

NIFCA Species Challenge Competition

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ACKNOWLEDGEMENTS

NIFCA would like to say a massive thank you to all the recreational sea anglers who participated and provided data in the Species Challenge competitions. We would like to extend our congratulations to the winners, Robby Robson (2023) and Gavin Dodds (2024). Without everyone's effort this initiative would not have been possible.

Summary

With recreational sea angling now a recognised stakeholder in UK fisheries management under the Fisheries Act (2020), it has never been more important for data to be available to support the sector, as government agencies require it to make decisions impacting the sector. The Northumberland Inshore Fisheries & Conservation Authority (NIFCA) drafted the first Angling Strategy in 2021, designed to improve and strengthen engagement with recreational sea angling stakeholders in the NIFCA district. It also served to acknowledge the importance of the angling community with its link to fisheries stock management, individuals' knowledge and the socio-economic benefits it brings. NIFCA recognises the importance of best available data, giving the sector a voice, and ensuring future policy or management decisions are informed and proportionate. With this in mind, and to act as a roadmap to improved communication, NIFCA launched its first shore-based competition in the NIFCA district in 2023, and again with more interest in 2024, to help us understand more about the different fish species present in the Northumberland IFCA district.

About the Species Challenge

In 2011, NIFCA commissioned research in collaboration with a Newcastle University MSc student to analyse data from recreational fishermen. The study collected data from seven angling clubs and at competitions from Dover to Aberdeen via questionnaires. It highlighted the valuable knowledge recreational fishermen have about local fish species and how this information was unutilised. The report strongly recommended the need to engage with RSA and apply their knowledge into future fisheries management, reviews, and decisions (Aftergood 2012). NIFCA developed Species Challenge with the primary purpose to further engagement with local stakeholders who have a passion for angling. It is also hoped from the data collected it can increase information available and evidence fish species present and absent in the NIFCA district across the whole calendar year, and how these change in the long term. To date NIFCA have limited information on finfish populations due to the nature of commercial fisheries in the region which are dominated by shellfish species.

In 2021, NIFCA revised its Sea Angling Strategy originally created in 2013 -14, to the NIFCA RSA Strategyⁱ, in which seven aims are outlined. The Species Challenge competition works towards these aims, with a particular focus on:

- *To build strong relationships with recreational sea angling stakeholders within the NIFCA district.*
- *To gain a better understanding of recreational sea angling catch and inshore fish species in the NIFCA district.*
- *To ensure evidence-based decisions for sustainable recreational sea angling activity are made (as and when required).*
- *Improved communication and knowledge sharing between NIFCA and stakeholders, and to ensure stakeholders are represented and have an opportunity to voice their views and/or concerns.*

The pilot Species Challenge competition was launched in May 2023 and ran until the end of that year, and due to its success was relaunched for the whole of 2024. The competition was developed and revised with input from local recreational anglers, most notably in streamlining the process to submit records while fishing. Through engaging with NIFCA officers, recreational anglers raised concerns about the practicalities and survivability of fish, in particular the undersize fish for taking measurements and photos while fishing. This led to several improvements from the 2023 competition; the introduction of different methods to submit, including through an online survey portal, and providing waterproof registration cards displaying competitor's details, attached to a lanyard to facilitate submissions more swiftly (fig 1). Other improvements suggested and implemented included changes to the prize and competition communications. In 2023 only one prize of £150 was available to the angler who had submitted the most species throughout the competition. In 2024 a monthly £50 angling voucher was awarded for the greatest number of submissions per month, the overall prize increased to £500, and regular social media updates were posted with an active leaderboard.

ⁱ The full NIFCA RSA strategy (2024) is available for download here- <https://nifca.gov.uk/recreational-fishing/sea-angling/>

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NIFCA Species Challenge 2024 (Shore-based)

Competition registration number

Date caught

Species caught

Fish length (cm)

Approximate location caught

54°35'N 0°37'W

Belfast, Dublin, Leeds

Photo submission



Figure 1 | Survey data submission form (Left) and waterproof registration card and lanyard provided to all registered anglers (Above)

The rules of the competition were also updated for 2024 to help clarify and standardised the method and type of data collected. As of 2024 the competition required the following:

- The fish must be caught via rod and line from the shore
- Submissions must be caught within the NIFCA district
- To include the following data with each submission
 - 1) Species (if known)
 - 2) Date caught
 - 3) Fish length
 - 4) Approximate location
 - 5) Photograph of fish with NIFCA registration card

Results

Participation & Submissions

Over the course of the competition a total of 126 anglers registered to Species Challenge, 60 entrants in 2023 (May – Dec) and 89 in 2024 (Jan – Dec), with 26 anglers registering in both years. Of the registered anglers, 48% submitted records in 2023, and 28% in 2024. Some anglers who had not officially registered, or competed still contributed their unusual finds to the Species Challenge database, which included a shad and bonito! A total 1,127 submissions were received with varying effort along the coastline: 62 in 2023 and 1,065 in 2024, 67% of which from the southern region of the NIFCA District (Fig 2a). Eight submissions by two participants were received outside of the NIFCA district, one to the north near Eyemouth and seven to the south near Sunderland. As these submissions were not within NIFCA's district and/or not caught from the shore as per the competition rules, they were not included in the competition's tally towards prizes but have been included in the data analysis of this report.

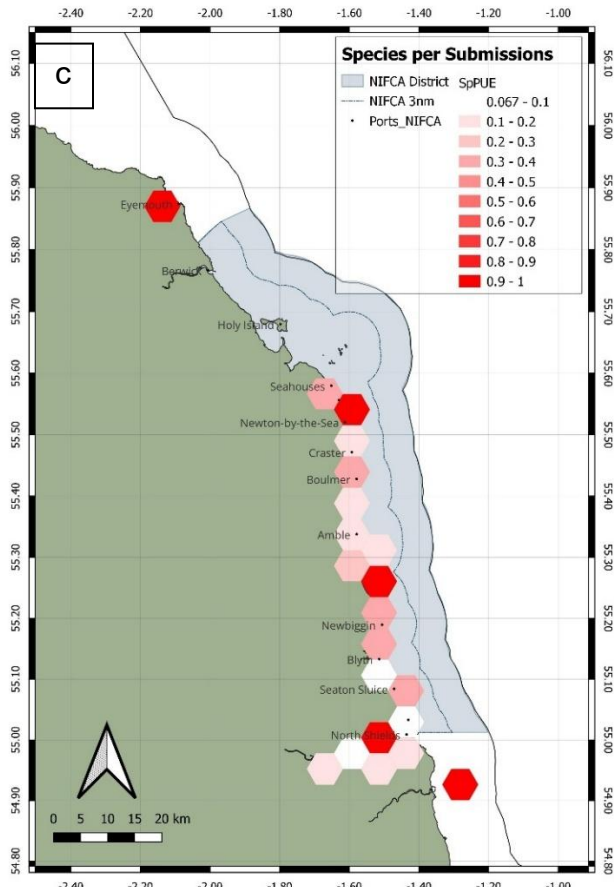
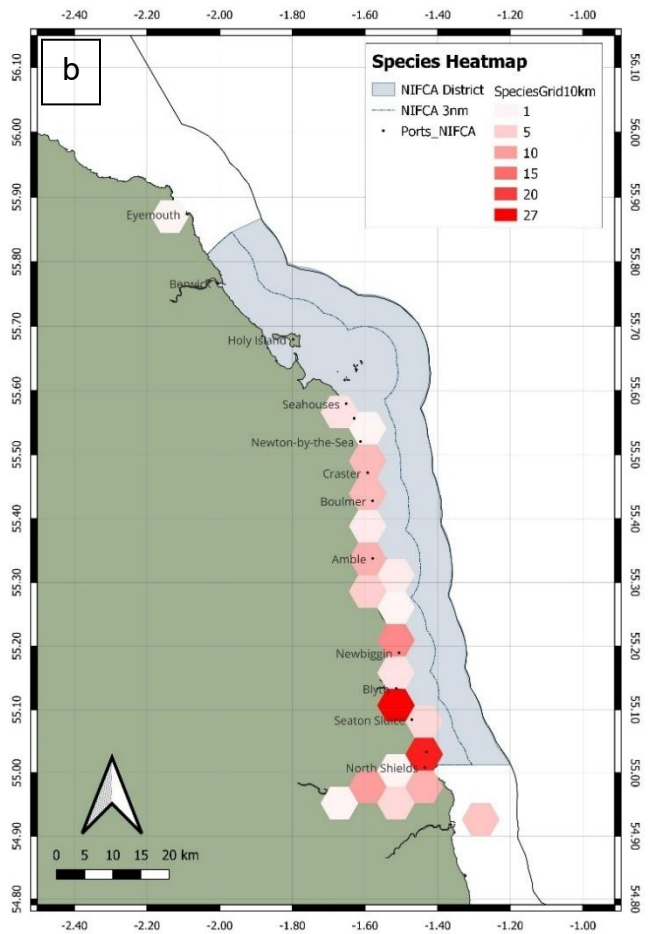
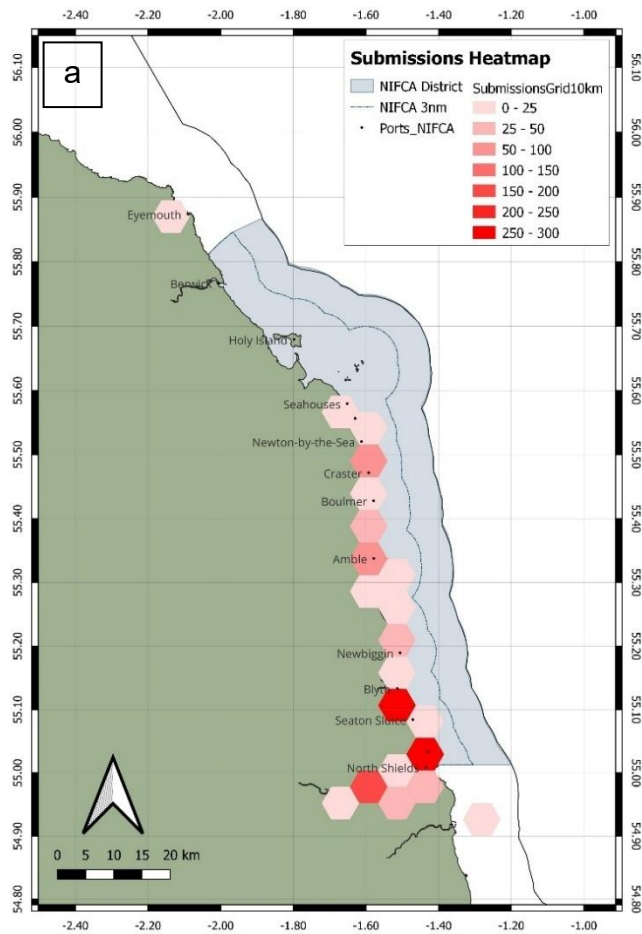


Figure 2 | 10km² grid heatmaps displaying (a) submission's locations, (b) species recorded & (c) species recorded per number of submissions.

Species Abundance & Diversity

From all submissions, 38 different species were identified (Annex I), 21 species in 2023 and 35 in 2024 (Fig 3) with, a higher number of species recorded in the southern region of the district (Fig 2b). The higher number of species records for the southern part of the district is due to the higher number of submissions for this area. Standardising the submissions effort with species recorded across 10km² grid sections along the coast, the species hotspot areas are sporadic, and no obvious species diversity trend is visible across the NIFCA district (Fig 2c).

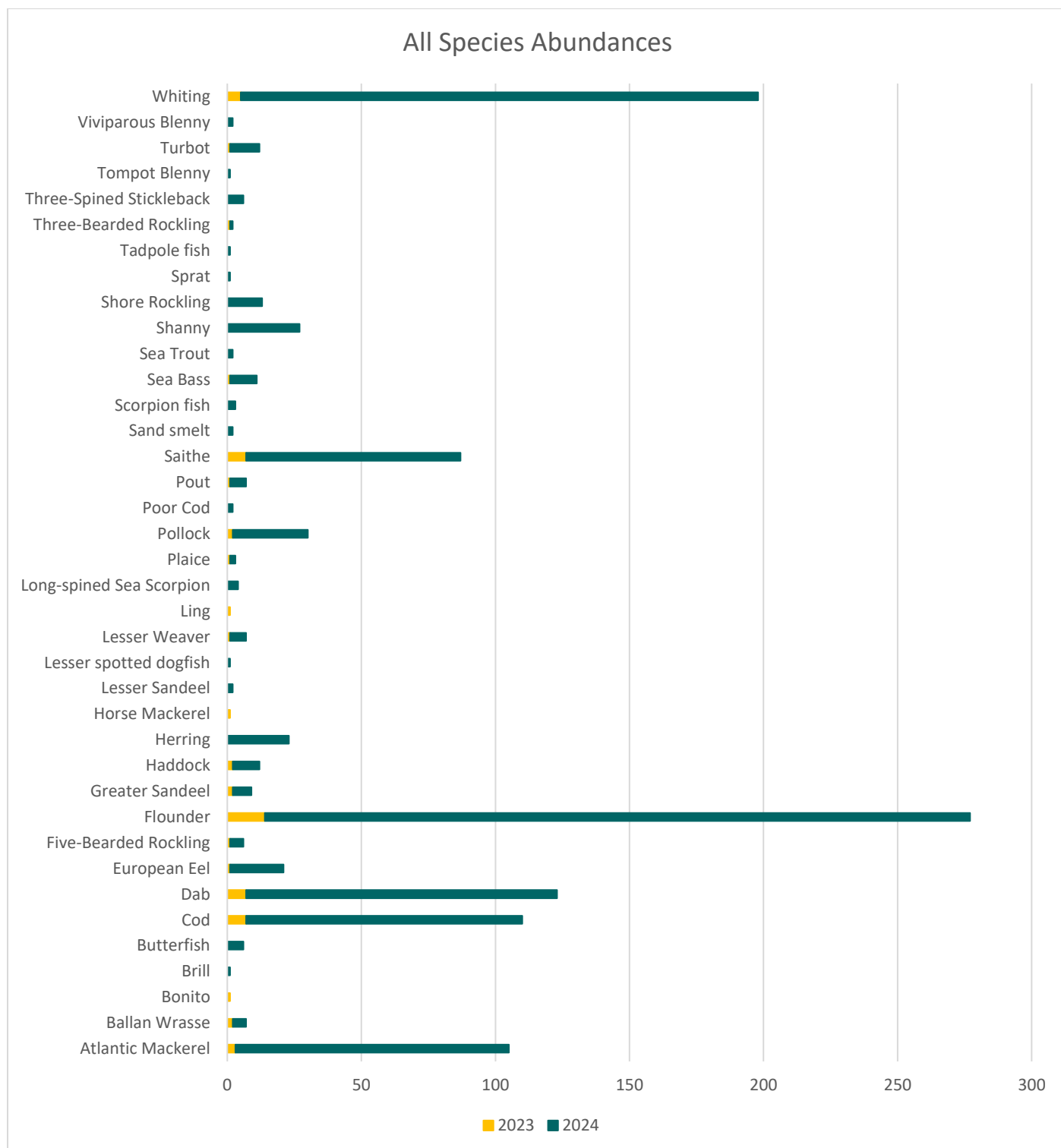


Figure 3 | Species identified and associated abundances per competition and in total.

Overall, six of the 38 species were more frequently recorded, representing 79.8% of all submissions received. These were the European flounder, the most frequent species caught representing 24.8% (n=277 from 28 anglers), followed by whiting, 17.6% (n=198 from 20 anglers), dab 10.9% (n=123 from 12 anglers), cod, 9.8% (n=110 from 23 anglers), Atlantic mackerel 9.3%, (n=105 from 12 anglers) and saithe 7.7% (n=87, from 18 anglers). Species which were only recorded once included bonito, brill, horse mackerel, lesser spotted dogfish, ling, sprat, tadpole fish and a tompot blenny.

Seasonality

No data was received before May 2023 before the start date of the competition, therefore a full annual comparison between the two competitions is limited. Overall, the least number of submissions received were recorded over the winter months, November (n=51), December (n=2) and January (n=7), with December and January also recording the lowest number of species (Figure 4). The highest number of submissions were received during February (n=169, 15.0%) comprising of 2024 entrants only. The highest number of species were reported in August and September (n= 21, 53.8%).

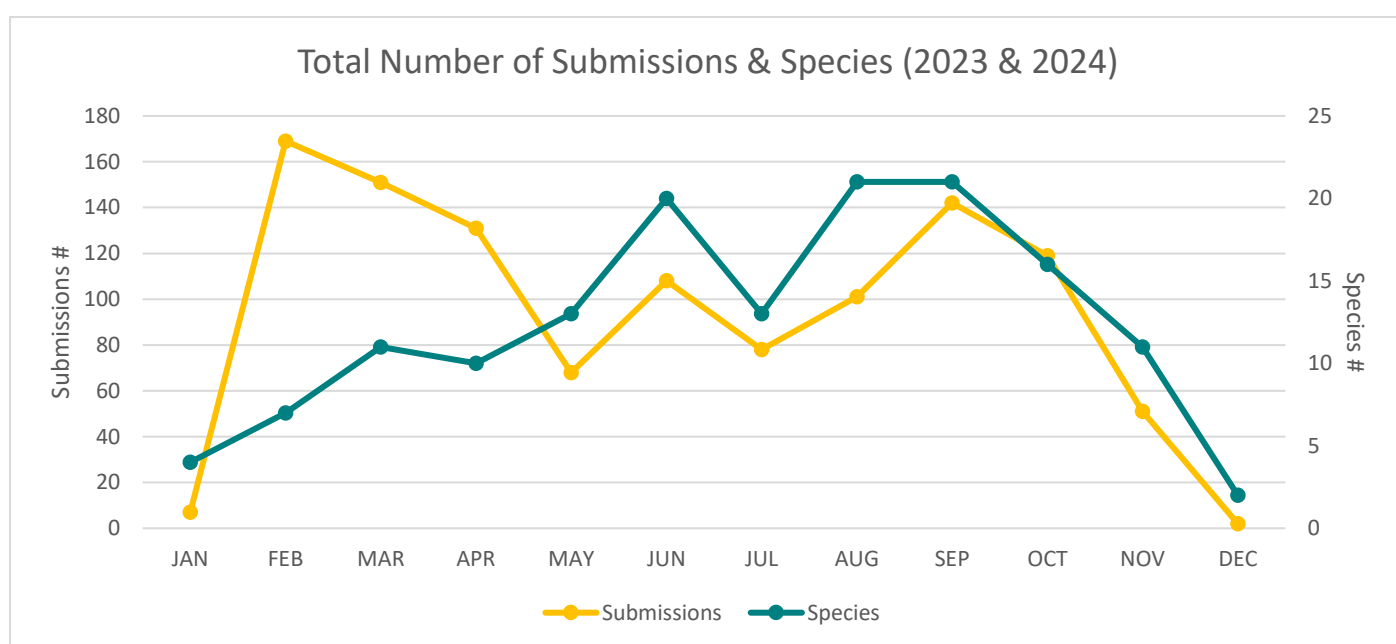


Figure 4 | The combined number of submissions and species recorded each month for both competitions

Combining both competitions datasets, all but one of the top six species were recorded throughout most of the year (9mths <= 11mths). Flounder was not recorded during January and December, Cod or Saithe not during December, whiting not during July and dab not in January, June and December (Figure 5)

Atlantic mackerel was recorded over a distinct period in the district for four months, June through to Septemberⁱⁱ. Other species which were recorded less frequently, but also exhibited a seasonal trend were, European eel during May to Augustⁱⁱ, herring from May to Septemberⁱⁱ and haddock which was not recorded between April to Augustⁱⁱ. All other species displayed more sporadic recordings throughout the year (Annex I), however with the collection of subsequent annual datasets, more distinctive seasonal catches may be revealed.

ⁱⁱ Inclusive

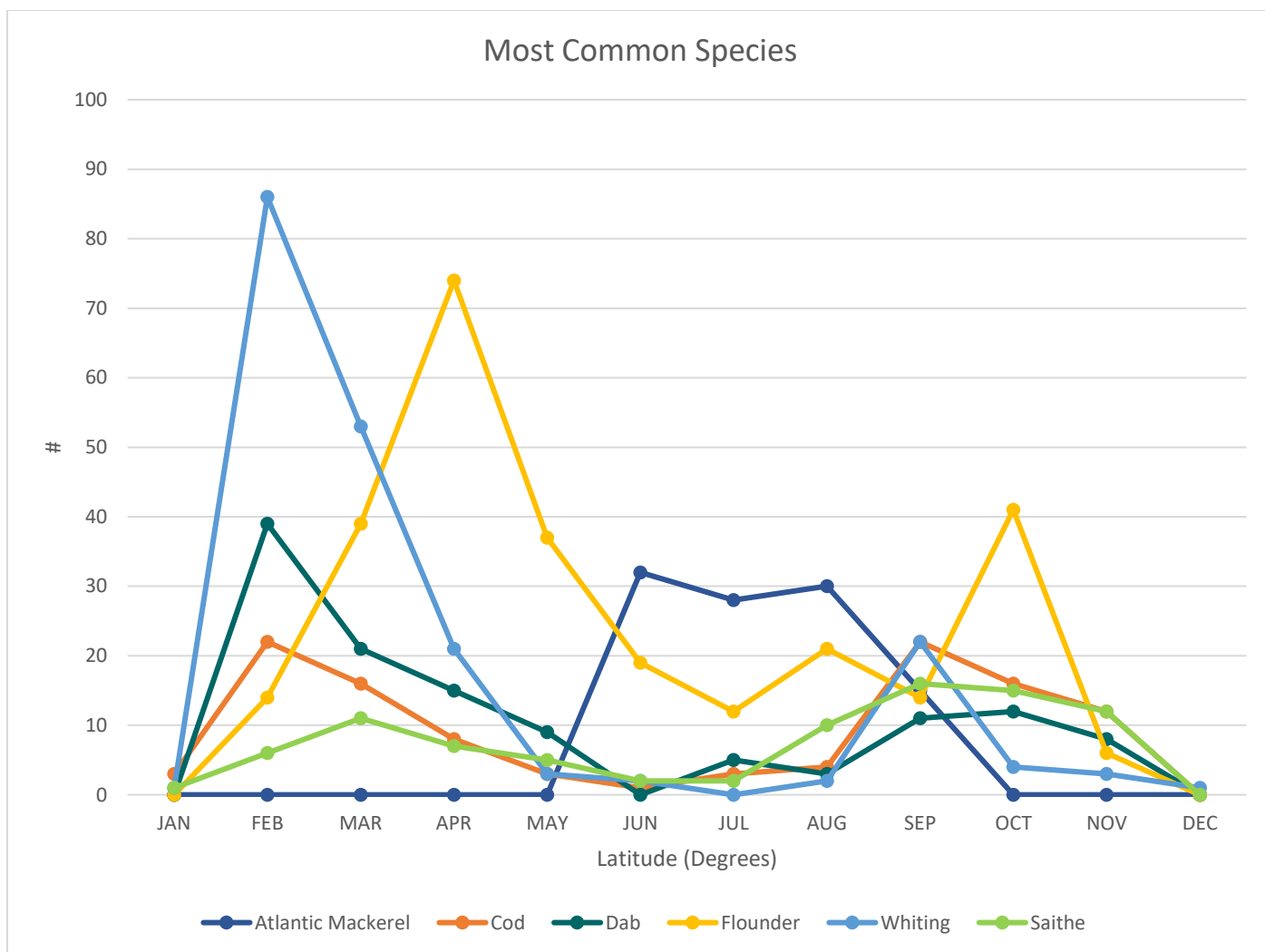
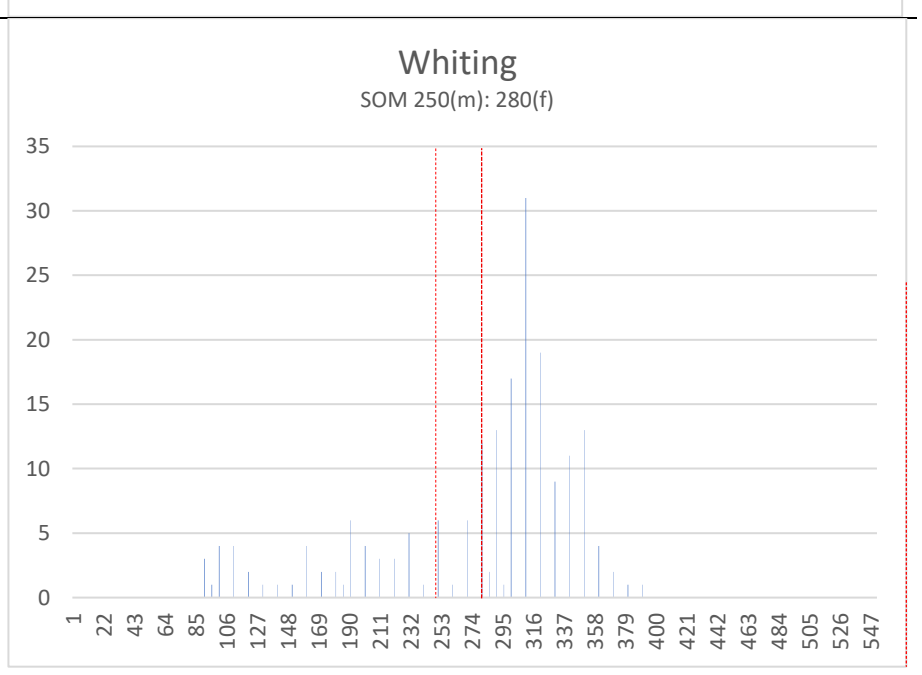
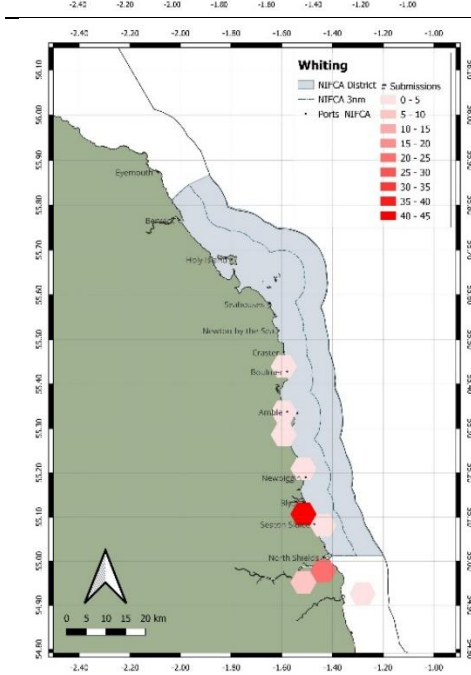
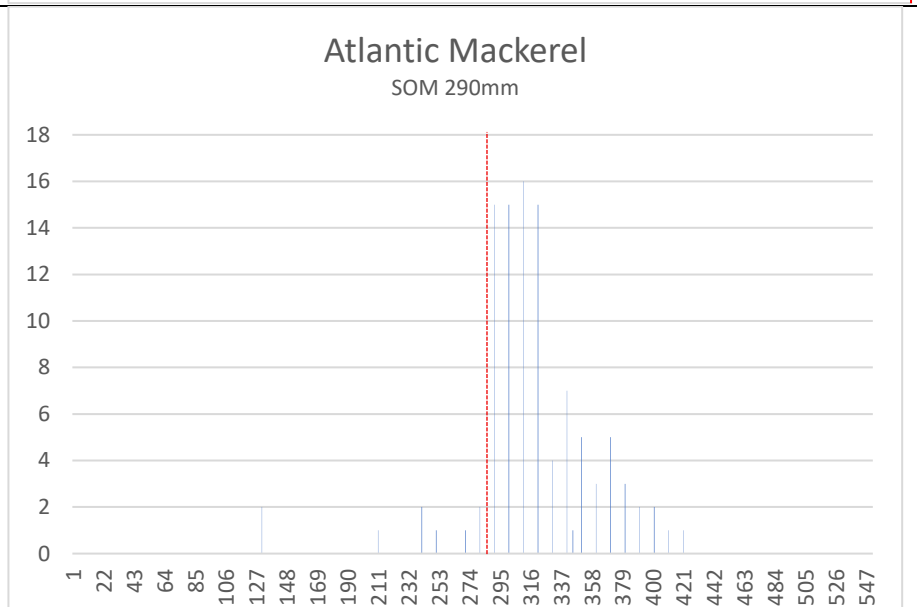
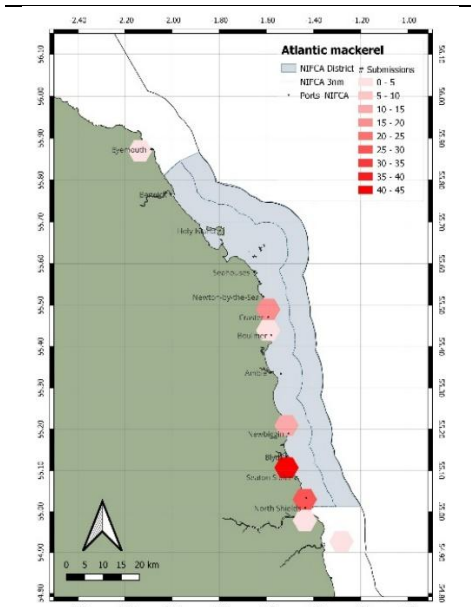
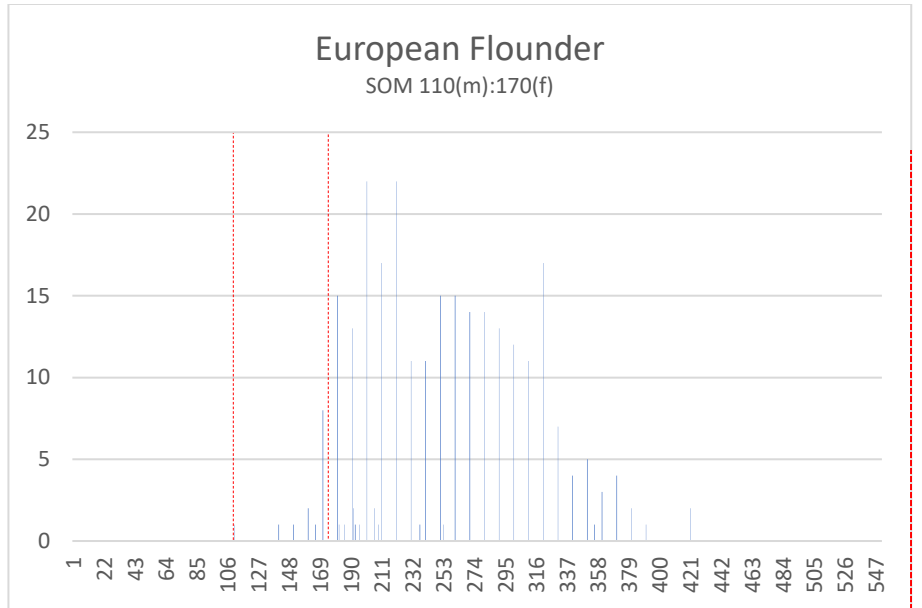
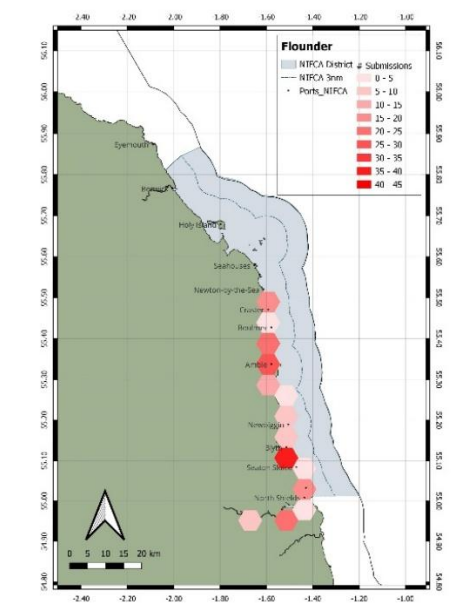


Figure 5 | The combined total of submissions each month of the most frequent species recorded. Not standardised to number of submissions.

Species Length & Distribution

Length measurements provided for the most frequent species caught (Figure 6), revealed that all the dab and the majority of the European flounder (98%), and Atlantic mackerel (91%) were adults. On the other hand, most cod (74%) and saithe (99%) caught, comprised of juveniles. As for whiting, 69% of the measurements were adults and 24% of juveniles. The remaining 13% of measurements fell in-between the differing sizing of maturity for males and females.

The distribution of the six most frequently recorded species was widespread across the NIFCA district (Figure 6), and when including the species submitted outside the NIFCA district, both saithe and Atlantic mackerel were caught over the largest distribution across the coast. Dab was recorded over the smallest area, only in two distinct locations. Distribution maps of all the other species can be found in Annex II.



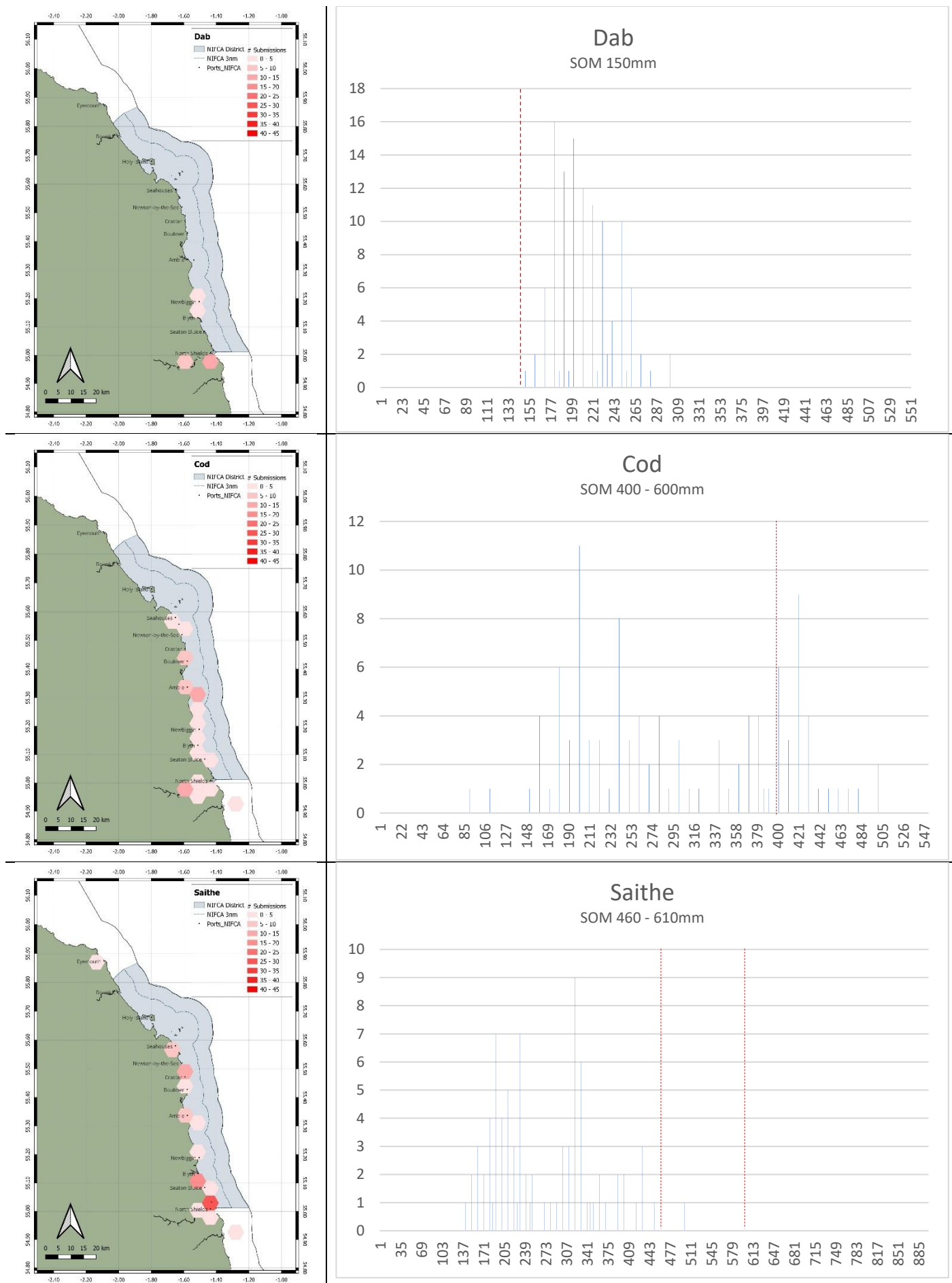


Figure 6 |Top frequently recorded species; LEFT - map distribution, not standardised to submission numbers and RIGHT - length frequency with Size of Maturity, SOM (Red line).

Key Findings & Recommendations

The Species Challenge competition was NIFCA's first initiative dedicated to collecting fin fish data from recreational shore anglers across the district. Thanks to the efforts and contributions made by all the participants, (2023 and 2024 winners are pictured in Figure 7), the data collected have contributed to creating a baseline database of finfish species in the district.



Figure 7 | The winners of NIFCA's Species Challenge for 2023 Robbie Robson (LEFT) and 2024 Gavin Dodds (RIGHT) receiving their annual prize.

From the data collected so far, the following points represent the key findings and recommendations for potential future research or actions.

Data Gaps: Submission effort across NIFCA's district was spatially uneven and differed monthly. Spatially no submissions were received in the northern part of NIFCA's district, from Seahouses to the border of Scotland. This is most likely due to the suitability of the coastal environment, presence of infrastructure, accessibility and personal preference of the individual RSA. Throughout the year, monthly submissions varied from 169 in February to just two in December, which for the latter also presented the lowest number of species recorded for any given month. It was highlighted by a RSA attending NIFCA's RSA stakeholder meeting event that it was unusual not to have specific species recorded during certain months, e.g. Cod in December. Therefore, months with extremely low submissions cannot be presumed to provide an accurate representation. Both these scenarios show data deficiencies in our database.

Recommendations:

- (1) Continue to engage with RSAs in the district to map angling effort both seasonally and spatially across the entire NIFCA's district and identify any limiting factors.
- (2) Create an engagement plan to target RSAs fishing in the northern part of the district, especially if re-launching Species Challenge competition.
- (3) Continue to collect data through Species Challenge initiatives to increase database and increase confidence in findings.

Incorporating a Holistic Approach: The fact that European flounder was the most recorded caught species from participants ($n = 277$, from 28 anglers) is not surprising. This fish is a popular recreational gateway species due to its inhabitancy of inshore and estuarine habitats, and inclination for bait (Skerritt 2010). From the submissions that included measurements, 99% and 97% measured as mature males or females respectively.

The majority of flounder (46%) were caught during the second quarter of the year (April – June) and within close proximity to estuaries along the coast. This correlates with the species life history strategy for feeding on inshore grounds and estuaries, then retreating to deeper waters during the winter months (Henderson 2014, p.295). Despite mostly adults being recorded in the competition, juvenile populations are known in the NIFCA district. One key site is at Alnmouth, where juvenile founders (n=744, av. 70mm) have been consistently recorded in small fish surveys conducted by NIFCA officers since 2015 (Smart & Rae 2025). It is highly probable that other estuaries not surveyed by NIFCA will also hold key juvenile development habitats for this species. Other previous small fish surveys carried out by NIFCA across the district have also recorded flounder (Wallace 2015, 2017), supporting evidence that populations of both adult and juvenile flounder are widespread across the district.

Recommendations: (3) Explore the possibility to create a central depository to input all finfish data collected within the NIFCA district. Combining existing databases will provide a more holistic monitoring strategy and analysis of finfish population dynamics across the NIFCA district.

Fisheries Management Input: Asserting a size for maturity for most fish species is highly complex, as this is influenced by multiple external factors such as exploitation, temperature and prey availability, which varies across different populations. For cod it is estimated that some individuals mature at 400mm, but all are considered mature at 600mm and above. In applying these lengths to the measurements provided for cod caught in Species Challenge, the percentage of juveniles recorded would be between 74% and 100%. When considering that the National minimum landing size for cod is 350mm, which is transposed into NIFCA's minimum size byelaw, and depending on if the individuals above MLS are retained, approximately 12% to 39% (SOM 400mm to 600mm) of all the cod reported are removed before reaching maturity. This disparity between the MLS and SOM was raised by some concerned recreational anglers at NIFCA's stakeholder event (May 2025) who supported increasing the MLS.

Recommendations: (4) Conduct a RSA stakeholder study on the opinions of the current MLS for Cod and other species of concern.
(5) To expand data collection to include a condition rating of the fish and its fate, whether it was kept or released. This will assist in understanding retention rates across the NIFCA district and RSA preferences.

Identification of Temporal & Spatial Trends: Species Challenge has generated a baseline database specific to the NIFCA district, however due to the timespan of the data collected, analysis for any spatial or temporal trends cannot be achieved at this time. Other insightful studies do exist which include the NIFCA district for identifying inshore finfish species populations and their distributions. These include, collecting questionnaire data from recreational fishers along the UK North Sea coastline, for changes in population abundances and distribution for seven Lusitanian fish (Aftergood 2012), and identifying local inshore fish species from the intakes of power stations around the North Sea (Henderson *et al* 2017). Cefas' also carry out nationwide surveys with recreational anglers, and their 2021 report for 2016 and 2017 data found the topmost frequently caught species in the UK by recreational anglers (shore and boat) were Atlantic mackerel, whiting, lesser spotted dogfish and bass, followed by Cod, pout, dab and pollock (Hyder *et al*. 2020). While Atlantic mackerel and whiting were also frequently recorded in the NIFCA district, this contrasts with NIFCA's most recorded species, Flounder, which did not feature in the UK's top species list. Furthermore, lesser spotted dogfish (n =1) and bass (n=10) were both reported during species challenge, but ranked lower, 32rd and 14th respectively.

While these studies provide important insights they are limited for any meaningful evaluations within the NIFCA district due to their spatial scales, the methodology applied or research focus. This highlights the importance for continued collaboration with local RSA, to collect local knowledge and data to understand

current and future finfish population dynamics across the NIFCA district. A multitude of studies have found supporting evidence which shows changes in fish populations and distributions across the North Sea due to climate change. These studies examine the different species response to their changing environment and have revealed varying behaviours. Species have been shown to shift to higher latitudes, lower latitudes (Sailley *et al.* 2025, Dulvy *et al.* 2008, Perry *et al.* 2005) and deepening depths (Dulvy *et al.* 2008, Perry *et al.* 2005). One such species known to exhibit distribution shifts as a response to climate change is the European sea bass. This species is present in the NIFCA district, but little is known about the population. NIFCA will continue to engage and collaborate with the RSA community with the new Bass Scale project, to learn more about the local populations in the NIFCA district (<https://heyzine.com/flip-book/253f4eedb6.html>). By understanding the current fin fish species present across the NIFCA district and identifying their distributions and seasonality, we can monitor for changes more affectively to ensure management is appropriate, effective and dynamic, to safeguard the sustainability of our seas.

Recommendations: (6) Repeat Species Challenge every two to three years to contribute data to the current database. The systematic continuation of the collection of data will allow for the identification of changes in local species population dynamics and the identification of any spatial or temporal trends.
 (7) Engage with RSAs for their suggestions for any adjustments or improvements to the Species Challenge competition

References

- Aftergood S. (2012) 'A Study of recreational sea angler data and perception of distributions and changing abundances of certain warm water (Lusitanian) fish species along eastern UK coast' MSc Newcastle University.
- Dulvy, N.K., Rogers, S.I., Jennings, S., Stelzenmuller, V., Dye, S.R. and Skjoldal, H.R. (2008) 'Climate change and deepening of the North Sea fish assemblage: a biotic indicator of warming seas' *Journal of Applied Ecology*, 45, pp. 1029-1039
- Henderson P. (2014) 'Identification Guide to the Inshore Fish of British Isles' Hampshire, Pisces Conservation Ltd
- Henderson P.A. (2017) 'Long-term temporal and spatial changes in the richness and relative abundance of the inshore fish community of the British North Sea Coast' *Journal of Sea Research* 127, pp.212-226
- Hyder K., Brown A., Armstrong M., Bell B., Bradley K., Couce E., Gibson I., Hardman F., Harrison J., Haves V., Hook S., Kroese J., Mellor G., MacLeod E., Muench A., Radford Z & Townhill B. (2020) 'Participation, catches and economic impacts of sea anglers resident in the UK 2016 & 2017' CEFAS Report pp39
- Perry, A.L., Low, P.L., Ellis, J.R. and Reynolds, J.D. (2005) 'Climate change and distribution shifts of marine fishes' *Science*, 308, pp. 1912-1914
- Sailley S.F., Catalan I.A., Batsleer J., Bossier S., Damalas D., Hansen C., Huret M., Engelhard G., Hamon K., Kay S., Maynou F., Nielsen J.R., Ospina-Alvarez A., Pinnegar J., Poos J.J., Sgardeli V. & Peck M.A. (2025) 'Multiple Models of European Marine Fish Stocks: Regional Winners and Losers in a Future Climate' *Global Change Biology* 31:e70149
- Skerrit D.J. (2010) 'A review of the European flounder *Platichthys flesus* - Biology, Life History and Trends in Population'. MSc Thesis. Newcastle University
- Smart K. & Rae V. (2024) 'AIn Estuary Fish Survey Report (2015-2024)' NIFCA report pp 27
https://nifca.gov.uk/wp-content/uploads/2025/02/AIn-Report-2024_FINAL.pdf
- Wallace N. (2015) 'Druridge Bay Surveys Report' NIFCA Report pp34
- Wallace N. (2017) 'Beadnell Bay Transitional & Coastal Water Surveys' NIFCA Report pp11

Annex I: Summary of the length & month species were recorded over both competitions. Darker colour represents the month with the highest number of records

#	SPECIES	TOTAL	LENGTH (MM)			RECORDED											
			Max	Min	Av	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	Flounder	277	420	110	252												
2	Whiting	197	390	90	276												
3	Dab	117	300	150	212												
4	Cod	110	500	90	299												
5	Atlantic Mackerel	105	420	130	316												
6	Saithe	87	500	140	270												
7	Pollock	29	410	90	196												
8	Shanny	27	250	70	117												
9	Herring	23	190	80	148												
10	European Eel	20	620	260	410												
11	Shore Rockling	13	320	130	235												
12	Haddock	12	830	290	373												
13	Turbot	12	280	140	207												
14	Sea Bass	11	450	240	375												
15	Greater Sandeel	9	280	210	253												
16	Lesser Weaver	7	170	100	128												
17	Ballan Wrasse	7	420	240	323												
18	Pout	7	290	110	238												
19	Butterfish	6	250	100	188												
20	Five-Bearded Rockling	6	230	160	198												
21	Three- spined Stickleback	6	40	30	37												
22	Long-spined Sea Scorpion	4	140	60	117												
23	Plaice	3	270	205	232												
24	Scorpion Fish	3	150	150	150												
25	Lesser Sandeel	2	80	70	75												
26	Poor Cod	2	230	90	160												
27	Sand Smelt	2	270	230	250												
28	Sea Trout	2	200	160	180												
29	Three-Bearded Rockling	2	300	300	-												
30	Viviparous Blenny	2	300	250	275												
31	Bonito	1	Unknown	-	-												
32	Brill	1	330	-	-												
33	Horse Mackerel	1	150	-	-												
34	Lesser Spotted Dogfish	1	600	-	-												
35	Ling	1	Unknown	-	-												
36	Sprat	1	50	-	-												
37	Tadpole Fish	1	300	-	-												
38	Tompot Blenny	1	140	-	-												

Annex II : Distribution maps for the identified species. Not standardised to submission effort

