12 Sprat in the Celtic Seas (Subarea 6 and divisions 7.a-c and 7.f-k)

Most sprat fisheries in the Celtic Seas area are sporadic and occur in different places at different times. Separate fisheries have taken place in the Minch, and the Firth of Clyde (6.aN); in Donegal Bay (6.aS); Galway Bay and in the Shannon Estuary (7.b); in various bays in 7.j; in 7.aS; in the Irish Sea. A map of these areas is provided in Figure 12.1.

The stock structure of sprat populations in this ecoregion is not clear. In 2014, HAWG presented an update of the available data on these sprat populations, in a single chapter. However, HAWG does not necessarily advocate that subareas 6 and 7 constitutes a management unit for sprat, and further work is required to resolve the problem.

12.1 The Fishery

12.1.1 ICES advice applicable for 2022 and 2023

ICES analysed data for sprat in the Celtic Sea and West of Scotland. Currently there is no TAC for sprat in this area, and it is not clear whether there should be one or several management units. ICES stated that there is insufficient information to evaluate the status of sprat in this area. Therefore, when the precautionary approach is applied, ICES advises that catches should be no more than 2240 t in 2022 and 2023. The TAC for the English Channel (7.d and e) is the only one in place for sprat in this area.

12.1.2 Landings

The total sprat landings, by ICES Subdivision (where available) are provided in tables 12.1.1–12.1.7, with the total landings in Table 12.1.8, and in figures 12.2.1–12.2.8. Only Ireland and the United Kingdom landed from the stock in 2022, with Ireland taking the majority of the landings (Table 12.1.8).

12.1.3 Division 6.a (West of Scotland and Northwest of Ireland)

Landings have been dominated by UK-Scotland and Ireland (Table 12.1.1). The Scottish fisheries have taken place in both the Minch and in the Firth of Clyde. The Irish fishery has always been in Donegal Bay. Despite the wide separation of these areas, the trends in landings between the two countries are similar, though the UK data have been higher. Irish data may be underestimated, due to difficulties in quantifying the landings from vessels of less than 10 m length.

The Scottish fishery is mainly for human consumption and is typically a winter fishery taking place in November and December, occasionally continuing into January. Landings were high in the early part of the time-series peaking with average annual landings of ~7000 t in the period 1972 to 1978 (Figure 12.2.1). Landings were low for a period after this until a second peak in the period 1995 to 2000 where landings averaged just around 4600 tonnes annually. In 2005 to 2009 the fishery was virtually absent but has slowly picked up again since 2010. In 2013 landings reached 968 tonnes, lower than in 2012, but then increased again in the last 3 years, until 2176 t in 2016. In 2015 Irish landings were higher than the Scottish ones, with 1300 t, but decreased again to low values in 2016. 2018 landing were only recorded for Ireland and were much lower in 2017, 1 tonne in total. Irish landings in 2019 increased substantially to 3423 tonnes. This has

been attributed to a low herring quota in the Celtic sea for the Irish fishery. Landings dropped to 736 tonnes in 2020 and anecdotal reports suggest the fleet may have moved to 7.aS to target abundant sprat in the area. Limitations to the licensing of large vessels (>18 m) in Irish inshore waters that were due to come into effect in 2020 have been delayed due to an ongoing legal case. A total of 245.7 tonnes was taken in 2021, 160.7 by Scotland and the remainder (85 tonnes) by Ireland.

Division 7.a

The main historic fishery was by Irish boats, in the 1970s, in the western Irish Sea. This was an industrial fishery and landings were high throughout the 1970s, peaking at over 8000 t in 1978 (figures for 7.aN are presented in Table 12.1.2 and 7.aS presented in Table 12.1.3). The fishery came to an end in 1979, due to the closure of the fishmeal factory in the area. It is not known what proportion of the catch was made up of juvenile herring, though the fishing grounds were in the known herring nursery areas. In the late 1990s and early 2000s, UK vessels landed up to 500 t per year. In recent years a trial fishery for sprat was carried out by the vessels that fish herring in the area. This was carried out to investigate the feasibility of a clean commercially viable sprat fishery. The results of the trials were inconclusive and plans to conduct further experiments are under discussion.

Irish Landings from 1950–1994 may be from 7.aN or 7.aS. Very high catches in 7.aS were reported in 2012 (Table 12.1.3) with a decrease in 2013 and only 16 t reported in 2014. In 2015 the catches raised again to over 3500 t and dropped again to less than 1000 t in 2016. Despite the high catches registered in some years, those figures should be interpreted with caution because they may be overestimated. In 2020 landings from 7.aS increased to 6888 tonnes up from 2785 tonnes in 2019. Irish landings from 7.aS are predominantly from Waterford Harbour (Table 12.1.3)

No landings from 7.aN were reported by Ireland in 2009–2013 or 2018 (Table 12.1.2), however there have been reported landings of 522 t in 2014, 771 t in 2015 and 150 t in 2016 and 2017. Irish landings in 2020 were 2521 tonnes up from 9 tonnes in 7.aN in 2019. Scotland reported landings in 2021 of less than a tonne while Ireland took 381 tonnes

12.1.4 Divisions 7.b–c (West of Ireland)

Sporadic fisheries have taken place, mainly in Galway Bay and the Mouth of the Shannon. The highest recorded landings were in 1980 and 1981 during winter of 1980-1981, when over 5000 t were landed by Irish boats (Table 12.1.4, Figure 12.2.4). This fishery took place in Galway Bay in winter 1980-1981 (Department of Fisheries and Forestry, 1982). Since the early 1990s landings fluctuated from very low levels to no more than 700 t per year in 2000. Zero catches were reported for 2016, increasing to above 500 tonnes in the two subsequent years. Irish landings in 2020 were 1308 tonnes and 295 tonnes in 2021. Irish data may be underestimated, due to difficulties in quantifying the landings from vessels of less than 10 m length.

12.1.5 Divisions 7.g–k (Celtic Sea)

Sprat landings in the Celtic Sea from 1985 onwards are WG estimates. In the Celtic Sea, Ireland has dominated landings. Patterns of Irish landings in divisions 7.g and 7.j are similar, though the 7.j landings have been higher. Landings for 7.g and 7.j were aggregated in this report. Landings have increased from low levels in the early 1990s, with catches fluctuating between 0 t in 1993 and just under 4200 t in 2005 (Table 12.1.7). The average catches in the last 10 years were equal to 2452 t. Irish landings increased significantly in 2019 to 6148 tonnes, this has dropped to 2933 tonnes in 2020. Irish landings in 2021 increased to 5524 tonnes. Irish data may be underestimated, due to difficulties in quantifying the landings from vessels of less than 10 m length.

12.1.6 Fleets

Most sprat in the Celtic Seas Ecoregion are caught by small pelagic vessels that also target herring, mainly Irish, English and Scottish vessels. In Ireland, many polyvalent vessels target sprat on an opportunistic basis. At other times these boats target demersals and tuna, as well as other small pelagics. Targeted fishing takes place when there are known sprat abundances. However, the availability of herring quota is a confounding factor in the timing of a sprat-targeted fishery around Ireland.

Sprat may also be caught in mixed shoals with herring. The level of discarding is unknown, but based on a limited number of samples available to the working group this is estimated to be less than 1% of the catch.

In Ireland, larger sprats are sold for human consumption while smaller ones for fishmeal. Other countries mainly land catches for industrial purposes.

12.1.7 Regulations and their effects

There is a TAC for sprat for 7.d–e, English Channel. No other TACs or quotas for sprat exist in this ecoregion. Most sprat catches are taken in small-mesh fisheries for either human consumption or reduction to fishmeal and oil. It is not clear whether bycatches of herring in sprat fisheries in Irish and Scottish waters are subtracted from quota.

Recently the Irish government changed the regulation relating to the access of the inshore fishing grounds. Vessels >18 m LOA will not have access to the 6nm inshore zone from 1 January 2020. For vessels targeting sprat, an exemption from this regulation is in place that allows a total sprat catch of up to 2000 t in 2020, up to 1000 t in 2021 and these vessels will not have access to the inshore zone from 2022. However, the policy directive is subject to an ongoing legal case and is not yet fully implemented.

12.1.8 Changes in fishing technology and fishing patterns

There is insufficient information available.

12.2 Biological Composition of the Catch

12.2.1 Catches in number and weight-at-age

There is no information on catches in number or weight in the catch for sprat in this ecoregion.

12.2.2 Biological sampling from the Scottish Fishery (6.a)

Between 1985 and 2002 the fishery was relatively well sampled and length and age data exists for this period with some gaps. Unfortunately, the data are not available electronically at the present time.

Sampling of sprat in 6.a came to an end in 2003 and no information on biological composition of catches exists in the period 2003–2011. Sampling was resumed in 2012 where a total of 8 landings were sampled. The sampling programme has been carried out since and it is anticipated that it will continue in the future.

12.3 Fishery-independent information

12.3.1 Celtic Sea Acoustic Survey (A4057)

The Irish Celtic Sea Herring Acoustic Survey calculates an annual estimate of sprat biomass. Biomass estimates for Celtic Sea Sprat for the period November 1991 to October 2020 are shown in Figure 12.3.1 and Table 12.3.1. However, the survey results prior to 2002 are not comparable with the latter surveys because different survey designs were applied.

Since 2004 the survey has taken place each October in the Celtic Sea. Due to the lack of reliable 38 kHz data in 2010, no sprat abundance is available for this year.

It can be seen that there are large interannual variations in sprat abundance. Large sprat schools were notably missing in 2006, and so no biomass could be calculated. The utility of this survey as an index of sprat abundance should be considered carefully (Fallon *et al*., 2012). Sprat is the second most abundant species observed from survey data. Sprat biomass over the time-series up to 2009 is highly variable, more so than could be accounted for by 'normal' inter survey variability (Table 12.3.1**)**. The variability in the latter years is in part due to the behaviour of sprats in the Celtic Sea which are often seen in the highest numbers after the survey has ended in November/December and again in spring during spawning. The survey is placed to coincide with peak herring abundance and is temporally mismatched with what would be considered sprat peak abundance.

Sprat biomass in the survey has decreased substantially from 60 608 tonnes in 2019 to 4523 tonnes in 2020 and is the lowest since 2003. The distribution of sprat was notably different in 2020 with the distribution concentrated along the shore in the east and a lack of fish in the southwest. Anecdotal evidence suggests that prior to the survey a high abundance of sprat was observed in the southwest and was the focus of prolonged and persistent marine mammal feeding activity. Given the inshore distribution observed this year it is possible that the sprat stock was not fully contained within the survey area and so the estimate is low. The size profile of sprat was dominated by larger fish overall and lacked the spread of cohorts normally observed. This is not considered reflective of the state of the stock but rather a year effect which has been observed previously (O'Donnell *et al*, 2020).

The biomass of sprat in 2021 was higher than observed in 2020 (2021: 12 376 t and 2020: 4523 t). As in 2020, the distribution of sprat was concentrated in inshore waters. Given the inshore distribution this year it is possible that the sprat stock was not fully contained within the survey area and so an unknown proportion of the stock remains unaccounted for. The size profile of sprat was dominated by smaller fish compared to 2020 and lacked the larger length cohorts that dominated catches.

12.3.2 Scottish Acoustic Surveys (A9481)

A Clyde herring and sprat acoustic survey was carried out in June/July 1985–1990 and then discontinued (Figure 12.3.2 for coverage). Biomass estimates from all years as well as lengths and ages from some years are available from this survey but not presented here.

In 2012 this survey was reinstated as an October/November survey for herring mainly. Full results from these surveys for sprats are not available at the moment. Age and length distribution from the survey in 2012 are in Figure 12.3.3. In 2013 the survey was cancelled due to technical problems but has been continued up to 2018.

12.3.3 Scottish IBTS surveys (G1179)

The Scottish West Coast IBTS has been carried out in Q1 since 1981 to the present and in Q4 from 1991 onwards (Figure 12.3.2). Although the survey is a groundfish bottom trawl survey it does catch sprat throughout the survey area. The survey provides numbers at length per haul and aggregated age-length keys on a subarea basis. In the period 1981 to 2012 a total of 1434 hauls were completed and approximately half of these caught sprat. Although the survey is still carried out the figure has not been updated in the last five years (2013 to 2018).

12.3.4 Northern Ireland Groundfish Survey (G7144)

The Agri-Food and Biosciences Institute of Northern Ireland (AFBINI) groundfish survey of ICES Division 7.aN are carried out in March and October at standard stations between 53° 20′N and 54° 45′N (see Stock Annex for more detail on the survey). Sprat is routinely caught in the groundfish surveys however; data were not available at the time of submission of this report.

12.3.5 AFBI Acoustic Survey (A4075)

The Agri-Food and Biosciences Institute of Northern Ireland (AFBINI) carries out an annual acoustic survey in the Irish Sea each September (see the Stock Annex for a description of the survey). While targeting herring, a sprat biomass is also calculated. The annual calculated biomass from 1998–2014 is shown in Figure 12.3.4 and Table 12.3.2. The biomass is estimated to have peaked in 2002 with 405 000 t and it has declined since then to just under 95 000 t in 2010. Recent estimates suggest an increase with 2014 being the second highest estimate in the time-series, followed by a decline in the final year of the survey. Spatial distribution of sprat at the time of the survey is shown in Figure 12.3.5. Further work is required to investigate the utility of this survey for measuring sprat biomass in this area.

12.4 Mean weight-at-age and maturity-at-age

No data on mean weight-at-age or maturity-at-age in the catch are available.

12.5 Recruitment

The various groundfish and acoustic surveys may provide an index of sprat recruitment in this ecoregion. However further work is required.

12.6 Stock Assessment

Currently, the only assessment carried out in the Celtic ecoregion is for sprat in 7.d-e and it is based on a survey index of biomass (Please refer to Section 12 - Sprat in divisions 7.d-e).

12.7 State of the Stock

The state of the sprat stock in the Celtic Seas is currently unknown and the data available are not enough to provide any indication on its status. The only assessment available in the area for this species is for sprat in the English Channel (for that, please refer to Section 12 of this report).

12.8 Short-term projections

No projections are presented for this stock.

12.9 Reference Points

No precautionary reference points are defined for sprat populations in the region

12.10 Quality of the Assessment

The stock status is unknown and the Working Group does not have enough information to assess the status of the stock in relation to reference points.

12.11 Management Considerations

Sprat is a short-lived species with large interannual fluctuations in stock biomass. The natural interannual variability of stock abundance, mainly driven by recruitment variability, is high and does not appear to be strongly influenced by the observed levels of fishing effort.

The sprat has mainly been fished together with herring. The human consumption fishery only takes a minor proportion of the total catch. Within the current management regime, where there is a bycatch ceiling limitation of herring as well as bycatch percentage limits, the sprat fishery is controlled by these factors. Most management areas in this ecoregion do not have a quota for sprat. However, there is a quota in 7.d–e, English Channel, which has not been fully utilized.

12.12 Ecosystem Considerations

In the North Sea Multispecies investigations have demonstrated that sprat is one of the important prey species in the North Sea ecosystem, for both fish and seabirds. At present, there are no data available on the total amount of sprat, and in general of other pelagic species, taken by seabirds in the Celtic Seas Ecoregion.

The Celtic Seas Ecoregion is a feeding ground for several species of large baleen whales (O'Donnell *et al.*, 2004–2009). These whales feed primarily on sprat and herring from September to February.

Table 12.1.1 Sprat in the Celtic Seas Ecoregion. Landings of sprat, 1985–2021, Division 6.a. Irish data may be underestimated, due to difficulties in quantifying the landings from vessels of less than 10 m length. (tonnes)

Country	Denmark	Faroe Islands	Ireland	Norway	UK Eng+Wales+N.Irl.	UK Scotland	Other	Total
1985	0	0	51	557	0	2946	0	3554
1986	0	0	348	0	2	520	0	870
1987	269	0	0	0	0	582	0	851
1988	364	0	150	0	0	3864	0	4378
1989	0	0	147	0	0	1146	0	1293
1990	0	0	800	0	0	813	0	1613
1991	0	0	151	0	0	1526	0	1677
1992	28	0	360	0	0	1555	0	1943
1993	22	0	2350	0	0	2230	0	4602
1994	0	0	39	0	0	1491	0	1530
1995	241	0	0	0	0	4124	0	4365
1996	0	0	269	0	0	2350	0	2619
1997	0	0	1596	0	0	5313	0	6909
1998	40	0	94	0	0	3467	0	3601
1999	0	0	2533	0	310	8161	0	11004
2000	0	0	3447	0	0	4238	0	7685
2001	0	0	4	0	98	1294	0	1396
2002	0	0	1333	0	0	2657	0	3990
2003	887	0	1060	0	0	2593	0	4540
2004	0	0	97	0	0	1416	0	1513
2005	0	252	1134	0	13	0	0	1399
2006	0	0	601	0	0	0	0	601
2007	0	0	333	0	0	14	0	347
2008	0	0	892	0	0	0	0	892
2009	0	0	104	0	0	70	0	174
2010	0	0	332	0	0	537	0	869
2011	0	0	468	0	248	507	0	1223
2012	0	0	113	0	0	1688	0	1801

Country	Denmark	Faroe Islands	Ireland	Norway	UK Eng+Wales+N.Irl.	UK Scotland	Other	Total
2013	0	0	487	0	0	968	0	1455
2014	0	0	3	0	0	1540	0	1543
2015	0	0	1305	0	0	1060	0	2365
2016	0	0	431	0	0	2177	0	2608
2017	0	0	604	0	0	1354	0	1958
2018	0	0	1	0	0	0	0	1
2019	0	1	3243	0	66	1265	1	4575
2020	0	0	796	0	0	724	0	1520
2021	0	0	85	0	0	161	0	246

Table 12.1.2 Sprat in the Celtic Seas Ecoregion. Irish landings of sprat, 1985–2021 from Division 7.aN. Irish data may be underestimated, due to difficulties in quantifying the landings from vessels of less than 10 m length. (tonnes)

Country	Ireland	Isle of Man	UK Eng+Wales+N.Irl.	UK Scotland	Total
1985	668	0	20	0	688
1986	1152	1	6	0	1159
1987	41	0	0	0	41
1988	0	0	4	6	10
1989	0	0	1	0	1
1990	0	0	0	0	0
1991	0	0	3	0	3
1992	0	0	0	0	0
1993	0	0	0	0	0
1994	0	0	0	0	0
1995	0	0	30	0	30
1996	0	0	0	0	0
1997	0	0	2	0	2
1998	0	0	3	0	3
1999	0	0	146	0	146
2000	0	0	371	0	371

Country	Ireland	Isle of Man	UK Eng+Wales+N.Irl.	UK Scotland	Total
2001	0	0	269	3	272
2002	0	0	306	0	306
2003	0	0	592	0	592
2004	0	0	134	0	134
2005	0	0	591	0	591
2006	0	0	563	0	563
2007	0	0	0	0	0
2008	0	0	2	0	2
2009	0	0	0	0	0
2010	0	0	0	0	0
2011	0	0	0	0	0
2012	0	0	0	0	0
2013	0	0	0	0	0
2014	522	0	0	0	522
2015	792	0	0	0	792
2016	150	0	0	0	150
2017	150	0	0	0	150
2018	0	0	0	0	0
2019	9	0	0	0	9
2020	2521	0	0	0	2521
2021	381	0	0	0.078	381

Table 12.1.3 Sprat in the Celtic Seas Ecoregion. Irish landings of sprat, 1985–2021 from Division 7.aS. Irish data may be underestimated, due to difficulties in quantifying the landings from vessels of less than 10 m length. (tonnes)

Country	Ireland
1985	0
1986	0
1987	0
1988	0
1989	0
1990	0
1991	0
1992	0
1993	0
1994	0
1995	0
1996	0
1997	0
1998	7
1999	25
2000	123
2001	7
2002	0
2003	3103
2004	408
2005	361
2006	114
2007	0
2008	102
2009	0
2010	433
2011	1535
2012	6261

Country	Ireland
2013	2545
2014	16
2015	3659
2016	935
2017	935
2018	1117
2019	2785
2020	6888
2021	7861

Table 12.1.4. Sprat in the Celtic Seas Ecoregion. Landings of sprat, 1985–2021, from divisions 7.b–c. Irish data may be underestimated, due to difficulties in quantifying the landings from vessels of less than 10 m length. (tonnes)

Country	Ireland
1985	0
1986	0
1987	100
1988	0
1989	0
1990	400
1991	40
1992	50
1993	3
1994	145
1995	150
1996	21
1997	28
1998	331
1999	5
2000	698
2001	138

Country	Ireland
2002	11
2003	38
2004	68
2005	260
2006	40
2007	32
2008	1
2009	238
2010	0
2011	0
2012	23
2013	237
2014	0
2015	250
2016	0
2017	874
2018	508
2019	842
2020	1308
2021	294

Table 12.1.6 Sprat in the Celtic Seas Ecoregion. Landings of sprat, 1985–2021, Division 7.f. (tonnes)

Country	Netherlands	UK Eng+Wales+N.Irl.	Total
1985	273	0	273
1986	0	0	0
1987	0	0	0
1988	0	0	0
1989	0	0	0
1990	0	0	0
1991	0	1	1
1992	0	0	0
1993	0	0	0
1994	0	2	2
1995	0	0	0
1996	0	0	0
1997	0	0	0
1998	0	51	51
1999	0	0	0
2000	0	0	0
2001	0	0	0
2002	0	0	0
2003	0	0	0
2004	0	0	0
2005	0	0	0
2006	0	0	0
2007	0	2	2
2008	0	0	0
2009	0	1	1
2010	0	7	7
2011	0	1	1
2012	0	2	2

Country	Netherlands	UK Eng+Wales+N.Irl.	Total
2013	0	2	2
2014	0	1	1
2015	0	0	0
2016	0	1	1
2017	0	0	0
2018	0	0	0
2019	0	0	0
2020	0	3	0
2021	0	0.35	0.35

Table 12.1.7 Sprat in the Celtic Seas Ecoregion. Landings of sprat, 1985–2021, divisions 7.g–k. Irish data may be underestimated due to difficulties in quantifying the landings from vessels of less than 10 m length. (tonnes)

Country	Denmark	France	Ireland	Netherlands	Spain	UK Eng+Wales+N.Irl.	Total
1985	0	0	3245	0	0	0	3245
1986	538	0	3032	0	0	2	3572
1987	0	1	2089	0	0	0	2090
1988	0	0	703	1	0	0	704
1989	0	0	1016	0	0	0	1016
1990	0	0	125	0	0	0	125
1991	0	0	14	0	0	0	14
1992	0	0	98	0	0	0	98
1993	0	0	0	0	0	0	0
1994	0	0	48	0	0	0	48
1995	250	0	649	0	0	0	899
1996	0	0	3924	0	0	0	3924
1997	0	0	461	0	0	6	467
1998	0	0	1146	0	0	0	1146
1999	0	0	3263	0	0	0	3263
2000	0	0	1764	0	0	0	1764

Country	Denmark	France	Ireland	Netherlands	Spain	UK Eng+Wales+N.Irl.	Total
2001	0	0	306	0	0	0	306
2002	0	0	385	0	0	0	385
2003	0	0	747	0	0	0	747
2004	0	0	3523	0	0	0	3523
2005	0	0	4173	0	0	0	4173
2006	0	0	768	0	0	0	768
2007	0	0	3380	0	1	0	3381
2008	0	0	1358	0	0	0	1358
2009	0	0	3431	0	0	0	3431
2010	0	0	2436	0	0	0	2436
2011	0	0	1767	0	0	12	1779
2012	0	0	2632	0	0	0	2632
013	0	0	1648	0	0	0	1648
2014	0	0	2311	0	0	0	2311
2015	0	0	3322	0	0	0	3322
2016	0	0	3248	0	0	0	3248
2017	0	0	1755	0	0	0	1755
2018	10	0	1955	0	0	0	1965
2019	0	0	6148	0	0	0	6148
2020	0	0	2933	0	0	0	2933
2021	0	0	5524	0	0	0	5524

Table 12.1.8 Sprat in the Celtic Seas Ecoregion. Landings of sprat, 1985–2021 in Subarea 6 and divisions 7.a–c and 7.f–k.

Country	Denmark	Faroe Islands	France	Ireland	Isle of Man	Netherlands	Norway	Spain	UK England & Wales	UK Scotland	Total
1985	538	0	0	4532	1	0	0	0	10	520	5601
1986	269	0	1	2230	0	0	0	0	0	582	3082
1987	364	0	0	853	0	1	0	0	4	3870	5092
1988	0	0	0	1163	0	0	0	0	1	1146	2310
1989	0	0	0	1325	0	0	0	0	0	813	2138
1990	0	0	0	205	0	0	0	0	4	1526	1735
1991	28	0	0	508	0	0	0	0	0	1555	2091
1992	22	0	0	2353	0	0	0	0	0	2230	4605
1993	0	0	0	232	0	0	0	0	2	1491	1725
1994	491	0	0	799	0	0	0	0	30	4124	5444
1995	0	0	0	4214	0	0	0	0	0	2350	6564
1996	0	0	0	2085	0	0	0	0	8	5313	7406
1997	40	0	0	1578	0	0	0	0	54	3467	5139
1998	0	0	0	5826	0	0	0	0	456	8161	14443
1999	0	0	0	6032	0	0	0	0	371	4238	10641
2000	0	0	0	455	0	0	0	0	367	1297	2119
2001	538	0	0	4532	1	0	0	0	10	520	5601
2002	0	0	0	1729	0	0	0	0	306	2657	4692
2003	887	0	0	4948	0	0	0	0	592	2593	9020
2004	0	0	0	4096	0	0	0	0	134	1416	5646
2005	0	252	0	5928	0	0	0	0	604	0	6784
2006	0	0	0	1523	0	0	0	0	563	0	2086
2007	0	0	0	3745	0	0	0	1	2	14	3762
2008	0	0	0	2353	0	0	0	0	2	0	2355
2009	0	0	0	3773	0	0	0	0	1	70	3844
2010	0	0	0	3200	0	0	0	0	7	537	3744
2011	0	0	0	3770	0	0	0	0	261	507	4538

Country	Denmark	Faroe Islands	France	Ireland	Isle of Man	Netherlands	Norway	Spain	UK England & Wales	UK Scotland	Total
2012	0	0	0	9029	0	0	0	0	2	1688	10719
2013	0	0	0	4916	0	0	0	0	2	968	5887
2014	0	0	0	2852	0	0	0	0	1	1540	4392
2015	0	0	0	9328	0	0	0	0	0	1060	10389
2016	0	0	0	4763	0	0	0	0	1	2177	6941
2017	0	0	0	4318	0	0	0	0	0	1354	5672
2018	10	0	0	3580	0	0	0	0	0	0	3590
2019	0	1	0	13018	0	3	0	0	66	1265	14353
2020	0	0	0	14446	0	0	0	0	3	724	15173
2021	0	0	0	14145					0.35	0.078	14146

Table 12.3.1. Sprat in the Celtic Seas Ecoregion. Sprat biomass by year from the MI Celtic Sea Herring Acoustic Survey.

Year	Biomass (t)
Nov/Dec-91	36880
Jan-92	15420
Jan-92	5150
Nov-92	27320
Jan-93	18420
Nov-93	95870
Jan-94	8035
Nov-95	75440
2002	20600
2003	1395
2004	50810
2005	29019
2008	5493
2009	16229
2011	31593

Year	Biomass (t)
2012	35114
2013	44685
2014	54826
2015	83779
2016	42694
2017	70745
2018	47806
2019	60608
2020	4523
2021	12376

Table 12.3.2. Sprat in the Celtic Seas Ecoregion. Annual sprat biomass in ICES Division 7.a (Source: AFBI annual herring acoustic survey).

Year	Sprat & 0-group herring			Sprat
	Biomass (t)	CV	% sprat	Biomass (t)
1994	68 600	0.1	95	65,200
1995	348 600	0.13	n/a	n/a
1996	n/a	n/a	n/a	n/a
1997	45 600	0.2	n/a	n/a
1998	228 000	0.11	97	221 300
1999	272 200	0.1	98	265 400
2000	234 700	0.11	94	221 400
2001	299 700	0.08	99	295 100
2002	413 900	0.09	98	405 100
2003	265 900	0.1	95	253 800
2004	281 000	0.07	96	270 200
2005	141 900	0.1	96	136 100
2006	143 200	0.09	87	125 000
2007	204 700	0.09	91	187 200
2008	252 300	0.12	83	209 800

Year	Sprat & 0-group herring			Sprat
	Biomass (t)	CV	% sprat	Biomass (t)
2009	175 200	0.08	78	136 200
2010	107 400	0.1	87	93 700
2011	280 000	0.11	85	238 400
2012	171 200	0.11	95	162 600
2013	255 300	0.09	77	197 500
2014	393 000	0.1	93	367 100
2015	237 000	0.09	84	199,100
2016				236 000
2017				222 000
2018				219 000
2019				146 000
2020				117 000

Figure 12.1. Sprat in the Celtic Seas Ecoregion. Map showing areas mentioned in the text.

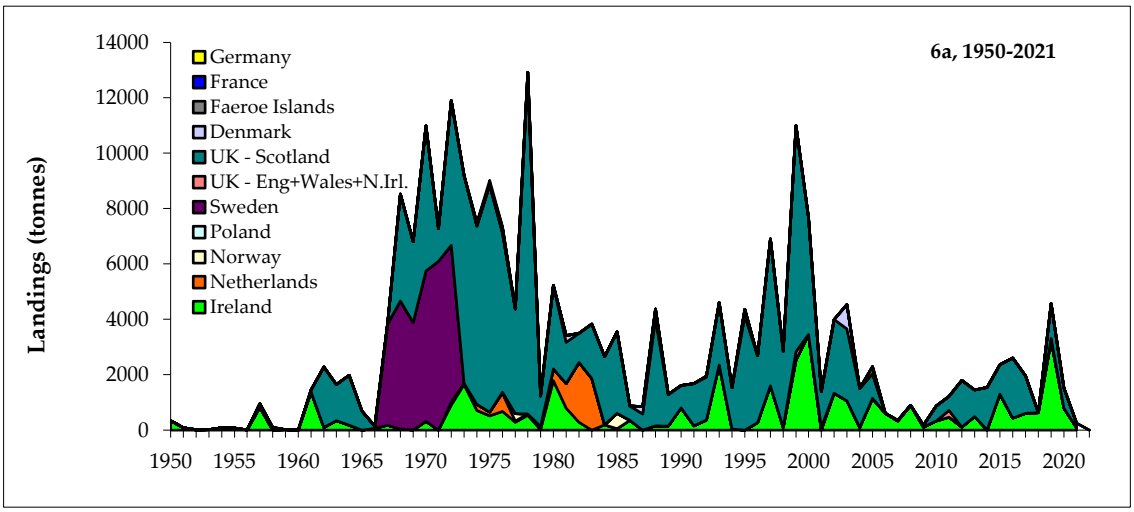

Figure 12.2.1. Sprat in the Celtic Seas Ecoregion. Landings of sprat 1950–2021 ICES Division 6.a.

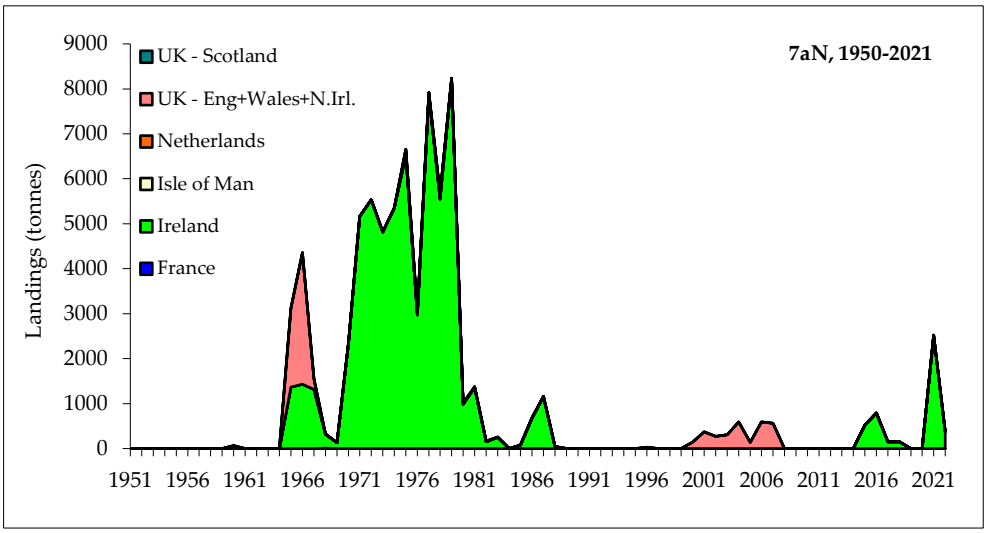

Figure 12.2.2. Sprat in the Celtic Seas Ecoregion. Landings of sprat 1950–2021 ICES Division 7.aN. Note: Irish landings from 1973–1995 may be from 7.aN or 7.aS.

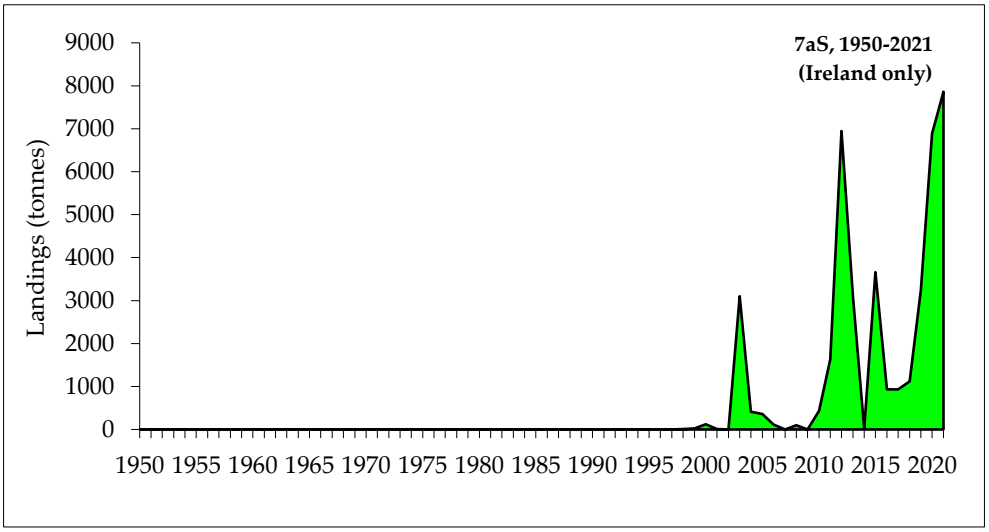

Figure 12.2.3. Sprat in the Celtic Seas Ecoregion. Landings of sprat 1950–2021 ICES Division 7.aS.

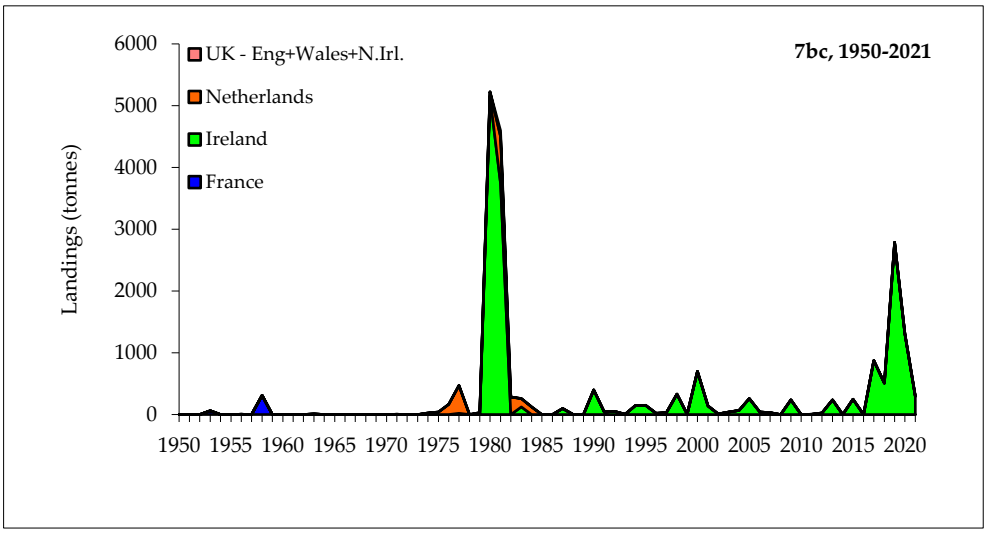

Figure 12.2.4. Sprat in the Celtic Seas Ecoregion. Landings of sprat 1950–2021 ICES divisions 7.b–c.

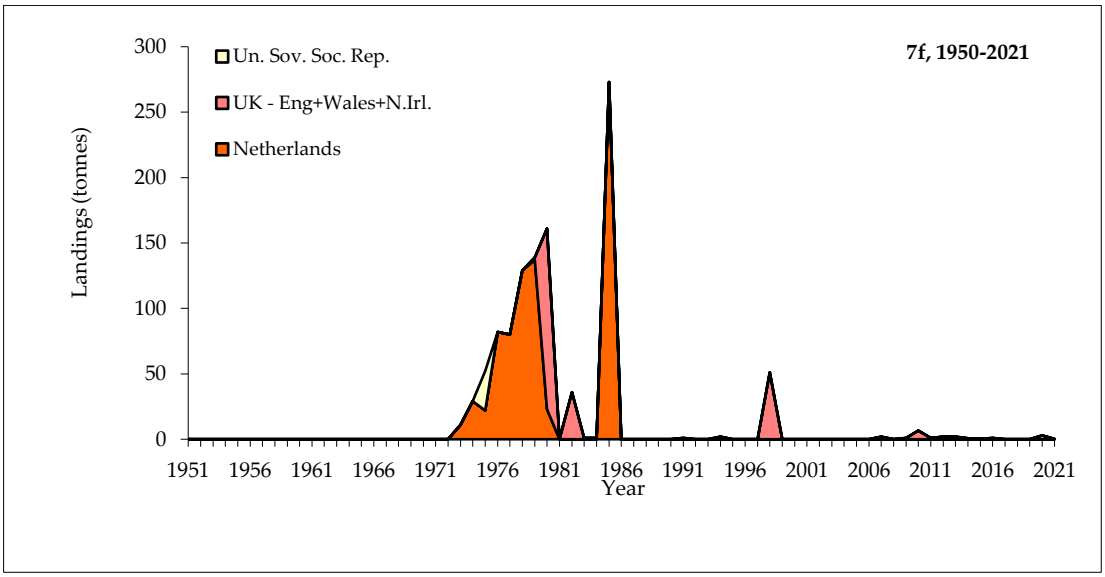

Figure 12.2.6. Sprat in the Celtic Seas Ecoregion. Landings of sprat 1950–2021 ICES Division 7.f.

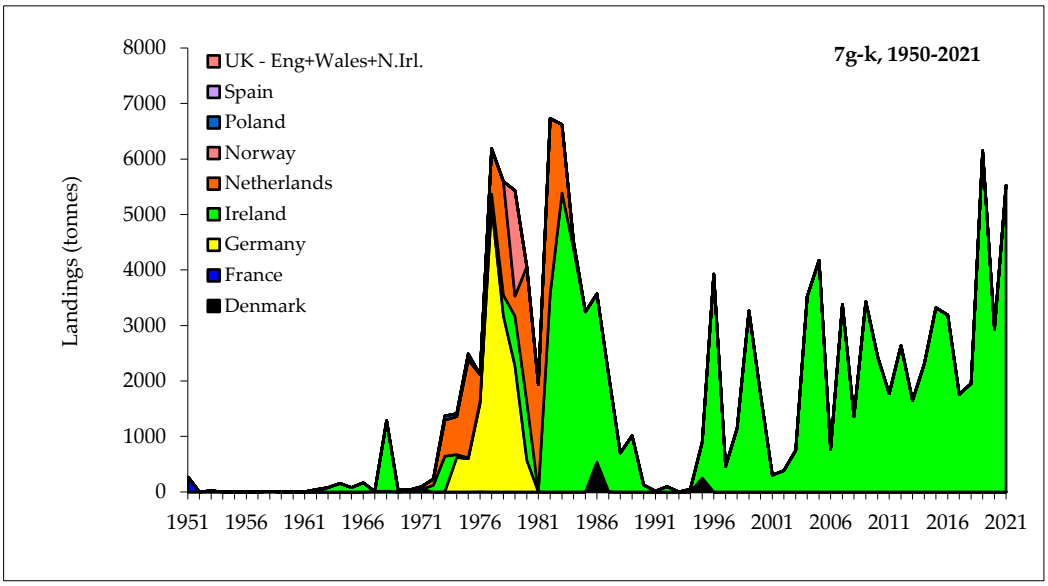

Figure 12.2.7. Sprat in the Celtic Seas Ecoregion. Landings of sprat 1950–2021 ICES divisions 7.g–k.

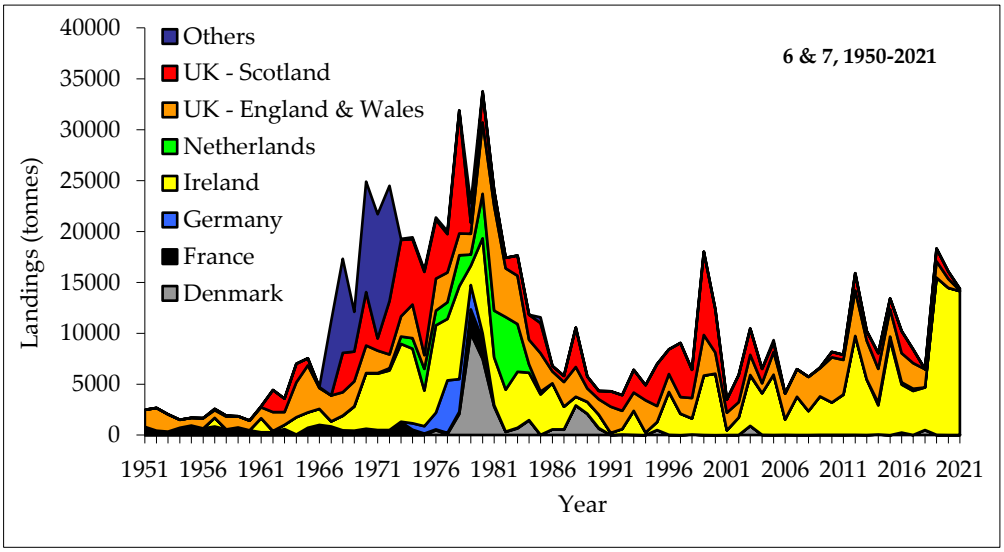

Figure 12.2.8. Sprat in the Celtic Seas Ecoregion. Landings of sprat 1950–2021 ICES subareas 6 and 7 (Celtic Seas Ecoregion).

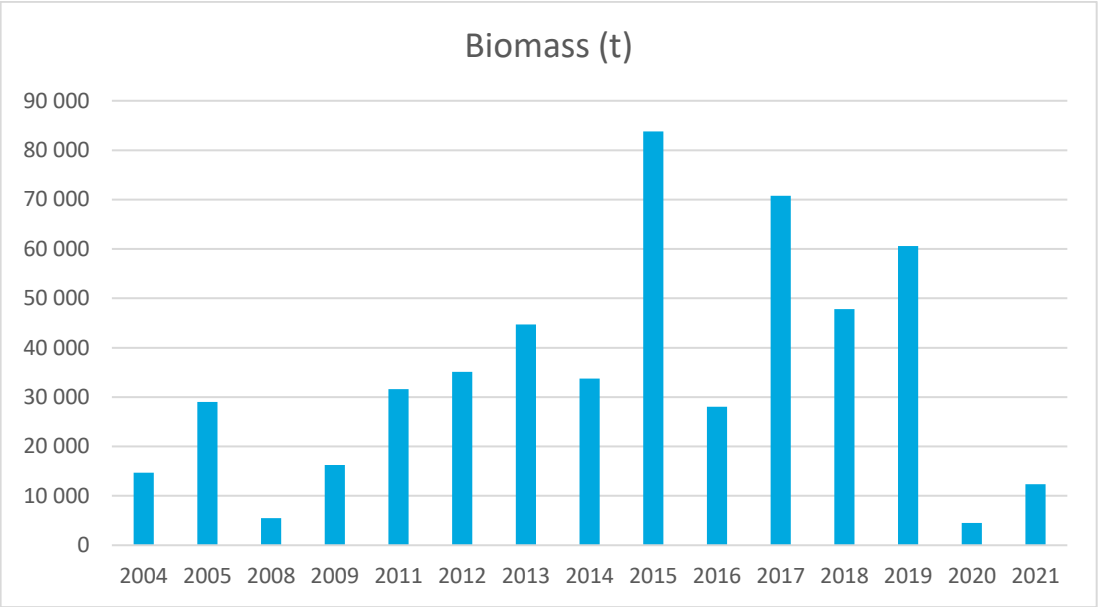

Figure 12.3.1. Sprat in the Celtic Seas Ecoregion. Estimated sprat biomass from the MI Celtic Sea Herring Acoustic Survey 2004–2021 (A4705).

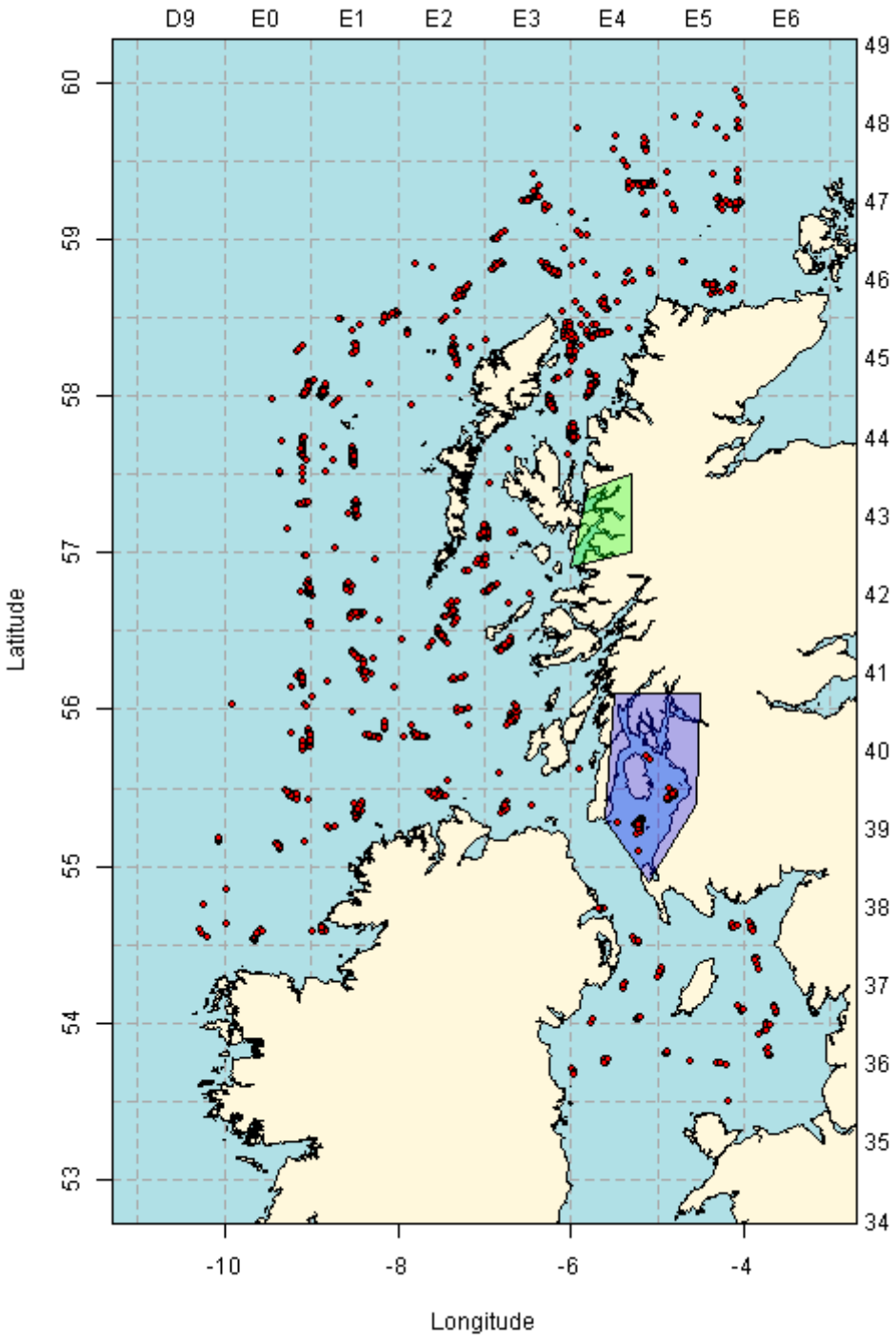

Figure 12.3.2: Extent of Scottish surveys that may provide information about sprat in 6.a. In purple is the extent of the Clyde Herring and Sprat Acoustic Surveys carried out in July between 1985 and 1989 and again in October 2012. In green is the extent of the Sea Lochs Surveys carried out annually in Q1 and Q4 between 2001 and 2005. Red markers indicate all hauls from the Q1 and Q4 Scottish West Coast IBTS between 1985 and 2012 (G7144).

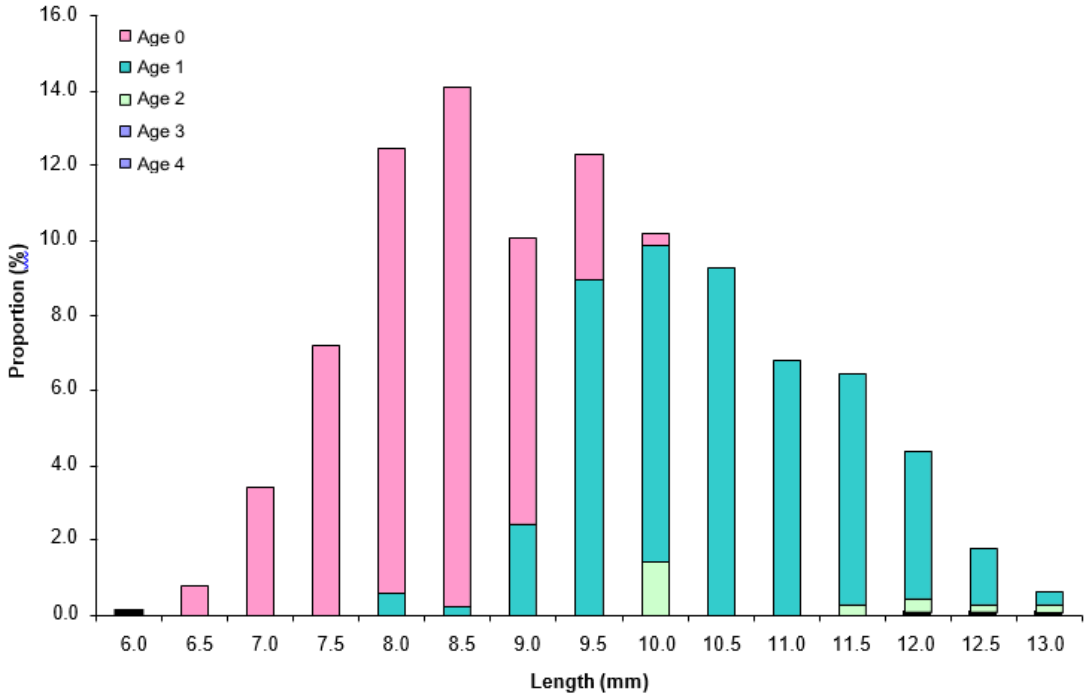

Figure 12.3.3. Length and age of sprat caught in the October 2012 Clyde Herring and Sprat Acoustic Survey. Data from six hauls were combined giving equal weight to the age and length distribution in each haul. 1442 sprat were measured and 182 were aged (G7144).

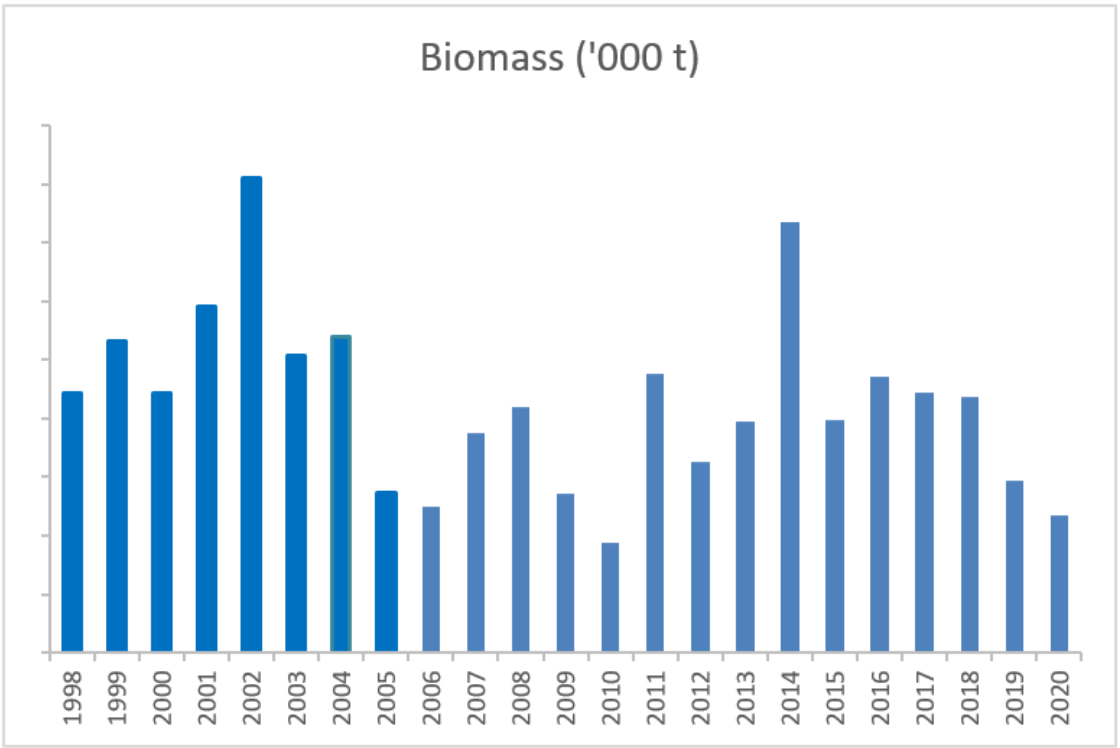

Figure 12.3.4. Sprat in the Celtic Seas Ecoregion. Annual sprat biomass in ICES Division 7.aN from the AFBI Acoustic Survey (A4075)

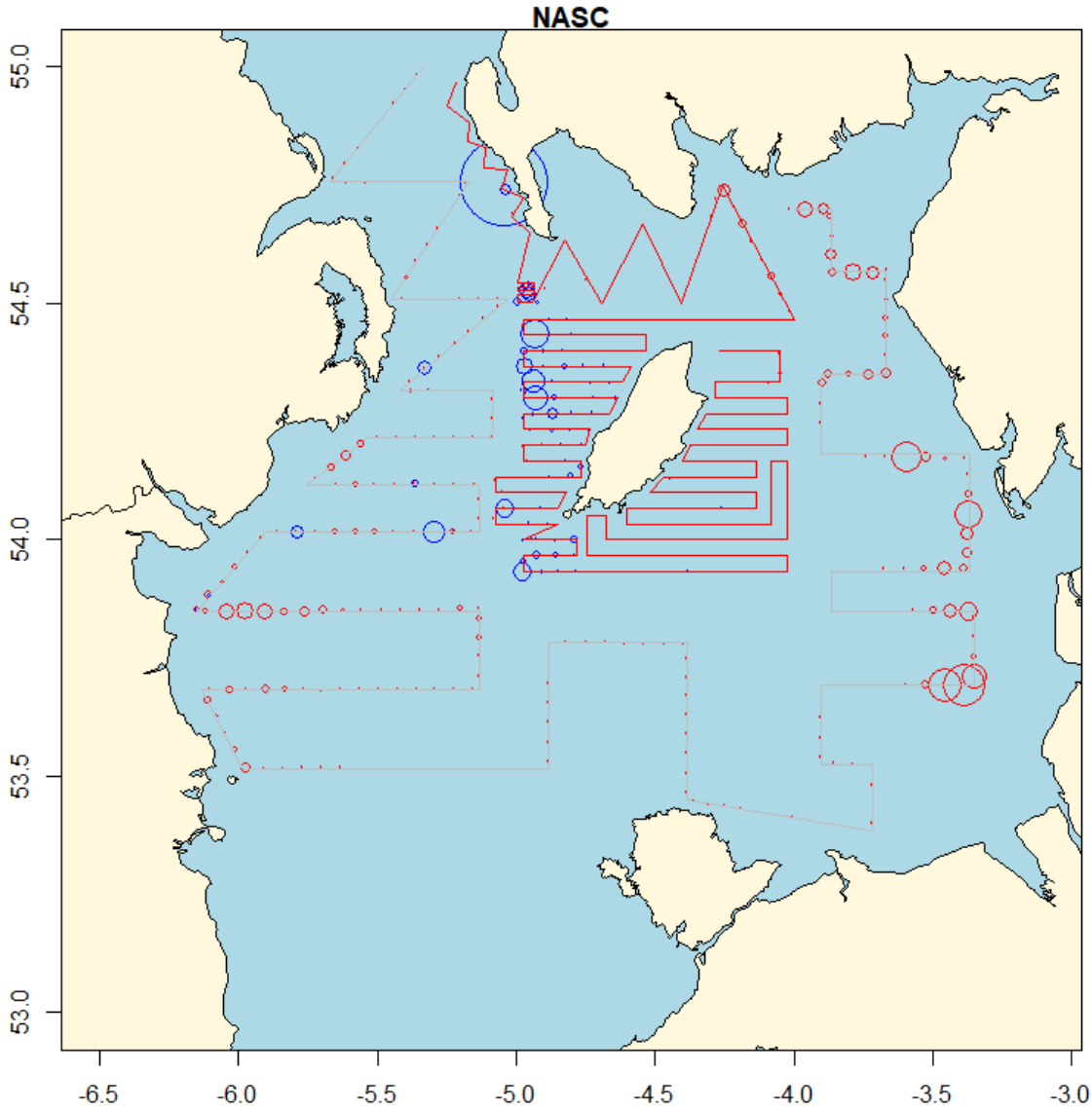

Figure 12.3.5. Map of the Irish Sea and North Channel with a post plot showing the distribution of NASC values (size of ellipses is proportional to square root of the NASC value per 15-minute interval) obtained during the 2020 acoustic survey on RV "Corystes". (a) Open blue circles are for herring NASC values (maximum value was 18895 and (b) open red circles are for clupeoid mix NASC, which include juvenile herring and sprat (maximum value was 2714) from the AFBI acoustic survey (A4705).