

Northern Fishing Alliance

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6th November 2022

Anglerfish (*Lophius budegassa*, *Lophius piscatorius*) in subareas 4 and 6, and in Division 3.a (North Sea, Rockall and West of Scotland, Skagerrak and Kattegat)

Dear XXXX

The Northern Fishing Alliance¹ met recently to discuss the advice on the above-mentioned anglerfish stock. What became apparent at that meeting, notwithstanding the severity of the advice, was that every piece of information on the stock points to a return to normal levels of abundance.

Estimates from the Scottish Irish Anglerfish Megrim Industry Science Survey (SIAMISS) in both North Sea and west of Shetland, and in the North Sea IBTS survey show abundance and catch rates greater in 2022 relative to 2021. In addition, the analyses of logbook data by two Producer Organisations (POs) gives further support to the logic that a decrease of 30% for the years 2023 and 2024 is wholly unjustified.

There is no escaping the data deficient status of the stock, yet there is a way of avoiding the automatic output of the ICES process. Applying the ICES framework for category 3 stocks at a time when so many variables, such as incomplete surveys and a recent anomalous upward spike in the biomass, are at play, requires managers to carefully examine the evidence. This we believe, shows that the stock is returning to normal levels of abundance. Survey trends have decreased from the relatively high abundances seen in 2017-18, but from 2019 onwards the abundance looks steady, which is at odds with the picture of continuous decline that the advice in recent years would suggest.

¹ Northern Fishing Alliance is currently made up of catching sector representatives from the UK, Norway, Denmark, Germany, Belgium, and France.

Looking at the assumptions made around the average calculations for the indices, and how 2020 missing point is accounted for, the concern of an underestimation of the ratio between Index A and B emerges. While it would be logical to consider the value for 2020 sitting somewhere between 2019 and 2021 points, making this average more realistic to be considered, the actual values used are those for 2018 and 2019, evidently too high. Looking at the trends, a much more realistic value would have been the 2019-2021 average.

Danish fishers are avoiding traditional fishing grounds to prevent anglers from becoming a choke species and at least one of the larger vessels have shifted their trawl to a model that is less efficient in catching anglers.

It is against this backdrop that we urge managers to take account of the full breadth of information at hand rather than accepting the output of an approach that can take no account of anomalies in the biomass or incomplete information.

It is our view that a cut in the TAC of 30% for two years is not supported by a detailed consideration of the evidence at hand, but the result of a formulaic application of advice rules. As with cod throughout 2022, fishermen will encounter more anglers on the grounds but have significantly less quota available to them. Taking also into account the advised catch increases for associated stocks in the mixed fisheries, a 30% cut would likely generate a dysfunctional management outcome by creating a choke with associated loss of visibility of catches. With survey trends looking broadly similar since 2019 and catch rates the same or above previous years there is truly something wrong when the TAC advice points to a tonnage that would be the lowest in over 20 years.

The annex to this short note sets out in more detail the points raised above.

Yours Sincerely

Michael Park

Mike Park
On behalf of the Northern Fishing Alliance

Annex

ICES Anglerfish Advice 2023

Key Points

- ◆ The principal reason that ICES has advised a 30% cut in the monkfish TAC is the substantial decrease in the stock size from 2018/19 to 2021/22.
- ◆ But the abundance of monkfish in 2018 (and perhaps 2019) was inflated by a period of unusually high abundances from 2015 to 2018.
- ◆ Arguably, the decline in monkfish abundance after 2017 (and in 2018 and 2019) represents a return to more 'normal' levels of abundance, rather than an undesirable decline that should be reversed.
- ◆ The weaknesses in the 2022 survey do not appear to have contributed to the advised cut in monkfish TAC.
- ◆ The formula used by ICES to calculate its advice appears to require a cut in the TAC even if the stock size remains unchanged.
- ◆ The monkfish quota had been cut by 55% since 2019. A further 30% cut would take the cumulative reduction to more than two-thirds.

1. Trends in Monkfish Abundance

The biomass of northern shelf² monkfish (Figure 1) is estimated from the Scottish Irish Anglerfish and Megrin Industry Science Survey (SIAMISS) which has been carried out annually since 2005.

During the first 10 years of the survey the estimated abundance of monkfish remained relatively steady, generally fluctuating between about 35,000 and 50,000 tonnes (average = 42,500 tonnes). The estimated abundance increased substantially in 2015 (by 28%) and again in 2016 and 2017, reaching a peak of 88,000 tonnes, double the average biomass prior to 2015.

After the 2017 peak the estimated biomass decreased in 2018 and 2019. The survey was not completed in 2020 due to the Covid-19 pandemic but the estimated biomass in 2021 was about 48,000 tonnes, above the 2005-14 average. The 2022 survey did not cover Rockall (due to a breakdown of the research vessel) and apparently collected fewer samples in the North Sea (Figure 2).

ICES estimated values for the missing data from Rockall and the overall estimated biomass in 2022 was about 15% greater than that in 2021. The incomplete 2022 survey did not in itself result in a lower estimate of monkfish abundance in 2022.

² 'Norther Shelf' = ICES subareas 4 (North Sea), VIa (West of Scotland), VIb (Rockall) and division 3a (Skagerrak & Kattegat).

Northern Shelf Monkfish

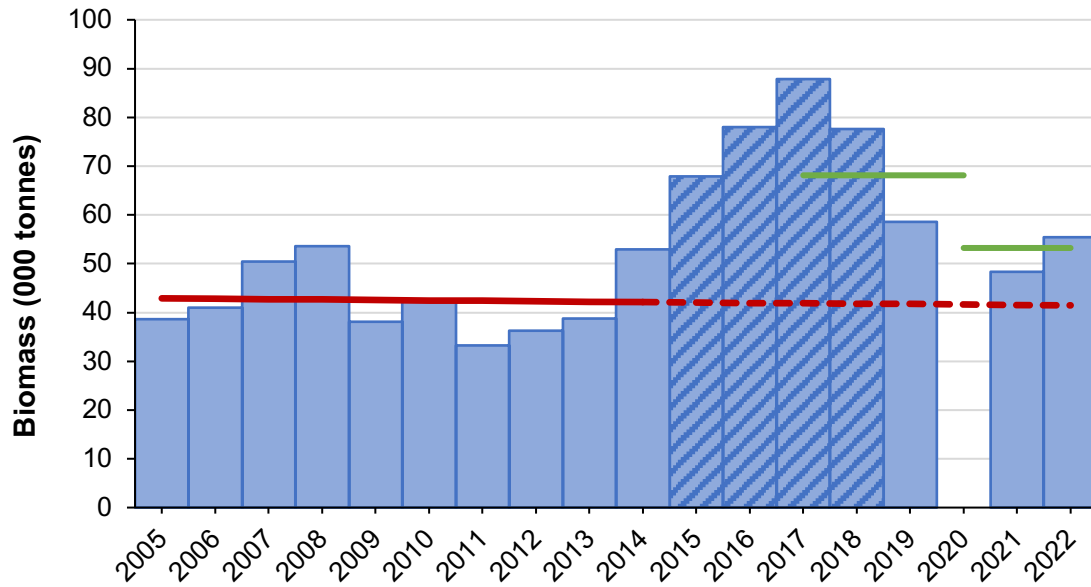


Figure 1 The estimated stock biomass of northern shelf monkfish from 2005 to 2022 (SIAMISS survey). The horizontal red line indicates the trend in biomass from 2005 to 2014 and is projected forward to 2022 (dashed). The years of unusually high abundance (the ‘monkfish outburst’) are indicated. ICES advice is based on the average biomasses in 2018-20 and 2021-22 (indicated by horizontal orange lines).

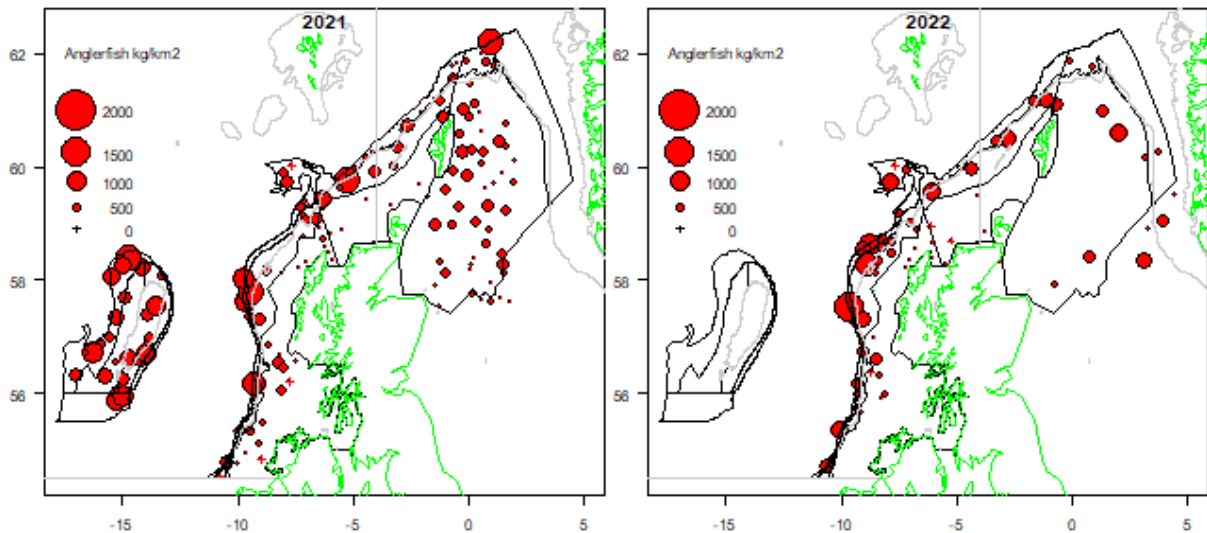


Figure 2 The weight of monkfish (kg per km²) observed by SIAMISS surveys in 2021 and 2022. Note the lack of coverage of the Rockall area and the apparently smaller number of samples in the North Sea in 2022. (From ICES WG report.)

2. The Basis of ICES Advice

ICES advice is based on several parameters, including a biomass safeguard, a 'precautionary multiplier', and the observed average length of the fish caught in the commercial fishery (see Appendix).

Most significantly, the advice depends on the difference between the average of the last two annual estimates of abundance and the average of the three estimates before that (essentially on the trend in abundance over the previous five years).

Thus, the 2023 advice is based on the difference between the average biomass in 2021 and 2022 (53,222 tonnes) and the average biomass in 2018 and 2019 (68,118 tonnes). (It should have been the average over 2018, 2019 and 2020 but no value was available for 2020 as no survey was carried out that year.)

The difference between these biomass estimates (53,222 t. v. 68,118 t.) feeds through the ICES calculation to result in a large cut in the recommended TAC for 2023. (The advice calculation results in a recommended cut of 35% but that is capped at 30% by a 'stability clause'.)

3. Alternative Interpretation

ICES advice calculation interprets the difference between the biomasses in 2018-19 and 2021-22 as a large fall in the abundance of monkfish but ignores the fact that this decline followed a previous large increase in abundance.

The estimated abundance of monkfish increased substantially from 2015 to 2017, to a level about double the average over the previous decade (see Figure 1). Although it fell somewhat in 2018 the estimated abundance in that year (77,700 tonnes) remained well above the long-term average.

ICES advice calculation appears to treat the high abundances of monkfish from 2015 to 2018 as 'normal' and interprets the fall in abundance after 2017 as an undesirable decline that should be reversed.

An alternative interpretation is that the abundance of monkfish was unusually high during the period from 2015 to 2018 but that this does not reflect the 'normal' abundance of northern shelf monkfish. Therefore, the decline after 2018 can be seen as a return to more 'normal' levels of abundance rather than as an undesirable and reversible 'decline'.

The 'unusually' high abundance of monkfish in 2018 (and perhaps to a lesser extent in 2019) appears to have distorted ICES perception of the state of the monkfish stock. By (apparently) uncritically using the inflated 2018-19 abundance in their advice calculation they have produced advice that does not reflect the true state of the monkfish stock in 2022.

Anglerfish Abundance 2021 – 2022

4. A summary of Industry and Survey Information

Evidence from several sources indicates that the abundance of anglerfish (monkfish) in the North Sea and West of Scotland area (ICES subareas IV and VI) increased from 2021 to 2022 (Figure 3):

- ◆ The estimated abundance of anglerfish in subareas IV and VI increased by 15% (SIAMISS survey; page 6).
- ◆ The estimated abundance of anglerfish in the North Sea (subarea IV) increased by 34% (SIAMISS survey; page 6).
- ◆ The average catch rate of anglerfish in the North Sea IBTS survey increased by 13% (page 9).
- ◆ The overall average catch rate of anglerfish in the north-western North Sea by nine SFPO member fishing boats was 19% higher during the first six months of 2022 than in the same period of 2021 (page 9).
- ◆ The overall average catch rate of anglerfish in the Northern Shelf Area by nine SFO member fishing boats was 8% higher during the first five months of 2022 than in the same period of 2021 (page 11).

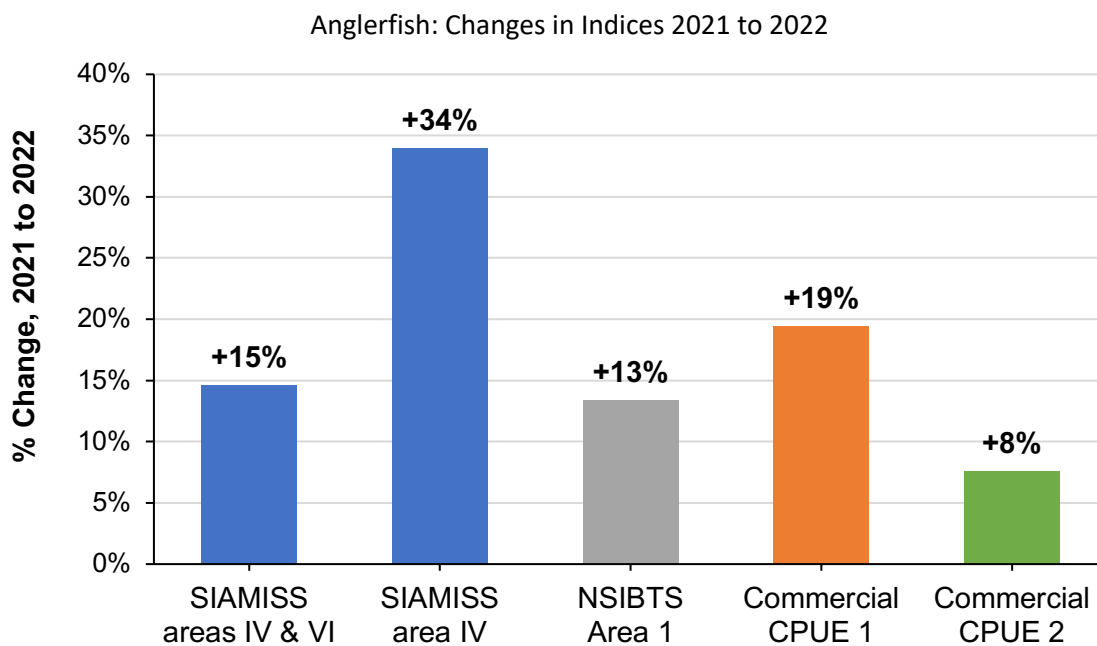


Figure 3 The percentage changes from 2021 to 2022 in various indices of anglerfish abundance. See text for details.

5. SIAMISS Survey

Estimates from the Scottish Irish Anglerfish Megrim Industry Science Survey (SIAMISS) show that the total biomass of anglerfish in the North Sea, West of Scotland and Rockall areas (ICES subareas IV and VI) generally fluctuated about 40,000 tonnes between 2005 and 2013 (Figure 4) before increasing to a peak in 2017. Thereafter it declined in 2018 and 2019. There was no survey in 2020 (due to COVID) but the estimated biomass increased from 2021 to 2022 (by 15%).

The advised cut in the anglerfish quota in 2023 is based on the difference between the average estimated biomasses in the periods 2018 to 2020 and 2021 to 2022 (Figure 4). As noted above, however, the estimated biomass declined after the 'spike' in around 2017 and the decline from 2018-2020 to 2021-2022 arguably represents a return towards 'normal' levels of abundance rather than a long-term decline.

The estimated abundance of anglerfish increased by 15% from 2021 to 2022. Abundances in both were above the pre-2014 long-term average and above the MSY $B_{trigger}$ proxy.

Over the 10 years from 2013 to 2022 the total estimated abundance of anglerfish increased by 43%. Changes in the estimated abundance of anglerfish in the North Sea were broadly similar (Figure 5).

However, the abundance in 2022 was 34% greater than that in 2021 and more than double that 10 years earlier (a 111% increase from 2013 to 2022).

The estimated abundance of anglerfish in the North Sea in 2022 is the third highest on record (Figure 6).

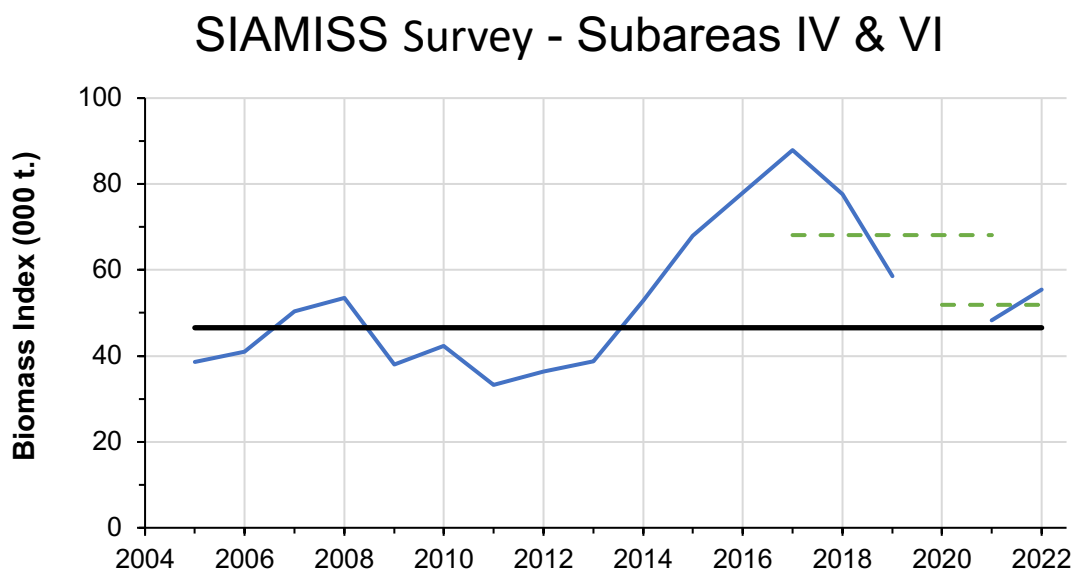


Figure 4 Annual estimates from the SIAMISS surveys of the biomass of anglerfish in the North Sea (subarea IV), West of Scotland (VIa) and Rockall (VIb) areas from 2005 to 2022. There was no survey in 2020. (Data from ICES 2022, Table 4.8³.) The heavy horizontal line shows the MSY $B_{trigger}$ proxy (46,554 tonnes). The dashed horizontal lines show the average estimated biomasses in 2018-20 and 2021-22.

³ ICES 2022. Working Group for the Celtic Seas Ecoregion (WGCSE). ICES Scientific Reports. 4:45. 1413 pp. <http://doi.org/10.17895/ices.pub.19863796>

SIAMISS Survey - Subarea IV

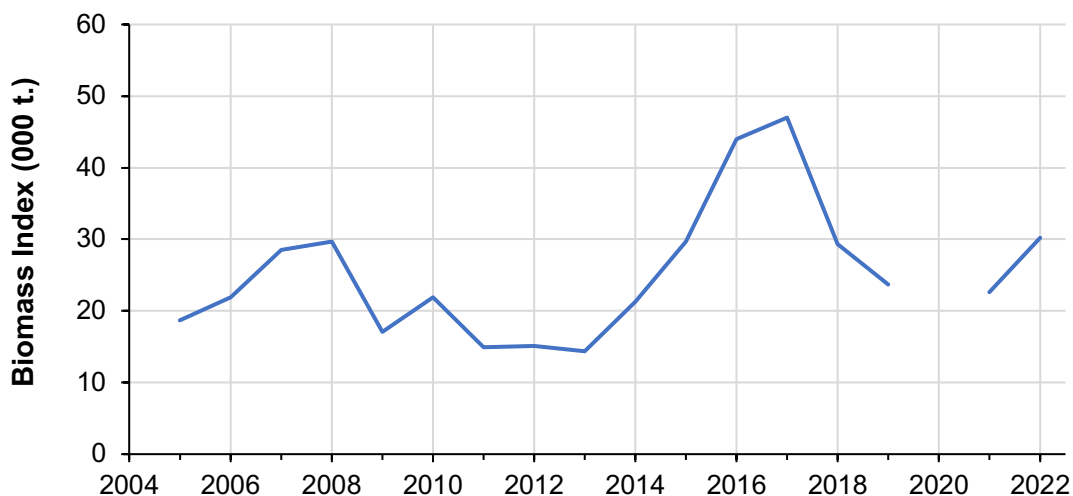


Figure 5 Annual estimates from the SIAMISS surveys of the biomass of anglerfish in the North Sea (subarea IV) from 2005 to 2022. There was no survey in 2020. (Data from ICES 2022, Table 4.8³.)

SIAMISS Survey - Subarea IV

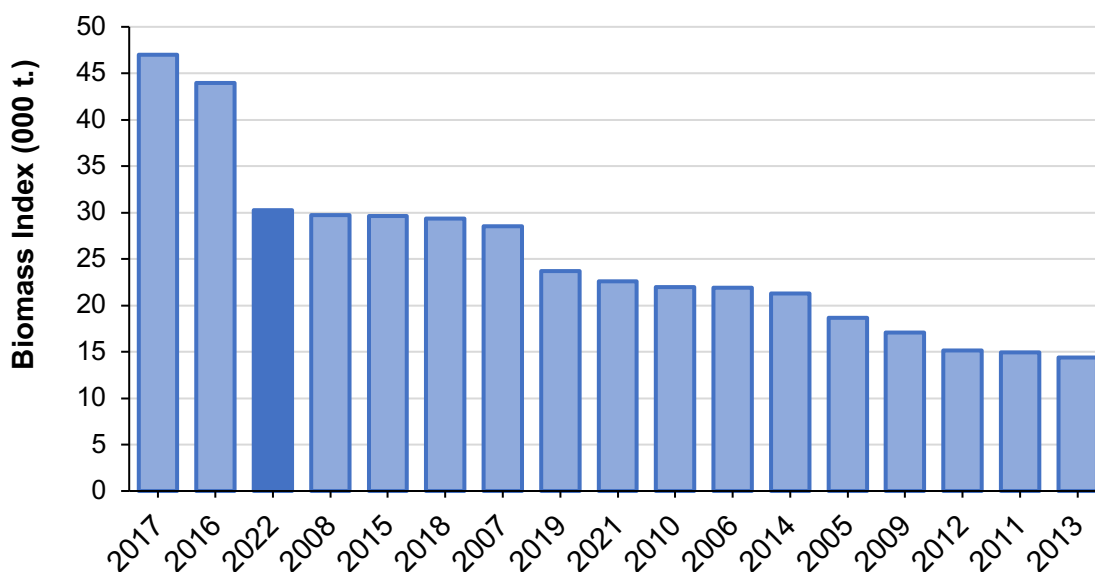


Figure 6 Annual estimates from the SIAMISS surveys of the biomass of anglerfish in the North Sea (subarea IV) from 2005 to 2022 ranked in decreasing order.

Maps of the abundance of anglerfish in the SIAMISS surveys (Figure 7) indicate that the 2022 survey was much more limited than was usual in previous years. In particular, there was no coverage of the Rockall Bank and relatively few samples in the North Sea.

Nevertheless, where samples were collected in both 2021 and 2022 the size of the circles in 2022 were similar to those in 2021 and 2019, indicating similar abundances of anglerfish in these areas.

The larger circles in 2017 and 2018 reflect the 'spike' in anglerfish abundance in those years (Figure).

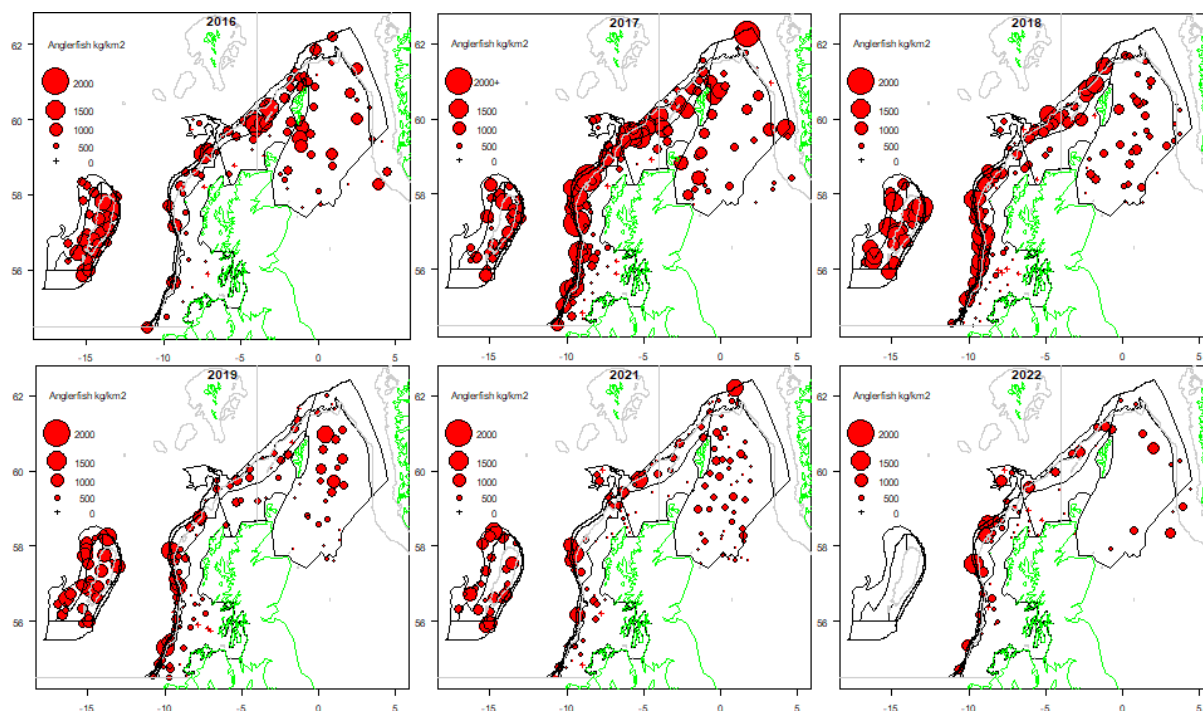


Figure 7 Weights of anglerfish (kg per km²) observed by SIAMISS surveys 2016–2022. From ICES 2022, Figure 4.15³.

6. North Sea IBTS Survey

Although relatively few anglerfish are caught in the North Sea IBTS⁴ survey (the survey gear and survey design are not optimised for this species) the catch rate has remained fairly consistent over the last 40 years (Figure 8). Despite short-term fluctuations there is no evidence in this time-series of any long-term change in abundance over the last 40 years and the average catch rate in 2022 remained close to the long-term average.

The spike in the estimated abundance of anglerfish in the North Sea around 2015 and 2016 from the SIAMISS survey (Figure 5) is apparent in the NSIBTS data, as is the increase in abundance from 2021 to 2022.

⁴ IBTS = International Bottom Trawl Survey.

NSIBTS Survey - Sampling Area 1

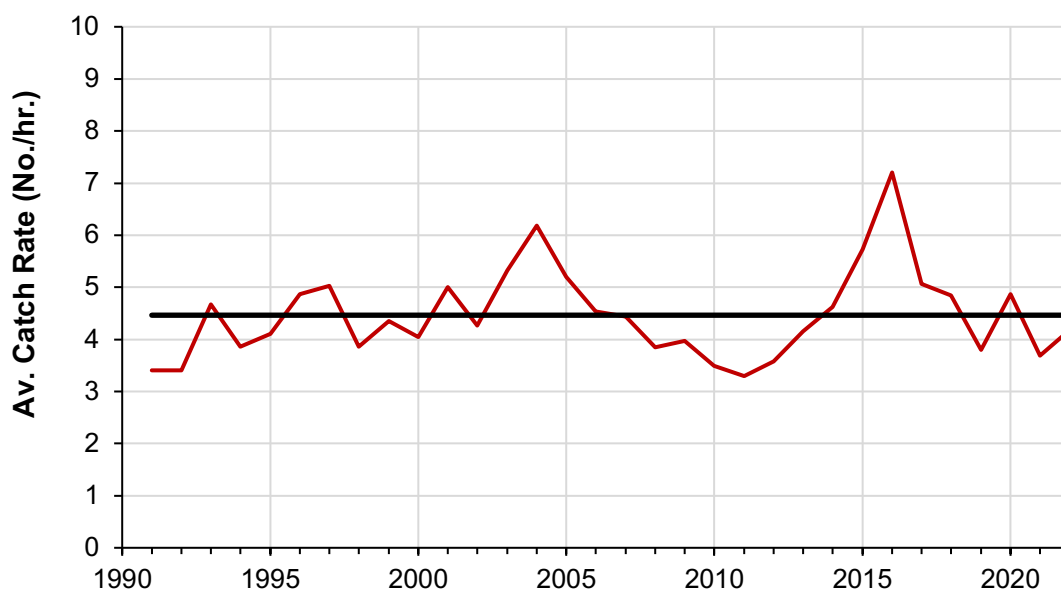


Figure 8 The average catch rates of anglerfish in the northern North Sea (survey area 1) in the Q1 and Q3 NSIBTS surveys from 1991 to 2022 (for each year, the average of the Q1 and Q3 catch rates). The horizontal line shows the average catch rate over the whole time period. Data from ICES DATRAS collection⁵.

7. Commercial Catch Rates - 1

Following reports from fishermen of higher anglerfish catches in 2022, a basic analysis of logbook data⁶ from member boats of the Shetland Fish Producer's Organisation (SFPO) investigated whether they provided any evidence of an increase in anglerfish catch rates in the north-western North Sea.

Numerically, the total reported fishing time by nine boats during the first six months of 2022 was less than in the same period of 2021 but their total reported catches of anglerfish was greater, resulting in an overall average catch rate of anglerfish (kg caught per hour fishing) that was about 19% higher in 2022. There was considerable variability in these data between boats and over time and none of these differences were statistically significant.

Analyses of individual boats' data found that the anglerfish catch rates of three were statistically significantly greater during the first six months of 2022 than during the same period of 2021 (Figure 9) with catch rates between 64% and 88% greater in 2022.

The catch rates of five of the remaining boats were not significantly different (and not significantly less). (Catch rates for the remaining boat could not be compared statistically due to data limitations.)

⁵ ICES DATRAS collection (datras.ices.dk/Data_products/Download/Download_Data_public): CPUE per Length per Haul per Hour – North Sea International Bottom Trawl Survey (parameters: Quarters 1 & 3; All Years; All Ships; GOV; Area: 1; *Lophius piscatorius*).

⁶ Napier, I.R. & Angus, C. (2022). Monkfish Catch Rates by Shetland Fishing Boats in 2021 and 2022. UHI Shetland report for Shetland Fishermen's Association, October 2022. Available at: <https://www.shetlandfishermen.com/site/assets/files/2261/monkfish-cpue-report-2022-11-final.pdf>.

If the catch rates of anglerfish are assumed to reflect their abundance, then these results suggest that anglerfish were at least as abundant (and certainly no less abundant) in the north-western North Sea during the first half of 2022 as during the same period of 2021.

The boats included in this analysis operate within a mixed demersal fishery with multiple factors that may influence the catches of individual species such as anglerfish. There were indications that fishermen responded to perceived increases in anglerfish abundance in 2022 by altering their fishing behaviour in ways that limited the increase in their total catches from 2021 to 2022.

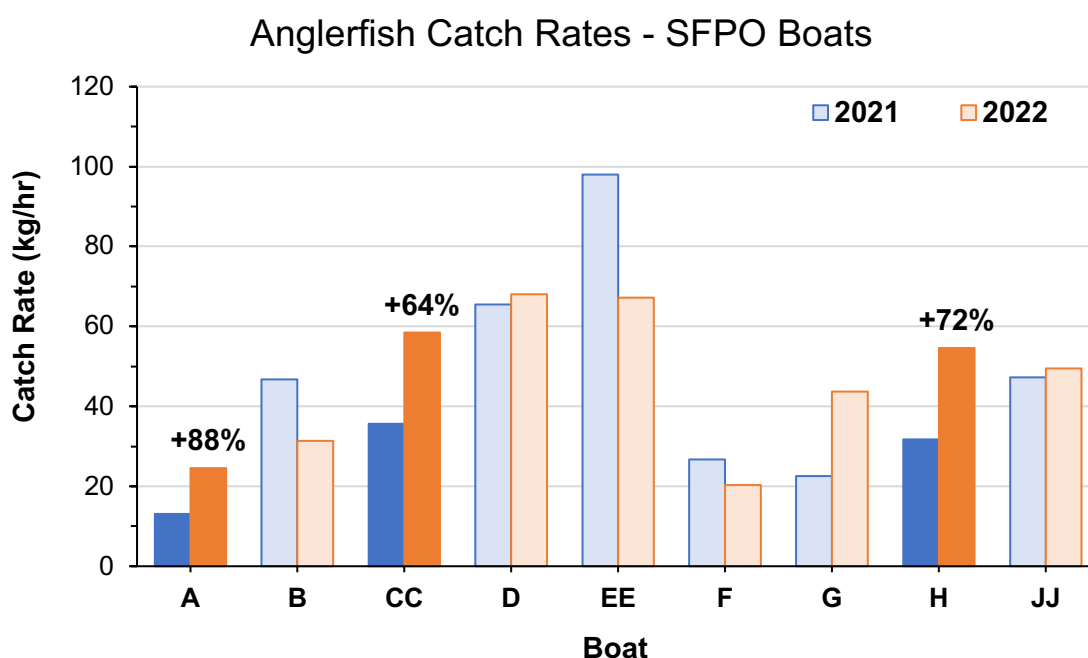


Figure 9 The individual overall average catch rates of anglerfish (kg/hr) in the Shetland area by nine SFPO member whitefish boats during the first six months of 2021 and 2022. The catch rates of boats A, CC and H (highlighted) were statistically significantly different in 2021 and 2022. The catch rates of five of the remaining boats were not statistically different, and not significantly less (boat 'EE' could not be tested statistically due to data limitations).

8. Commercial Catch Rates - 2

An exploratory analysis of catch and landings data⁷ by member boats of the Scottish Fishermen's Organisation (SFO) that target anglerfish was carried out to investigate whether trends in their catches were consistent with recent ICES advice on the size of the anglerfish stock. Reports from fishermen suggested that the expected year-to-year fluctuations in their anglerfish catches in recent years had not reflected the magnitude of the changes in the size of the stock suggested by recent ICES assessments. (Given that these boats tend to follow regular fishing patterns across the same fishing

⁷ MacDonald, P. (2022). General trends in monkfish landings for SFO vessels during the period 2018-2022. Report by Scottish Fishermen's Organisation.

grounds during the same seasons of each year it might be expected that their catches and catch rates would broadly reflect substantial changes in the abundance of anglerfish in the Northern Shelf area.)

The analysis found that trends in landings of anglerfish by SFO member boats have remained similar to or above those of recent years, despite the significant decrease in biomass reported by ICES and the total allowable catch (Figure 10).

The total catch of anglerfish from the early-year fishery was higher in 2022 than in the previous four years despite the significant reduction in the TAC and the catch rate (tonnes landed per trip) increased in both 2021 and 2022. **The average catch rate of anglerfish by nine SFO member boats in 2022 was 8% higher than in 2021 and 12% higher than in 2020.**

None of the trends in anglerfish landings, quota uptake or catch rates by SFO member boats are consistent with a significant decrease in the size of the anglerfish stock in recent years.

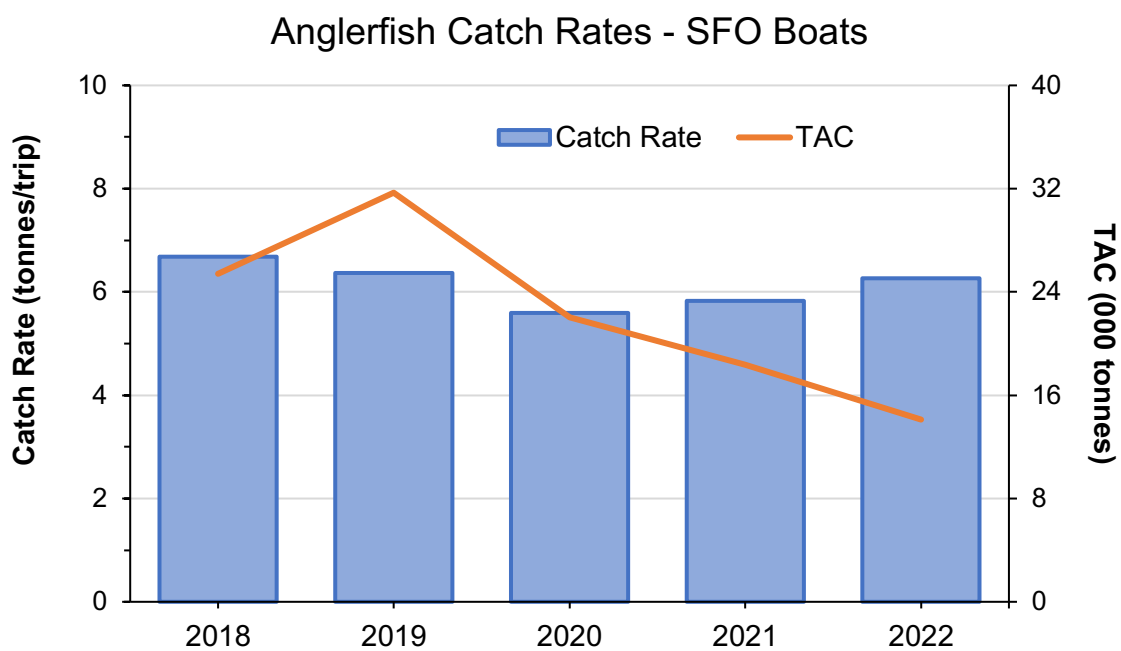


Figure 10 The average catch rate of anglerfish (tonnes landed per trip) by nine SFO-member whitefish boats during the first five months (Jan – May) of each year from 2018 to 2022 (bars; left axis) and the annual Total Allowable Catch of anglerfish (line; right axis).