		**198127**
27.8.a	1	29	33	1		**64**
27.8.b	30	92	27	10		**159**
27.8.c	4443	4061	6717	2780		**18001**
27.8.d		6	1			**7**
27.9.a	519	3124	1596	1046		**6286**
27.12	530					**530**
27.14.b	1	1	1	24		**27**
Total	**886826**	**629455**	**68447**	**212356**	**175**	**1797260**

Table 2.3.1.4. Blue whiting. ICES estimated catches (tonnes) from the main fisheries 1992–2024 by area.

Year	Norwegian Sea fishery (SAs1+2;Divs.5.a,14a-b)	Fishery in the spawning area (SA 12.; Divs. 5.b, 6.a-b, 7.a-c)	Directed- and mixed fisheries in the North Sea (SA4; Div.3.a)	Total northern areas	Total southern areas (SAs8+9;Divs.7.d-k)	Grand total
1988	55829	426037	45143	527009	30838	557847
1989	42615	475179	75958	593752	33695	627447
1990	2106	463495	63192	528793	32817	561610
1991	78703	218946	39872	337521	32003	369524
1992	62312	318018	65974	446367	28722	475026
1993	43240	347101	58082	448423	32256	480679
1994	22674	378704	28563	429941	29473	459414
1995	23733	423504	104004	551241	27664	578905
1996	23447	478077	119359	620883	25099	645982
1997	62570	514654	65091	642315	30122	672437
1998	177494	827194	94881	1099569	29400	1128969
1999	179639	943578	106609	1229826	26402	1256228
2000	284666	989131	114477	1388274	24654	1412928
2001	591583	1045100	118523	1755206	24964	1780170
2002	541467	846602	145652	1533721	23071	1556792
2003	931508	1211621	158180	2301309	20097	2321406
2004	921349	1232534	138593	2292476	85093	2377569
2005	405577	1465735	128033	1999345	27608	2026953
2006	404362	1428208	105239	1937809	28331	1966140
2007	172709	1360882	61105	1594695	17634	1612330
2008	68352	1111292	36061	1215704	30761	1246465
2009	46629	533996	22387	603012	32627	635639
2010	36214	441521	17545	495280	28552	523832
2011	20599	72279	7524	100401	3191	103592
2012	24391	324545	5678	354614	29402	384016*
2013	31759	481356	8749	521864	103973	625837**
2014	45580	885483	28596	959659	195620	1155279
2015	150828	895684	44661	1091173	305071	1396244
2016	59744	905087	55774	1020604	162583	1183187***
2017	136565	1284105	45474	1466144	91917	1558061
2018	143204	1445957	43484	1632646	78831	1711477
2019	68593	1271883	44856	1385333	130194	1515527
2020	92084	1059197	64327	1215608	279640	1495248
2021	112082	801768	39509	953359	190091	1143450
2022	105752	724086	59371	889209	149527	1038736
2023	112352	1115090	99955	1327396	409702	1737098
2024	122317	1384345	44864	1551526	245734	1797260

*** Official catches by area from Sweden are not included (2012);**

**** Official catches by area from Sweden and Greenland are not included (2013);**

***** Grand total includes only 1336 tonnes from UK(England + Wales) (2016 total catch from UK(England + Wales) = 1374 ton).**

Table 2.3.1.5. Blue whiting. ICES estimates (tonnes) of catches, landings and discards by country for 2024. Data submitted to InterCatch.

Country	BMS landings	Discards	Landings	Catches	% discards
Denmark	0		101521	101521	0.04
Faroe Islands			436591	436591	0.00
France			9194	9194	0.00
Germany			42127	42127	0.00
Greenland			28934	28934	0.00
Iceland			321572	321572	0.00
Ireland		827	62466	63293	1.39
Netherlands		0	91085	91085	0.00
Norway			388951	388951	0.00
Poland			41645	41645	0.00
Portugal		458	1279	1737	29.28
Russia			141241	141241	0.00
Spain	0.442	1697	21318	23015	6.64
Sweden		4	767	772	4.31
UK (England)		1	3875	3876	0.01
UK(Northern Ireland)			3088	3088	0.00
UK(Scotland)		175	98444	98619	0.00
Total	**0.442**	**3162**	**1794098**	**1797260**	**0.23**

Table 2.3.1.6. Blue whiting. ICES estimated catches (tonnes) inside and outside NEAFC regulatory area for 2024 by country. Data submitted to InterCatch.

Country	Outside NEAFC	Inside NEAFC	Total
Denmark	98179	3342	101521
Faroe Islands	352915	83676	436591
France*	9194	0	9194
Germany	-189609	231736	42127
Greenland	6893	22041	28934
Iceland	296260	25312	321572
Ireland	63293	0	63293
Netherlands	91076	9	91085
Norway*	236789	152162	388951
Poland	40127	1518	41645
Portugal	1737	0	1737
Russia	117175	24066	141241
Spain	23015	0	23015
Sweden	772	0	772
UK (England)	3736	140	3876
UK(Northern Ireland)	3088	0	3088
UK(Scotland)	98619	0	98619
Total	**1253258**	**544002**	**1797260**

Table 2.3.1.1.1. Blue whiting. ICES estimated catches (tonnes), the percentage of catch covered by the sampling programme, No. of age samples, No. of fish measured and No. of fish aged for 2000-2024. Data submitted to InterCatch.

Year	Catch (tonnes)	% catch covered by the sampling programme	No. Length Samples	No. Length measurements	No. Fish Aged
2000	1412928	-	1136	125162	13685
2001	1780170	-	985	173553	17995
2002	1556792	-	1037	116895	19202
2003	2321406	-	1596	188770	26207
2004	2377569	-	1774	181235	27835
2005	2026953	-	1833	217937	32184
2006	1966140	-	1715	190533	27014
2007	1610090	87	1399	167652	23495
2008	1246465	90	927	113749	21844
2009	635639	88	705	79500	18142
2010	524751	87	584	82851	16323
2011	103591	85	697	84651	12614
2012	373937	80	1143	173206	15745
2013	625837	96	915	111079	14633
2014	1155279	89	912	111316	39738
2015	1396244	94	1570	102367	29821
2016	1183187	89	1092	120329	13793
2017	1558061	91	1779	147297	15828
2018	1711078	87	1565	131779	16426
2019	1515527	84	1537	136604	17869
2020	1495248	81	672	89110	16641
2021	1143450	81	1676	129317	15215
2022	1038736	77	1868	167650	15636
2023	1737098	78	1977	164353	17632
2024	**1797260**	**77**	**2153**	**139929**	**18524**

Table 2.3.1.1.2. Blue whiting. ICES estimated catches (tonnes), the percentage of catch covered by the age sampling programme (catch-at-age numbers), No. of length samples, No. of age samples, No. of fish measured, No. of fish aged, No. of fish aged by 1000 tonnes and No. of fish measured by 1000 tonnes by country for 2024. Data submitted to InterCatch.

Country	ICES catches	% catch covered by age sampling programme	No. of Length Samples	No. of Length Measured	No. of Age Samples	No. Age Readings	No Aged/ 1000 tonnes	No Measured/ 1000 tonnes
Denmark	101521	93	30	2205	30	1679	17	22
Faroe Islands	436591	91	29	2792	29	2363	5	6
France	9194	0	0	0	0	0	0	0
Germany	42127	13	23	5510	23	302	7	131
Greenland	28934	0	0	0	0	0	0	0
Iceland	321572	99	271	26045	271	6508	20	81
Ireland	63293	98	35	10459	33	1500	24	165
Netherlands	91085	98	59	12437	59	1461	16	137
Norway	388951	97	55	1635	55	1635	4	4
Poland	41645	0	0	0	0	0	0	0
Portugal	1737	97	40	1205	40	1001	576	694
Russia	141241	10	170	42325	170	1095	8	300
Spain	23015	99	1340	33589	1340	955	41	1459
Sweden	772	0	0	0	0	0	0	0
UK (England)	3876	0	4	423	1	25	6	109
UK(Northern Ireland)	3088	0	0	0	0	0	0	0
UK(Scotland)	98619	0	97	1304	0	0	0	13
Total	**1797260**	**77**	**2153**	**139929**	**2051**	**18524**	**10**	**78**

Table 2.3.1.1.3. Blue whiting. ICES estimated catches (tonnes), No. of Age samples, No. of fish measured and No. of fish aged by country and quarter for 2024. Data submitted to InterCatch (cont).

Country	Catches (ton)	No. of Length Samples	No. of Length Measured	No. Age Readings
Denmark				
Quarter 1	55828	18	1339	1078
Quarter 2	30706	7	601	349
Quarter 3	34	0	0	0
Quarter 4	14954	5	265	252
Total	**101521**	**30**	**2205**	**1679**
Faroe Islands				
Quarter 1	174564	15	1502	1273
Quarter 2	200410	9	877	750
Quarter 3	35796	1	59	59
Quarter 4	25821	4	354	281
Total	**436591**	**29**	**2792**	**2363**
France				
Quarter 1	3897	0	0	0
Quarter 2	3397	0	0	0
Quarter 3	1	0	0	0
Quarter 4	1899	0	0	0
Total	**9194**	**0**	**0**	**0**
Germany				
Quarter 1	24606	0	0	0
Quarter 2	5299	23	5510	302
Quarter 3	25	0	0	0
Quarter 4	12196	0	0	0
Total	**42127**	**23**	**5510**	**302**
Greenland				
Quarter 1	6565	0	0	0
Quarter 2	14850	0	0	0
Quarter 3	66	0	0	0
Quarter 4	7453	0	0	0
Total	**28934**	**0**	**0**	**0**
Iceland				
Quarter 1	96243	82	8921	2000
Quarter 2	147180	82	8488	1956
Quarter 3	3234	0	0	0
Quarter 4	74915	107	8636	2552
Total	**321572**	**271**	**26045**	**6508**

Table 2.3.1.1.3. (continued) Blue whiting. ICES estimated catches (tonnes), No. of Age samples, No. of fish measured and No. of fish aged by country and quarter for 2024. Data submitted to InterCatch (cont.).

Country	Catches (ton)	No. of Length Samples	No. of Length Measured	No. Age Readings
Ireland				
Quarter 1	46068	24	7205	1000
Quarter 2	16829	11	3254	500
Quarter 3	30	0	0	0
Quarter 4	366	0	0	0
Total	**63293**	**35**	**10459**	**1500**
Netherlands				
Quarter 1	41835	39	7981	969
Quarter 2	21808	15	3319	368
Quarter 3	0	0	0	0
Quarter 4	27442	5	1137	124
Total	**91085**	**59**	**12437**	**1461**
Norway				
Quarter 1	319293	49	1455	1455
Quarter 2	52138	4	120	120
Quarter 3	11267	1	30	30
Quarter 4	6253	1	30	30
Total	**388951**	**55**	**1635**	**1635**
Poland				
Quarter 1	20344	0	0	0
Quarter 2	3067	0	0	0
Quarter 4	18233	0	0	0
Total	**41645**	**0**	**0**	**0**
Portugal				
Quarter 1	206	3	152	149
Quarter 2	588	15	546	243
Quarter 3	393	11	255	250
Quarter 4	549	11	252	359
Total	**1737**	**40**	**1205**	**1001**

Table 2.3.1.1.3. (continued) Blue whiting. ICES estimated catches (tonnes), No. of Age samples, No. of fish measured and No. of fish aged by country and quarter for 2024. Data submitted to InterCatch (cont.).

Country	Catches (ton)	No. of Length Samples	No. of Length Measured	No. Age Readings
Russia				
Quarter 1	14177	0	0	0
Quarter 2	99230	115	28595	944
Quarter 3	8857	38	9471	99
Quarter 4	18977	17	4259	52
Total	**141241**	**170**	**42325**	**1095**
Spain				
Quarter 1	4866	347	7783	263
Quarter 2	6888	375	8470	205
Quarter 3	7971	324	9447	217
Quarter 4	3290	294	7889	270
Total	**23015**	**1340**	**33589**	**955**
Sweden				
Quarter 1	0	0	0	0
Quarter 2	2	0	0	0
Quarter 3	762	0	0	0
Quarter 4	8	0	0	0
Total	**772**	**0**	**0**	**0**
UK (England and Wales)				
Quarter 1	3875	1	335	25
Quarter 3	1	3	88	0
Total	**3876**	**4**	**423**	**25**
UK (Northern Ireland)				
Quarter 1	3088	0	0	0
Total	**3088**	**0**	**0**	**0**
UK(Scotland)				
Quarter 1	71369	0	0	0
Quarter 2	27062	0	0	0
Quarter 3	10	0	0	0
Quarter 4	2	0	0	0
2024*	175	97	1304	0
Total	**98619**	**97**	**1304**	**0**
Total Geral	**1797260**	**2153**	**139929**	**18524**

Table 2.3.1.1.4. Blue whiting. ICES estimated catches (tonnes), No. of length samples, No. of age samples, No. of fish measured, No. of fish aged, No. of fish aged by 1000 tonnes and No. of fish measured by 1000 tonnes by ICES division for 2024. Data submitted to InterCatch.

ICES area	Catches (tonnes)	No. Samples	No. of Length Measured	No. of Age Samples	No. Age Readings	No. Aged/1000 tonnes	No. Measured/1000 tonnes
27.1.b	0	0	0	0	0	0	0
27.2.a	81810	119	23912	119	1146	14	292
27.2.b	1	0	0	0	0	0	0
27.3.a	83	0	0	0	0	0	0
27.4.a	44551	127	5512	56	1364	31	124
27.4.b	229	0	0	0	0	0	0
27.5.a	40479	19	1809	19	797	20	45
27.5.b	656847	207	34533	207	4286	7	53
27.6.a	251841	161	23367	142	4083	16	93
27.6.b	154585	34	4500	27	1034	7	29
27.7.b	2076	1	288	0	0	0	139
27.7.c	318466	86	7193	85	2299	7	23
27.7.d	0	0	0	0	0	0	0
27.7.e	0	0	0	0	0	0	0
27.7.f	1	3	88	0	0	0	169884
27.7.g	11	4	40	4	0	0	3656
27.7.h	186	10	2	10	0	0	11
27.7.j	22892	134	1766	134	124	5	77
27.7.k	198127	34	2825	34	1435	7	14
27.8.a	64	20	251	20	0	0	3905
27.8.b	159	98	1370	98	0	0	8616
27.8.c	18001	452	20101	452	522	29	1117
27.8.d	7	0	0	0	0	0	0
27.9.a	6286	644	12372	644	1434	228	1968
27.12	530	0	0	0	0	0	0
27.14.b	**27**	**0**	**0**	**0**	**0**	**0**	**0**
Total (2024)	**1797260**	**2153**	**139929**	**2051**	**18524**	**10**	**78**

Table 2.3.2.1. Blue whiting. ICES estimated preliminary landings (tonnes) in 2025 by quarter and ICES division. Data submitted to InterCatch.

	Landings		
ICES div.	**Quarter 1**	**Quarter 2**	**Total**
27.2.a	7484	65085	72569
27.3.a		0	0
27.4.a	3236	52401	55637
27.4.b	0	0	0
27.5.a	62	172	234
27.5.b	77953	270950	348903
27.6.a	110363	133536	243898
27.6.b	53202		53202
27.7.b	15997		15997
27.7.c	134613	12	134625
27.7.d	0		0
27.7.h	41		41
27.7.j	164		164
27.7.k	290630		290630
27.8.a	92	1	93
27.8.d		0	0
27.9.a	344	392	736
27.14.b	28	9	37
Total	**694210**	**522557**	**1216767**

Table 2.3.2.2. Blue whiting. ICES estimated preliminary catches (tonnes), No. of samples, No. of fish measured and No. of fish aged by ICES division for 2025 preliminary data (quarters 1 and 2). Data submitted to InterCatch.

ICES Division	Catch (tonnes)	No. samples	No. Measured	No. Aged
27.2.a	72569	4	326	280
27.3.a	0	0	0	0
27.4.a	55637	0	0	0
27.4.b	0	0	0	0
27.5.a	234	0	0	0
27.5.b	348903	9	652	466
27.6.a	243898	35	6273	1822
27.6.b	53202	5	103	219
27.7.b	15997	2	326	148
27.7.c	134625	14	1563	886
27.7.d	0	0	0	0
27.7.h	41	0	0	0
27.7.j	164	0	0	0
27.7.k	290630	19	539	1006
27.8.a	93	0	0	0
27.8.d	0	0	0	0
27.9.a	736	4	400	392
27.14.b	37	0	0	0
Total	1216767	92	10182	5219

Table 2.3.2.3. Blue whiting. ICES estimates of catches (tonnes) in 2025, based on (initial) declared quotas and expected uptake estimated by WGWIDE.

	InterCatch					
Country	**Q1**	**Q2**	**Total (Q1+Q2)**	**Total 1st half**	**Expected catch 2025 2S**	**Total Catch 2025**
Denmark	47465	31315	78780	78780		78780
Faroe Islands	104552	233485	338037	338037	77314	415351
Germany	25526	15720	41246	41246	3300	44546
Iceland	72916	122050	194966	194966	98321	293287
Ireland	42486	11190	53676	53676		53676
Norway	302274	66291	368565	368565	22000	390565
Poland	22747	19575	42323	42323		42323
Portugal	344	392	736	736	800	1536
UK	75916	28399		104315	100	104415
Greenland				20977	26215	47192
Spain				9738	10712	20450
France				8547		8547
Netherlands				59150	24009	83159
Lithuania				14802		14802
Sweden				3148	400	3548
Russia				132463		148835
Total Geral	**694210**	**522557**	**1216767**	**1471471**		**1751013**

Table 2.3.2.4. Blue whiting. Comparison of preliminary and final catches (in tonnes) calculated from sum of product of catch number and mean weight at age used in the assessment).

	Final	**Preliminary**	**Change in % ***
2016	1180786	1147000	2.9
2017	1555069	1559437	-0.3
2018	1709856	1712874	-0.2
2019	1512026	1444301	4.7
2020	1460507	1478358	-1.2
2021	1139531	1242727	-8.3
2022	1035891	1107529	-6.5
2023	1735017	1672378	3.7
2024	1797260	1881072	-4.5

* **(final-preliminary)/preliminary*100**

Table 2.3.3.1. Blue whiting. Catch-at-age numbers (thousands) by year. Discards included since 2014. Values for 2025 are preliminary.

Year Age	1	2	3	4	5	6	7	8	9	10+
1981	258000	348000	681000	334000	548000	559000	466000	634000	578000	1460000
1982	148000	274000	326000	548000	264000	276000	266000	272000	284000	673000
1983	2283000	567000	270000	286000	299000	304000	287000	286000	225000	334000
1984	2291000	2331000	455000	260000	285000	445000	262000	193000	154000	255000
1985	1305000	2044000	1933000	303000	188000	321000	257000	174000	93000	259000
1986	650000	816000	1862000	1717000	393000	187000	201000	198000	174000	398000
1987	838000	578000	728000	1897000	726000	137000	105000	123000	103000	195000
1988	425000	721000	614000	683000	1303000	618000	84000	53000	33000	50000
1989	865000	718000	1340000	791000	837000	708000	139000	50000	25000	38000
1990	1611000	703000	672000	753000	520000	577000	299000	78000	27000	95000
1991	266686	1024468	513959	301627	363204	258038	159153	49431	5060	9570
1992	407730	653838	1641714	569094	217386	154044	109580	79663	31987	11706
1993	263184	305180	621085	1571236	411367	191241	107005	64769	38118	17476
1994	306951	107935	367962	389264	1221919	281120	174256	90429	79014	30614
1995	296100	353949	421560	465358	615994	800201	253818	159797	59670	41811
1996	1893453	534221	632361	537280	323324	497458	663133	232420	98415	82521
1997	2131494	1519327	904074	577676	295671	251642	282056	406910	104320	169235
1998	1656926	4181175	3541231	1044897	383658	322777	303058	264105	212452	85513
1999	788200	1549100	5820800	3460600	412800	207200	151200	153100	68800	140500
2000	1814851	1192657	3465739	5014862	1550063	513663	213057	151429	58277	139791
2001	4363690	4486315	2962163	3806520	2592933	585666	170020	97032	76624	66410
2002	1821053	3232244	3291844	2242722	1824047	1647122	344403	168848	102576	142743
2003	3742841	4073497	8378955	4824590	2035096	1117179	400022	121280	19701	27493
2004	2156261	4426323	6723748	6697923	3044943	1276412	649885	249097	75415	36805
2005	1427277	1518938	5083550	5871414	4450171	1419089	518304	249443	100374	55226
2006	412961	939865	4206005	6150696	3833536	1718775	506198	181181	67573	36688
2007	167027	306898	1795021	4210891	3867367	2353478	935541	320529	130202	88573

Year Age	1	2	3	4	5	6	7	8	9	10+
2008	408790	179211	545429	2917190	3262956	1919264	736051	315671	113086	126637
2009	61125	156156	231958	594624	1596095	1156999	592090	251529	88615	48908
2010	349637	222975	160101	208279	646380	992214	702569	256604	70487	43693
2011	162997	101810	63954	53863	69717	116396	120359	55470	25943	12542
2012	239667	351845	663155	141854	106883	203419	363779	356785	212492	157947
2013	228175	508122	848597	896966	462714	224066	321310	397536	344285	383601
2014	588717	584084	2312953	2019373	1272862	416523	386396	462339	526141	662747
2015	2944849	2852384	2427329	2465286	1518235	707533	329882	258743	239164	450046
2016	1239331	3518677	2933272	1874011	1367844	756824	339851	185368	131039	288635
2017	401947	1999011	7864694	4063916	1509651	777185	263007	110351	63945	149369
2018	418781	541041	3572357	7340084	2983975	1022883	424206	150753	90387	163289
2019	249923	433573	1288871	3778379	5037323	1645999	431925	145916	50622	81357
2020	1135859	834162	1106838	1797157	3072708	3041983	923392	235330	80440	64535
2021	2069387	830692	1266077	1214790	1438769	1404443	1360105	304891	100993	59441
2022	1927303	3265756	1640425	1370794	924112	746761	670201	616695	123772	85610
2023	486523	4789545	8518376	3102660	1077444	543404	457654	323731	448035	162480
2024	675735	1034024	7263006	6891011	1662877	628131	358959	262393	100824	186569
2025	895497	1345920	3068807	7463552	3864524	802661	370908	156559	99423	81661

Table 2.3.4.1. Blue whiting. Individual mean weight (kg) at age in the catch. Preliminary values for 2025.

Year Age	1	2	3	4	5	6	7	8	9	10+
1981	0.052	0.065	0.103	0.125	0.141	0.155	0.170	0.178	0.187	0.213
1982	0.045	0.072	0.111	0.143	0.156	0.177	0.195	0.200	0.204	0.231
1983	0.046	0.074	0.118	0.140	0.153	0.176	0.195	0.200	0.204	0.228
1984	0.035	0.078	0.089	0.132	0.153	0.161	0.175	0.189	0.186	0.206
1985	0.038	0.074	0.097	0.114	0.157	0.177	0.199	0.208	0.218	0.237
1986	0.040	0.073	0.108	0.130	0.165	0.199	0.209	0.243	0.246	0.257
1987	0.048	0.086	0.106	0.124	0.147	0.177	0.208	0.221	0.222	0.254
1988	0.053	0.076	0.097	0.128	0.142	0.157	0.179	0.199	0.222	0.260
1989	0.059	0.079	0.103	0.126	0.148	0.158	0.171	0.203	0.224	0.253

Year Age	1	2	3	4	5	6	7	8	9	10+
1990	0.045	0.070	0.106	0.123	0.147	0.168	0.175	0.214	0.217	0.256
1991	0.055	0.091	0.107	0.136	0.174	0.190	0.206	0.230	0.232	0.266
1992	0.057	0.083	0.119	0.140	0.167	0.193	0.226	0.235	0.284	0.294
1993	0.066	0.082	0.109	0.137	0.163	0.177	0.200	0.217	0.225	0.281
1994	0.061	0.087	0.108	0.137	0.164	0.189	0.207	0.217	0.247	0.254
1995	0.064	0.091	0.118	0.143	0.154	0.167	0.203	0.206	0.236	0.256
1996	0.041	0.080	0.102	0.116	0.147	0.170	0.214	0.230	0.238	0.279
1997	0.047	0.072	0.102	0.121	0.140	0.166	0.177	0.183	0.203	0.232
1998	0.048	0.072	0.094	0.125	0.149	0.178	0.183	0.188	0.221	0.248
1999	0.063	0.078	0.088	0.109	0.142	0.170	0.199	0.193	0.192	0.245
2000	0.057	0.075	0.086	0.104	0.133	0.156	0.179	0.187	0.232	0.241
2001	0.050	0.078	0.094	0.108	0.129	0.163	0.186	0.193	0.231	0.243
2002	0.054	0.074	0.093	0.115	0.132	0.155	0.173	0.233	0.224	0.262
2003	0.049	0.075	0.098	0.108	0.131	0.148	0.168	0.193	0.232	0.258
2004	0.042	0.066	0.089	0.102	0.123	0.146	0.160	0.173	0.209	0.347
2005	0.039	0.068	0.084	0.099	0.113	0.137	0.156	0.166	0.195	0.217
2006	0.049	0.072	0.089	0.105	0.122	0.138	0.163	0.190	0.212	0.328
2007	0.050	0.064	0.091	0.103	0.115	0.130	0.146	0.169	0.182	0.249
2008	0.055	0.075	0.100	0.106	0.120	0.133	0.146	0.160	0.193	0.209
2009	0.056	0.085	0.105	0.119	0.124	0.138	0.149	0.179	0.214	0.251
2010	0.052	0.064	0.110	0.154	0.154	0.163	0.175	0.187	0.200	0.272
2011	0.055	0.079	0.107	0.136	0.169	0.169	0.179	0.189	0.214	0.270
2012	0.041	0.072	0.098	0.141	0.158	0.172	0.180	0.185	0.189	0.203
2013	0.051	0.077	0.094	0.117	0.139	0.162	0.185	0.188	0.198	0.197
2014	0.049	0.078	0.093	0.112	0.128	0.155	0.178	0.190	0.202	0.217
2015	0.039	0.070	0.094	0.117	0.137	0.155	0.174	0.183	0.193	0.201
2016	0.047	0.066	0.084	0.107	0.125	0.142	0.152	0.167	0.184	0.206
2017	0.056	0.072	0.080	0.094	0.113	0.131	0.148	0.172	0.190	0.212
2018	0.055	0.080	0.091	0.098	0.111	0.129	0.142	0.165	0.175	0.216

Year Age	1	2	3	4	5	6	7	8	9	10+
2019	0.068	0.085	0.099	0.109	0.118	0.130	0.144	0.167	0.167	0.228
2020	0.063	0.084	0.099	0.115	0.127	0.135	0.144	0.161	0.176	0.207
2021	0.058	0.086	0.099	0.119	0.133	0.143	0.150	0.166	0.181	0.209
2022	0.048	0.067	0.086	0.106	0.122	0.136	0.141	0.152	0.155	0.189
2023	0.051	0.067	0.078	0.091	0.117	0.138	0.157	0.166	0.176	0.202
2024	0.053	0.076	0.083	0.094	0.112	0.139	0.155	0.161	0.157	0.184
2025	0.048	0.069	0.082	0.095	0.109	0.145	0.156	0.158	0.212	0.201

Table 2.3.5.1. Blue whiting. Natural mortality and proportion mature.

Age	0	1	2	3	4	5	6	7–10+
Proportion mature	0.00	0.11	0.40	0.82	0.86	0.91	0.94	1.00
Natural mortality	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20

Table 2.3.6.1.1. Blue whiting. Time-series of StoX abundance estimates of blue whiting (millions) by age in the IBWSS. Total biomass in last column (1000 t). Shaded values (ages 1-8; years 2004-2025) are used as input to the assessment

	Age										
Year	1	2	3	4	5	6	7	8	9	10+	TSB
2004	1097	5538	13062	15134	5119	1086	994	593	164	0	3505
2005	2129	1413	5601	7780	8500	2925	632	280	129	23	2513
2006	2512	2222	10858	11677	4713	2717	923	352	198	31	3517
2007	468	706	5241	11244	8437	3155	1110	456	123	58	3274
2008	337	523	1451	6642	6722	3869	1715	1028	269	284	2647
2009	275	329	360	1292	3739	3457	1636	587	250	162	1599
2010*											
2011	312	1361	1135	930	1043	1712	2170	2422	1298	250	1827
2012	1141	1818	6464	1022	596	1420	2231	1785	1256	1022	2347
2013	586	1346	6183	7197	2933	1280	1306	1396	927	1670	3110
2014	4183	1491	5239	8420	10202	2754	772	577	899	1585	3761
2015	3255	4565	1888	3630	1792	465	173	108	206	247	1405

	Age										
Year	1	2	3	4	5	6	7	8	9	10+	TSB
2016	2745	7893	10164	6274	4687	1539	413	133	235	256	2873
2017	275	2180	15939	10196	3621	1711	900	75	66	144	3135
2018	836	628	6615	21490	7692	2187	755	188	72	144	4035
2019	1129	1169	3468	9590	16979	3434	484	513	99	144	4198
2020**											
2021	1948	2095	2545	2275	3914	3197	3379	463	189	114	2357
2022	4461	9313	4830	5460	2587	1880	898	1764	71	178	2707
2023	873	8135	14771	2744	1352	711	520	202	508	67	2501
2024	729	2885	18767	10787	1843	577	518	487	42	41	3176
2025	650	2236	3598	12034	4741	546	203	88	37	41	2262

***Survey discarded. **No survey**

Table 2.3.6.2.1. Blue whiting. Estimated abundance of 1 and 2-year old blue whiting (millions) from the International Ecosystem Survey in Nordic Seas (IESNS), 2003–2025.

Year\Age	Age 1	Age 2
2003*	16127	9317
2004*	17792	11020
2005*	19933	7908
2006*	2512	5504
2007*	592	213
2008	25	17
2009	7	8
2010	0	280
2011	1613	0
2012	9476	3265
2013	454	6544
2014	3937	2030
2015	8563	2796
2016	4223	8089

Year\Age	Age 1	Age 2
2017	1236	2087
2018	441	1491
2019	3157	215
2020	2822	481
2021	10264	1500
2022	17169	10575
2023	3873	4792
2024	2326	969
2025	8249	1057

***Using the old TS-value. To compare the results all values were divided by approximately 3.1.**

Table 2.3.6.2.2. Estimated abundance of 1-group of blue whiting (millions) from the Norwegian winter survey (late January-early March) in the Barents Sea. Blue whiting < 19 cm in total body length, which most likely belong to 1-group. (Time series revised in 2023)

Year	All	< 19 cm
1994	65.43	0.04
1995	29.24	0.79
1996	1502.53	1461.18
1997	1671.57	1360.46
1998	85.99	17.28
1999	75.50	5.96
2000	644.59	554.44
2001	2365.41	1567.94
2002	1157.96	149.59
2003	826.79	192.15
2004	1834.75	676.71
2005	2072.79	722.10
2006	2322.05	26.96
2007	960.64	0.75
2008	162.36	0.17
2009	75.73	0.02
2010	29.63	0.44
2011	10.71	0.05
2012	768.68	752.68
2013	510.46	21.67
2014	227.63	172.10
2015	1227.69	1012.16
2016	701.67	95.35
2017	1299.24	6.36
2018	106.96	0.62
2019	110.02	55.22
2020	209.66	150.22
2021	964.32	828.96
2022	599.84	293.71
2023	343.02	23.59
2024	154.70	37.98
2025	673.38	453.38

Table 2.3.6.2.3. Blue whiting. 1-group indices of blue whiting from the Icelandic bottom-trawl survey, 1-group (< 22 cm in March).

Catch Rate	
Year	**< 22 cm**
1996	6.5
1997	3.4
1998	1.1
1999	6.3
2000	9
2001	5.2
2002	14.2
2003	15.4
2004	8.9
2005	8.3
2006	30.4
2007	3.9
2008	0.1
2009	1.6
2010	0.2
2011	10.8
2012	29.9
2013	11.7
2014	66.3
2015	43.8
2016	6.3
2017	1.8
2018	0.4
2019	0.1
2020	9.8
2021	79.6
2022	91.2

Catch Rate	
Year	**< 22 cm**
2023	6.8
2024	9.6
2025	88.7

Table 2.3.6.2.4. Blue whiting. 1-group indices of blue whiting from Faroese bottom-trawl survey, 1-group (<= 23 cm in March).

Catch Rate	
Year	**<= 23 cm**
1994	1401
1995	1162
1996	4821
1997	2307
1998	463
1999	1717
2000	863
2001	4424
2002	4480
2003	1038
2004	15749
2005	35159
2006	23105
2007	11568
2008	1268
2009	4362
2010	855
2011	23323
2012	8366
2013	13254
2014	70139
2015	34806
2016	21316
2017	4446

Catch Rate	
Year	**<= 23 cm**
2018	1890
2019	286
2020	141
2021	2224
2022	1781
2023	3075
2024	412
2025	7895

Table 2.4.1.1. Blue whiting. Parameter estimates, from final assessment (2025) and previous assessments (2021-2024).

Parameter	2021	2022	2023	2024	2025
Random walk variance					
-F Age 1-10	0.36	0.36	0.35	0.35	0.35
Process error					
-log(N) Age 1	0.61	0.62	0.66	0.64	0.62
--- Age 2-10	0.18	0.18	0.18	0.18	0.18
Observation variance					
-Catch Age 1	0.44	0.43	0.42	0.42	0.42
--- Age 2	0.28	0.27	0.27	0.27	0.27
--- Age 3-8	0.19	0.18	0.18	0.19	0.18
--- Age 9-10	0.38	0.37	0.37	0.37	0.37
-IBWSS Age 1	0.71	0.72	0.69	0.68	0.67
--- Age 2	0.33	0.33	0.32	0.32	0.34
--- Age 3	0.39	0.38	0.36	0.35	0.36
--- Age 4-6	0.37	0.35	0.37	0.38	0.37
--- Age 7-8	0.53	0.53	0.55	0.54	0.53
Survey catchability					
-IBWSS Age 1	0.06	0.06	0.06	0.06	0.06
--- Age 2	0.12	0.11	0.12	0.12	0.13

Parameter	2021	2022	2023	2024	2025
--- Age 3	0.37	0.36	0.37	0.38	0.39
--- Age 4	0.68	0.68	0.68	0.66	0.68
--- Age 5-8	0.89	0.88	0.89	0.85	0.85
Rho					
--	0.94	0.93	0.93	0.93	0.94

Table 2.4.1.2. Blue whiting. Mohn's rho by year and average over the last five years (n=5).

Last data year	R(age 1)	SSB	Fbar(3-7)
2020	-0.037	0.026	-0.032
2021	-0.296	-0.012	-0.016
2022	0.106	0.242	-0.239
2023	-0.071	0.155	-0.046
2024	0.013	0.229	-0.202
Rho mean	-0.057	0.128	-0.107

Table 2.4.1.3. Blue whiting. Estimated recruitment (R) in thousands, spawning-stock biomass (SSB) in tonnes, average fishing mortality for ages 3 to 7 (Fbar 3-7) and total-stock biomass (TSB) in tonnes. Preliminary catch data for 2025 are included. Low and High refer to the 95% confidence limits.

Year	R(age 1)	Low	High	SSB	Low	High	Fbar(3-7)	Low	High	TSB	Low	High
1981	3939691	2560733	6061220	2843972	2252142	3591327	0.26	0.191	0.354	3340997	2693619	4143964
1982	4654551	2997613	7227368	2297533	1840207	2868514	0.222	0.166	0.298	2765596	2252331	3395826
1983	18416221	12083460	28067886	1852455	1515509	2264316	0.256	0.194	0.338	2888871	2361772	3533608
1984	18224483	12059905	27540165	1755006	1457529	2113199	0.32	0.245	0.416	3097959	2510218	3823313
1985	9615504	6386519	14477045	2096350	1737088	2529914	0.357	0.277	0.46	3240768	2656346	3953768
1986	7228446	4832283	10812783	2276606	1890198	2742006	0.437	0.34	0.561	3119168	2595186	3748946
1987	9150810	6106371	13713109	1932922	1607341	2324452	0.42	0.326	0.541	2820217	2349647	3385029
1988	6388402	4260238	9579671	1637416	1372470	1953507	0.439	0.342	0.565	2425041	2028103	2899668
1989	8504294	5649558	12801535	1546386	1300198	1839188	0.527	0.411	0.674	2391333	1990686	2872615
1990	18916096	12407122	28839781	1359259	1133286	1630290	0.516	0.396	0.672	2506282	2012997	3120446
1991	8961887	5813077	13816334	1779343	1435286	2205876	0.29	0.216	0.39	3221791	2536466	4092282
1992	6703233	4396126	10221120	2457377	1956815	3085984	0.234	0.174	0.314	3525329	2810443	4422059
1993	4976337	3229540	7667944	2536514	2029010	3170956	0.205	0.153	0.275	3413583	2748926	4238946

Year	R(age 1)	Low	High	SSB	Low	High	Fbar(3-7)	Low	High	TSB	Low	High
1994	8127693	5320277	12416532	2528472	2044129	3127577	0.185	0.138	0.249	3410295	2781415	4181364
1995	9301009	6147826	14071440	2305713	1905021	2790685	0.241	0.183	0.318	3351185	2769334	4055286
1996	28218692	18686627	42613074	2208446	1842049	2647723	0.297	0.227	0.388	3732720	3048379	4570692
1997	45157783	29976746	68026910	2471692	2056831	2970230	0.301	0.231	0.392	5458258	4310674	6911351
1998	26757284	17854208	40099918	3686245	3025391	4491454	0.403	0.313	0.519	6833778	5487554	8510260
1999	20252915	13460170	30473656	4453039	3642643	5443727	0.388	0.301	0.501	7181519	5864215	8794734
2000	39112927	25955352	58940486	4243985	3537602	5091417	0.475	0.371	0.608	7467683	6114073	9120973
2001	55819717	37318888	83492326	4580040	3834472	5470575	0.465	0.363	0.596	9005544	7299819	11109840
2002	48273348	32284877	72179805	5401613	4515399	6461760	0.472	0.367	0.606	10296062	8379223	12651399
2003	51316123	34776219	75722564	6839438	5703596	8201476	0.499	0.394	0.632	11717602	9667520	14202421
2004	28595612	19397020	42156426	6711654	5669865	7944862	0.537	0.426	0.677	10252334	8623149	12189324
2005	21988288	14937580	32367009	5974618	5058314	7056909	0.502	0.396	0.637	8423401	7122720	9961601
2006	8897990	5980536	13238652	5867072	4956660	6944705	0.455	0.357	0.581	7687190	6503407	9086452
2007	4680714	3150185	6954857	4656773	3923802	5526663	0.456	0.354	0.587	5671531	4792091	6712364
2008	5610274	3725628	8448287	3573977	2973053	4296362	0.404	0.306	0.534	4367764	3652003	5223807
2009	5452063	3526949	8427963	2727634	2215926	3357507	0.263	0.195	0.356	3413389	2794934	4168694
2010	14587776	9619647	22121728	2652233	2116822	3323067	0.183	0.133	0.253	3677920	2964523	4562992
2011	18715371	12470889	28086619	2654782	2135683	3300052	0.054	0.037	0.077	4315487	3475656	5358249
2012	19020408	12886753	28073474	3375645	2785721	4090495	0.113	0.085	0.15	5006726	4128288	6072083
2013	15544186	10567274	22865097	3707535	3116036	4411315	0.197	0.152	0.257	5482107	4590551	6546816
2014	35518806	24012188	52539386	3940046	3349990	4634034	0.38	0.295	0.49	6470452	5407448	7742422
2015	61604941	41926681	90519178	4068434	3460736	4782842	0.499	0.393	0.634	7882906	6470251	9603986
2016	33665082	22960977	49359299	4764351	3992764	5685044	0.443	0.347	0.565	8799102	7215233	10730658
2017	11381798	7702318	16819006	5886534	4900190	7071415	0.424	0.332	0.541	8497460	7067705	10216446
2018	11748402	8006740	17238593	5756364	4819546	6875279	0.434	0.34	0.555	7597074	6390071	9032066
2019	13001545	8724980	19374277	4937145	4160063	5859382	0.404	0.315	0.518	6723750	5692753	7941468
2020	21755724	14512222	32614683	4027164	3416909	4746410	0.463	0.363	0.592	6154076	5170411	7324883
2021	60179132	39852541	90873201	3719745	3158242	4381078	0.427	0.334	0.547	7932063	6278417	10021255
2022	62458426	40660627	95941831	4090814	3352390	4991889	0.436	0.338	0.562	9154812	7079117	11839130

Year	R(age 1)	Low	High	SSB	Low	High	Fbar(3-7)	Low	High	TSB	Low	High
2023	19403589	11941801	31527846	5502534	4356146	6950613	0.544	0.417	0.708	9288660	7158660	12052423
2024	18832298	10641616	33327217	5705454	4315112	7543769	0.599	0.426	0.842	8243148	6119812	11103199
2025	16882248	7522505	37887684	4452022	3039038	6521967	0.675	0.399	1.143	6391200	4269662	9566903
2026	22062028*			3507038^								

***assuming GM(1996-2024) recruitment in 2026**

^SSB calculated from the survivors age 2-10 and GM(1996-2024) recruitment in 2026

Table 2.5.1. Blue whiting. Estimated fishing mortalities. Catch data for 2025 are preliminary.

Year	1	2	3	4	5	6	7	8	9	10+
1981	0.077	0.117	0.172	0.214	0.247	0.32	0.348	0.443	0.481	0.481
1982	0.066	0.101	0.149	0.185	0.211	0.273	0.295	0.373	0.402	0.402
1983	0.077	0.115	0.171	0.212	0.242	0.316	0.339	0.42	0.444	0.444
1984	0.094	0.14	0.211	0.265	0.306	0.397	0.419	0.509	0.528	0.528
1985	0.099	0.148	0.229	0.295	0.347	0.447	0.466	0.562	0.576	0.576
1986	0.112	0.167	0.269	0.358	0.431	0.552	0.574	0.693	0.704	0.704
1987	0.1	0.15	0.249	0.339	0.416	0.537	0.56	0.675	0.676	0.676
1988	0.098	0.148	0.254	0.35	0.437	0.57	0.586	0.693	0.678	0.678
1989	0.113	0.171	0.304	0.42	0.523	0.679	0.707	0.837	0.804	0.804
1990	0.105	0.159	0.293	0.409	0.51	0.66	0.707	0.843	0.813	0.813
1991	0.059	0.089	0.168	0.235	0.289	0.365	0.392	0.463	0.449	0.449
1992	0.048	0.073	0.14	0.196	0.234	0.287	0.311	0.37	0.363	0.363
1993	0.042	0.063	0.126	0.176	0.207	0.248	0.269	0.32	0.315	0.315
1994	0.036	0.055	0.113	0.161	0.187	0.222	0.243	0.293	0.287	0.287
1995	0.046	0.07	0.149	0.215	0.244	0.286	0.313	0.382	0.368	0.368
1996	0.055	0.085	0.184	0.27	0.298	0.349	0.383	0.471	0.45	0.45
1997	0.054	0.084	0.187	0.278	0.302	0.352	0.384	0.475	0.454	0.454
1998	0.069	0.11	0.248	0.377	0.407	0.473	0.509	0.625	0.59	0.59
1999	0.064	0.102	0.235	0.365	0.397	0.459	0.484	0.591	0.558	0.558
2000	0.074	0.118	0.277	0.44	0.495	0.574	0.588	0.701	0.664	0.664
2001	0.07	0.112	0.264	0.426	0.491	0.57	0.575	0.678	0.644	0.644

Year	1	2	3	4	5	6	7	8	9	10+
2002	0.065	0.106	0.252	0.416	0.501	0.592	0.597	0.698	0.666	0.666
2003	0.068	0.109	0.263	0.437	0.539	0.629	0.627	0.706	0.669	0.669
2004	0.069	0.111	0.272	0.46	0.585	0.684	0.686	0.75	0.712	0.712
2005	0.061	0.098	0.242	0.42	0.551	0.644	0.653	0.702	0.668	0.668
2006	0.052	0.085	0.212	0.372	0.502	0.588	0.601	0.635	0.605	0.605
2007	0.049	0.081	0.202	0.36	0.5	0.596	0.622	0.655	0.627	0.627
2008	0.043	0.071	0.178	0.314	0.443	0.527	0.561	0.588	0.57	0.57
2009	0.028	0.047	0.117	0.203	0.287	0.34	0.369	0.385	0.375	0.375
2010	0.02	0.034	0.083	0.141	0.2	0.235	0.257	0.263	0.257	0.257
2011	0.006	0.01	0.025	0.042	0.058	0.068	0.075	0.077	0.076	0.076
2012	0.012	0.021	0.054	0.088	0.122	0.142	0.16	0.167	0.167	0.167
2013	0.02	0.036	0.093	0.155	0.215	0.246	0.279	0.293	0.294	0.294
2014	0.037	0.068	0.181	0.301	0.413	0.47	0.535	0.565	0.565	0.565
2015	0.048	0.089	0.238	0.398	0.543	0.62	0.697	0.733	0.731	0.731
2016	0.041	0.077	0.207	0.352	0.48	0.554	0.621	0.65	0.648	0.648
2017	0.039	0.074	0.2	0.341	0.462	0.53	0.587	0.608	0.609	0.609
2018	0.039	0.074	0.202	0.35	0.473	0.543	0.604	0.62	0.624	0.624
2019	0.035	0.068	0.187	0.327	0.441	0.503	0.561	0.57	0.575	0.575
2020	0.04	0.077	0.214	0.377	0.507	0.574	0.645	0.655	0.66	0.66
2021	0.036	0.07	0.197	0.35	0.467	0.527	0.595	0.609	0.615	0.615
2022	0.037	0.071	0.2	0.358	0.475	0.533	0.611	0.633	0.642	0.642
2023	0.045	0.088	0.251	0.451	0.592	0.661	0.763	0.808	0.824	0.824
2024	0.048	0.094	0.272	0.49	0.649	0.731	0.851	0.906	0.923	0.923
2025	0.054	0.106	0.305	0.547	0.728	0.828	0.969	1.031	1.046	1.046

Table 2.5.2. Blue whiting. Estimated stock numbers-at-age (thousands). Preliminary catch data for 2025 have been used

Year	1	2	3	4	5	6	7	8	9	10+
1981	3939691	3491795	4832053	2059502	2602045	2136348	1643463	1743728	1233229	2984125
1982	4654551	2961711	2516330	3270012	1575371	1491709	1290112	1012121	891435	1949500

Year	1	2	3	4	5	6	7	8	9	10+
1983	18416221	3784215	1879165	1816907	1896240	1212166	1008239	851032	627202	1260336
1984	18224483	14582601	2448551	1233644	1259744	1389617	811164	548107	479854	925385
1985	9615504	13616567	9802227	1455763	750131	910105	744159	457350	264822	722249
1986	7228446	6421381	9437618	5552779	945406	452792	468976	374880	230820	498655
1987	9150810	5059933	4090939	6856729	2568709	396220	253452	236969	156168	293155
1988	6388402	6881454	3521487	2877802	3715934	1268124	199274	125605	98691	169961
1989	8504294	4615089	4987842	2426299	2129608	1686826	352390	103027	60557	114972
1990	18916096	5994376	3093613	2730789	1482804	1190611	563345	121224	33324	85497
1991	8961887	15644814	4267102	1789401	1490126	874223	564983	190551	32519	45596
1992	6703233	7382301	12483653	3302317	1261123	792648	488479	289111	102534	39419
1993	4976337	5118668	5278388	9691987	2256381	975986	518169	283525	157998	74802
1994	8127693	3416215	4063287	3395094	6901127	1435188	763956	328001	207879	116674
1995	9301009	5873706	3141491	2568795	2845601	3731441	1037733	543724	220178	185067
1996	28218692	7107693	4086053	2397622	1550417	1856370	2233941	644904	306373	248869
1997	45157783	21396720	5509618	2576253	1418366	1065115	1059666	1213787	288541	335918
1998	26757284	37861894	16492110	3510913	1376999	924573	778983	604053	615229	292018
1999	20252915	20566632	27703493	10597945	1716305	774348	519850	411095	236589	427484
2000	39112927	15295911	16622756	15886749	4357345	1110539	472052	324504	153897	313773
2001	55819717	31406600	12106299	10790359	7496779	1704667	490581	228175	163777	178720
2002	48273348	45084936	20391268	8343511	5489616	3415520	692065	255509	103501	155132
2003	51316123	38507327	34874394	13603825	5093455	2985569	1211805	348132	89041	107059
2004	28595612	40287643	29694972	20862060	7318268	2482781	1322017	505675	152805	80628
2005	21988288	21569699	27750122	17972865	10818382	3262441	1117218	517180	193435	99104
2006	8897990	15175047	21995691	19207324	9520455	4500166	1368600	487465	219241	120433
2007	4680714	5801663	12891145	15816565	10362814	4738503	1852343	614783	231361	163976
2008	5610274	3238297	4215507	10898207	9182498	4950897	1874396	762606	238214	201882
2009	5452063	3790250	2293314	3610219	6909243	4732709	2208651	861121	327111	190216
2010	14587776	4782215	2268670	1801324	3321155	4328325	2842938	1205600	414299	266922
2011	18715371	12558648	3185081	1614290	1595999	2590997	2687062	1354201	814182	390503
2012	19020408	14824134	12043568	2253850	1179462	1608295	2324129	2108698	1077179	897047

Year	1	2	3	4	5	6	7	8	9	10+
2013	15544186	15707686	11330920	7205452	2210222	1086975	1371187	1632939	1339360	1375360
2014	35518806	12221579	13616232	7844030	4338868	1340774	928679	998236	1013442	1483544
2015	61604941	30560247	10465535	8332509	4185456	1736344	735148	519562	482697	1052760
2016	33665082	54184817	20630551	7478241	4289445	1804718	703553	351094	221475	590171
2017	11381798	26788346	43560261	14651384	4475295	2137222	734299	281571	159552	370084
2018	11748402	8780964	21313555	28330352	8591136	2442230	931252	309458	140116	258568
2019	13001545	8615684	8231907	14262377	15956867	4490113	1103629	396676	134215	188681
2020	21755724	10557090	6323935	6301004	8225187	7680588	2086789	539641	186493	150088
2021	60179132	15462232	7855928	4299720	4085769	3757658	3474015	766741	250132	147037
2022	62458426	52157505	10852693	5273315	2654270	2084133	1624944	1562000	330509	193965
2023	19403589	55454067	37278884	7660065	2730746	1366679	1026795	618662	703416	239824
2024	18832298	16348696	38425302	20535773	3680820	1262761	655861	467759	196776	332367
2025	16882248	15517256	12678156	22052955	9063123	1445484	576805	240961	158351	155857
2026	22062028*	13092326	11430712	7648887	10444445	3583782	517197	179281	70346	90378

***assuming GM(1996-2024) recruitment in 2026.**

Table 2.5.3. Blue whiting. Model estimate of total catch weight (in tonnes) and Sum of Product of catch number and mean weight at age for ages 1-10+ (Observed catch). Preliminary catch data for 2025 are included.

Year	Estimate	Low	High	Observed catch
1981	787353	570776	1086109	922980
1982	544169	417224	709737	550643
1983	510464	397610	655351	553344
1984	559158	434878	718956	615569
1985	636818	503071	806123	678214
1986	761649	602362	963056	847145
1987	640148	506336	809322	654718
1988	568262	450186	717308	552264
1989	617301	492035	774459	630316
1990	554553	439212	700185	558128
1991	407522	318964	520667	364008
1992	439114	348161	553828	474592

Year	Estimate	Low	High	Observed catch
1993	440690	347860	558291	475198
1994	426650	335101	543211	457696
1995	507600	404724	636626	505176
1996	597131	476213	748753	621104
1997	643111	508812	812858	639681
1998	1075543	846136	1367147	1131955
1999	1244677	975333	1588402	1261033
2000	1498760	1182390	1899781	1412449
2001	1560982	1232259	1977397	1771805
2002	1718943	1356058	2178938	1556955
2003	2195294	1739456	2770587	2365319
2004	2312076	1839660	2905808	2400795
2005	1994653	1589800	2502605	2018344
2006	1852353	1476594	2323734	1956239
2007	1557788	1239845	1957264	1612269
2008	1170832	925458	1481262	1251851
2009	655638	517217	831104	634978
2010	473702	368185	609459	539539
2011	138037	102684	185562	103771
2012	326393	260151	409502	375692
2013	589779	469756	740468	613863
2014	1099415	871654	1386690	1147650
2015	1332051	1063709	1668089	1390656
2016	1236690	985156	1552448	1180786
2017	1472163	1170569	1851463	1555069
2018	1697044	1343197	2144106	1709856
2019	1528075	1208079	1932831	1512026
2020	1420484	1127898	1788970	1460507
2021	1145430	916289	1431873	1139531

Year	Estimate	Low	High	Observed catch
2022	1077447	858651	1351995	1035891
2023	1580496	1252732	1994017	1735017
2024	1932627	1524640	2449788	1789724
2025	1879263	1463226	2413593	1751013

Table 2.8.2.1.1. Blue whiting. Input to short-term projection (median values for exploitation pattern and stock numbers). Mean weight in 2026+ is the average weight for 2023-2025.

Age	Mean weight in the stock and catch (kg) in 2025	Mean weight in the stock and catch (kg) in 2026+	Proportion mature	Natural mortality	Exploitation pattern	Stock number (2026) (thousands)
Age 1	0.048	0.051	0.11	0.2	0.08	22062028
Age 2	0.069	0.071	0.4	0.2	0.156	17109289
Age 3	0.082	0.081	0.82	0.2	0.452	11430712
Age 4	0.095	0.093	0.86	0.2	0.81	7648887
Age 5	0.109	0.113	0.91	0.2	1.078	10444445
Age 6	0.145	0.141	0.94	0.2	1.226	3583782
Age 7	0.156	0.156	1	0.2	1.434	517197
Age 8	0.158	0.162	1	0.2	1.527	179281
Age 9	0.212	0.182	1	0.2	1.549	70346
Age 10+	0.201	0.196	1	0.2	1.549	90378

Table 2.8.2.1.2. Blue whiting. Deterministic forecast, intermediate year assumptions and recruitments.

Variable	Value	Notes
F ages 3-7 (2025)	0.675	From the assessment (based on assumed 2025 catches)
SSB (2026)	3645041	From the forecast; in tonnes
R age 1 (2025)	22062028	GM (1996–2024); in thousands
R age 1 (2026-2027)	22062028	GM (1996–2024); in thousands
Total catch (2025)	1751013	As estimated by ICES, based on declared national quotas and expected uptake; in tonnes

Table 2.8.2.2.1. Blue whiting. Deterministic forecast (weights in tonnes).

	Catch (2026)	F (2026)	SSB (2027)	% SSB change*	% Catch change**	% Advice change***
Long-term management strategy ($F=F_{MSY}$)	851344	0.32	3838995	5.3	-51	-41
MSY approach: F_{MSY}	851344	0.32	3838995	5.3	-51	-41
F = 0	0	0	4669000	28	-100	-100
F_{pa}	851344	0.32	3838995	5.3	-51	-41
SSB (2027) = B_{lim} ^	3447737	2.8	1499996	-59	97	138
SSB (2027 = B_{pa} = MSY $B_{trigger}$ ^	2556488	1.44	2250006	-38	46	77
F = F (2025)	1561172	0.68	3162004	-13.3	-10.8	7.9
SSB (2027) = SSB (2026) ^	1052983	0.41	3645039	-0.000055	-40	-27
Catch (2026) = Catch (2025) ^	1751035	0.79	2984052	-18.1	0.00126	21
Catch (2026) = Catch (2025) -20 %	1400817	0.59	3313434	-9.1	-20	-3.2
Catch (2026) = Catch (2025) +25%	2188766	1.1	2580336	-29	25	51
Catch (2026) = Advice (2025) -20 %	1157645	0.46	3544843	-2.7	-34	-20
Catch (2026) = Advice (2025) +25%	1808788	0.83	2930237	-19.6	3.3	25
F = 0.05	149319	0.05	4522299	24	-91	-90
F = 0.1	292140	0.1	4382391	20	-83	-80
F = 0.15	428794	0.15	4248925	16.6	-76	-70
F = 0.16	455412	0.16	4222976	15.9	-74	-69
F = 0.17	481799	0.17	4197268	15.2	-72	-67
F = 0.18	507956	0.18	4171799	14.5	-71	-65
F = 0.19	533886	0.19	4146567	13.8	-70	-63
F = 0.2	559591	0.2	4121569	13.1	-68	-61
F = 0.21	585074	0.21	4096803	12.4	-67	-60
F = 0.22	610337	0.22	4072267	11.7	-65	-58
F = 0.23	635382	0.23	4047957	11.1	-64	-56
F = 0.24	660212	0.24	4023872	10.4	-62	-54
F = 0.25	684828	0.25	4000009	9.7	-61	-53
F = 0.26	709233	0.26	3976365	9.1	-59	-51
F = 0.27	733428	0.27	3952940	8.4	-58	-49

	Catch (2026)	F (2026)	SSB (2027)	% SSB change*	% Catch change**	% Advice change***
F = 0.28	757417	0.28	3929729	7.8	-57	-48
F = 0.29	781201	0.29	3906731	7.2	-55	-46
F = 0.3	804782	0.3	3883945	6.6	-54	-44
F = 0.31	828163	0.31	3861366	5.9	-53	-43
F = 0.32	851344	0.32	3838995	5.3	-51	-41
F = 0.33	874330	0.33	3816827	4.7	-50	-40
F = 0.34	897120	0.34	3794861	4.1	-49	-38
F = 0.35	919718	0.35	3773096	3.5	-47	-36
F = 0.45	1135523	0.45	3565992	-2.2	-35	-22
F = 0.5	1236852	0.5	3469247	-4.8	-29	-14.5

*** SSB 2027 relative to SSB 2026.**

**** Catch 2026 relative to expected catch in 2025 (1 751 013 tonnes).**

***** Catch 2026 relative to advice for 2025 (1 447 054 tonnes).**

^ SSB2027 and Catch2026 values are the closest available approximation to either Blim, Bpa, Btrigger, SSB2026, or target catches.

Table 2.8.2.3.1. Blue whiting. Stock numbers at age estimated by WGWIDE 2025 as a ratio of stock numbers at age estimated by WGWIDE 2024.

Age	2021	2022	2023	2024	2025
1	0.88	0.84	0.82	1.13	0.96
2	0.92	0.87	0.83	0.79	1.18
3	0.94	0.91	0.85	0.79	0.81
4	0.96	0.94	0.89	0.78	0.69
5	0.99	0.96	0.94	0.82	0.64
6	0.99	0.98	0.91	0.94	0.69
7	0.99	0.99	1.01	0.70	0.98
8	0.96	0.95	0.94	1.19	0.67
9	0.95	0.92	0.89	0.82	1.00
10	0.92	0.90	0.85	0.74	0.54

Table 2.8.2.3.2. Blue whiting. Stock numbers at age multiplied by weight at age, estimated by WGWIDE 2025 as a ratio of stock numbers at age multiplied by weight at age estimated by WGWIDE 2024.

Age	2021	2022	2023	2024	2025
1	0.88	0.84	0.82	1.54	1.06
2	0.92	0.87	0.83	0.89	1.25
3	0.94	0.91	0.85	0.83	0.81
4	0.96	0.94	0.89	0.80	0.66
5	0.99	0.96	0.94	0.82	0.61
6	0.99	0.98	0.91	0.93	0.70
7	0.99	0.99	1.01	0.72	1.02
8	0.96	0.95	0.94	1.17	0.68
9	0.95	0.92	0.89	0.74	1.08
10	0.92	0.90	0.85	0.69	0.54

Table 2.8.2.3.3. Blue whiting. Deterministic forecast, intermediate year assumptions and recruitments used in previous and current assessment.

	WGWIDE 2024		WGWIDE 2025	
	Year	Value	Year	Value
F	2024	0.514	2025	0.675
SSB	2025	5 966 970	2026	3 645 041
Assumed recruitment	2024	16 667 202	2025	22 062 028
	2025–2026	22 993 253	2026–2027	22 062 028
Catch	2024	1 881 072	2025	1 751 013

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