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Riaghaltas na h-Alba

SCOTTISH FISH FARM PRODUCTION SURVEY 2022

October 2023

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This report was prepared by the Marine Directorate

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// Foreword

The annual production survey of fish farms in Scotland for 2022 was carried out by the Marine Directorate of the Scottish Government. This survey collates annual production data from Scottish fin fish farm sites operated by authorised aquaculture production businesses. These are Official Statistics published in accordance with, **https://gss.civilservice.gov.uk/policy-store/code-of-practice-for-statistics**/. The production tonnage obtained is for the wet weight (i.e. weight of live fish) at harvest.

Responses to questionnaires from Scottish fish farming companies covering the period 1st January to 31st December 2022 are summarised in this report and returns are consistently received from 100% of companies. The questionnaires are given in Appendix 1a-d. The survey is structured to allow readers to follow industry trends within the rainbow trout, Atlantic salmon and other farmed species sectors. Data from previous years have been reassessed and updated where necessary. To allow direct comparison to data provided in previous surveys, production information by region is presented in defined areas.

Some Tables have been reformatted in this report. Tables 33 and 34 (salmon farm and company sizes) use different size categories compared to those used in earlier reports, reflecting the larger farms and companies involved in modern salmon production. Historic data has been recalculated to these new categories for comparability. The old format data will still be available on the Marine Scotland Data pages, **https://data.marine.gov.scot/dataset/scottish-fish-farm-production-survey-data**. In addition, Table 40 and Table 42 now exclude production figures for larval stage cleaner fish which may be traded for on-growing at facilities outside of Scotland, shortly after hatching. These tables now refer only to cleaner fish large enough to deploy on salmon farms. Trade in larval stage fish are included in Table 44: Trade in small fish.

The cooperation of the Scottish fish farming industry in completing the questionnaires is gratefully acknowledged. The author also acknowledges William Ellison, Liam Mason, Joanne Murphy, Sandy Murray, Keith Mutch, Mhairi Sinclair, Ronald Smith, Stuart Wallace and Andrea Warwick for their contributions to the production of this report.

L A Munro

October 2023

Contents

// Executive summary

The tables below summarise the results from the 2022 fish farms annual production survey (slight differences in these summary figures from figures in the main report are due to rounding).

Rainbow Trout (*Oncorhynchus mykiss*)

		2021	2022
Total production	(tonnes)	8,156	8,757
Production for the table	(tonnes)	7,655	8,184
Production for restocking	(tonnes)	501	573
Number of staff employed		146	138
Mean productivity	(tonnes/person)	55.9	63.5
Number of ova laid down to hatch	(millions)	4.9	4.2
Number of ova imported	(millions)	3.6	2.6

In 2022, the production of rainbow trout increased by 601 tonnes. Employment decreased by eight staff and mean productivity increased to 63.5 tonnes per person. The number of ova laid down to hatch decreased by 0.7 million and the number of ova imported decreased by 1.0 million.

Atlantic salmon (*Salmo salar*)

Ova and Smolts

		2021	2022
Number of ova produced	(millions)	46.3	53.2
Number of ova laid down to hatch	(millions)	72.8	78.5
Number of ova exported	(millions)	0	0
Number of ova imported	(millions)	50.7	43.9
Number of smolts produced	(millions)	51.2	55.1
Number of smolts put to sea	(millions)	51.1	55.3
Number of staff employed		291	295
Mean productivity (000's smolts/person)		175.9	186.6

The production of ova increased by 5.9 million in 2022 and the number of ova laid down to hatch increased by 5.7 million. No ova were exported in 2022 and the number of ova imported decreased by 6.8 million from the 2021 figure. The number of smolts produced increased by 3.9 million. In 2022 the number of staff employed increased by four and mean productivity increased by 10,700 smolts per person.

Production fish

		2021	2022
Total production	(tonnes)	205,393	169,194
Production of 0-year fish	(tonnes)	34	135
Production of grilse	(tonnes)	93,346	65,163
Production of pre-salmon	(tonnes)	51,349	52,738
Production of year 2 salmon	(tonnes)	60,664	51,158
Mean fish weight 0-year	(kg)	2.1	1.7
Mean fish weight grilse	(kg)	5.0	4.4
Mean fish weight pre-salmon	(kg)	4.6	4.8
Mean fish weight salmon	(kg)	5.7	5.2
Number of staff employed		1,495	1,508
Mean productivity	tonnes/person	137.4	112.2

Production tonnage decreased by 36,199 tonnes with a decrease in the mean harvest weight of year 0, grilse, pre-salmon and year 2 salmon. Staff numbers decreased by 13 and mean productivity decreased to 112.2 tonnes per person.

Smolt survival (percentage harvested)

Survival (%)	Years 0+1	Year 2	Total
2019 input year class	54.4	20.0	74.4
2020 input year class	57.2	18.7	75.9

The smolt survival rate for the 2020 input year class increased to 75.9%. Mortality is included in the number of fish not harvested for human consumption, which also consists of fish which have escaped, been culled for production reasons, removed for sampling purposes, statutory culls or selected for broodstock production.

Other Species

Including brown/sea trout *(Salmo trutta)*; halibut *(Hippoglossus hippoglossus)*; lumpsucker *(Cyclopterus lumpus)* and several species of wrasse (Labridae).

		2021	2022
Total production	(tonnes)	61[a]	46[a]
Number of staff employed	(full-time)	28	28
	(part-time)	13	14
Number of ova laid down to hatch	(millions)	60.0	3.5[b]
Number of ova imported	(millions)	0.7	0.9

Some figures are excluded from this report as providing them would reveal production information from an individual company.
[a]Excluding halibut production.
[b]Excluding halibut ova laid down to hatch.

In 2022, the production of other species decreased by 15 tonnes from the 2021 total, although this figure does not include halibut production. Overall, employment increased by one in 2022. There was a decrease in the number of ova laid down to hatch during 2022 but any halibut ova laid down to hatch in 2022 were not included in the 2022 figure.

Number of Confirmed Escape Incidents from Fish Farms Notified to the Scottish Government

Species	Number of reported incidents which could have led to an escape of farmed fish	Number of reported incidents which did lead to an escape of farmed fish	Number of fish escaped
Rainbow trout	2	1	3,918
Atlantic salmon (freshwater stages)	0	0	0
Atlantic salmon (seawater stages)	6	2	52,463

// 1.Rainbow trout *(Oncorhynchus mykiss)*

Production survey information was collected from all 20 companies actively involved in rainbow trout production, farming 46 active sites. This figure represents the entire industry operating in Scotland.

Production

Table 1a: Annual production (tonnes) of rainbow trout during 2008-2022 and projected production in 2023

Year	Tonnes	Percentage difference	Year	Tonnes	Percentage difference
2008	7,670	3	2016	8,096	-6
2009	6,766	-12	2017	7,637	-6
2010	5,139	-24	2018	6,413	-16
2011	4,619	-10	2019	7,405	15
2012	5,670	23	2020	7,576	2
2013	5,611	-1	2021	8,156	8
2014	5,882	5	2022	8,757	7
2015	8,588	46	2023	8,708*	

* Industry estimate based on stocks currently being on-grown.

Production increased in 2022 by 601 tonnes, an increase of 7%, to 8,757 tonnes.

Table 1b: Production (tonnes) for the table trade during 2013-2022 according to weight category

Year	<450 g <1 lb	450-900 g 1-2 lbs	>900 g >2 lbs	Total Tonnes
2013	1,908	825	2,268	5,001
2014	2,334	290	2,704	5,328
2015	2,299	258	5,476	8,033
2016	2,393	234	4,810	7,437
2017	2,000	544	4,453	6,997
2018	803	223	4,848	5,874
2019	343	228	6,335	6,906
2020	403	164	6,465	7,032
2021	384	154	7,117	7,655
2022	345	188	7,651	8,757

Production for the table in 2022 was 8,184 tonnes, an increase of 529 tonnes (7%) on the 2021 total. This accounted for 93% of the total rainbow trout production, a decrease on the proportion to that produced in 2021. Also, an increase in the number of fish in the medium and large size ranges and a decrease in the number of fish in the small size range were observed.

Table 1c: Production (tonnes) for the restocking trade during 2013-2022 according to weight category

Year	<450 g <1 lb	450-900 g 1-2 lbs	>900 g >2 lbs	Total Tonnes
2013	24	221	365	610
2014	28	256	270	554
2015	15	158	382	555
2016	35	183	441	659
2017	10	150	480	640
2018	14	143	382	539
2019	16	113	370	499
2020	46	130	368	544
2021	14	128	359	501
2022	25	207	341	573

In 2022, production for the restocking of angling waters increased to 573 tonnes representing an increase of 72 tonnes (14%) on the 2021 total. This accounted for 7% of total rainbow trout production in 2022. These figures represent the tonnage of fish supplied to angling waters for restocking purposes; they do not account for the catch taken by anglers. There was an increase in the number of fish in the small and medium size ranges but a decrease in the number of fish in the large size range.

Production by Site

Table 2: Number of sites grouped by tonnage produced during 2013-2022

Year	Number of sites per production tonnage				Total number of sites
	<1-25	26-100	101-200	>200	
2013	6	11	5	8	30
2014	6	11	5	9	31
2015	4	10	5	11	30
2016	6	10	3	13	32
2017	4	8	5	11	28
2018	5	10	3	11	29
2019	5	9	4	10	28
2020	6	13	2	11	32
2021	4	10	3	10	27
2022	6	10	3	10	29

Production was reported from 29 of the 46 active sites. The number of producers in the <1-25 tonnes size bracket increased while those in the 26-100, 101-200 and >200 tonnes size brackets remained the same as in 2021. These figures do not include those sites specialising in the production of ova or young fish for on-growing.

Production by Method

Table 3: Grouping of rainbow trout sites by production tonnages, main methods of production in 2022 and comparison with production in 2021

Production method	Production grouping (tonnes) in 2022					Total tonnage and (%) by method		Number of sites	
	<10	10-25	26-50	51-100	>100	2021	2022	2021	2022
FW pens	1	0	0	0	5	1,976 (24%)	2,454 (28%)	5	6
FW ponds and raceways	1	2	5	3	3	968 (12%)	970 (11%)	13	14
FW tanks and hatcheries	2	0	0	1	0	68 (1%)	87 (1%)	3	3
SW pens	0	0	0	1	5	5,144 (63%)	5,246 (60%)	6	6
SW tanks	0	0	0	0	0	0	0	0	0
Total	4	2	5	5	13	8,156	8,757	27	29

Seawater production accounted for 5,246 tonnes (60%) and freshwater production the remaining 3,511 tonnes (40%). Production from facilities increased during 2022.

Company and Site Data

Table 4: Number of companies and sites in production during 2013-2022

Year	No. of companies	No. of sites
2013	24	46
2014	24	46
2015	24	45
2016	24	44
2017	23	44
2018	23	53
2019	22	52
2020	21	50
2021	22	48
2022	20	46

In 2022, the number of companies authorised by the Scottish Government and actively engaged in rainbow trout production was 20. The number of sites registered and in production was 46.

Staffing and Productivity

Table 5: Number of staff employed and productivity per person during 2013-2022

Year	Full-time Male	Full-time Female	Total Full-time	Part-time Male	Part-time Female	Total Part-time	Total Staff	Productivity (tonnes/ person)
2013	85	4	89	16	5	21	110	51.0
2014	86	7	93	13	7	20	113	52.1
2015	100	10	110	10	6	16	126	68.2
2016	90	10	100	15	6	21	121	66.9
2017	98	12	110	15	7	22	132	57.9
2018	103	8	111	17	8	25	136	47.2
2019	103	11	114	21	9	30	144	51.4
2020	97	13	110	20	4	24	134	56.5
2021	107	16	123	19	4	23	146	55.9
2022	105	13	118	16	4	20	138	63.5

The overall number of staff employed in 2022 decreased by eight to 138. The number of full-time staff decreased by five while the number of part-time staff decreased by three. Productivity, measured as tonnes produced per person, increased by 13% in 2022 with no distinction between full and part-time employees being made for this calculation.

Production by Area

Table 6: Production and staffing by area in 2022

Area	No. of sites	Table production (tonnes)	Restocking production (tonnes)	Total tonnes (tonnes)	Mean tonnes per site	Staffing			Productivity (tonnes/ person)
						F/T	P/T	Total	
North*	8	1,120	33	1,153	144.1	9	2	11	104.8
East	12	935	256	1,191	99.3	35	9	44	27.1
West	15	5,587	5	5,592	372.8	51	4	55	101.7
South	11	542	279	821	74.6	23	5	28	29.3
All	46	8,184	573	8,757	190.6	118	20	138	63.5

*From 2018, the North area also included production and staff from the Western Isles and from 2021 production and staff from Orkney was also included

Productivity was greatest in the West at 372.8 tonnes per site while productivity per person was greatest in the North at 104.8 tonnes per person.

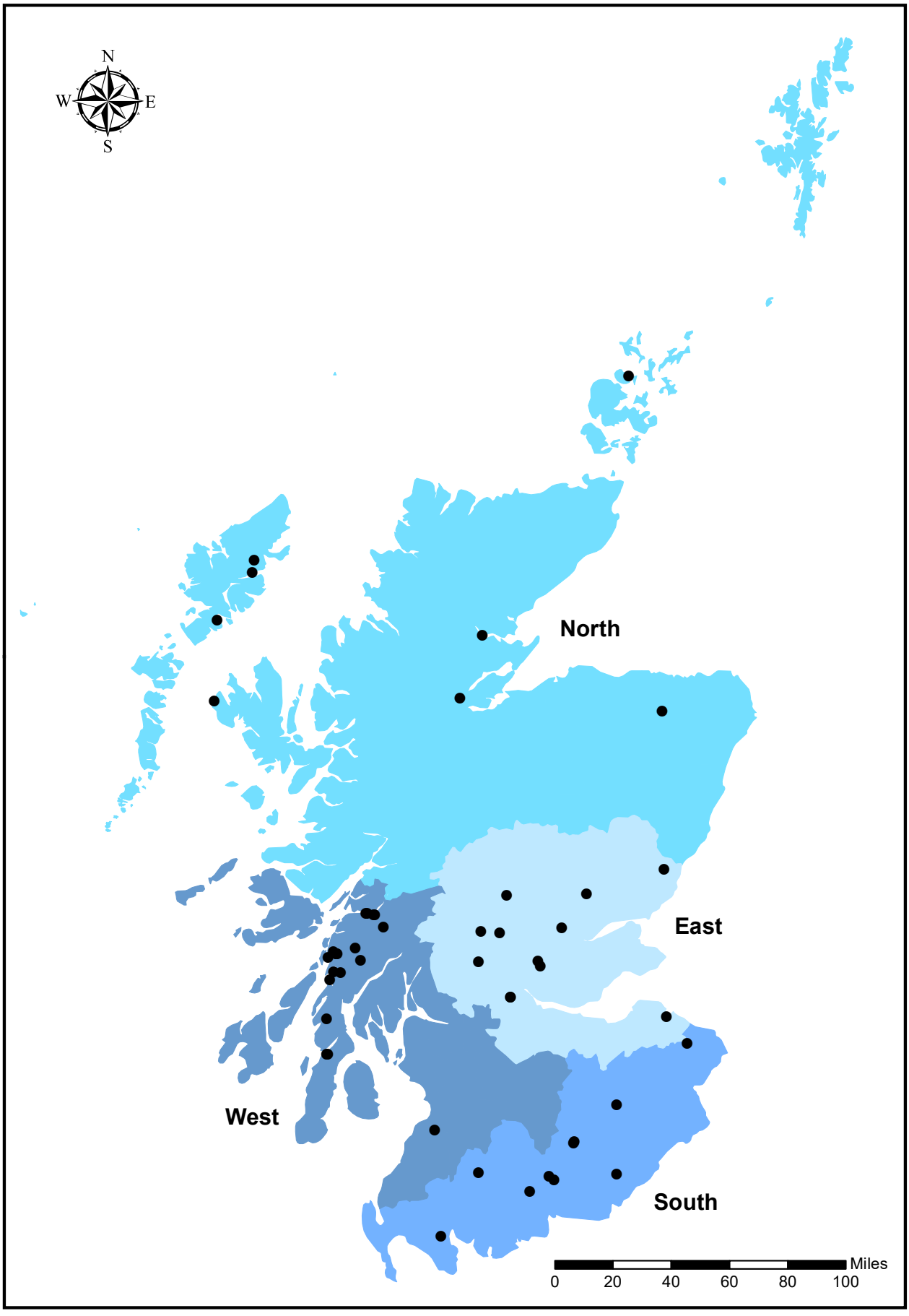


Figure 1: The regional distribution of active rainbow trout sites in 2022

Type of Ova Laid Down

Table 7: Number (000's) and proportions (%) of eyed ova types laid down to hatch during 2013-2022

Year	All female diploid no. (%)	Triploid no. (%)	Mixed sex diploid no. (%)	Total ova
2013	7,857 (80)	1,955 (20)	77 (<1)	9,889
2014	8,321 (75)	2,710 (25)	9 (<1)	11,040
2015	10,245 (85)	1,800 (15)	76 (<1)	12,121
2016	7,986 (80)	1,943 (20)	5 (<1)	9,934
2017	2,366 (34)	4,670 (66)	5 (<1)	7,041
2018	1,460 (23)	4,843 (77)	15 (<1)	6,318
2019	1,077 (16)	5,369 (82)	105 (2)	6,551
2020	286 (5)	5,943 (95)	15 (<1)	6,244
2021	2 (<1)	4,877 (<100)	15 (<1)	4,894
2022	8 (<1)	4,138 (<100)	5 (<1)	4,151

Source of Ova Laid Down

Table 8: Number (000's) and sources of eyed ova laid down to hatch in 2013-2022

Year	Ova produced in Great Britain (GB)			Imported ova			Total Ova Laid Down
	Own stock	Other stock	Total	Northern hemisphere	Southern hemisphere	Total Imported	
2013	77	537	614	9,275	0	9,275	9,889
2014	9	655	664	10,376	0	10,376	11,040
2015	6	888	894	11,227	0	11,227	12,121
2016	35	349	384	9,550	0	9,550	9,934
2017	20	547	567	6,474	0	6,474	7,041
2018	15	495	510	5,808	0	5,808	6,318
2019	10	22	32	6,519	0	6,519	6,551
2020	15	1,552	1,567	3,712	965	4,677	6,244
2021	181	1,068	1,249	3,645	0	3,645	4,894
2022	740	744	1,514	2,637	0	2,637	4,151

In 2022, the total number of eyed ova laid down to hatch decreased by 0.7 million (15%) on the 2021 figure. Imported ova all came from the Northern hemisphere during 2022. The proportion of ova from GB broodstock increased (36% of the total) and the rainbow trout industry remained reliant on imported ova. Data on the importation of ova into Scotland are also available from the health certificates and are shown in Table 9a. Any discrepancy between the figures in Tables 8 and 9a is due to data being obtained from two independent sources.

Imports from Official Import Health Certificates

Table 9a: Number (000's) and sources of ova imported into Scotland from outwith GB during 2013-2022

Source	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Denmark	1,315	2,500	2,330	5,535	3,518	3,728	5,567	3,703	1,861	0
Isle of Man	800	1,000	175	20	300	0	0	0	0	0
N. Ireland	5,125	4,780	6,535	3,040	1,240	1,085	380	150	0	0
Norway	175	710	670	500	774	0	0	0	0	0
South Africa	0	0	0	0	0	0	0	1,225	0	0
Spain	0	0	0	0	0	0	60	180	828	428
USA	2,350	1,700	1,675	750	0	855	430	0	950	2,330
Totals	9,765	10,690	11,385	9,845	5,832	5,668	6,437	5,258	3,639	2,758

Table 9b: Seasonal variation in numbers (000's) and sources of ova imported into Scotland from outwith GB during 2022

Month	Spain	USA
January	0	160
February	0	100
March	0	410
April	280	500
May	0	0
June	0	100
July	0	0
August	0	100
September	0	560
October	148	300
November	0	100
December	0	0
Totals	428	2,330

Table 9c: Number (000's) and sources of fish imported into Scotland from outwith GB during 2013-2022

Source	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
N. Ireland	537	674	746	592	486	391	935	787	463	609

Suppliers from the USA accounted for 84% of ova imported into Scotland during 2022, with suppliers from within the European Union (EU) accounting for the remaining 16%. In recent years there has been a trend for producers to import part grown rainbow trout into Scotland from Northern Ireland.

Trade in Fry and Fingerlings

Table 10: Number (000's) of fry and fingerlings traded during 2013-2022

Year	Fry and fingerlings bought			Total number bought	Total number sold
	All female diploid no. (%)	Triploid no. (%)	Mixed sex diploid no. (%)		
2013	6,734 (84)	1,239 (16)	0	7,973	6,749
2014	5,911 (81)	1,423 (19)	0	7,334	6,719
2015	6,104 (87)	598 (9)	290 (4)	6,992	6,971
2016	6,452 (85)	1,125 (15)	0	7,577	6,779
2017	3,989 (73)	1,446 (27)	0	5,435	4,145
2018	979 (42)	1,361 (58)	0	2,340	2,383
2019	861 (25)	2,532 (75)	0	3,393	2,832
2020	937 (33)	1,916 (67)	0	2,853	2,544
2021	417 (13)	2,711 (87)	2 (<1)	3,130	3,389
2022	29 (1)	2,763 (99)	1 (<1)	2,793	2,975

The established trade between hatcheries and on-growing farms continued in 2022. Some companies specialised in fry and fingerling production. The total number of fry and fingerlings bought decreased by 11% and the number sold decreased by 12%. The disparity between supply and demand is due to trade with England and Wales.

Use of Vaccines

Table 11: Number of sites rearing fish vaccinated against enteric redmouth disease (ERM) and number of fish vaccinated (millions) during 2013-2022

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
No. of sites	19	21	17	18	18	17	21	18	19	18
No. of fish	9.9	10.0	8.3	7.3	5.4	3.4	3.4	2.8	3.1	2.8

Vaccines continued to be used as a preventative treatment against enteric redmouth disease (ERM), a potentially serious bacterial infection, caused by *Yersinia ruckeri*. Vaccination is generally carried out as a bath treatment at the fingerling stage, although some vaccines are administered by intra-peritoneal injection. A total of 2.8 million fish were vaccinated on 18 sites.

Organic Production

Of the 46 sites recorded as being active in rainbow trout production in 2022, none were certified as organic.

Escapes

There was one incident involving the loss of 3,918 fish from a rainbow trout site in 2022. There were two additional incidents reported where the company confirmed there was no loss of fish.

//2. Atlantic salmon (*Salmo salar*) – ova and smolts

Production survey information was collected from all 21 companies actively involved in the freshwater production of Atlantic salmon, farming 70 active sites. This figure represents the entire freshwater industry operating in Scotland.

Company and Site Data

Table 12: Number of companies and sites in production during 2013-2022

Year	No. of companies	No. of sites
2013	27	102
2014	26	96
2015	25	87
2016	26	87
2017	24	79
2018	24	71
2019	23	76
2020	24	78
2021	22	74
2022	21	70

In 2022, the number of companies authorised by the Scottish Government for freshwater production of Atlantic salmon decreased by one to 21. A total of 70 sites were actively engaged in commercial production, a decrease of four from the 2021 figure.

Production and Staffing

Table 13: Number (000's) of smolts produced, staff employed and smolt productivity during 2013-2022

Year	Number (000's) of Smolts produced	Full-time Male	Full-time Female	Total Full-time	Part-time Male	Part-time Female	Total Part-time	Total Staff	Productivity, (000's) smolts per person
2013	40,457	226	11	237	29	19	48	285	142.0
2014	45,004	226	18	244	42	23	65	309	145.6
2015	44,571	208	31	239	41	14	55	294	151.6
2016	42,894	225	27	252	35	7	42	294	145.9
2017	46,152	219	31	250	33	8	41	291	158.6
2018	47,097	210	29	239	30	9	39	278	169.4
2019	51,430	215	32	247	26	8	34	281	183.0
2020	50,492	233	30	263	23	6	29	292	172.9
2021	51,198	229	33	262	18	11	29	291	175.9
2022	55,057	233	31	264	22	9	31	295	186.6

Smolt production in 2022 increased by 8% compared to 2021. The number of staff employed in 2022 increased by four and productivity increased by 6% to a figure of 186,600 smolts produced per person. Data for staffing and productivity in 2013 are shown, however, there are uncertainties with these data due to consolidation within the industry.

Smolts by Age Group

Table 14: Number of smolts (000's) produced by type during 2013-2022

Year	S½	S1	S1½	Total
2013	19,024	21,279	154	40,457
2014	22,367	22,473	164	45,004
2015	23,850	20,711	10	44,571
2016	25,072	17,822	0	42,894
2017	28,072	18,080	0	46,152
2018	24,058	23,039	0	47,097
2019	25,607	25,823	0	51,430
2020	22,872	27,620	0	50,492
2021	30,175	20,709	314	51,198
2022	26,587	28,470	0	55,057

In 2022, there was a decrease of 12% in the number of S½ smolts produced and an increase of 37% in the number of S1 smolts produced. In 2022 there was no production of S1½ smolts.

Production Systems

Table 15: Number and capacity of production systems during 2018-2022

System	No. of sites with system					Total capacity, 000's cubic metres				
Year	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Pens	27	27	27	26	23	346	351	379	374	364
Tanks and Raceways	44	49	51	48	47	54	68	62	65	63
Total	71	76	78	74	70	400	419	441	439	427

The types of facility used for the production of smolts in freshwater are pens or tanks and raceways. In 2022, the number of farms using pens deceased by three and the number of farms using tanks and raceways decreased by one. In terms of volume, pen capacity decreased by 10,000 m^3 and tank and raceway capacity decreased by 2,000 m^3. This resulted in a net decrease in volume of 12,000 m^3 available for the production of smolts in Scotland during 2022.

Table 16: Number (000's) of smolts produced and stocking densities by production system during 2018-2022

	Number of smolts produced (000's)					Stocking densities (smolts/m³)				
Year	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Pens	21,771	18,964	18,331	19,344	20,310	63	54	48	52	56
All others	25,326	32,466	32,161	31,854	34,747	469	477	519	490	552
Total	47,097	51,430	50,492	51,198	55,057	-	-	-	-	-

The average stocking densities of pens increased from 52 to 56 smolts per m^3 in 2022 compared to 2021, while densities in tanks and raceways increased from 490 to 552 smolts per m^3.

Ova Production

Table 17: Number (000's) of salmon ova produced during 2013-2022

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
No. of ova	56,904	33,450	11,605	13,689	12,631	15,228	11,618	20,021	46,255	53,195

In 2022, over 53 million ova were stripped, an increase of 15% from the number of ova produced in 2021.

Table 18: Source, number (000's), previous year's estimate of ova laid down to hatch during 2013-2022 and projected production for 2023

Year	In-house broodstock	Out-sourced GB broodstock	GB wild broodstock	Imported ova	Total	Previous year's estimate
2013	16,996	8,263	0	41,315	66,573	49,249
2014	14,418	2,725	10	53,684	70,837	48,149
2015	6,479	223	10	61,463	68,175	65,284
2016	5,884	4	0	58,458	64,346	59,604
2017	6,228	360	0	59,158	65,746	60,673
2018	8,780	200	0	61,499	70,479	67,374
2019	5,516	1,724	75	63,931	71,246	71,571
2020	5,195	4,480	258	68,685	78,618	70,598
2021	6,383	22,581	124	43,707	72,795	68,588
2022	2,906	29,871	0	45,761	78,538	77,306
2023						73,096

The number of ova laid down to hatch was 78.5 million, an increase of 5.7 million (8%) on the 2021 figure. The majority of the ova (58%) were derived from foreign sources, this being an increase of 2 million (5%) on the 2021 figure. Supplies derived from GB broodstock (excluding wild origin ova) increased by 5.1 million, a 7% increase on the 2021 figure. In 2022, no ova from GB wild broodstock were laid down to hatch, ova derived from wild stocks are generally held and hatched for wild stock enhancement by the aquaculture industry in cooperation with wild fisheries managers.

Smolts Produced and Put to Sea

Table 19: Actual and projected smolt production and smolts put to sea (millions) during 2013-2024

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Actual smolts put to sea	40.9	48.1	45.5	43.0	46.1	45.5	53.0	52.5	51.1	55.3		
Smolts produced	40.5	45.0	44.6	42.9	46.2	47.1	51.4	50.5	51.2	55.1		
Estimated production	28.1	39.9	43.4	36.6	39.3	46.1	38.6	52.1	55.6	54.1	47.1	56.6
Ratio of ova laid down to smolts produced	1.6	1.6	1.5	1.5	1.4	1.5	1.4	1.6	1.4	1.4		

The figure for the number of smolts put to sea includes smolts produced in England and smolts imported from elsewhere, whereas smolt production data relate only to those produced in Scotland. Smolt producers estimate putting 47.1 million smolts to sea in 2023. The ratio of ova laid down to hatch to smolts produced in 2022 was the same as the ratio in 2021.

Scale of Production

Table 20: Smolt-producing sites grouped by numbers (000's) of smolts produced during 2013-2022

Year	Scale of production								No. of sites in production	Total smolts produced
	1-10	11-25	26-50	51-100	101-250	251-500	501-1,000	>1,000		
2013	1	0	1	7	14	14	7	14	58	40,457
2014	0	0	2	1	11	9	14	13	50	45,004
2015	1	1	2	4	9	11	16	11	55	44,571
2016	1	1	0	3	7	11	13	12	48	42,894
2017	1	0	0	2	6	11	10	15	45	46,152
2018	0	1	0	0	6	9	14	12	42	47,097
2019	1	0	0	2	8	8	10	16	45	51,430
2020	1	1	0	4	4	5	10	16	41	50,492
2021	1	0	0	2	6	5	9	16	39	51,198
2022	0	0	0	0	5	9	9	15	38	55,057

Note: These data refer only to sites producing smolts. The sites holding only ova, fry or parr are excluded.

The number of sites producing smolts in 2022 was 38. There were no sites producing less than 101,000 smolts during 2022 while the number of sites producing between 101,000 and one million smolts per year increased by three. The number of sites producing in excess of one million smolts per year decreased by one to 15 sites.

Production of Ova and Smolt by Production Area

Table 21: Staffing in 2022, ova laid down to hatch in 2021-2022, smolt production in 2021-2022 and estimated production in 2023-2024 by region

Region	Number of staff employed in 2022		Ova laid down to hatch (000's)		Smolt production (000's)		Estimated smolt production (000's)	
	F/T	P/T	2021	2022	2021	2022	2023	2024
North West	156	19	39,077	47,168	28,369	30,336	27,773	32,784
Orkney	2	2	175	175	111	109	0	0
Shetland	22	2	4,239	3,459	2,905	3,962	1,760	3,240
West	59	4	24,766	25,421	16,063	17,489	14,114	17,770
Western Isles	20	2	4,493	2,315	2,695	2,173	2,475	1,770
East and South	5	2	45	0	1,055	988	946	1,000
All Scotland	**264**	**31**	**72,795**	**78,538**	**51,198**	**55,057**	**47,068**	**56,564**

In 2022, the North West and the West were the main areas where ova were laid down to hatch. The North West and the West were the main smolt producing areas. The greatest number of staff were employed in the North West region.

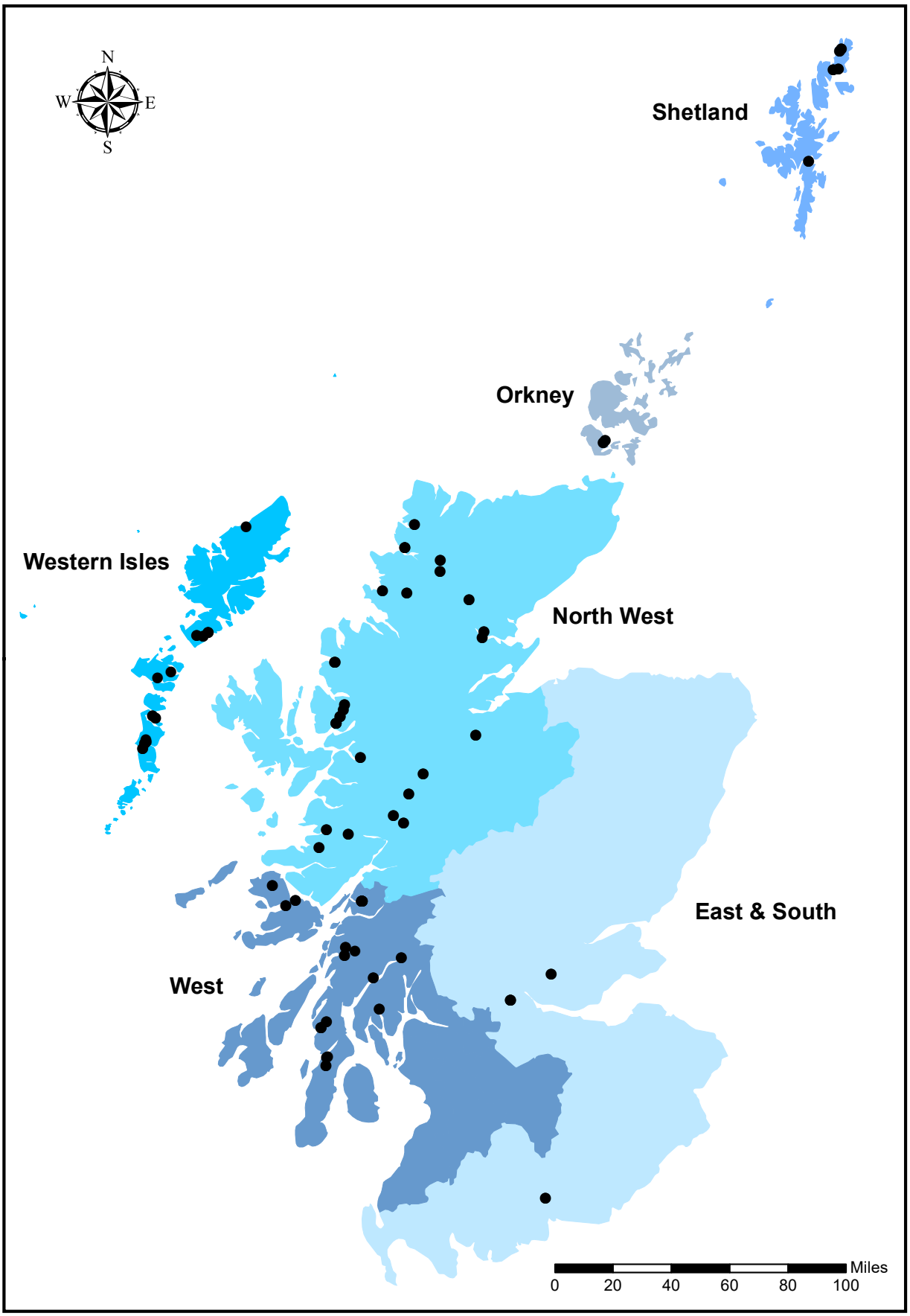


Figure 2: The regional distribution of active atlantic salmon smolt sites in 2022

International Trade

Scotland has a high health status with regard to the listed diseases. Imports of Atlantic salmon must originate from a source that is of equal or higher health status and consignments must be accompanied by a health certificate issued by the competent authority confirming that all requirements have been met.

Exports are subject to the health conditions placed by the importing country. Potential exporters should ascertain from the competent authority in the importing country any specific health testing requirements that may be a condition of import and obtain a copy of the required health certificate. The Fish Health Inspectorate will provide advice on whether the source site can fulfil the export requirements.

Imports and Exports

Table 22a: Source and number (000's) of salmon ova, fry, parr and smolts imported during 2013-2022 derived from health certificates

Import Year	Ova				Fry, Parr and Smolts		
	Iceland	Norway	Republic of Ireland	Total	Norway	Republic of Ireland	Total
2013	2,719	35,044	10,700	48,463	0	55	55
2014	3,813	49,831	5,218	58,862	1,748	1,602	3,350
2015	8,978	45,926	4,815	59,719	365	2,118	2,483
2016	5,324	38,602	5,444	49,370	0	1,956	1,956
2017	13,883	37,025	7,000	57,908	0	2,012	2,012
2018	10,116	48,430	7,250	65,796	0	1,700	1,700
2019	26,352	23,673	10,184	60,209	0	297	297
2020	41,756	220	15,296	57,272	0	1,130	1,130
2021	31,276	160	19,260	50,696	0	300	300
2022	23,370	175	20,367	43,912	0	0	0

The numbers of ova imported decreased by 13% in 2022. During 2022 no fry, parr or smolts were imported.

Table 22b: Number (000's) of salmon ova, fry, parr and smolts exported during 2013-2022 derived from health certificates

Export year	Farmed origin ova	Fry, Parr and Smolts
2013	650	404
2014	0	259
2015	95	8
2016	358	173
2017	339	206
2018	23	71
2019	0	263
2020	0	389
2021	0	371
2022	0	0

In 2022, no ova, fry, parr or smolts were exported.

Vaccines

Table 23: Number of sites using vaccines and number (millions) of fish vaccinated during 2013-2022

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
No. of sites	63	56	55	47	46	43	46	43	43	40
No. of fish (millions) vaccinated	47.5	44.7	48.0	42.6	58.4	51.0	52.4	59.2	54.9	56.2

Vaccines were used to provide protection against furunculosis, infectious pancreatic necrosis (IPN), ERM, vibriosis and salmonid alphavirus (SAV). The majority of fish were vaccinated against furunculosis, IPN and SAV, with smaller numbers of fish being vaccinated against ERM and vibriosis. A total of 56.2 million fish were vaccinated across 40 sites.

Escapes

In 2022, there were no reported escapes from sites rearing freshwater Atlantic salmon.

// 3.Atlantic salmon – Production

Production

Production survey information was collected from all 10 companies actively involved in Atlantic salmon production, farming 210 active sites. This figure represents the entire industry operating in Scotland.

Table 24: Annual production of salmon (tonnes) 2002-2022 and projected production in 2023

Year	Tonnes	Percentage difference	Year	Tonnes	Percentage difference
2002	144,589	4	2013	163,234	1
2003	169,736	17	2014	179,022	10
2004	158,099	-7	2015	171,722	-4
2005	129,588	-18	2016	162,817	-5
2006	131,847	2	2017	189,707	17
2007	129,930	-1	2018	156,025	-18
2008	128,606	-1	2019	203,881	31
2009	144,247	12	2020	192,129	-6
2010	154,164	7	2021	205,393	7
2011	158,018	3	2022	169,194	-18
2012	162,223	3	2023	187,725*	

*industry estimate of projected tonnage based on stocks currently being on-grown.

The total production of Atlantic salmon during 2022 was 169,194 tonnes, a decrease of 36,199 tonnes (18%) on the 2021 total.

Table 25: Number (000's), production (tonnes) of salmon harvested and mean fish weight (kg) per year class during 2013-2022

	Year of smolt input	Year of harvest	Number (000's)	Production (tonnes)	Mean weight at harvest (kg)
Harvest in year 0 (i.e. in year of input)	2013	2013	0	0	-
	2014	2014	286	720	2.5
	2015	2015	223	626	2.8
	2016	2016	114	333	2.9
	2017	2017	0	0	-
	2018	2018	84	247	2.9
	2019	2019	319	931	2.9
	2020	2020	323	1,208	3.7
	2021	2021	16	34	2.1
	2022	2022	79	135	1.7
Harvest in year 1	2012	2013	21,264	106,161	5.0
	2013	2014	20,316	101,997	5.0
	2014	2015	24,038	114,112	4.7
	2015	2016	24,633	111,163	4.5
	2016	2017	25,596	126,445	4.9
	2017	2018	21,825	110,554	5.1
	2018	2019	26,324	132,090	5.0
	2019	2020	28,529	141,775	5.0
	2020	2021	29,697	144,695	4.9
	2021	2022	25,777	117,901	4.6
Harvest in year 2	2011	2013	11,283	57,073	5.1
	2012	2014	13,712	76,305	5.6
	2013	2015	10,910	56,984	5.2
	2014	2016	10,940	51,321	4.7
	2015	2017	11,094	63,262	5.7
	2016	2018	7,165	45,224	6.3
	2017	2019	12,212	70,860	5.8
	2018	2020	8,883	49,146	5.5
	2019	2021	10,602	60,664	5.7
	2020	2022	9,796	51,158	5.2

Table 26: Number (000's) and production (tonnes) of grilse and pre-salmon harvested during 2013-2022

Year	Grilse (January-August)			Pre-salmon (September-December)		
	Number	Tonnes	Average weight (kg)	Number	Tonnes	Average weight (kg)
2013	9,618	47,496	4.9	11,646	58,665	5.0
2014	9,048	46,686	5.2	11,268	55,311	4.9
2015	11,243	53,930	4.8	12,795	60,182	4.7
2016	13,463	59,853	4.4	11,170	51,310	4.6
2017	13,523	68,116	5.0	12,073	58,329	4.8
2018	10,815	53,244	4.9	11,010	57,310	5.2
2019	14,495	72,243	5.0	11,829	59,847	5.1
2020	17,855	85,543	4.8	10,674	56,232	5.3
2021	18,512	93,346	5.0	11,185	51,349	4.6
2022	14,784	65,163	4.4	10,993	52,738	4.8

Table 27: Percentage (by weight) of annual production by growth stage harvested during 2013-2022

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Growth stage	-	-	-	-	-	-	-	-	-	-
Input year fish	0	<1	<1	<1	0	<1	<1	<1	<1	<1
Grilse	29	26	31	37	36	34	35	45	45	39
Pre-salmon	36	31	35	31	31	36	29	29	25	31
Year 2 salmon	35	42	33	31	33	29	35	26	30	30

Survival and Production in Smolt Year Classes

Table 28: Survival and production in smolt year classes during 2003-2022

Year of smolt input	Smolt input (000's)	Harvest year 0				Harvest year 1				Harvest year 2				Total % of year class harvested (survival)	Year class weight (tonnes)	Yield per smolt (kg)
		Number (000's)	Weight (tonnes)	Mean weight (kg)	% harvest	Number (000's)	Weight (tonnes)	Mean weight (kg)	% harvest	Number (000's)	Weight (tonnes)	Mean weight (kg)	% harvest			
2003	43,083	82	276	3.4	0.2	19,596	85,792	4.4	45.5	13,920	61,850	4.4	32.3	78.0	147,918	3.43
2004	39,041	168	319	1.9	0.4	15,075	67,738	4.5	38.6	14,237	67,537	4.7	36.5	75.5	135,594	3.47
2005	37,168	0	0	-	0	14,036	64,099	4.6	37.8	14,999	69,000	4.6	40.3	78.1	133,099	3.58
2006	41,091	115	211	1.8	0.3	13,787	60,890	4.4	33.5	15,881	73,631	4.6	38.6	72.5	134,732	3.28
2007	37,853	23	40	1.7	0.06	13,011	54,759	4.2	34.4	14,133	66,448	4.7	37.3	71.8	121,247	3.20
2008	36,662	116	216	1.9	0.3	16,338	77,621	4.7	44.6	13,666	68,070	5.0	37.3	82.2	145,907	3.98
2009	38,548	81	178	2.2	0.2	18,266	85,826	4.7	47.4	13,772	66,606	4.8	35.7	83.3	152,610	3.96
2010	38,490	128	268	2.1	0.3	18,694	91,105	4.9	48.6	13,053	64,178	4.9	33.9	82.8	155,551	4.04
2011	42,733	109	307	2.8	0.3	21,502	97,744	4.5	50.3	11,283	57,073	5.1	26.4	77.0	155,124	3.63
2012	41,094	127	301	2.4	0.3	21,264	106,161	5.0	51.7	13,712	76,305	5.6	33.4	85.4	182,767	4.45
2013	40,936	0	0	-	0	20,316	101,997	5.0	49.6	10,910	56,984	5.2	26.7	76.3	158,981	3.88
2014	48,112	286	720	2.5	0.6	24,038	114,112	4.7	50.0	10,940	51,321	4.7	22.7	73.3	166,153	3.45
2015	45,465	223	626	2.8	0.5	24,633	111,163	4.5	54.2	11,094	63,262	5.7	24.4	79.1	175,051	3.85
2016	42,957	114	333	2.9	0.3	25,596	126,445	4.9	59.6	7,165	45,224	6.3	16.7	76.6	172,002	4.00
2017	46,116	0	0	-	0	21,825	110,554	5.1	47.3	12,212	70,860	5.8	26.5	73.8	181,414	3.93
2018	45,513	84	247	2.9	0.2	26,324	132,090	5.0	57.8	8,883	49,146	5.5	19.5	77.5	181,483	3.99
2019	52,990	319	931	2.9	0.6	28,529	141,775	5.0	53.8	10,602	60,664	5.7	20.0	74.4	203,370	3.84
2020	52,492	323	1,208	3.7	0.6	29,697	144,695	4.9	56.6	9,796	51,158	5.2	18.7	75.9	197,061	3.75
2021	51,131	16	34	2.1	0.03	25,777	117,901	4.6	50.4							
2022	55,261	79	135	1.7	0.1											

In 2020, the last year for which survival can be calculated, the survival rate from smolt input to harvest increased to 75.9%. Of the 2021 year class, 50.4% of the input has been harvested, 6.8% lower than the average harvest of fish one year after input in the 2020 year class. In 2022, 0.1% of the fish were harvested from the 2022 input. This was an increase compared with the proportion of fish harvested from the same year class in 2021.

Smolts to Sea

Table 29: Number (000's) and origin of smolts put to sea during 2013-2022

Year	Smolts put to sea (000's)			Total (000's)	Scottish Origin	English Origin		Other Origin	
	S½	S1	S1½		%	(000's)	%	(000's)	%
2013	19,262	21,534	140	40,936	97	1,169	3	0	0
2014	23,758	24,212	142	48,112	94	893	2	2,072	4
2015	22,886	22,569	10	45,465	96	938	2	1,082	2
2016	22,052	20,905	0	42,957	97	1,048	2	611	1
2017	25,490	20,626	0	46,116	97	976	2	300	<1
2018	21,767	23,746	0	45,513	96	1,318	3	364	<1
2019	24,525	28,465	0	52,990	98	751	1	297	<1
2020	24,809	27,683	0	52,492	96	1,070	2	1,130	2
2021	29,421	21,396	314	51,131	97	1,016	2	300	<1
2022	28,698	26,563	0	55,261	98	997	2	0	0

The total number of smolts put to sea in 2022 was just under 55.3 million. This smolt input comprised S½s (52%) and S1s (48%). No S1½s were produced in 2022. Two percent of the smolts stocked to Scottish salmon farms were sourced from outwith Scotland and no smolts coming from sources outwith GB in 2022. This was a decrease of 1% compared with the proportion observed in 2021.

Survival and Production in Smolt Year Classes by Production Area

Table 30: Number (000's) of smolts put to sea and year class survival by area during 2011-2022

Region	Smolts put to sea (000's)		Harvest in year 0			Harvest in year 1			Harvest in year 2			Total Harvest	
	Year	No	Year	No	%	Year	No	%	Year	No	%	No	%
North West	2011	12,605	2011	53	0.4	2012	7,937	63.0	2013	1,744	13.8	9,734	77.2
	2012	11,588	2012	127	1.1	2013	7,179	62.0	2014	2,623	22.6	9,929	85.7
	2013	10,975	2013	0	0	2014	6,549	59.7	2015	1,695	15.4	8,244	75.1
	2014	17,543	2014	191	1.1	2015	9,649	55.0	2016	3,768	21.5	13,608	77.6
	2015	8,646	2015	223	2.6	2016	6,122	70.8	2017	1,695	19.6	8,040	93.0
	2016	14,534	2016	114	0.8	2017	9,711	66.8	2018	1,882	12.9	11,707	80.5
	2017	9,527	2017	0	0	2018	3,809	40.0	2019	1,739	18.3	5,548	58.2
	2018	15,177	2018	84	0.6	2019	10,947	72.1	2020	1,852	12.2	12,883	84.9
	2019	15,071	2019	205	1.4	2020	7,838	52.0	2021	1,976	13.1	10,019	66.5
	2020	19,075	2020	126	0.7	2021	12,443	65.2	2022	3,350	17.6	15,919	83.5
	2021	13,868	2021	10	0.1	2022	7,256	52.3					
	2022	18,130	2022	0	0								
Orkney	2011	2,718	2011	0	0	2012	1,203	44.3	2013	765	28.1	1,968	72.4
	2012	2,727	2012	0	0	2013	1,422	52.1	2014	1,167	42.8	2,589	94.9
	2013	2,104	2013	0	0	2014	1,023	48.6	2015	512	24.3	1,535	72.9
	2014	2,829	2014	0	0	2015	1,412	49.9	2016	1,244	44.0	2,656	93.9
	2015	3,266	2015	0	0	2016	1,580	48.4	2017	1,521	46.6	3,101	95.0
	2016	3,050	2016	0	0	2017	1,184	38.8	2018	1,571	51.5	2,755	90.3
	2017	3,524	2017	0	0	2018	1,699	48.2	2019	835	23.7	2,534	71.9
	2018	3,616	2018	0	0	2019	2,068	57.2	2020	1,382	38.2	3,450	95.4
	2019	4,670	2019	0	0	2020	2,230	47.8	2021	1,970	42.2	4,200	89.9
	2020	4,578	2020	0	0	2021	2,162	47.2	2022	1,487	32.5	3,649	79.7
	2021	4,469	2021	0	0	2022	1,640	36.7					
	2022	5,217	2022	0	0								
Shetland	2011	11,206	2011	49	0.4	2012	4,911	43.8	2013	2,709	24.2	7,669	68.4
	2012	11,389	2012	0	0	2013	4,995	43.9	2014	4,022	35.3	9,017	79.2
	2013	9,956	2013	0	0	2014	4,289	43.1	2015	3,034	30.5	7,323	73.6
	2014	11,309	2014	0	0	2015	5,042	44.6	2016	2,663	23.5	7,705	68.1
	2015	9,040	2015	0	0	2016	5,322	58.9	2017	1,592	17.6	6,914	76.5
	2016	10,640	2016	0	0	2017	6,012	56.5	2018	1,723	16.2	7,735	72.7
	2017	8,539	2017	0	0	2018	4,579	53.6	2019	2,005	23.5	6,584	77.1
	2018	11,312	2018	0	0	2019	4,430	39.2	2020	2,527	22.3	6,957	61.5
	2019	7,613	2019	114	1.5	2020	4,241	55.7	2021	2,186	28.7	6,541	85.9
	2020	10,072	2020	84	0.8	2021	5,246	52.1	2022	2,735	27.2	8,065	80.1
	2021	10,090	2021	0	0	2022	4,850	48.1					
	2022	10,571	2022	0	0								
South West	2011	7,493	2011	0	0	2012	2,673	35.7	2013	3,706	49.4	6,379	85.1
	2012	7,363	2012	0	0	2013	2,841	38.6	2014	3,863	52.5	6,704	91.1
	2013	7,801	2013	0	0	2014	3,202	41.0	2015	3,564	45.7	6,766	86.7
	2014	6,981	2014	95	1.4	2015	3,771	54.0	2016	2,023	29.0	5,889	84.4
	2015	11,156	2015	0	0	2016	4,944	44.3	2017	3,643	32.7	8,587	77.0
	2016	8,093	2016	0	0	2017	4,643	57.4	2018	1,622	20.0	6,265	77.4
	2017	11,106	2017	0	0	2018	5,330	48.0	2019	3,648	32.8	8,978	80.8
	2018	7,177	2018	0	0	2019	4,799	66.9	2020	1,150	16.0	5,949	82.9
	2019	11,100	2019	0	0	2020	6,126	55.2	2021	2,094	18.9	8,220	74.1
	2020	9,485	2020	112	1.2	2021	5,248	55.3	2022	1,143	12.1	6,503	68.6
	2021	10,013	2021	0	0	2022	5,743	57.4					
	2022	10,152	2022	79	0.8								
Western Isles	2011	8,711	2011	7	0.1	2012	4,778	54.9	2013	2,358	27.1	7,143	82.0
	2012	8,027	2012	0	0	2013	4,827	60.1	2014	2,037	25.4	6,864	85.5
	2013	10,100	2013	0	0	2014	5,254	52.0	2015	2,105	20.8	7,359	72.8
	2014	9,451	2014	0	0	2015	4,164	44.1	2016	1,242	13.1	5,406	57.2
	2015	13,357	2015	0	0	2016	6,665	49.9	2017	2,643	19.8	9,308	69.7
	2016	6,640	2016	0	0	2017	4,046	60.9	2018	367	5.5	4,413	66.4
	2017	13,420	2017	0	0	2018	6,408	47.7	2019	3,985	29.7	10,393	77.4
	2018	8,231	2018	0	0	2019	4,080	49.6	2020	1,972	24.0	6,052	73.5
	2019	14,536	2019	0	0	2020	8,094	55.7	2021	2,377	16.4	10,471	72.0
	2020	9,282	2020	0	0	2021	4,599	49.5	2022	1,082	11.7	5,681	61.2
	2021	12,691	2021	6	<0.1	2022	6,289	49.6					
	2022	11,190	2022	0	0								

The practice of putting smolts to sea in one region and subsequently moving them to another sea water site in another region for harvest can lead to an overestimation of survival in some regions and under-estimation in others.

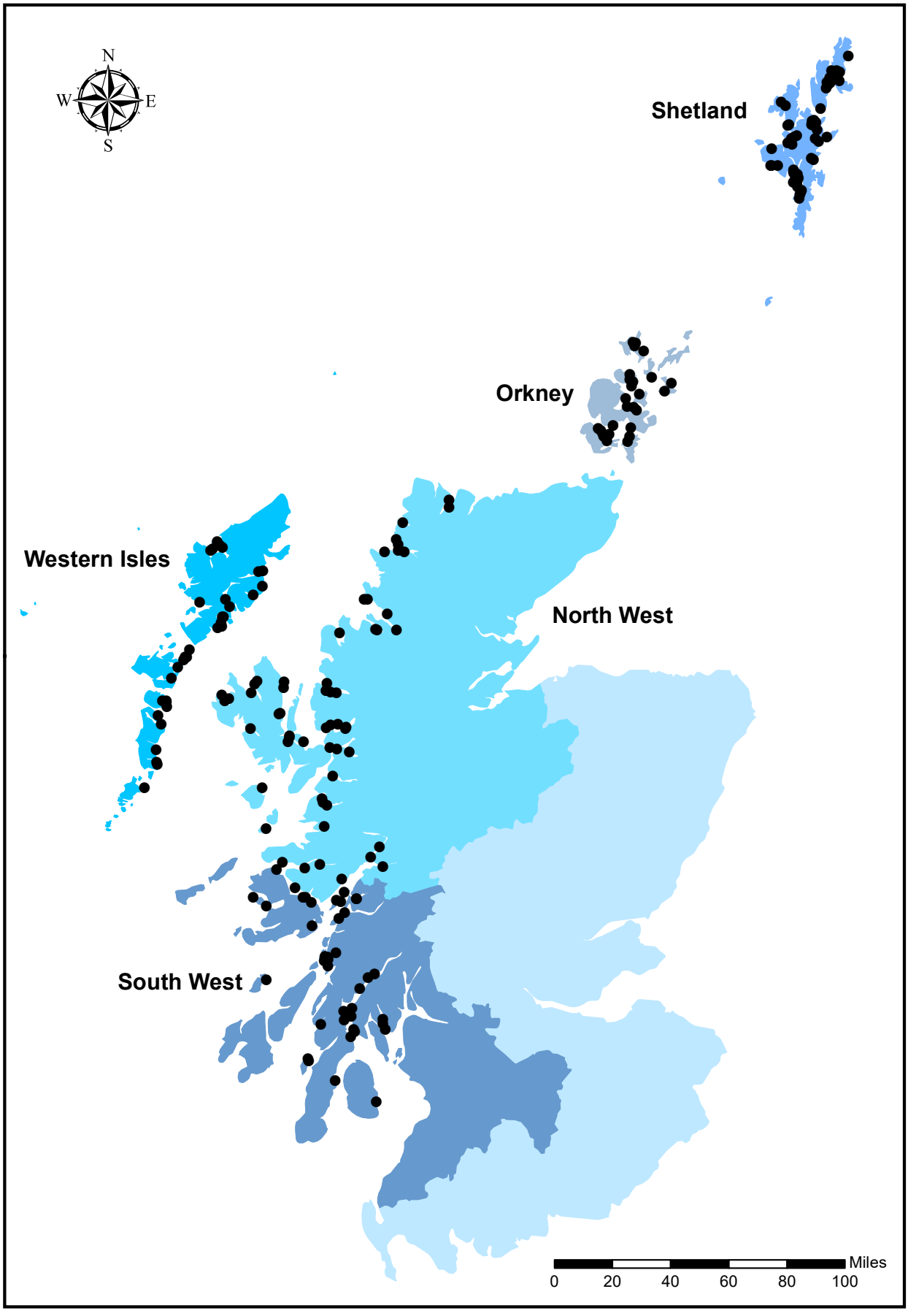


Figure 3: The regional distribution of active atlantic salmon production sites in 2022

Staffing

Table 31: Number of staff employed in the production of salmon during 2013-2022

Year	Full-time Male	Full-time Female	Total Full-time	Part-time Male	Part-time Female	Total Part-time	Total Staff	Productivity (tonnes/person)
2013	997	84	1,081	74	25	99	1,180	138.3
2014	1,082	109	1,191	98	36	134	1,325	135.1
2015	1,125	131	1,256	70	37	107	1,363	126.0
2016	1,182	197	1,379	67	40	107	1,486	109.6
2017	1,175	145	1,320	59	10	69	1,389	136.6
2018	1,273	142	1,415	35	16	51	1,466	106.4
2019	1,425	166	1,591	35	25	60	1,651	123.5
2020	1,412	145	1,557	45	28	73	1,630	117.9
2021	1,308	133	1,441	27	27	54	1,495	137.4
2022	1,260	166	1,426	47	35	82	1,508	112.2

In 2022, the total number of staff employed in salmon production was 1,508, an increase of 13 compared with 2021. The staffing figures collected refer specifically to the production of Atlantic salmon and do not include figures for staff involved with processing or marketing activities. Productivity decreased from 137.4 to 112.2 tonnes produced per person.

Production Methods

Table 32: Production methods, capacity, tonnage and average stocking densities (kg/m^3) during 2020-2022

Method	Number of sites			Total capacity (000's cubic metres)			Production (tonnes)		
	2020	2021	2022	2020	2021	2022	2020	2021	2022
Seawater tanks	1	1	1	5.1	5.6	5.6	18	14	17
Seawater pens	231	212	209	22,818	22,187	25,089	192,111	205,379	169,177
For pen sites: ratio of production (kg) to pen capacity (m^3)							8.4	9.3	6.7

In 2022, the majority of fish were produced in seawater pens. There were 17 tonnes of production from seawater tank sites in 2022. This reflects the high installation and running costs incurred in operating seawater tank systems. Most seawater tank capacity has been re-deployed for the production of other species of marine finfish or salmon broodstock.

Sea pen capacity increased by 2,902,000 m3 during 2022 and the number of sea pen sites in production decreased by three. Production efficiency in sea pens, measured as the ratio of fish weight in kilograms produced per cubic metre, decreased from 9,3 kg/m3 in 2021 to 6.7 kg/m3 in 2022.

Scale of Production by Site

Table 33: Number of sites shown in relation to their production grouping and percentage share of production 2013-2022

Production grouping (tonnes)	0	1-500	501-1,000	1,001-2,000	2001-3,000	3001-4,000	>4,000	Total	
								Sites*	Tonnes
2013	112	42	36	50	8	7	2	257	163,234
2014	117	44	29	37	22	9	2	260	179,022
2015	115	38	26	56	11	6	2	254	171,722
2016	117	37	26	50	18	4	1	253	162,817
2017	91	25	33	50	20	4	3	226	189,707
2018	100	31	26	39	21	2	2	221	156,025
2019	80	33	24	60	17	9	3	226	203,881
2020	101	32	18	43	27	7	4	232	192,129
2021	73	28	25	50	25	9	3	213	205,393
2022	87	26	25	46	13	11	2	210	169,194
2013	0	5	17	45	11	16	6	-	-
2014	0	6	12	29	30	18	5	-	-
2015	0	6	12	50	15	12	5	-	-
2016	0	5	12	44	27	9	3	-	-
2017	0	4	14	40	26	7	9	-	-
2018	0	4	14	39	32	5	6	-	-
2019	0	3	10	45	20	15	7	-	-
2020	0	3	7	34	34	12	10	-	-
2021	0	3	9	37	28	15	8	-	-
2022	0	3	11	40	19	22	5	-	-

*Includes farms stocked but having no production.

In 2022, the number of sites with no production increased by 14 and the number producing 1 to 1,000 tonnes decreased by two. The number of sites producing 1,000 to 4,000 tonnes decreased by 14 and sites producing over 4,000 tonnes decreased by one. The trend towards production in larger sites continued, with 86% of production being derived from sites producing over 1,000 tonnes.

Company Productivity

Table 34: Number of companies grouped by production (tonnes), staff and productivity (tonnes per person) during 2021-2022

Total Tonnage		0-1,000	1,001-5,000	5,001-10,000	10,001-30,000	>30,000	Total
No. of companies	2021	3	3	1	2	3	12
	2022	3	2	1	2	2	10
No. of tonnes	2021	14	5,213	6,149	43,388	150,629	205,393
	2022	17	3,772	5,686	58,398	101,321	169,194
Staff (total)	2021	16	75	93	466	845	1,495
	2022	17	60	87	481	862	1,508
Productivity (tonnes/person)	2021	0.9	70	66	93	178	137
	2022	0.9	63	65	121	118	112

The greatest productivity of 121 tonnes per person was achieved in the companies producing over 10,001-30,000 tonnes. The least productivity of 0.9 tonnes per person was from the companies producing between 0-1,000 tonnes. In comparison with 2021, the average company productivity decreased from 137 to 112 tonnes per person. Overall, production was dominated by two companies in 2022 which between them accounted for 60% of Scotland's farmed Atlantic salmon production.

Staff and Production by Production Area

Table 35: Staff and production (tonnes) by area 2013-2022 and projected production in 2023

Region	Year	Staff		Annual Production	Productivity (t/person)	Year of input		Grilse		Pre-salmon		Year 2 Salmon	
		F/T	P/T			Tonnes	Mean weight (kg)	Tonnes	Mean weight (kg)	Tonnes	Mean weight (kg)	Tonnes	Mean weight (kg)
North west	2013	350	48	43,320	109	0	-	17,937	4.9	16,417	4.7	8,966	5.1
	2014	348	46	50,873	129	511	2.7	26,440	5.3	8,731	5.5	15,191	5.8
	2015	382	66	54,741	122	626	2.8	18,046	4.8	26,897	4.6	9,172	5.4
	2016	538	30	46,917	83	333	2.9	21,576	4.7	7,515	5.0	17,493	4.6
	2017	437	11	55,690	124	0	-	32,113	5.1	14,920	4.4	8,657	5.1
	2018	453	17	30,948	66	247	2.9	11,899	4.9	7,780	5.6	11,022	5.9
	2019	662	32	66,633	96	472	2.3	35,020	5.0	21,873	5.5	9,268	5.3
	2020	546	19	48,762	86	539	4.2	24,065	4.7	13,852	5.2	10,306	5.7
	2021	442	18	70,062	156	21	2.2	42,463	5.0	17,151	4.3	10,427	5.3
	2022	422	23	48,800	110	0	-	16,775	4.2	14,441	4.4	17,584	5.2
	2023			65,749*									
Orkney	2013	86	3	11,479	129	0	-	3,191	5.1	4,491	5.7	3,797	5.0
	2014	90	6	13,029	136	0	-	980	5.5	5,045	6.0	7,004	6.0
	2015	93	1	11,074	118	0	-	1,386	5.0	6,129	5.4	3,559	6.9
	2016	102	8	14,752	134	0	-	3,491	4.6	4,668	5.7	6,593	5.3
	2017	108	9	16,756	143	0	-	3,215	5.3	3,823	6.6	9,718	6.4
	2018	93	0	20,956	225	0	-	2,808	5.2	6,906	6.0	11,242	7.2
	2019	110	1	17,758	160	0	-	6,393	5.9	5,952	6.1	5,413	6.5
	2020	138	13	21,612	143	0	-	4,383	5.8	8,875	6.0	8,354	6.0
	2021	136	3	24,407	176	0	-	3,565	5.4	8,066	5.4	12,776	6.5
	2022	169	19	18,786	100	0	-	3,879	6.3	6,615	6.5	8,292	5.6
	2023			18,448*									
Shetland	2013	210	14	36,694	164	0	-	5,822	4.5	18,121	4.9	12,751	4.7
	2014	224	24	46,369	187	0	-	6,196	5.7	17,604	5.5	22,569	5.6
	2015	228	19	42,786	173	0	-	11,134	5.4	14,939	5.0	16,713	5.5
	2016	200	23	37,464	168	0	-	11,844	4.4	12,906	4.9	12,714	4.8
	2017	207	12	38,908	178	0	-	14,132	4.6	15,284	5.2	9,492	6.0
	2018	206	3	35,947	172	0	-	12,741	5.4	12,835	5.8	10,371	6.0
	2019	227	6	36,141	155	459	4.0	11,478	5.2	12,451	5.6	11,753	5.9
	2020	280	12	40,749	140	356	4.2	13,970	5.7	11,167	6.3	15,256	6.0
	2021	276	10	43,770	148	0	-	15,644	5.7	14,074	5.6	14,052	6.4
	2022	270	18	39,258	136	0	-	11,908	4.8	13,423	5.7	13,927	5.1
	2023			38,376*									
South West	2013	251	19	34,924	129	0	-	5,847	4.8	9,111	5.6	19,966	5.4
	2014	279	29	34,976	114	209	2.2	4,278	5.1	10,476	4.4	20,013	5.2
	2015	302	12	35,911	114	0	-	10,356	4.7	6,686	4.3	18,869	5.3
	2016	305	26	31,022	94	0	-	12,349	4.3	9,246	4.4	9,427	4.7
	2017	316	18	44,575	133	0	-	11,206	5.7	12,903	4.8	20,466	5.6
	2018	375	14	37,506	96	0	-	9,690	5.1	17,246	5.0	10,570	6.5
	2019	338	7	44,881	130	0	-	8,071	5.4	13,846	4.2	22,964	6.3
	2020	331	17	36,367	105	313	2.8	16,394	4.9	13,519	4.8	6,141	5.3
	2021	340	7	36,085	104	0	-	18,830	5.3	5,965	3.5	11,290	5.1
	2022	330	14	31,236	91	135	1.7	16,337	4.3	8,906	4.6	5,858	5.1
	2023			34,210*									
Western Isles	2013	184	15	36,817	185	0	-	14,699	5.2	10,525	5.2	11,593	4.9
	2014	250	29	33,775	121	0	-	8,792	4.5	13,455	4.1	11,528	5.7
	2015	251	9	27,210	105	0	-	13,008	4.4	5,531	4.5	8,671	4.1
	2016	234	20	32,662	129	0	-	10,593	4.2	16,975	4.1	5,094	4.1
	2017	252	19	33,778	125	0	-	7,450	4.7	11,399	4.6	14,929	5.6
	2018	288	17	30,668	101	0	-	16,106	4.5	12,543	4.4	2,019	5.5
	2019	254	14	38,468	144	0	-	11,281	4.1	5,725	4.2	21,462	5.4
	2020	262	12	44,639	163	0	-	26,731	4.3	8,819	4.6	9,089	4.6
	2021	247	16	31,069	118	13	2.1	12,844	5.0	6,093	4.6	12,119	5.1
	2022	235	8	31,114	128	0	-	16,264	4.2	9,353	3.9	5,497	5.1
	2023			30,942*									
Scotland Total	2013	1,081	99	163,234	138	0	-	47,496	4.9	58,665	5.0	57,073	5.1
	2014	1,191	134	179,022	135	720	2.5	46,686	5.2	55,311	4.9	76,305	5.6
	2015	1,256	107	171,722	126	626	2.8	53,930	4.8	60,182	4.7	56,984	5.2
	2016	1,379	107	162,817	110	333	2.9	59,853	4.4	51,310	4.6	51,321	4.7
	2017	1,320	69	189,707	137	0	-	68,116	5.0	58,329	4.8	63,262	5.7
	2018	1,415	51	156,025	106	247	2.9	53,244	4.9	57,310	5.2	45,224	6.3
	2019	1,591	60	203,881	124	931	2.9	72,243	5.0	59,847	5.1	70,860	5.8
	2020	1,557	73	192,129	118	1,208	3.7	88,025	4.8	57,808	5.3	45,088	5.5
	2021	1,441	54	205,393	137	34	2.1	93,346	5.0	51,349	4.6	60,664	5.7
	2022	1,426	82	169,194	112	135	1.7	65,163	4.4	52,738	4.8	51,158	5.2
	2023			187,725*									

*Estimated production for 2023.

Company and Site Data

Table 36: Number of companies and sites engaged in the production of Atlantic salmon during 2013-2022

Year	Number of companies			Number of sites		
	Producing	Non-producing	Total	Producing	Non-producing	Total
2013	15	6	21	145	112	257
2014	11	7	18	143	117	260
2015	10	6	16	139	115	254
2016	10	5	15	136	117	253
2017	8	4	12	133	93	226
2018	8	4	12	121	100	221
2019	8	3	11	146	80	226
2020	8	3	11	131	101	232
2021	10	2	12	140	73	213
2022	8	2	10	123	87	210

The number of companies authorised and actively producing Atlantic salmon in 2022 was eight, two less than in 2021. Two companies remained active and authorised, although not producing salmon for harvest in 2022. These 10 companies had 210 registered active sites, although not all these sites produced fish for harvest in 2022.

Fallowing

Table 37: Number of seawater pen sites employing a fallow period during 2013-2022

Year	Fallow Period (weeks)						Total
	0	<4	4-8	9-26	27-51	52	
2013	51	4	31	92	35	43	253
2014	48	4	36	89	29	51	257
2015	45	6	41	84	27	47	250
2016	47	5	27	88	32	49	248
2017	40	9	21	88	24	40	222
2018	46	5	32	76	26	32	217
2019	37	12	31	85	22	37	224
2020	57	8	33	74	14	45	231
2021	29	11	32	85	29	26	212
2022	33	15	34	68	30	29	209

Of the 209 seawater pen sites recorded as being active in 2022, 29 sites were fallow for the entire year whilst 147 sites were fallow for a variable period. There were 33 sites that did not fallow in 2022. The normal production cycle in seawater varies in length between 12 months and two years. A fallow period at the end of production can break the cycle of disease or parasitic infections.

Broodstock Sites

Table 38: Number of sites holding Atlantic salmon broodstock during 2013-2022

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Broodstock sites	8	8	4	3	4	4	3	4	4	4

In 2022, the number of freshwater and seawater sites holding broodstock remained at four sites. A total of 3,166 fish were stripped, yielding 53.2 million ova, giving an average yield of 16,804 ova per fish.

Organic Production

Table 39: Organic production of Atlantic salmon during 2013-2022

Year	Number of active pen sites	Number of pen sites certified as organic	Production (tonnes)
2013	253	8	5,207
2014	257	8	3,588
2015	250	5	2,382
2016	248	5	3,903
2017	222	5	4,644
2018	217	5	4,219
2019	224	4	4,462
2020	231	9	12,528
2021	212	12	18,285
2022	209	9	17,768

Of the 209 active Atlantic salmon seawater pen sites in 2022, nine were certified as organic, producing 17,768 tonnes.

Escapes

There were two incidents involving the loss of 52,463 fish from seawater Atlantic salmon sites in 2022. There were six additional incidents reported where the companies confirmed there was no loss of fish.

// 4.Other Species

The Scottish aquaculture industry has continued to farm other species of fish during 2022. The production of brown/sea trout (*Salmo trutta*) showed a small decrease, with the majority of production being for the angling restocking market. In 2022 there was production of halibut (*Hippoglossus hippoglossus*) but the figure cannot be published without revealing the production from an individual company. Lumpsucker (*Cyclopterus lumpus*) and several species of wrasse (Labridae) were also produced in 2022. The production of lumpsucker and wrasse are targeted at the marine Atlantic salmon industry where they are used as a biological control for parasites. Lumpsucker and wrasse figures were amalgamated into a single cleaner fish category as separate publication of lumpsucker data would reveal the production of an individual company.

Company, Site and Production Data

Table 40: Number of companies and sites producing other species in 2022, annual production of other species (tonnes) during 2019-2022 and projected production in 2023

Species	No. of companies	No. of sites	2019 Production tonnage	2020 Production tonnage	2021 Production tonnage	2022 Production tonnage	2023 Production tonnage*
Brown/sea trout	9	10	25	24	23	23	25
Halibut	1	3	†	†	†	†	‡
Cleaner fish▲	2	3	16	19	38	23	21

* Industry estimates based on stocks currently being on-grown.
† Production occurred but this cannot be shown without revealing the figure for an individual company.
‡ Estimate provided but cannot be shown without revealing the figure for an individual company.
▲Amalgamated lumpsucker and wrasse figures (excluding larval stage fish)

Staffing

Table 41: Number of staff employed in farming other species during 2013-2022

Year	Full-time Male	Full-time Female	Total Full-time	Part-time Male	Part-time Female	Total Part-time	Total Staff
2013	26	3	29	17	4	21	50
2014	25	4	29	17	3	20	49
2015	33	2	35	11	4	15	50
2016	38	5	43	14	6	20	63
2017	37	8	45	13	4	17	62
2018	37	8	45	11	4	15	60
2019	32	6	38	10	5	15	53
2020	19	3	22	9	4	13	35
2021	22	6	28	11	2	13	41
2022	23	5	28	11	3	14	42

In 2022, the overall number of staff employed in the production of other species increased by one, to 42.

Production of Cleaner fish

Table 42: Number (000's) of cleaner fish (lumpsucker and wrasse) produced during 2015-2022

	Number of fish produced (000's)							
Species	2015	2016	2017	2018	2019	2020	2021	2022
Cleaner fish▲	310	380	983	656	719	576	689	647

▲Amalgamated lumpsucker and wrasse figures (excluding larval stage fish)

In recent years lumpsucker and wrasse spp. have been produced for use as a biological control for parasites in the marine Atlantic salmon industry. Data on the number of fish produced has only been collected since 2015. These figures do not include production of larval stage cleaner fish which may be traded for on-growing at facilities outside of Scotland, shortly after hatching.

Ova Laid Down to Hatch

Table 43: Source of ova from other species laid down to hatch during 2022

Species	Source of ova laid down to hatch (000's)		
	Own broodstock	Other GB broodstock	Imported ova
Brown/sea trout	10	105	0
Halibut	§	0	0
Cleaner fish▲	2,500	0	900

§ Own broodstock ova was laid down to hatch but this cannot be shown without revealing the figure for an individual company.

▲Amalgamated lumpsucker and wrasse figures the figure for an individual company.

Trade in Small Fish

Table 44: Trade in small fish of other species in 2022

Species	Bought (000's)	Sold (000's)
Brown/sea trout	55	9
Halibut	#	#
Cleaner fish▲	530	7,350

▲Amalgamated lumpsucker and wrasse figures.

During 2022 there was trade of small halibut but figures cannot be shown without revealing the figure for an individual company.

There was also a small amount of production of brook charr (*Salvelinus fontinalis*) and tiger trout (Salmo trutta x Salvelinus fontinalis). However, due to the small number of companies in production, it is not possible to summarise these data without revealing the production of individual companies.

Organic Production

Of the 16 sites recorded as producing other species in 2022, no organic production was reported.

Escapes

There were no reported escapes from sites rearing other species during 2022.

// 5.Scottish marine regions

The Marine (Scotland) Act 2010 introduces integrated management of Scotland's seas. The creation of a National Marine Plan, as required by the Act, sets the wider context for planning within Scotland including what should be considered when creating regional marine plans. Eleven Scottish Marine Regions have been created under the Act (see Figure 4) which cover sea areas extending out to 12 nautical miles.

To support the development of Regional Marine Plans by Regional Marine Planning Partnerships, tonnages and financial values of annual finfish production have been calculated for the regions defined under the Act. These regional data are presented in Appendix 3. In order to maintain commercial confidentiality salmon production figures for Argyll & Clyde and the North Coast & West Highlands have been merged. Other finfish species including brown/sea trout, rainbow trout, cod, halibut and cleaner fish were produced, however these figures cannot be attributed to Scottish Marine Regions due to commercial confidentiality.

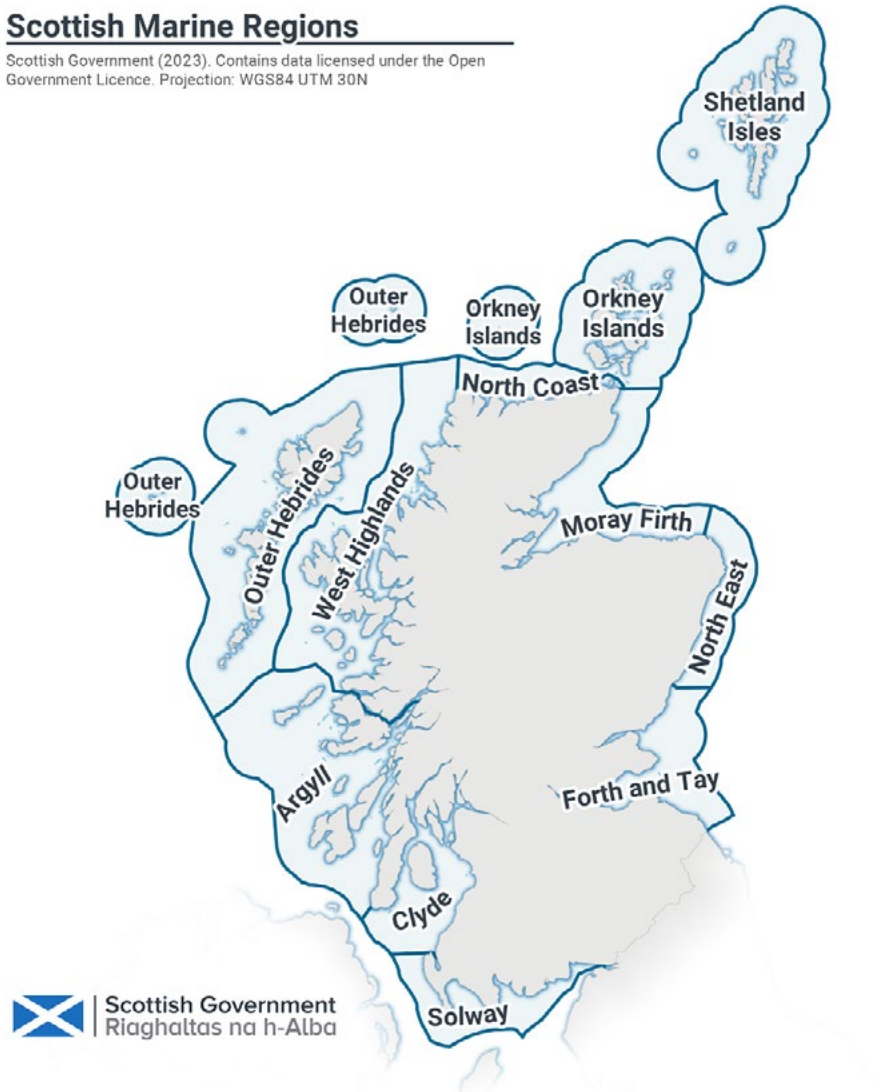


Figure 4: Scottish marine regions

// 6.Summary

Rainbow trout

The production of rainbow trout increased by 7% in 2022 to 8,757 tonnes and was directed at the table (93%) and restocking (7%) markets. The total numbers of staff employed by the sector decreased by eight to 138. There was an overall increase in the productivity of the industry to 63.5 tonnes per person.

In 2022, the number of eyed ova laid down to hatch (4.1 million) decreased by 0.7 million and was mainly triploid stock (99.7%). The proportion of ova from GB broodstock increased to 36%. The USA was the largest source of imported ova with 84% of the total, this was an increase proportionally from 2021. The Scottish rainbow trout industry continues to be highly dependent on imported ova. Additionally, imports of part grown rainbow trout from Northern Ireland continued in 2022.

Atlantic salmon

In 2022, the total production of Atlantic salmon decreased by 36,199 tonnes to 169,194 tonnes, an 18% decrease on the 2021 production total. The survey showed an increase in the production of year 0 salmon and pre-salmon but a decrease in the production of grilse and year 2 salmon during 2022. The number of staff directly employed on the farms increased by 13. Overall, there was a decrease in the productivity of tonnes produced per person from 137.4 to 112.2. The estimated harvest forecast for 2023 is 187,725 tonnes. The trend towards concentrating production in larger sites was maintained with 86% of production being concentrated in the sites producing over 1,000 tonnes per annum.

During 2022, there was an increase in the number of ova produced to 53.2 million. The number of ova laid down to hatch increased by 8% to 78.5 million. 2022 saw 58% of ova being imported with the remaining 42% being derived from GB broodstock (an increase of 7% on the 2021 figure). Smolt production increased to 55.1 million, with 48% being produced as S½ smolts and 52% as S1 smolts. The number of staff directly employed on freshwater sites increased by four in 2022 to 295 staff while productivity increased to 186,600 smolts per person. Projections for 2023 suggest that less smolts will be produced than was seen in 2022, followed by an increase in 2024.

Other Species

Production of brown/sea trout remained at 23 tonnes in 2022. Halibut production occurred in 2022 but the figure cannot be shown without revealing the production of individual companies. Lumpsucker and wrasse continued to be produced for use as biological controls for parasites in the marine Atlantic salmon farming industry. In 2022, the total number of staff employed in the production of other species increased by one to 42.

// Appendix 1

Questionnaires sent to Fish Farmers

ANNUAL RETURN OF INFORMATION FROM SCOTTISH FISH FARMS
FOR THE PERIOD 1 JANUARY TO 31 DECEMBER 2022
RAINBOW TROUT – DATA
Please complete and return by 31 January 2023 to L A Munro, Marine Scotland Science
375 Victoria Road, Aberdeen, AB11 9DB

Business No:

1	How many staff were employed in rainbow trout production (company total)	Full time male Full time female Full time Other /Prefer not to say/Unknown		Part time male Part time female Part time Other /Prefer not to say/Unknown	
2	Please detail any accreditation schemes this company is a member of;				
3	How many eyed ova were laid down for hatching in 2022				
a	from own broodstock				
b	from other GB broodstock				
c	from abroad (Northern Hemisphere)				
d	from abroad (Southern Hemisphere)				
4	How many of the above ova were				
a	all female diploid				
b	mixed sex diploid				
c	all triploid				
5	How many fry/fingerlings were				
a	bought				
b	sold				
6	How many bought fry/fingerlings were				
a	all female diploid				
b	mixed sex diploid				
c	all triploid				
7	How many of these fish were vaccinated against ERM				
a	vaccinated on site				
b	bought vaccinated				
8	What was your total production in TONNES for the TABLE TRADE				
a	<450 g (<1 lb)				
b	450-900 g (1-2 lb)				
c	>900 g (>2 lb)				
9	What was your total production in TONNES for the RESTOCKING TRADE				
a	<450 g (<1 lb)				
b	450-900 g (1-2 lb)				
c	>900 g (>2 lb)				
10	From the total production what amount in TONNES was certified as organic				
11	What is your predicted production in 2023 in TONNES				
12	What is the fish holding capacity of the holding units for each site in cubic metres				
a	Tanks				
b	Ponds				
c	Raceways				
d	Pens				

ANNUAL PRODUCTION SURVEY 2022

GUIDANCE NOTES FOR QUESTIONNAIRE

RAINBOW TROUT

GENERAL NOTES

1. Please check that the pre-printed information on the sheet is correct.
2. If a site is inactive and **not part of a fallowing cycle**, please write "INACTIVE" after the site name.
3. When completing the boxes please start from the right, if NONE then enter a **zero** in right hand box eg

					0

Hopefully all questions are self-explanatory but you may wish to note that:

Q1. How many staff

a Please give the total number of full and part-time workers employed by the company in rainbow trout production

b Please ensure that the same staff are NOT included more than once if the company/business operates more than one site

c Staff employed solely in processing dead fish for marketing should NOT be included

Q2. Accreditation Schemes

Please include membership to trade associations, quality schemes or organic certification schemes.

Q3. Ova laid down for hatching

Give the TOTAL NUMBER of ova laid down, if the number exceeds six figures please indicate the total number clearly in margin beside the appropriate box - this also applies to questions 3-5
Ova from abroad- Northern Hemisphere includes those from Northern Ireland and Isle of Man.

Q8-9. Weight of fish sold for:

Please record the weight of fish sold to the nearest **tonne** (not in kgs), for part tonnes please indicate strongly using a decimal point, eg **31.5**

Q12. Fish Holding Capacity

Please enter the total cubic metre capacity for each type of production unit

It will be appreciated if the questionnaires are returned promptly and not later than 31 January 2023 to allow the Annual Survey Report for 2022 to be produced.

ANNUAL RETURN OF INFORMATION FROM SCOTTISH FISH FARMS
FOR THE PERIOD 1 JANUARY TO 31 DECEMBER 2022
ATLANTIC SALMON - SMOLT DATA

Please complete and return by 31 January 2023 to L A Munro, Marine Scotland
375 Victoria Road, Aberdeen, AB11 9DB

Business No:

1 **How many staff were employed in smolt production (company total)**

Full time male		**Part time male**	
Full time female		**Part time female**	
Full time Other /Prefer not to say/Unknown		**Part time Other /Prefer not to say/Unknown**	

2 **Please detail any accreditation schemes this company is a member of;** _____

3	**How many ova were produced in the winter of 2021-2022 (company total)**				
4	**How many eyed ova were laid down for hatching in winter of 2021-2022**				
a	From own farmed broodstock				
b	From other GB farmed broodstock				
c	From GB wild broodstock				
d	From foreign sources				
5	**How many eyed ova do you expect to hatch this winter (2022-2023)**				
6	**How many fry or parr were**				
a	Transferred into the site				
b	Transferred out of the site				
7	**How many smolts were produced as**				
a	**S$^{1}/_{2}$s** (ie from 2022 hatch)				
b	**S1s** (ie from 2021 hatch)				
c	**S1$^{1}/_{2}$s or S2s** (ie from 2021 or 2020 hatch)				
8	**How many smolts were sold as**				
a	**S1s** (incl S$^{1}/_{2}$s)				
b	**S2s** (incl S1$^{1}/_{2}$s)				
9	**How many smolts do you expect to produce for sea winter on-growing in 2023 as**				
a	**S1s** (incl S$^{1}/_{2}$s)				
b	**S2s** (incl S1$^{1}/_{2}$s)				
10	**How many smolts do you plan to produce in 2024**				
11	**What is the current fish holding capacity of each site in cubic metres**				
12	**Duration of FALLOW PERIOD in WEEKS (pen sites; MAX = 52)**				
13	**How many fish did you vaccinate**				
a	against furunculosis				
b	against ERM				
c	against IPN				
d	against *Vibrio* spp.				
e	against SAV (PD)				

ANNUAL PRODUCTION SURVEY 2022

GUIDANCE NOTES FOR QUESTIONNAIRE
ATLANTIC SALMON SMOLTS

GENERAL NOTES

1. Please check that the pre-printed information on the sheet is correct.
2. If a site is inactive and **not part of a fallowing cycle**, please write "INACTIVE" after the site name.
3. When completing the boxes please start from the right, if NONE then enter a **zero** in right hand box eg

					0

4. If the numbers for any box exceeds 6 figures please indicate the total number clearly in margin beside the appropriate box

Hopefully all questions are self-explanatory but you may wish to note that:

Q1. How many staff

Please enter the total number of full and part-time staff employed in smolt production, this includes maintenance staff and staff seasonally employed for specific purposes, eg vaccination - please indicate clearly if you have contracted out vaccinating work to avoid duplication in numbers

Please ensure that the same staff are NOT included more than once if your company operates more than one site, especially for companies which operate both smolt and salmon grower sites

Companies are asked to use their discretion as to what they class as full and part-time staff

Q2. Accreditation Schemes

Please include membership to trade associations, quality schemes or organic certification schemes.

Q3. Number of ova produced

Enter the total number of ova produced by the company only once, if more than one form is used please enter **zero** or score out on subsequent forms

Q7. How many smolts produced as S½ or S1 etc

The definitions used for the survey are:

S1/2 **≤18 months old**, ie put to sea in July-December
S1 **≤18 months old**, ie put to sea in January-June
S1 1/2 **19-24 months old**, ie when put to sea
S2 **>24 months old**, ie when put to sea

Q8. } **For S1s** - combine numbers of S1/2s with S1s and
Q9. } **For S2s** - combine numbers of S1 1/2s with S2s

Q10. Enter here the total number of smolts (any stage) likely to be produced

Q11. Please enter the total cubic metre capacity for all tanks or pens combined

Q12. Fallow period - applies to pen sites only
Please enter any weeks that the site was fallow in 2022 (maximum = 52)

It will be appreciated if the questionnaires are returned promptly and not later than 31 January 2023 to allow the Annual Survey Report for 2022 to be produced.

ANNUAL RETURN OF INFORMATION FROM SCOTTISH FISH FARMS
FOR THE PERIOD 1 JANUARY TO 31 DECEMBER 2022

ATLANTIC SALMON - PRODUCTION DATA

Please complete and return by 31 January 2023 to L A Munro, Marine Scotland
375 Victoria Road, Aberdeen, AB11 9DB

Business No:

1 **How many staff were employed in salmon production (company total), excluding post-harvest processing staff**

Full time male		**Part time male**	
Full time female		**Part time female**	
Other/Prefer not to say/Unknown		**Other/Prefer not to say/Unknown**	

2 **Please detail any accreditation schemes this company is a member of;** ____________________

3 **How many smolts were put into the site in 2022 as:**

a **$S^1/_2$s** (ie from 2022 hatch)

b **S1s** (ie from 2021 hatch)

c **$S1^1/_2$s** or **S2s** (ie from 2021 or 2020 hatch)

4 **How many of above came from England**

5 **Total smolt input proposed in 2023**

6 **HARVEST of 2022 SMOLT INPUT in 2022**

a Number of tonnes (wet weight at harvest)

b Number of fish

7 **HARVEST of 2021 SMOLT INPUT from 1 JANUARY to 31 AUGUST**

a Number of tonnes (wet weight at harvest)

b Number of fish

8 **HARVEST of 2021 SMOLT INPUT from 1 SEPTEMBER to 31 DECEMBER**

a Number of tonnes (wet weight at harvest)

b Number of fish

9 **HARVEST of 2020 SMOLT INPUT**

a Number of tonnes (wet weight at harvest)

b Number of fish

10 **From the total production what amount in TONNES was certified as organic**

11 **How many tonnes of fish do you expect to harvest in 2023**

12 **BROODSTOCK PRODUCTION**

a **Were brood fish produced in 2022** — YES/NO — YES/NO — YES/NO

b **How many fish were stripped**

13 **What is the current fish holding capacity of each site in cubic metres**

14 **Duration of FALLOW PERIOD in WEEKS (pen sites; MAX = 52)**

15 **Please enter the conversion factor used in Q6, Q7, Q8 and Q9 to convert gutted weight to wet weight at harvest**

ANNUAL PRODUCTION SURVEY 2022

GUIDANCE NOTES FOR QUESTIONNAIRE

ATLANTIC SALMON

GENERAL NOTES

1. Please check that the pre-printed information on the sheet is correct.
2. If a site is inactive and **not part of a fallowing cycle**, please enter "INACTIVE" after the site name.
3. All harvest tonnages should be supplied for the wet weight of fish at harvest.
4. If a site was used **only to hold broodstock** for stripping please enter "BRD" after the site name.
5. When completing the boxes please start from the right eg for 250 tonnes enter as | | | | 2 | 5 | 0 | or if NONE then enter as | | | | | | 0 |

Hopefully all questions are self-explanatory but you should note that:

Q1. How many staff

Please enter the total number of full and part-time workers employed in salmon production; this includes site staff, veterinary and maintenance staff, vaccination teams, administrative and harvesting staff but NOT processing or marketing staff

Please ensure that the same staff are NOT included more than once if the company operates more than one site, especially if your company operates both salmon grower and smolt sites.

Q2. Accreditation Schemes

Please include membership to trade associations, quality schemes or organic certification schemes.

Q3. How many smolts put to sea

The definitions used for the survey are:

S1/2 **≤18 months old**, ie put to sea in July-December
S1 **≤18 months old**, ie put to sea in January-June
S1 1/2 **19-24 months old**, ie when put to sea
S2 **>24 months old**, ie when put to sea

Q12. Broodstock production

Please circle **YES** if broodfish were produced on the site

Q13. Fish holding capacity

Please enter the total cubic metre capacity for all tanks and pens combined or, if not known, give the size of tanks or pens (area or circumference plus depth x nos tanks or pens)

Q14. Fallow period

For pen sites only, please enter any number of weeks a site was fallow in 2022 (the total number of fallow weeks should not exceed 52)

Q15. Conversion Factor

Please enter the value used to convert gutted weights to wet weight at harvest (i.e. weight of live fish)

It will be appreciated if the questionnaires are returned promptly and not later than 31 January 2023 to allow the Annual Survey Report for 2022 to be produced.

ANNUAL RETURN OF INFORMATION FROM SCOTTISH FISH FARMS
FOR THE PERIOD 1 JANUARY TO 31 DECEMBER 2022
OTHER SPECIES – DATA

Please complete and return by 31 January 2023 to L A Munro, Marine Scotland
375 Victoria Road, Aberdeen, AB11 9DB

Business No:

1 **How many staff were employed in other species production (company total)**

Full time male		**Part time male**	
Full time female		**Part time female**	
Full time Other /Prefer not to say/Unknown		**Part time Other /Prefer not to say/Unknown**	

2 **Please detail any accreditation schemes this company is a member of:** _____

3 **How many eyed ova were laid down for hatching in 2022**

a	from own broodstock			
b	from other GB broodstock			
c	from foreign sources			

4 **How many fry/small fish were**

a	bought			
b	sold			

5 **What was your total production for the market in 2022**

a	Number of tonnes			
b	Number of fish			

6 **From this production what amount in TONNES was certified as organic**

7 **What is your predicted production for the market in 2023**

a	Number of tonnes			
b	Number of fish			

8 **What is the holding capacity of the holding units for each site in cubic metres**

a	Tanks			
b	Ponds			
c	Raceways			
d	Pens			

ANNUAL PRODUCTION SURVEY 2022

GUIDANCE NOTES FOR QUESTIONNAIRE

OTHER SPECIES

GENERAL NOTES

1. Please check that the pre-printed information on the sheet is correct.

2. If a site is inactive and **not part of a fallowing cycle**, or is no longer used to culture the species concerned, please score through the relevant site or species code.

3. When completing the boxes please start from the right, if NONE then enter a **zero** in right hand box eg

					0

Q1. How many staff

Please include those staff that were involved only in other species production. Please do not include staff that are involved in the production of Atlantic salmon or rainbow trout.

Q2. Accreditation Schemes

Please include membership to trade associations, quality schemes or organic certification schemes.

Q5 - 7. Weight of fish sold

Please record the wet weight of fish sold to the nearest **tonne** (not in kgs), for part tonnes please indicate strongly using a decimal point, e.g. **31.5**

It will be appreciated if the questionnaires are returned promptly and not later than 31 January 2023 to allow the Annual Survey Report for 2022 to be produced.

// Appendix 2

Glossary and Abbreviations

Active	Fish farms in a production growing cycle which may contain stock or be fallow.
Alevin	Young fish, at stage from hatching to end of dependence on yolk sacs as primary source of nutrition.
Broodstock	Adult fish held until maturation for breeding purposes.
Diploid	Fish with the normal two sets of chromosomes.
ERM	Enteric redmouth disease.
Eyed-ova/eggs	Fish egg(s) at the stage of development when the heavily pigmented eyes of the embryo are sufficiently developed to be clearly visible.
Fallow	Fish farm having no stock, but still part of a growing cycle.
Fingerling	A term commonly applied to young stages of salmonid fish.
Fry	The life stage of a young salmon from independence of the yolk sac as the primary source of nutrition to dispersal from the redd.
Grilse	Salmon harvested between 1st January and 31st August after one winter at sea.
Intra-peritoneal	Within the body cavity.
IPN	Infectious pancreatic necrosis.
Larval Stage	Recently hatched fish which live off a yolk sac attached to their bodies.
Non-producing	A site which is active, may be stocked with fish, but has not produced any fish for harvest during the specified year.
On-growing	Farm producing fish for the table market.
Ova	Eggs.
0-year fish	Fish in their first year of life.

Parr	Young salmon at stage from dispersal from redd to migration as a smolt.
Photoperiod	Alteration of the daylight regime.
Pre-salmon	Salmon harvested between 1st September and 31st December after one winter at sea.
Raceway	Concrete or brick channels used for farming fish.
SAV	Salmonid alphavirus.
S½	Salmon or sea trout smolting at approximately six months from hatch (usually by photoperiod and/or temperature manipulation).
S1	Salmon or sea trout smolting at approximately one year from hatch.
S1½	Salmon or sea trout smolting at approximately 18 months from hatch.
Smolt	Fully silvered juvenile salmon or sea trout ready to be transferred or migrate to sea.
Stripped	Collection of ova/milt from broodfish.
Triploid	Triploid fish are sterile fish which have three sets of chromosomes, unlike a fertile fish that have two sets of chromosomes (diploid).
Year 2 Salmon	Adult salmon harvested during their 2nd year at sea.
Year class	Fish hatched or put to sea in a given year.

// Appendix 3

Scottish Marine Regions

Salmon Production by Scottish Marine Region (Tonnage and Value)

	2013		2014	
Region	**Tonnage**	**Value (£)**	**Tonnage**	**Value (£)**
Argyll & Clyde	34,924	172,384,864	34,976	163,442,848
Orkney Islands	11,479	56,660,344	13,029	60,884,517
Outer Hebrides	36,817	181,728,712	33,775	157,830,575
Shetland Isles	36,694	181,121,584	46,369	216,682,337
North Coast & West Highlands	43,320	213,827,520	50,873	237,729,529
All Scotland	**163,234**	**805,723,024**	**179,022**	**836,569,806**

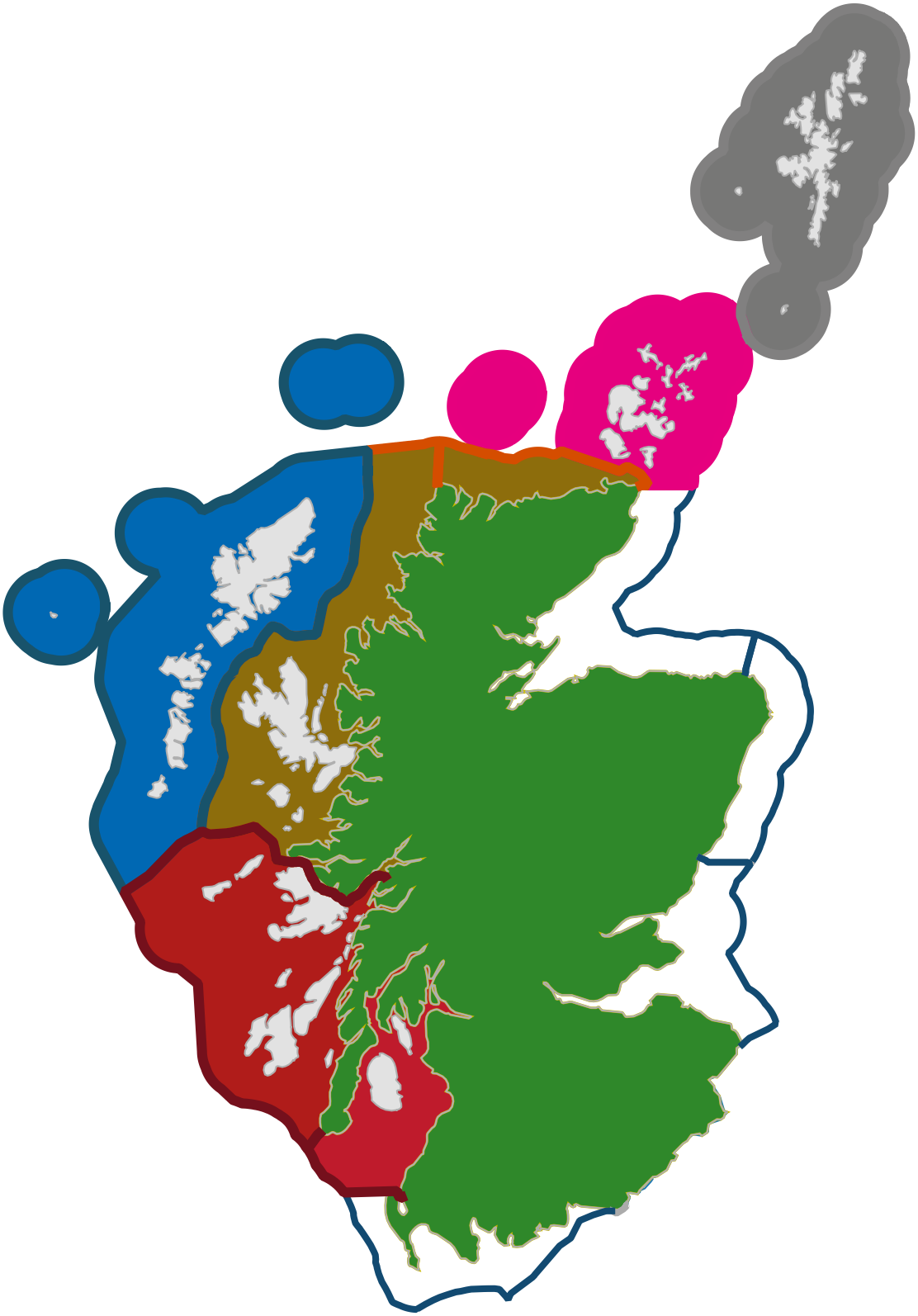
	2015		2016	
Region	**Tonnage**	**Value (£)**	**Tonnage**	**Value (£)**
Argyll & Clyde	35,911	153,555,436	31,022	166,712,228
Orkney Islands	11,074	47,352,424	14,752	79,277,248
Outer Hebrides	27,210	116,349,960	32,662	175,525,588
Shetland Isles	42,786	182,952,936	37,464	201,331,536
North Coast & West Highlands	54,741	234,072,516	46,917	252,131,958
All Scotland	**171,722**	**734,283,272**	**162,817**	**874,978,558**

	2017		2018	
Region	**Tonnage**	**Value (£)**	**Tonnage**	**Value (£)**
Argyll & Clyde	44,575	276,677,025	37,506	232,724,730
Orkney Islands	16,756	104,004,492	20,956	130,031,980
Outer Hebrides	33,778	209,660,046	30,668	190,294,940
Shetland Isles	38,908	241,501,956	35,947	223,051,135
North Coast & West Highlands	55,690	345,667,830	30,948	192,032,340
All Scotland	**189,707**	**1,177,511,349**	**156,025**	**968,135,125**

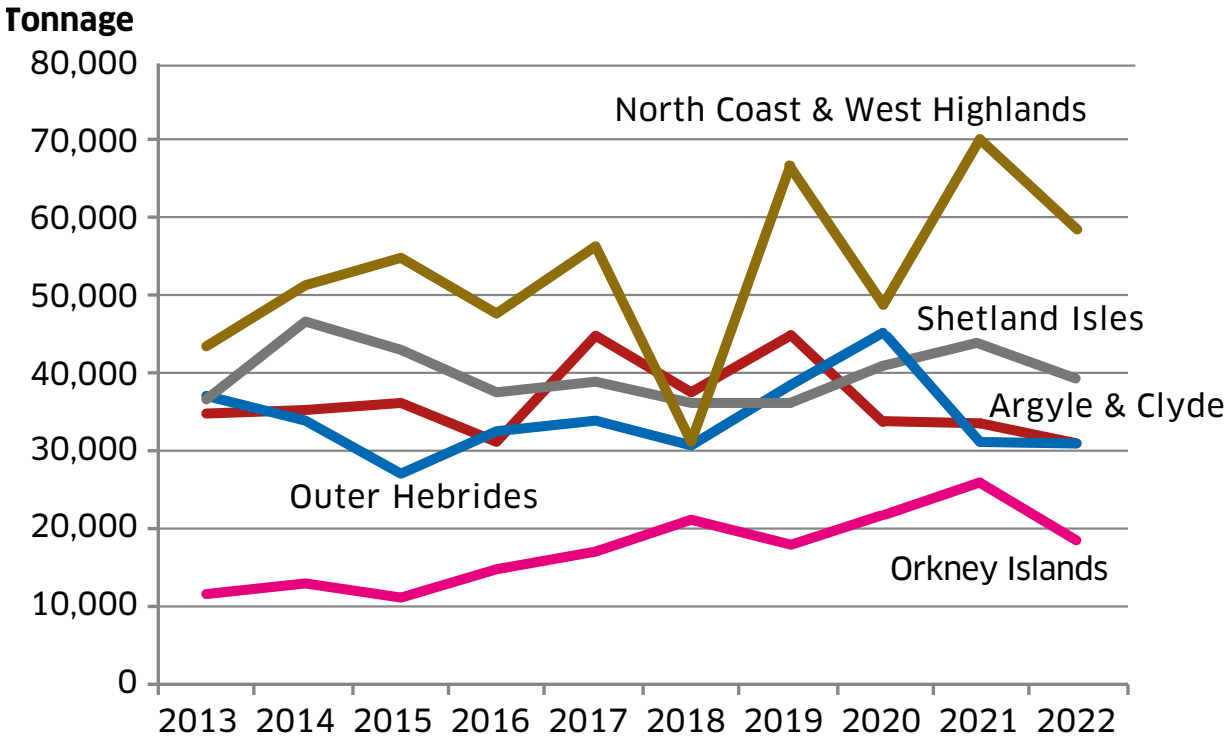
	2019		2020	
Region	**Tonnage**	**Value (£)**	**Tonnage**	**Value (£)**
Argyll & Clyde	44,881	256,090,986	36,367	186,126,306
Orkney Islands	17,758	101,327,148	21,612	110,610,216
Outer Hebrides	38,468	219,498,408	44,639	228,462,402
Shetland Isles	36,141	206,220,546	40,749	208,553,382
North Coast & West Highlands	66,633	380,207,898	48,862	250,075,716
All Scotland	**203,881**	**1,163,344,986**	**192,129**	**983,316,222**

	2021		2022	
Region	**Tonnage**	**Value (£)**	**Tonnage**	**Value (£)**
Argyll & Clyde	36,085	185,982,090	31,236	227,085,720
Orkney Islands	24,407	125,793,678	18,786	136,574,220
Outer Hebrides	31,069	160,129,626	31,114	226,198,780
Shetland Isles	43,770	225,590,580	39,258	285,405,660
North Coast & West Highlands	70,062	361,099,548	48,800	354,776,000
All Scotland	**205,393**	**1,058,595,522**	**169,194**	**1,230,040,380**

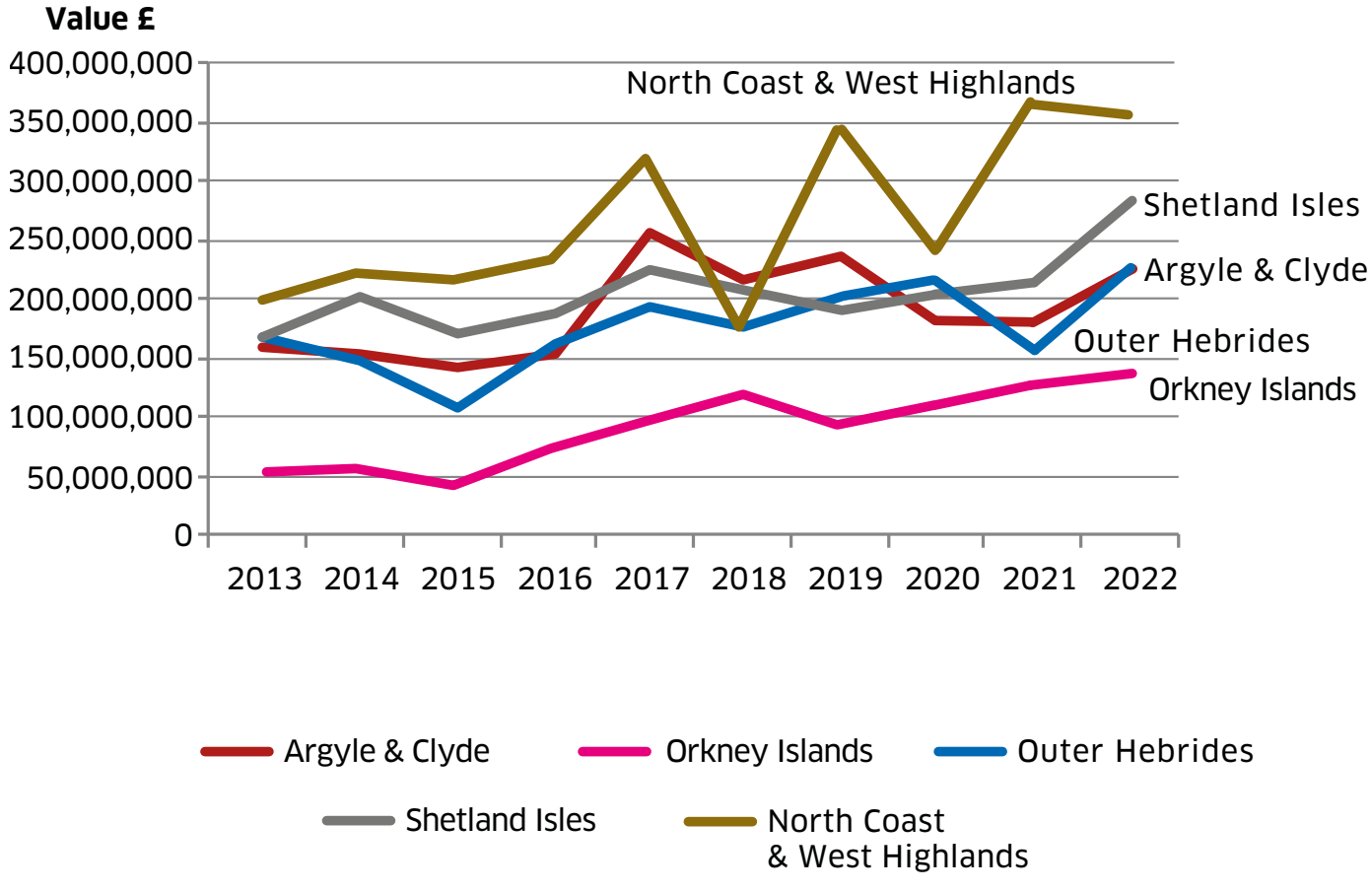
Footnote: Figures for Argyll & Clyde and the North Coast & West Highlands have been merged due to commercial confidentiality. Other finfish species including brown/sea trout, rainbow trout, halibut and cleaner fish were produced but cannot be attributed to Scottish Marine Regions due to commercial confidentiality. Average price (real) have been adjusted for inflation based on 2022 price estimates.



Salmon Tonnes



Value £ real price (inflation adjusted on 2022 Price estimates)



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