

Marine Scotland Science

Scottish Shellfish Farm Production Survey 2019



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SCOTTISH FISH FARM PRODUCTION SURVEY 2019

This report was prepared by Marine Scotland Science

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// Foreword

The annual production survey of fish farms in Scotland for 2019 was carried out by Marine Scotland Science (MSS). 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 the Code of Practice for official Statistics, <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 2019 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.

The cooperation of the Scottish fish farming industry in completing the questionnaires is gratefully acknowledged, especially given the COVID-19 pandemic. The author also acknowledges Alan Christie, Liam Mason, Sandy Murray, Keith Mutch, Chahat Sekhon, Mhairi Sinclair, Ronald Smith, Stuart Wallace and Andrea Warwick for their contributions to the production of this report.

L A Munro

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// Executive summary

The tables below summarise the results from the 2019 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*)

		2018	2019
Total production	(tonnes)	6,413	7,405
Production for the table	(tonnes)	5,874	6,906
Production for restocking	(tonnes)	539	499
Number of staff employed		136	144
Mean productivity	(tonnes/person)	47.2	51.4
Number of ova laid down to hatch	(millions)	6.3	6.6
Number of ova imported	(millions)	5.8	6.5

In 2019, the production of rainbow trout increased by 992 tonnes. Employment increased by eight staff and mean productivity increased to 51.4 tonnes per person. The number of ova laid down to hatch increased by 0.3 million and the number of ova imported increased by 0.7 million.

Atlantic salmon (*Salmo salar*)

Ova and Smolts

		2018	2019
Number of ova produced	(millions)	15.2	11.6
Number of ova laid down to hatch	(millions)	70.5	71.2
Number of ova exported	(millions)	0.02	0
Number of ova imported	(millions)	65.8	60.2
Number of smolts produced	(millions)	47.1	51.4
Number of smolts put to sea	(millions)	45.4	53.0
Number of staff employed		278	281
Mean productivity (000's smolts/person)		169.4	183.0

The production of ova decreased by 3.6 million in 2019 and the number of ova laid down to hatch increased by 0.7 million. No ova were exported in 2019 and the number of ova imported decreased by 5.6 million from the 2018 figure. The number of smolts produced increased by 4.3 million. In 2019 the number of staff employed increased by three and mean productivity increased by 13,600 smolts per person.

Production fish

		2018	2019
Total production	(tonnes)	156,025	203,881
Production of 0-year fish	(tonnes)	247	931
Production of grilse	(tonnes)	53,244	72,243
Production of pre-salmon	(tonnes)	57,310	59,847
Production of year 2 salmon	(tonnes)	45,224	70,860
Mean fish weight 0-year	(kg)	2.9	2.9
Mean fish weight grilse	(kg)	4.9	5.0
Mean fish weight pre-salmon	(kg)	5.2	5.1
Mean fish weight salmon	(kg)	6.3	5.8
Number of staff employed		1,466	1,651
Mean productivity	tonnes/person	106.4	123.5

Production tonnage increased by 47,856 tonnes with an increase in the mean harvest weight of grilse but a decrease in the mean weight of pre-salmon and year 2 salmon. Staff numbers increased by 185 and mean productivity increased to 123.5 tonnes per person.

Smolt survival (percentage harvested)

Survival (%)	Years 0+1	Year 2	Total
2016 input year class	59.9	16.7	76.6
2017 input year class	47.3	26.5	73.8

The smolt survival rate for the 2017 input year class decreased to 73.8%. 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).

		2018	2019
Total production	(tonnes)	40 ^a	41 ^a
Number of staff employed	(full-time)	45	38
	(part-time)	15	15
Number of ova laid down to hatch	(millions)	38.9 ^b	19.8 ^b
Number of ova imported	(millions)	1.5	1.3

Some figures are excluded from this report as providing them would reveal production information from an individual company.

^aExcluding halibut production.

^bExcluding halibut ova laid down to hatch.

In 2019, the production of other species increased by one tonne from the 2018 total, although this figure does not include halibut production. Overall, employment decreased by seven in 2019. There was a decrease in the number of ova laid down to hatch during 2019 and again any halibut ova laid down to hatch were excluded from this 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	0	3	37,372
Atlantic salmon (freshwater stages)	0	1	4,465
Atlantic salmon (seawater stages)	16	3	28,470

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

Production survey information was collected from all 22 companies actively involved in rainbow trout production, farming 52 active sites. This figure represents the entire industry operating in Scotland.

Production

Table 1a: Annual production (tonnes) of rainbow trout during 2005-2019 and projected production in 2020

Year	Tonnes	Percentage difference	Year	Tonnes	Percentage difference
2005	6,989	10	2013	5,611	-1
2006	7,492	7	2014	5,882	5
2007	7,414	-1	2015	8,588	46
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	10,011*	

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

Production increased in 2019 by 992 tonnes, an increase of 15%, to 7,405 tonnes.

Table 1b: Production (tonnes) for the table trade during 2010-2019 according to weight category

Year	<450 g	450-900 g	>900 g	Total Tonnes
	<1 lb	1-2 lbs	>2 lbs	
2010	2,125	727	1,606	4,458
2011	1,421	1,004	1,433	3,858
2012	1,195	1,655	2,209	5,059
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

Production for the table in 2019 was 6,906 tonnes, an increase of 1,032 tonnes (18%) on the 2018 total. This accounted for 93% of the total rainbow trout production, an increase on the proportion to that produced in 2018. Also, an increase in the number of fish in the large and medium size ranges and a decrease in the number of fish in the small size range were highlighted.

Table 1c: Production (tonnes) for the restocking trade during 2010-2019 according to weight category

Year	<450 g <1 lb	450-900 g 1-2 lbs	>900 g >2 lbs	Total Tonnes
2010	19	201	461	681
2011	8	419	334	761
2012	22	266	323	611
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

In 2019, production for the restocking of angling waters decreased to 499 tonnes representing a decrease of 40 tonnes (7%) on the 2018 total. This accounted for 7% of total rainbow trout production in 2019. These figures represent the tonnage of fish supplied to angling waters for restocking purposes; they do not account for the catch taken by anglers. The production of medium and large sized fish showed decreases while there was an increase in the production of small sized fish.

Production by Site

Table 2: Number of sites grouped by tonnage produced during 2010-2019

Year	Number of sites per production tonnage				Total number of sites
	<1-25	26-100	101-200	>200	
2010	7	13	9	7	36
2011	9	10	6	8	33
2012	10	10	6	8	34
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

Production was reported from 28 of the 52 active sites. The number of producers in the 101-200 tonnes size bracket increased while those in the 26-100 and >200 tonnes size brackets decreased. The number of producers in the <1-25 tonnes size bracket remained the same as in 2018. 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 2019 and comparison with production in 2018

Production method	Production grouping (tonnes) in 2019					Total tonnage and (%) by method		Number of sites	
	<10	10-25	26-50	51-100	>100	2018	2019	2018	2019
FW cages	1	0	0	0	5	1,838 (28.7%)	2,273 (30.7%)	6	6
FW ponds and raceways	0	1	5	3	3	1,142 (17.8%)	971 (13.1%)	14	12
FW tanks and hatcheries	3	0	0	1	0	70 (1.1%)	78 (1.1%)	3	4
SW cages	0	0	0	0	6	3,363 (52.4%)	4,083 (55.1%)	6	6
SW tanks	0	0	0	0	0	0	0	0	0
Total	4	1	5	4	14	6,413	7,405	29	28

Seawater production accounted for 4,083 tonnes (55.1%) and freshwater production the remaining 3,322 tonnes (44.9%). Production from freshwater cages, freshwater tanks and hatcheries and seawater cages all increased during 2019 while production from freshwater ponds and raceways decreased.

Company and Site Data

Table 4: Number of companies and sites in production during 2010-2019

Year	No. of companies	No. of sites
2010	25	51
2011	23	48
2012	25	48
2013	24	46
2014	24	46
2015	24	45
2016	24	44
2017	23	44
2018	23	53
2019	22	52

In 2019, the number of companies authorised by the Scottish Government and actively engaged in rainbow trout production was 22. The number of sites registered and in production was 52.

Staffing and Productivity

Table 5: Number of staff employed and productivity per person during 2010-2019

Year	Full-time Male	Full-time Female	Total Full-time	Part-time Male	Part-time Female	Total Part-time	Total Staff	Productivity (tonnes/person)
2010	95	3	98	24	7	31	129	39.8
2011	90	5	95	16	7	23	118	39.1
2012	74	5	79	23	5	28	107	53.0
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

The overall number of staff employed in 2019 increased by eight to 144. The number of full-time staff increased by three while the number of part-time staff increased by five. Productivity, measured as tonnes produced per person, increased by 8.9% in 2019 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 2019

Area	No. of sites	Table production (tonnes)	Restocking production (tonnes)	Mean tonnes per site	Staffing			Productivity (tonnes/person)
					F/T	P/T	Total	
North*	13	122	29	11.6	5	7	12	12.6
East	13	1,030	232	97.1	33	10	43	29.3
West	16	5,312	18	333.1	62	4	66	80.8
South	10	442	220	66.2	14	9	23	28.8
All	52	6,906	499	142.4	114	30	144	51.4

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

Productivity was greatest in the West at 333.1 tonnes per site and 80.8 tonnes per person.

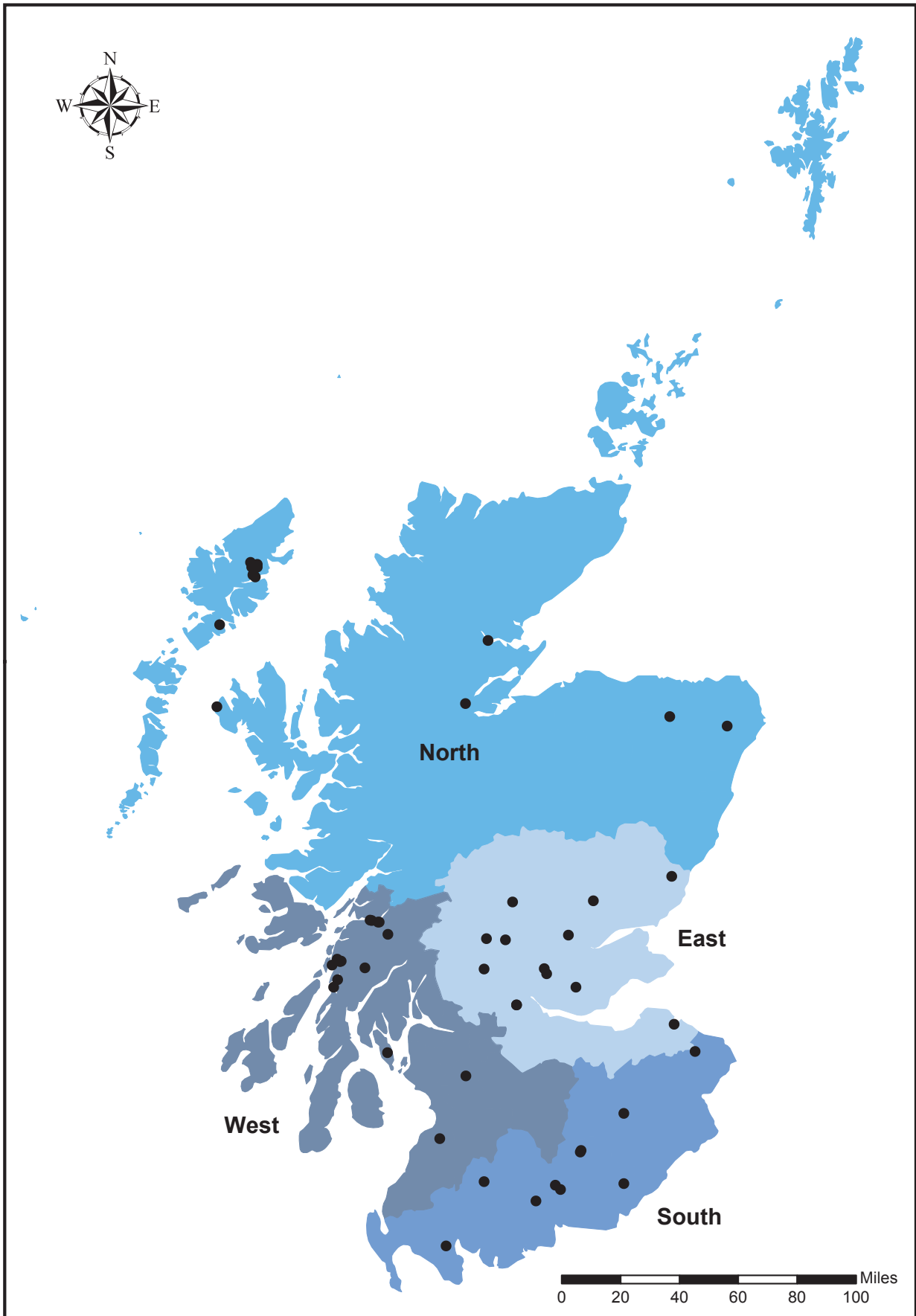


Figure 1: The regional distribution of active rainbow trout sites in 2019

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Type of Ova Laid Down

Table 7: Number (000's) and proportions (%) of eyed ova types laid down to hatch during 2010-2019

Year	All female diploid no. (%)	Triploid no. (%)	Mixed sex diploid no. (%)	Total ova
2010	13,352 (89)	1,052 (7)	675 (4)	15,079
2011	12,673 (84)	2,254 (15)	215 (1)	15,142
2012	10,967 (85)	2,005 (15)	7 (<1)	12,979
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

Source of Ova Laid Down

Table 8: Number (000's) and sources of eyed ova laid down to hatch in 2010-2019

Year	Ova produced in Great Britain (GB)			Total imported ova	Total
	Own stock	Other stock	Total	Northern hemisphere	
2010	415	50	465	14,614	15,079
2011	215	189	404	14,738	15,142
2012	14	230	244	12,735	12,979
2013	77	537	614	9,275	9,889
2014	9	655	664	10,376	11,040
2015	6	888	894	11,227	12,121
2016	35	349	384	9,550	9,934
2017	20	547	567	6,474	7,041
2018	15	495	510	5,808	6,318
2019	10	22	32	6,519	6,551

In 2019, the total number of eyed ova laid down to hatch increased by 0.2 million (4%) on the 2018 figure. All ova were imported from the Northern hemisphere. The proportion of ova from GB broodstock decreased (0.5% 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 2010-2019

Source	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Denmark	1,715	5,250	1,950	1,315	2,500	2,330	5,535	3,518	3,728	5,567
Isle of Man	1,400	520	300	800	1,000	175	20	300	0	0
N. Ireland	9,247	7,320	8,332	5,125	4,780	6,535	3,040	1,240	1,085	380
Norway	200	130	300	175	710	670	500	774	0	0
Spain	0	0	0	0	0	0	0	0	0	60
USA	2,340	1,580	1,800	2,350	1,700	1,675	750	0	855	430
Totals	14,902	14,800	12,682	9,765	10,690	11,385	9,845	5,832	5,668	6,437

Table 9b: Seasonal variation in numbers (000's) and sources of ova imported into Scotland from outwith GB during 2019

Month	Denmark	N. Ireland	Norway	USA
January	805	0	0	0
February	558	0	0	0
March	1,099	30	0	0
April	595	0	0	150
May	870	0	0	0
June	0	0	0	150
July	0	50	0	0
August	0	300	0	0
September	0	0	0	130
October	980	0	0	0
November	660	0	60	0
December	0	0	0	0
Totals	5,567	380	60	430

Table 9c: Number (000's) and sources of fish imported into Scotland from outwith GB during 2010-2019

Source	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
N. Ireland	<1	72	155	537	674	746	592	486	391	935
Republic of Ireland	2	0	0	0	0	0	0	0	0	0

Suppliers within the European Union (EU) accounted for 93.3% of ova imported into Scotland during 2019 with the USA accounting for the remaining 6.7%. In recent years there has been a trend for producers to import part grown rainbow trout into Scotland from outwith GB.

Trade in Fry and Fingerlings

Table 10: Number (000's) of fry and fingerlings traded during 2010-2019

Year	Fry and fingerlings bought			Total number bought	Total number sold
	All female diploid no. (%)	Triploid no. (%)	Mixed sex diploid no. (%)		
2010	15,539 (95)	585 (4)	141 (1)	16,265	14,686
2011	16,288 (88.5)	1,970 (10.7)	138 (0.8)	18,396	16,612
2012	12,543 (91)	1,226 (9)	0	13,769	12,088
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

The established trade between hatcheries and on-growing farms continued in 2019. Some companies specialised in fry and fingerling production. The total number of fry and fingerlings bought increased by 45.0% while the number sold increased by 18.8%. 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 2010-2019

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
No. of sites	27	26	24	19	21	17	18	18	17	21
No. of fish	20.0	20.3	20.4	9.9	10.0	8.3	7.3	5.4	3.4	3.4

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 3.4 million fish were vaccinated on 21 sites.

Organic Production

Of the 52 sites recorded as being active in rainbow trout production in 2019, none were certified as organic.

Escapes

There were three incidents involving the loss of 37,372 fish from rainbow trout sites in 2019.

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

Production survey information was collected from all 23 companies actively involved in the freshwater production of Atlantic salmon, farming 76 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 2010-2019

Year	No. of companies	No. of sites
2010	31	104
2011	28	98
2012	28	100
2013	27	102
2014	26	96
2015	25	87
2016	26	87
2017	24	79
2018	24	71
2019	23	76

In 2019, the number of companies authorised by the Scottish Government for freshwater production of Atlantic salmon decreased by one to 23. A total of 76 sites were actively engaged in commercial production, an increase of five from the 2018 figure.

Production and Staffing

Table 13: Number (000's) of smolts produced, staff employed and smolt productivity during 2010-2019

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
2010	36,872	213	20	233	42	14	56	289	127.6
2011	43,626	207	18	225	45	23	68	293	148.9
2012	44,324	218	17	235	60	33	93	328	135.1
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

Smolt production in 2019 increased by 9% compared to 2018. The number of staff employed in 2019 increased by three and productivity increased by 8% to a figure of 183,000 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 2010-2019

Year	S½	S1	S1½	Total
2010	14,116	22,756	0	36,872
2011	17,233	26,393	0	43,626
2012	18,795	25,239	290	44,324
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

In 2019, there were increases in the numbers of S½ (6.4%) and S1 (12.1%) smolts produced. There was no production of S1½ smolts in 2019.

Production Systems

Table 15: Number and capacity of production systems during 2015-2019

System	No. of sites with system					Total capacity, 000's cubic metres				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
Cages	38	38	36	27	27	355	400	357	346	351
Tanks and Raceways	49	49	43	44	49	47	46	55	54	68
Total	87	87	79	71	76	402	446	412	400	419

The types of facility used for the production of smolts in freshwater are cages or tanks and raceways. In 2019, the number of farms using cages remained the same as in 2018 and the number of farms using tanks and raceways increased by five. In terms of volume, cage capacity increased by 5,000 m³ and tank and raceway capacity increased by 14,000 m³. This resulted in a net increase in volume of 19,000 m³ available for the production of smolts in Scotland during 2019.

Table 16: Number (000's) of smolts produced and stocking densities by production system during 2015-2019

Year	Number of smolts produced (000's)					Stocking densities (smolts/m ³)				
	2015	2016	2017	2018	2019	2015	2016	2017	2018	2019
Cages	18,135	15,884	17,207	21,771	18,964	51	40	48	63	54
All others	26,436	27,010	28,945	25,326	32,466	562	587	526	469	477
Total	44,571	42,894	46,152	47,097	51,430	-	-	-	-	-

The average stocking densities of cages decreased from 63 to 54 smolts per m³ in 2019 compared to 2018, while densities in tanks and raceways decreased from 469 to 477 smolts per m³.

Ova Production

Table 17: Number (000's) of salmon ova produced during 2010-2019

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
No. of ova	91,655	78,208	57,489	56,904	33,450	11,605	13,689	12,631	15,228	11,618

In 2019, 11.6 million ova were stripped, a decrease of 24% from the number of ova produced in 2018.

Table 18: Source, number (000's), previous year's estimate of ova laid down to hatch during 2010-2019 and projected production for 2020

Year	In-house broodstock	Out-sourced GB broodstock	GB wild broodstock	Foreign ova	Total	Previous year's estimate
2010	13,744	26,220	0	29,657	69,621	61,011
2011	15,664	14,630	0	34,322	64,616	54,526
2012	18,556	9,981	0	34,700	63,237	55,723
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						70,598

The number of ova laid down to hatch was 71.2 million, an increase of 0.8 million (1.1%) on the 2018 figure. The majority of the ova (89.7%) were derived from foreign sources, this being an increase of 2.4 million (4.0%) on the 2018 figure. Supplies derived from GB broodstock decreased by 1.7 million, an 18.5% decrease on the 2018 figure. In 2019, 75,000 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 2010-2021

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Actual smolts put to sea	38.5	42.7	41.1	40.9	48.1	45.5	43.0	46.1	45.4	53.0		
Smolts produced	36.9	43.6	44.3	40.5	45.0	44.6	42.9	46.2	47.1	51.4		
Estimated production	28.7	35.9	31.3	28.1	39.9	43.4	36.6	39.3	46.1	38.6	52.1	56.6
Ratio of ova laid down to hatch to smolts produced	1.9	1.5	1.4	1.6	1.6	1.5	1.5	1.4	1.5	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 52.1 million smolts to sea in 2020. The ratio of ova laid down to hatch to smolts produced in 2019 was less than the ratio in 2018.

Scale of Production

Table 20: Smolt-producing sites grouped by numbers (000's) of smolts produced during 2010-2019

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		
2010	1	0	4	4	16	15	10	14	64	36,872
2011	1	0	4	5	11	14	9	17	61	43,626
2012	0	0	1	3	19	14	11	13	61	44,324
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

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 2019 was 45. The number of sites producing less than 101,000 smolts increased by two and there has also been an increase of four in the number of sites producing in excess of one million smolts per year. The number of sites producing between 101,000 and one million smolts per year decreased by three.

Production of Ova and Smolt by Production Area

Table 21: Staffing in 2019, ova laid down to hatch in 2018-2019, smolt production in 2018-2019 and estimated production in 2020-2021 by region

Region	Number of staff employed in 2019		Ova laid down to hatch (000's)		Smolt production (000's)		Estimated smolt production (000's)	
	F/T	P/T	2018	2019	2018	2019	2020	2021
North West	130	15	41,362	34,519	28,975	29,660	25,397	29,896
Orkney	1	2	0	0	108	102	100	140
Shetland	25	1	5,708	6,512	3,287	4,560	4,350	4,500
West	56	11	16,673	23,221	10,451	11,772	17,799	17,059
Western Isles	31	2	6,694	6,952	3,514	4,362	3,835	4,285
East and South	4	3	42	42	762	974	616	700
All Scotland	247	34	70,479	71,246	47,097	51,430	52,097	56,580

In 2019, 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.

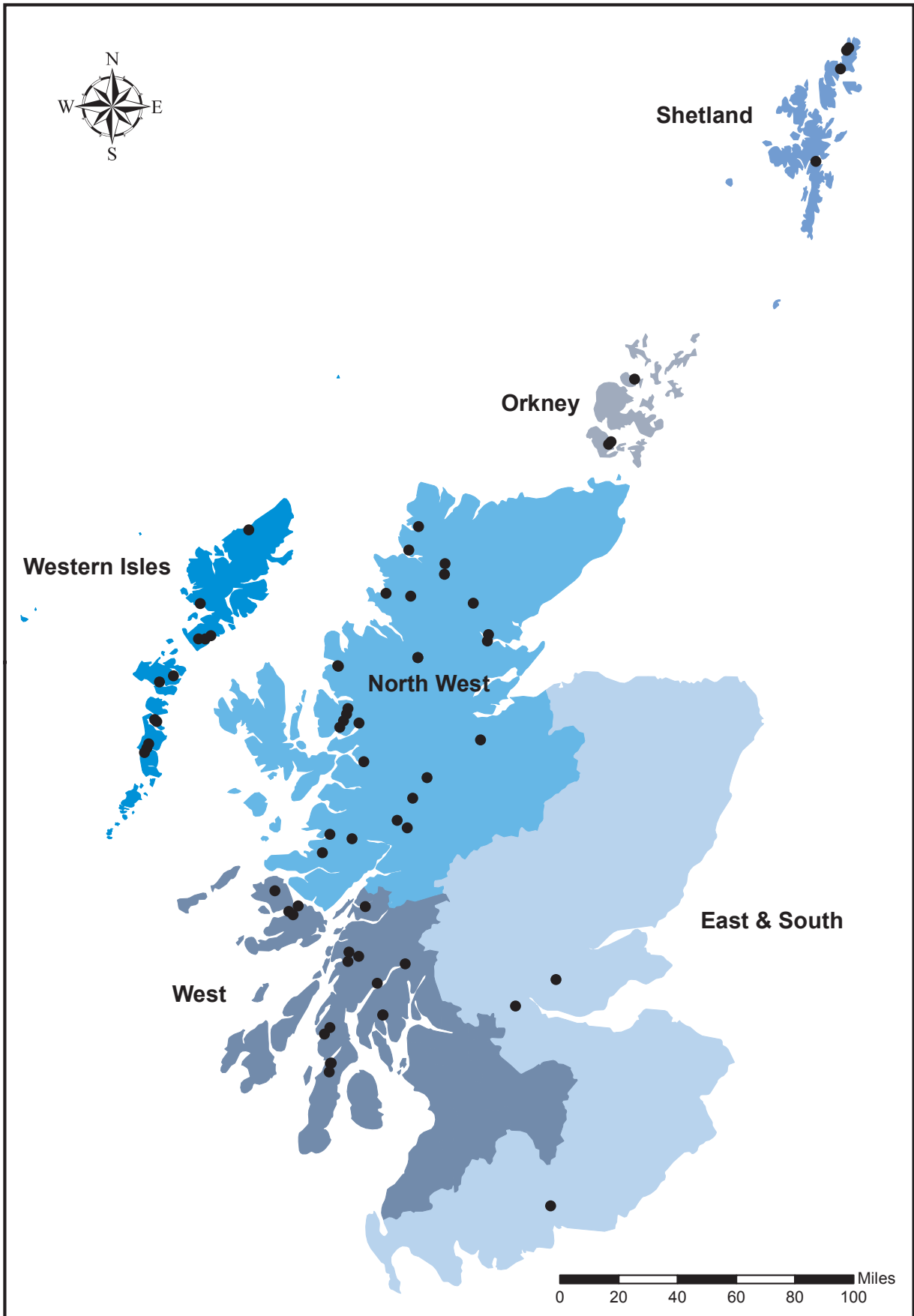


Figure 2: The regional distribution of active atlantic salmon smolt sites in 2019

International Trade in Ova

Since the introduction of the EU single market on 1st January 1993 and the associated Fish Health Regulations common to all EU member states, a trade in live salmon and ova has been established. In addition, the European Economic Area (EEA) agreement allows trade between the EU and the member states of the European Free Trade Association (EFTA). Trade is based on the same rules as are established within the EU regarding compartments and zones declared free from listed diseases.

Trade with Third Countries has also been established, but only from sites that have met the same health standards as are established within the EU regarding the approval of farms and zones for listed diseases. Exports to countries outside the EU are subject to the health conditions placed by the importing country. Marine Scotland Science advises potential exporters to ascertain with the importing country any specific health testing requirements that may be a condition of import.

Imports and Exports

Table 22a: Source and number (000's) of salmon ova, fry, parr and smolts imported during 2010-2019 derived from health certificates

Import Year	Ova				Fry, Parr and Smolts	
	EU Member States	EFTA		Total	EU Member States	EFTA-Norway
		Iceland	Norway			
2010	2,150	0	26,533	28,683	452	0
2011	3,400	0	35,851	39,251	800	0
2012	10,134	0	23,849	33,983	0	0
2013	10,700	2,719	35,044	48,463	55	0
2014	5,218	3,813	49,831	58,862	1,602	1,748
2015	4,815	8,978	45,926	59,719	2,118	365
2016	5,444	5,324	38,602	49,370	1,956	0
2017	7,000	13,883	37,025	57,908	2,012	0
2018	7,250	10,116	48,430	65,796	1,700	0
2019	10,184	26,352	23,673	60,209	297	0

The numbers of ova imported decreased by 8.5%. The number of fry, parr and smolts imported decreased from that observed in 2018, with 0.3 million imported from EU member states.

Table 22b: Destination and number (000's) of salmon ova, fry, parr and smolts exported during 2010-2019 derived from health certificates

Export year	Farmed origin ova			Total	Fry, Parr and Smolts
	EU	Norway	Others		
2010	189	600	0	789	130
2011	0	0	820	820	183
2012	0	0	0	0	55
2013	650	0	0	650	404
2014	0	0	0	0	259
2015	93	0	2	95	8
2016	335	0	23	358	173
2017	16	0	323	339	206
2018	23	0	0	23	71
2019	0	0	0	0	263

In 2019, no ova were exported. Fry, parr and smolt exports increased by 192,000 fish on the 2018 figure.

Vaccines

Table 23: Number of sites using vaccines and number (millions) of fish vaccinated during 2010-2019

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
No. of sites	70	67	63	63	56	55	47	46	43	46
No. of fish (millions) vaccinated	42.6	49.2	48.1	47.5	44.7	48.0	42.6	58.4	51.0	52.4

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, vibriosis and IPN, with smaller numbers of fish being vaccinated against ERM and SAV. A total of 52.4 million fish were vaccinated across 46 sites.

Escapes

In 2019, there was one incident involving the loss of 4,465 fish from a site rearing freshwater Atlantic salmon.

// 3. Atlantic salmon - Production

Production

Production survey information was collected from all 11 companies actively involved in Atlantic salmon production, farming 226 active sites. This figure represents the entire industry operating in Scotland.

Table 24: Annual production of salmon (tonnes) during 1999-2019 and projected production in 2020

Year	Tonnes	Percentage difference	Year	Tonnes	Percentage difference
1999	126,686	14	2010	154,164	6.9
2000	128,959	2	2011	158,018	2.5
2001	138,519	7	2012	162,223	2.7
2002	144,589	4	2013	163,234	0.6
2003	169,736	17	2014	179,022	9.7
2004	158,099	-7	2015	171,722	-4.1
2005	129,588	-18	2016	162,817	-5.2
2006	131,847	2	2017	189,707	16.5
2007	129,930	-1.4	2018	156,025	-17.8
2008	128,606	-1	2019	203,881	30.7
2009	144,247	12	2020	207,630*	

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

The total production of Atlantic salmon during 2019 was 203,881 tonnes, an increase of 47,856 tonnes (30.7%) on the 2018 total and the highest ever level of production recorded in Scotland.

Table 25: Number (000's), production (tonnes) of salmon harvested and mean fish weight (kg) per year class during 2010-2019

	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)	2010	2010	128	268	2.1
	2011	2011	109	307	2.8
	2012	2012	127	301	2.4
	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
Harvest in year 1	2009	2010	18,266	85,826	4.7
	2010	2011	18,694	91,105	4.9
	2011	2012	21,502	97,744	4.5
	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
Harvest in year 2	2008	2010	13,666	68,070	5.0
	2009	2011	13,772	66,606	4.8
	2010	2012	13,053	64,178	4.9
	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

Table 26: Number (000's) and production (tonnes) of grilse and pre-salmon harvested during 2010-2019

Year	Grilse (January-August)			Pre-salmon (September-December)		
	Number	Tonnes	Average weight (kg)	Number	Tonnes	Average weight (kg)
2010	6,877	29,733	4.3	11,389	56,093	4.9
2011	7,604	35,146	4.6	11,090	55,959	5.0
2012	11,337	53,216	4.7	10,165	44,528	4.4
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

Table 27: Percentage (by weight) of annual production by growth stage harvested during 2010-2019

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Growth stage	-	-	-	-	-	-	-	-	-	-
Input year fish	<1	<1	<1	0	<1	<1	<1	0	<1	<1
Grilse	19	22	33	29	26	31	37	36	34	35
Pre-salmon	36	35	27	36	31	35	31	31	36	29
Year 2 salmon	44	42	39	35	42	33	31	33	29	35

Survival and Production in Smolt Year Classes

Table 28: Survival and production in smolt year classes during 2000-2019

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			
2000	45,185	765	2,673	3.5	1.7	22,726	96,539	4.2	50.3	11,354	53,535	4.7	25.1	77.1	152,747	3.38
2001	48,643	557	1,227	2.2	1.1	23,528	90,230	3.8	48.4	15,619	73,255	4.7	32.1	81.6	164,712	3.39
2002	50,086	272	824	3.0	0.5	22,602	96,205	4.3	45.1	15,555	71,988	4.6	31.1	76.7	169,017	3.37
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	45,375	84	247	2.9	0.2	26,324	132,090	5.0	58.0							
2019	52,990	319	931	2.9	0.6											

In 2017, the last year for which survival can be calculated, the survival rate from smolt input to harvest decreased to 73.8%. Of the 2018 year class, 58.2% of the input has been harvested, 10.9% higher than the average harvest of fish one year after input in the 2017 year class. In 2019, 0.6% of the fish were harvested from the 2019 input. This was an increase compared with the proportion of fish harvested from the same year class in 2018.

Smolts to Sea

Table 29: Number (000's) and origin of smolts put to sea during 2010-2019

Year	Smolts put to sea (000's)			Total (000's)	Scottish Origin %	English Origin		Other Origin	
	S½	S1	S1½			(000's)	%	(000's)	%
2010	14,069	24,421	0	38,490	95	1,541	4	120	<1
2011	17,721	25,012	0	42,733	96	1,765	4	0	0
2012	17,334	23,480	280	41,094	96	1,510	4	0	0
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	21,629	23,746	0	45,375	96	1,318	3	364	<1
2019	24,525	28,465	0	52,990	98	751	1	297	<1

The total number of smolts put to sea in 2019 was almost 53.0 million. This smolt input comprised S½s (46.3%) and S1s (53.7%). Two percent of the smolts stocked to Scottish salmon farms were sourced from outwith Scotland, less than 1% of which came from sources outwith GB. This was a decrease of 2% compared with the proportion observed in 2018.

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 2008-2019

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	2008	9,099	2008	116	1.3	2009	4,897	53.8	2010	2,687	29.5	7,700	84.6
	2009	9,986	2009	42	0.4	2010	7,045	70.5	2011	2,003	20.1	9,090	91.0
	2010	9,924	2010	117	1.2	2011	6,324	63.7	2012	2,802	28.2	9,243	93.1
	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					
2019	15,071	2019	205	1.4									
Orkney	2008	1,912	2008	0	0	2009	507	26.5	2010	1,120	58.6	1,627	85.1
	2009	1,154	2009	0	0	2010	741	64.2	2011	95	8.2	836	72.4
	2010	2,557	2010	0	0	2011	1,126	44.0	2012	936	36.6	2,062	80.6
	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	3,478	2018	0	0	2019	2,068	59.5					
2019	4,670	2019	0	0									
Shetland	2008	13,929	2008	0	0	2009	4,992	35.8	2010	4,659	33.4	9,651	69.2
	2009	10,031	2009	29	0.3	2010	4,201	41.9	2011	3,234	32.2	7,464	74.4
	2010	11,573	2010	0	0	2011	4,134	35.7	2012	4,292	37.1	8,426	72.8
	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					
2019	7,613	2019	114	1.5									
South West	2008	6,507	2008	0	0	2009	4,153	63.8	2010	2,969	45.6	7,122	109.4*
	2009	8,200	2009	10	0.1	2010	2,700	32.9	2011	4,697	57.3	7,407	90.3
	2010	6,565	2010	12	0.2	2011	3,000	45.7	2012	2,648	40.3	5,660	86.2
	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					
2019	11,100	2019	0	0									
Western Isles	2008	5,214	2008	0	0	2009	1,789	34.3	2010	2,231	42.8	4,020	77.1
	2009	9,177	2009	0	0	2010	3,579	39.0	2011	3,743	40.8	7,322	79.8
	2010	7,870	2010	0	0	2011	4,110	52.2	2012	2,375	30.2	6,485	82.4
	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					
2019	14,536	2019	0	0									

* The survival of the 2008 smolt input in the South West is over 100% due to the practice of putting smolts to sea in one region and subsequently moving them to another sea water site in another region for harvest.

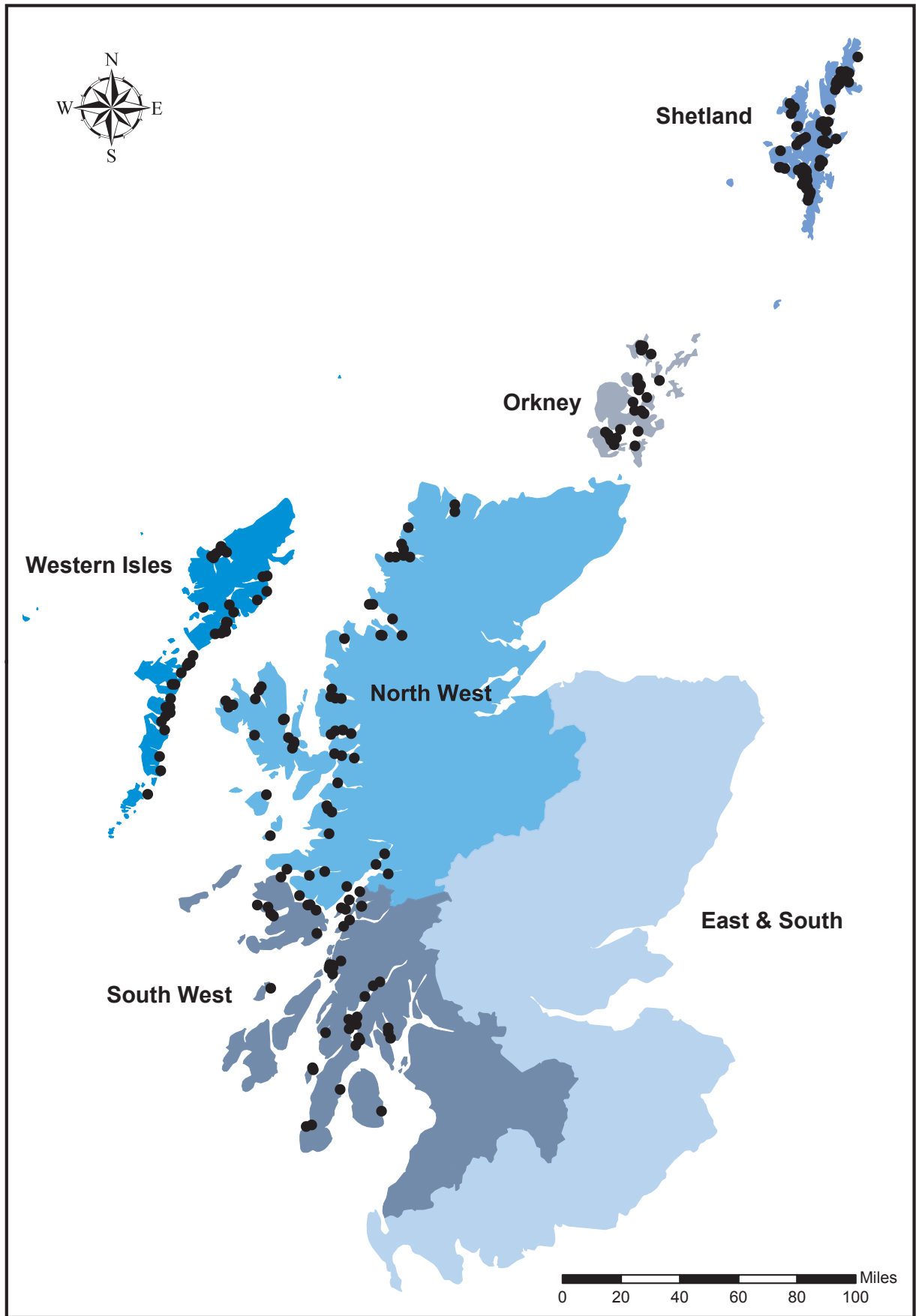


Figure 3: The regional distribution of active atlantic salmon production sites in 2019

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Staffing

Table 31: Number of staff employed in the production of salmon during 2010-2019

Year	Full-time Male	Full-time Female	Total Full-time	Part-time Male	Part-time Female	Total Part-time	Total Staff	Productivity (tonnes/person)
2010	854	90	944	86	34	120	1,064	144.9
2011	847	76	923	62	28	90	1,013	156.0
2012	870	74	944	80	35	115	1,059	153.2
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

In 2019, the total number of staff employed in salmon production was 1,651, an increase of 185 compared with 2018. 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 increased from 106.4 to 123.5 tonnes produced per person.

Production Methods

Table 32: Production methods, capacity, tonnage and average stocking densities (kg/m³) during 2017-2019

Method	Number of sites			Total capacity (000's cubic metres)			Production (tonnes)		
	2017	2018	2019	2017	2018	2019	2017	2018	2019
Seawater tanks	4	4	2	5.7	7.1	6.3	26	35	28
Seawater cages	222	217	224	19,108	19,922	21,628	189,681	155,990	203,853
For cage sites: ratio of production (kg) to cage capacity (m ³)							9.9	7.8	9.4

In 2019, the majority of fish were produced in seawater cages. There were 28 tonnes of production from seawater tank sites in 2019. 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 cage capacity increased by 1,706,000 m³ during 2019 and the

number of sea cage sites in production increased by seven. Production efficiency in sea cages, measured as the ratio of fish weight in kilograms produced per cubic metre, increased from 7.8 kg/m³ in 2018 to 9.4 kg/m³ in 2019.

Scale of Production by Site

Table 33: Number of sites shown in relation to their production grouping and percentage share of production 2010-2019

Production grouping (tonnes)	0	1-50	51-100	101-200	201-500	501-1,000	>1,000	Total	
								Sites*	Tonnes
2010	109	5	6	10	33	22	64	249	154,164
2011	106	9	7	9	28	29	66	254	158,018
2012	115	3	5	9	25	33	67	257	162,223
2013	112	9	3	12	18	36	67	257	163,234
2014	117	8	1	9	26	29	70	260	179,022
2015	115	2	1	9	26	26	75	254	171,722
2016	117	3	3	9	22	26	73	253	162,817
2017	93	2	0	8	13	33	77	226	189,707
2018	100	6	2	6	17	26	64	221	156,025
2019	80	8	7	1	17	24	89	226	203,881
2010	0	0.1	0.3	0.9	7.3	10.8	80.6	-	-
2011	0	0.2	0.3	0.8	6.4	13.4	78.9	-	-
2012	0	<0.1	0.2	0.9	5.0	15.0	78.8	-	-
2013	0	0.1	0.1	1.1	4.0	16.7	78.0	-	-
2014	0	0.1	<0.1	0.8	5.0	12.0	82.0	-	-
2015	0	<0.1	<0.1	0.9	5.0	11.6	82.4	-	-
2016	0	<0.1	0.1	0.8	4.6	11.7	82.8	-	-
2017	0	<0.1	0	0.6	3.2	13.9	82.3	-	-
2018	0	<0.1	<0.1	0.6	3.7	13.5	82.0	-	-
2019	0	<0.1	0.3	<0.1	2.8	9.7	87.1	-	-

*Includes farms stocked but having no production.

In 2019, the number of sites with no production decreased by 20 and the number producing 1 to 500 tonnes increased by two. The number of sites producing over 500 tonnes increased by 23 and the trend towards production in larger sites continued, with 87.1% 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 2018-2019

Total Tonnage		0-100	101-200	201-400	401-700	701-1,000	1,001-2,000	>2,000	Total
No. of companies	2018	5	0	0	0	1	0	6	12
	2019	4	0	0	0	0	1	6	11
No. of tonnes	2018	35	0	0	0	866	0	155,124	156,025
	2019	28	0	0	0	0	1,636	202,217	203,881
Staff (total)	2018	7	0	0	0	35	0	1,424	1,466
	2019	13	0	0	0	0	36	1,602	1,651
Productivity (tonnes/person)	2018	5	-	-	-	25	-	109	106
	2019	2	-	-	-	-	45	126	124

The greatest productivity of 126 tonnes per person was achieved in the companies producing over 2,000 tonnes. The least productivity of 2 tonnes per person was from the companies producing between 0-100 tonnes. In comparison with 2018, the average company productivity increased from 106 to 124 tonnes per person. Overall, production was dominated by six companies in 2019 which between them accounted for 99% of Scotland's farmed Atlantic salmon production.

Staff and Production by Production Area

Table 35: Staff and production (tonnes) by area 2010-2019 and projected production in 2020

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	2010	294	44	47,353	140	239	2.0	15,895	4.4	17,837	5.1	13,382	5.0
	2011	303	38	41,656	122	174	3.2	13,152	4.3	16,879	5.1	11,451	5.7
	2012	300	40	50,987	150	301	2.4	31,121	4.7	5,842	4.7	13,723	4.9
	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			51,955*									
Orkney	2010	58	2	9,388	156	0	-	1,221	4.1	2,279	5.1	5,888	5.3
	2011	69	0	6,369	92	0	-	3,508	5.1	2,355	5.4	506	5.3
	2012	65	6	11,694	165	0	-	3,532	5.3	2,720	5.1	5,442	5.8
	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			19,476*									
Shetland	2010	178	23	45,439	226	0	-	3,624	4.9	17,179	5.0	24,636	5.3
	2011	189	22	35,493	168	118	2.4	4,611	4.7	16,071	5.1	14,693	4.5
	2012	188	16	43,010	211	0	-	6,083	4.3	15,784	4.5	21,143	4.9
	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			35,485*									
South West	2010	231	39	27,751	103	29	2.5	6,032	4.2	7,118	5.7	14,572	4.9
	2011	212	17	37,157	162	0	-	3,618	4.8	10,899	4.8	22,640	4.8
	2012	221	24	26,850	110	0	-	9,315	5.4	4,508	4.8	13,027	4.9
	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			42,419*									
Western Isles	2010	183	12	24,233	124	0	-	2,961	3.7	11,680	4.2	9,592	4.3
	2011	150	13	37,343	229	15	2.1	10,257	4.7	9,755	5.0	17,316	4.6
	2012	170	29	29,682	149	0	-	3,165	3.7	15,674	4.0	10,843	4.6
	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			58,295*									
Scotland Total	2010	944	120	154,164	145	268	2.1	29,733	4.3	56,093	4.9	68,070	5.0
	2011	923	90	158,018	156	307	2.8	35,146	4.6	55,959	5.0	66,606	4.8
	2012	944	115	162,223	153	301	2.4	53,216	4.7	44,528	4.4	64,178	4.9
	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			207,630*									

*Estimated production for 2020.

Company and Site Data

Table 36: Number of companies and sites engaged in the production of Atlantic salmon during 2010-2019

Year	Number of companies			Number of sites		
	Producing	Non-producing	Total	Producing	Non-producing	Total
2010	20	10	30	140	109	249
2011	21	6	27	148	106	254
2012	16	6	22	142	115	257
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

The number of companies authorised and actively producing Atlantic salmon in 2019 was eight, the same number as in 2018. Three companies remained active and authorised, although not producing salmon for harvest in 2019. This continued the trend of Atlantic salmon production becoming concentrated within fewer companies. These 11 companies had 226 registered active sites, although not all these sites produced fish for harvest in 2019.

Fallowing

Table 37: Number of seawater cage sites employing a fallow period during 2010-2019

Year	Fallow Period (weeks)						Total
	0	<4	4-8	9-26	27-51	52	
2010	53	8	26	83	41	36	247
2011	60	10	31	85	27	39	252
2012	58	4	31	97	28	37	255
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

Of the 224 seawater cage sites recorded as being active in 2019, 37 sites were fallow for the entire year whilst 150 sites were fallow for a variable period. There were 37 sites that did not fallow in 2019. 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 2010-2019

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Broodstock sites	10	11	7	8	8	4	3	4	4	3

In 2019, the number of freshwater and seawater sites holding broodstock decreased by one to three sites. The number of sites holding broodstock in any one year can be variable, as can be seen from the previous years' figures, which indicate no obvious trend. A total of 3,033 fish were stripped, yielding 11.6 million ova, giving an average yield of 3,825 ova per fish.

Organic Production

Table 39: Organic production of Atlantic salmon during 2010-2019

Year	Number of active cage sites	Number of cage sites certified as organic	Production (tonnes)
2010	247	14	6,122
2011	252	10	3,104
2012	255	7	4,597
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

Of the 224 active Atlantic salmon seawater cage sites in 2019, four were certified as organic, producing 4,462 tonnes.

Escapes

There were three incidents involving the loss of 28,470 fish from seawater Atlantic salmon sites in 2019. There were 16 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 2019. The production of brown/sea trout (*Salmo trutta*) showed an increase, with the majority of production being for the angling restocking market. In 2019 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 2019. The production of lumpsucker and wrasse are targeted at the marine Atlantic salmon industry where they are used as a biological control for parasites.

Company, Site and Production Data

Table 40: Number of companies and sites producing other species in 2019, annual production of other species (tonnes) during 2016-2019 and projected production in 2020

Species	No. of companies	No. of sites	2016 Production tonnage	2017 Production tonnage	2018 Production tonnage	2019 Production tonnage	2020 Production tonnage*
Brown trout/ Sea trout	8	9	41	61	20	25	24
Halibut	1	3	67	†	†	†	‡
Lumpsucker	2	3	10	26	14	13	21
Wrasse spp.	2	3	4	4	6	3	10

* 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.

Staffing

Table 41: Number of staff employed in farming other species during 2010-2019

Year	Full-time Male	Full-time Female	Total Full-time	Part-time Male	Part-time Female	Total Part-time	Total Staff
2010	18	1	19	20	4	24	43
2011	22	2	24	17	2	19	43
2012	22	3	25	19	2	21	46
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

In 2019, the overall number of staff employed in the production of other species decreased by seven, to 53 staff.

Production of Cleaner fish

Table 42: Number (000's) of cleaner fish produced during 2015-2019

Species	Number of fish produced (000's)				
	2015	2016	2017	2018	2019
Lumpsucker	235	262	925	553	660
Wrasse spp.	75	118	58	103	59

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. As data for future years is collected it will show trends in cleaner fish production.

Ova Laid Down to Hatch

Table 43: Source of ova from other species laid down to hatch during 2019

Species	Source of ova laid down to hatch (000's)		
	Own broodstock	Other GB broodstock	Foreign ova
Brown/sea trout	10	0	57
Halibut	§	0	0
Lumpsucker	0	0	1,200
Wrasse spp.	12,000	6,500	0

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

Trade in Small Fish

Table 44: Trade in small fish of other species in 2019

Species	Bought (000's)	Sold (000's)
Halibut	#	#
Brown /sea trout	57	18

During 2019 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 20 sites recorded as producing other species in 2019, no organic production was reported.

Escapes

There were no reported escapes from sites rearing other species during 2019.

// 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.

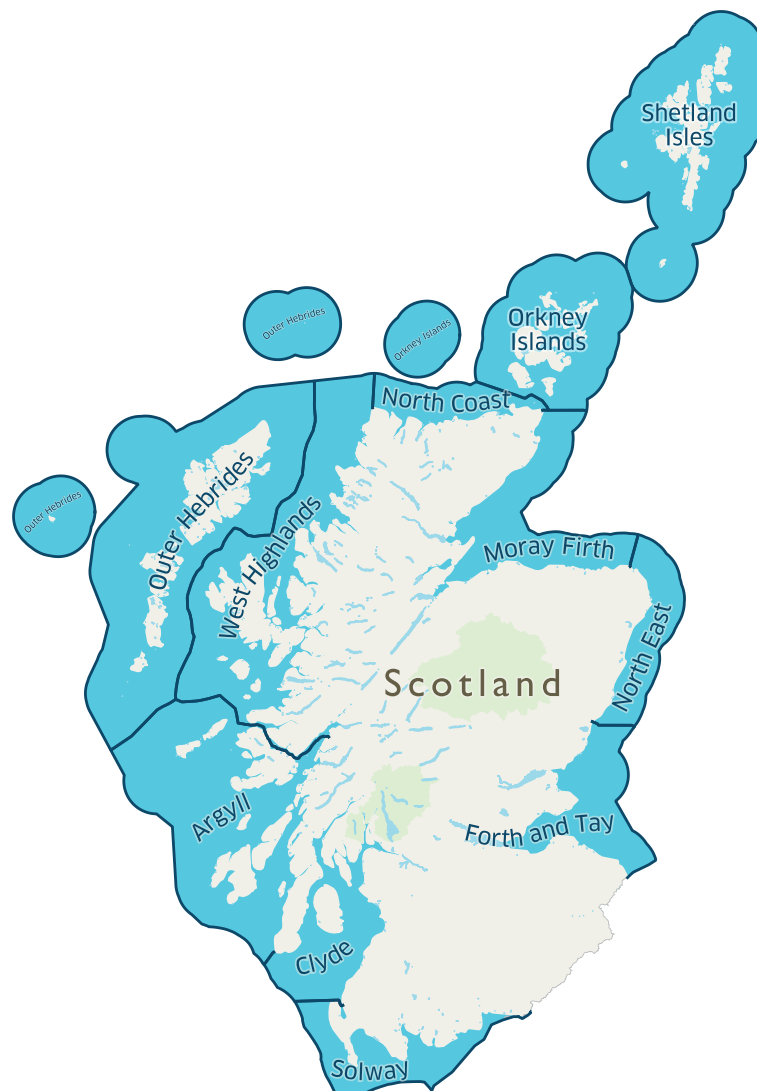


Figure 4: Scottish Marine regions

// 6.Summary

Rainbow trout

The production of rainbow trout increased by 15% in 2019 to 7,405 tonnes and was directed at the table (93%) and restocking (7%) markets. The total numbers of staff employed by the sector increased by eight to 144. There was an overall increase in the productivity of the industry to 51.4 tonnes per person.

In 2019, the number of eyed ova laid down to hatch (6.6 million) increased by 0.2 million and was mainly triploid stock (82%). The proportion of ova from GB broodstock decreased to 0.5%. Denmark was the largest source of imported ova with 86.5% of the total, this was an increase proportionally from 2018. 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 2019.

Atlantic salmon

In 2019, the total production of Atlantic salmon increased by 47,856 tonnes to 203,881 tonnes, a 30.7% increase on the 2018 production total. The survey shows increases in the production of grilse, pre-salmon and year 2 salmon. The number of staff directly employed on the farms increased by 185. Overall, there was an increase in the productivity of tonnes produced per person from 106.4 to 123.5. The estimated harvest forecast for 2020 is 207,630 tonnes. The trend towards concentrating production in larger sites was maintained with 87.1% of production being concentrated in the sites producing over 1,000 tonnes per annum.

During 2019, there was a decrease in the number of ova produced to 11.6 million. The number of ova laid down to hatch increased by 1.1% to 71.2 million. This highlights the trend towards using foreign ova sources with 89.7% of the ova laid down to hatch being imported and only 10.3% derived from GB sources. Smolt production increased to 51.4 million, with 49.8% being produced as S½ smolts and the remainder as S1 smolts (50.2%). The number of staff directly employed on freshwater sites increased by three in 2019 to 281 staff while productivity increased to 183,000 smolts per person. Projections for 2020 suggest that more smolts will be produced than was seen in 2019, followed by a further increase in 2021.

Other Species

There was an increase in the production of brown/sea trout from 20 tonnes in 2018 to 25 tonnes in 2019. Halibut production occurred in 2019 but the figure cannot be shown without revealing the production of an individual company. Lump sucker and wrasse were produced for use as biological controls for parasites in the marine Atlantic salmon farming industry. In 2019, the total number of staff employed in the production of other species decreased by seven to 53.

// Appendix 1

Questionnaires sent to Fish Farmers

**ANNUAL RETURN OF INFORMATION FROM SCOTTISH FISH FARMS
FOR THE PERIOD 1 JANUARY TO 31 DECEMBER 2019
RAINBOW TROUT – DATA**

Please complete and return by 31 January 2020 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					Part time male				
		Full time female					Part time female				
2	Please detail any accreditation schemes this company is a member of; _____										
3	How many eyed ova were laid down for hatching in 2019										
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 2020 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	Cages										

ANNUAL PRODUCTION SURVEY 2019

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 2020 to allow the Annual Survey Report for 2019 to be produced.

ANNUAL RETURN OF INFORMATION FROM SCOTTISH FISH FARMS
FOR THE PERIOD 1 JANUARY TO 31 DECEMBER 2019
ATLANTIC SALMON - SMOLT DATA
 Please complete and return by 31 January 2020 to L A Munro, Marine Scotland Science
 375 Victoria Road, Aberdeen, AB11 9DB

Business No:

<p>1 How many staff were employed in smolt production (company total)</p>	<p>Full time male Full time female</p>	<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>							<p>Part time male Part time female</p>	<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>																								
<p>2 Please detail any accreditation schemes this company is a member of; _____</p>																																		
<p>3 How many ova were produced in the winter of 2018-2019 (company total)</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>																																	
<p>4 How many eyed ova were laid down for hatching in winter of 2018-2019</p>	<p>a From own farmed broodstock</p>	<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>										
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<p>c From GB wild broodstock</p>	<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											
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<p>5 How many eyed ova do you expect to hatch this winter (2019-2020)</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>																																	
<p>6 How many fry or parr were</p>	<p>a Transferred into the site</p>	<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>										
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<p>7 How many smolts were produced as</p>	<p>a S¹/₂s (ie from 2019 hatch)</p>	<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>										
<p>b S¹s (ie from 2018 hatch)</p>	<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											
<p>c S¹/₂s or S²s (ie from 2018 or 2017 hatch)</p>	<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											
<p>8 How many smolts were sold as</p>	<p>a S¹s (incl S¹/₂s)</p>	<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>										
<p>b S²s (incl S¹/₂s)</p>	<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											
<p>9 How many smolts do you expect to produce for sea winter on-growing in 2020 as</p>	<p>a S¹s (incl S¹/₂s)</p>	<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>										
<p>b S²s (incl S¹/₂s)</p>	<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>											
<p>10 How many smolts do you plan to produce in 2021</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>																																	
<p>11 What is the current fish holding capacity of each site in cubic metres</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>																																	
<p>12 Duration of FALLOW PERIOD in WEEKS (cage sites; MAX = 52)</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td><td style="width: 20px; height: 20px;"></td></tr> </table>																																	
<p>13 How many fish did you vaccinate</p>	<p>a against furunculosis</p>	<table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr></tr></table>																																

ANNUAL PRODUCTION SURVEY 2019

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 following 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 S¹/₂ or S1 etc

The definitions used for the survey are:

- S¹/₂ <12 months old, ie put to sea in year of hatch
- S1 12-18 months old, ie put to sea in January-June in year post hatch
- S1¹/₂ 19-24 months old, ie put to sea in July-December in year post hatch
- S2 >24 months old when put to sea

Q8. } For S1s - combine numbers of S¹/₂s with S1s and

Q9. } For S2s - combine numbers of S1¹/₂s 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 cages combined

Q12. Fallow period - applies to cage sites only

Please enter any weeks that the site was fallow in 2019 (maximum = 52)

It will be appreciated if the questionnaires are returned promptly and not later than 31 January 2020 to allow the Annual Survey Report for 2019 to be produced.

**ANNUAL RETURN OF INFORMATION FROM SCOTTISH FISH FARMS
FOR THE PERIOD 1 JANUARY TO 31 DECEMBER 2019
ATLANTIC SALMON - PRODUCTION DATA**

Please complete and return by 31 January 2020 to L A Munro, Marine Scotland Science
375 Victoria Road, Aberdeen, AB11 9DB

Business No:

<p>1 How many staff were employed in salmon production (company total), excluding post-harvest processing staff</p>	<p>Full time male Full time female</p>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </table>									<p>Part time male Part time female</p>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </table>								

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

3 How many smolts were put into the site in 2019 as:

a S ¹ / ₂ s (ie from 2019 hatch)	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>
b S ¹ s (ie from 2018 hatch)	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>
c S ¹ / ₂ s or S ² s (ie from 2018 or 2017 hatch)	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>

4 How many of above came from England

5 Total smolt input proposed in 2020

6 HARVEST of 2019 SMOLT INPUT in 2019

a Number of tonnes (wet weight at harvest)	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>
b Number of fish	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>

7 HARVEST of 2018 SMOLT INPUT from 1 JANUARY to 31 AUGUST

a Number of tonnes (wet weight at harvest)	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>
b Number of fish	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>

8 HARVEST of 2018 SMOLT INPUT from 1 SEPTEMBER to 31 DECEMBER

a Number of tonnes (wet weight at harvest)	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>
b Number of fish	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>

9 HARVEST of 2017 SMOLT INPUT

a Number of tonnes (wet weight at harvest)	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>
b Number of fish	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>

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 2020

12 BROODSTOCK PRODUCTION

a Were brood fish produced in 2019	YES/NO	YES/NO	YES/NO
b How many fish were stripped	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>	<table border="1" style="border-collapse: collapse; width: 100px; height: 20px;"></table>

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

14 Duration of FALLOW PERIOD in WEEKS (cage 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

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:

S^{1/2} <12 months old, ie put to sea in year of hatch

S1 12-18 months old, ie put to sea in January-June in the year post hatch

S^{1 1/2} 19-24 months old, ie put to sea in July-December in the year post hatch

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 cages combined or, if not known, give the size of tanks or cages (area or circumference plus depth x nos tanks or cages)

Q14. Fallow period

For cage sites only, please enter any number of weeks a site was fallow in 2019 (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 2020 to allow the Annual Survey Report for 2019 to be produced.

**ANNUAL RETURN OF INFORMATION FROM SCOTTISH FISH FARMS
FOR THE PERIOD 1 JANUARY TO 31 DECEMBER 2019
OTHER SPECIES – DATA**

Please complete and return by 31 January 2020 to L A Munro, Marine Scotland Science
375 Victoria Road, Aberdeen, AB11 9DB

Business No:

<p>1 How many staff were employed in other species production (company total)</p>	<p>Full time male Full time female</p>	<table border="1" style="border-collapse: collapse; width: 60px; height: 20px;"> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>							<p>Part time male Part time female</p>	<table border="1" style="border-collapse: collapse; width: 60px; height: 20px;"> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table>						

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

3 How many eyed ova were laid down for hatching in 2019

a from own broodstock	<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										
b from other GB broodstock	<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										
c from foreign sources	<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										

4 How many fry/small fish were

a bought	<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										
b sold	<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										

5 What was your total production for the market

a Number of tonnes	<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										
b Number of fish	<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										

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

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7 What is your predicted production for the market in 2020

a Number of tonnes	<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										
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8 What is the holding capacity of the holding units for each site in cubic metres

a Tanks	<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										
b Ponds	<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										
c Raceways	<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										
d Cages	<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>											<table border="1" style="border-collapse: collapse; width: 120px; height: 20px;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table>										

ANNUAL PRODUCTION SURVEY 2019

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 2020 to allow the Annual Survey Report for 2019 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.
EEA	European Economic Area.
EFTA	European Free Trade Association.
ERM	Enteric redmouth disease.
EU	European Union.
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.
Gamete	Reproductive cells.
Grilse	Salmon harvested between 1 st January and 31 st August after one winter at sea.
Intra-peritoneal	Within the body cavity.
IPN	Infectious pancreatic necrosis.
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.
MSS	Marine Scotland Science.
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 1 st September and 31 st 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.
Third Country	Country outside the EU except Norway and Iceland.
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 2 nd 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)

Region	2010		2011	
	Tonnage	Value (£)	Tonnage	Value (£)
Argyll & Clyde	27,751	113,502,244	37,157	158,808,591
Orkney Islands	9,388	38,396,920	6,369	27,221,106
Outer Hebrides	24,233	99,112,970	37,343	159,603,982
Shetland Isles	45,439	185,845,510	35,493	151,697,082
North Coast & West Highlands	47,353	193,673,770	41,656	178,037,744
All Scotland	154,164	630,531,414	158,018	675,368,505

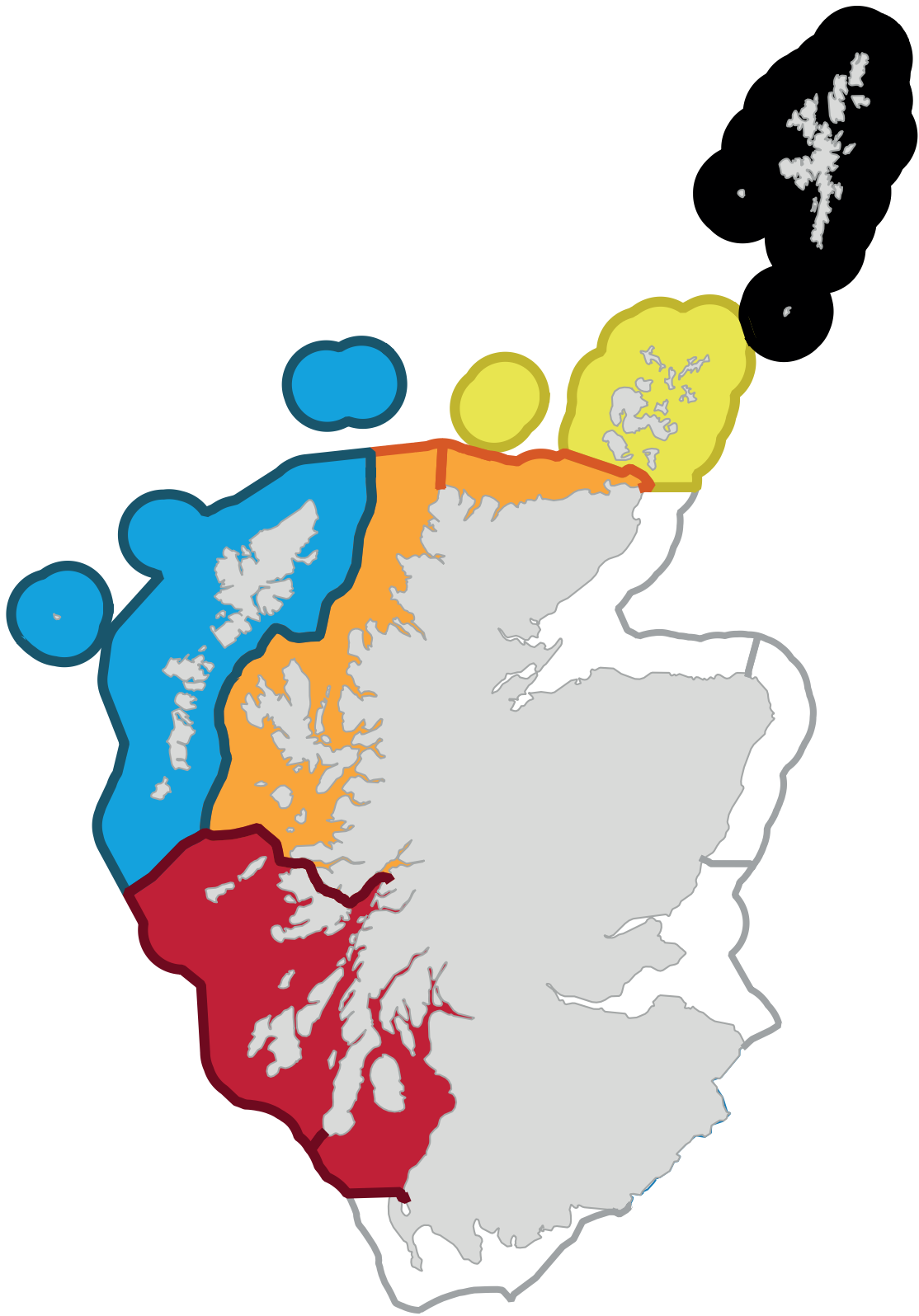
Region	2012		2013	
	Tonnage	Value (£)	Tonnage	Value (£)
Argyll & Clyde	26,850	100,580,100	34,924	160,685,324
Orkney Islands	11,694	43,805,724	11,479	52,814,879
Outer Hebrides	29,682	111,190,270	36,817	169,395,017
Shetland Isles	43,010	161,115,460	36,694	168,829,094
North Coast & West Highlands	50,987	190,997,302	43,320	199,315,320
All Scotland	162,223	607,688,856	163,234	751,039,634

Region	2014		2015	
	Tonnage	Value (£)	Tonnage	Value (£)
Argyll & Clyde	34,976	152,565,312	35,911	142,925,780
Orkney Islands	13,029	56,832,498	11,074	44,074,520
Outer Hebrides	33,775	147,326,550	27,210	108,295,800
Shetland Isles	46,369	202,261,578	42,786	170,288,280
North Coast & West Highlands	50,873	221,908,026	54,741	217,869,180
All Scotland	179,022	780,893,964	171,722	683,453,560

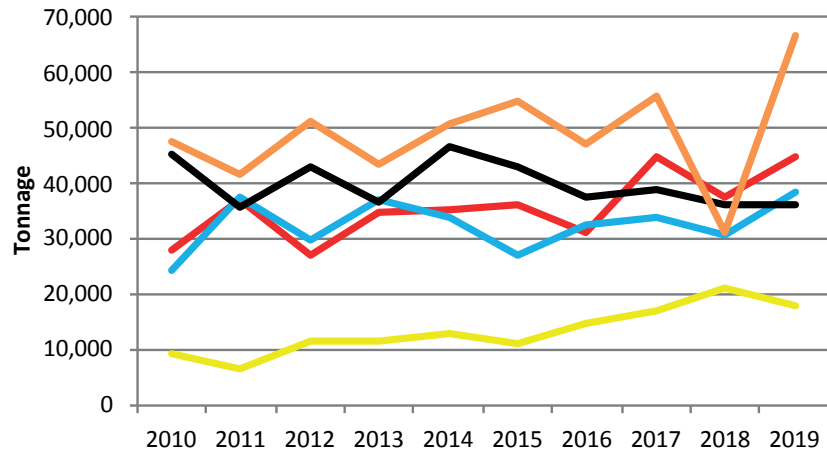
Region	2016		2017	
	Tonnage	Value (£)	Tonnage	Value (£)
Argyll & Clyde	31,022	155,078,978	44,575	256,573,700
Orkney Islands	14,752	73,745,248	16,756	96,447,536
Outer Hebrides	32,662	163,277,338	33,778	194,426,168
Shetland Isles	37,464	187,282,536	38,908	223,954,448
North Coast & West Highlands	46,917	234,538,083	55,690	320,551,640
All Scotland	162,817	813,922,183	189,707	1,091,953,492

Region	2018		2019	
	Tonnage	Value (£)	Tonnage	Value (£)
Argyll & Clyde	37,506	215,659,500	44,881	236,522,870
Orkney Islands	20,956	120,497,000	17,758	93,584,660
Outer Hebrides	30,668	176,341,000	38,468	202,726,360
Shetland Isles	35,947	206,695,250	36,141	190,463,070
North Coast & West Highlands	30,948	177,951,000	66,633	351,155,910
All Scotland	156,025	897,143,750	203,881	1,074,452,870

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 Scottish Marine Regions due to commercial confidentiality. Average prices (real) have been adjusted for inflation based on 2019 price estimates.



Salmon Tonnes



Argyle & Clyde

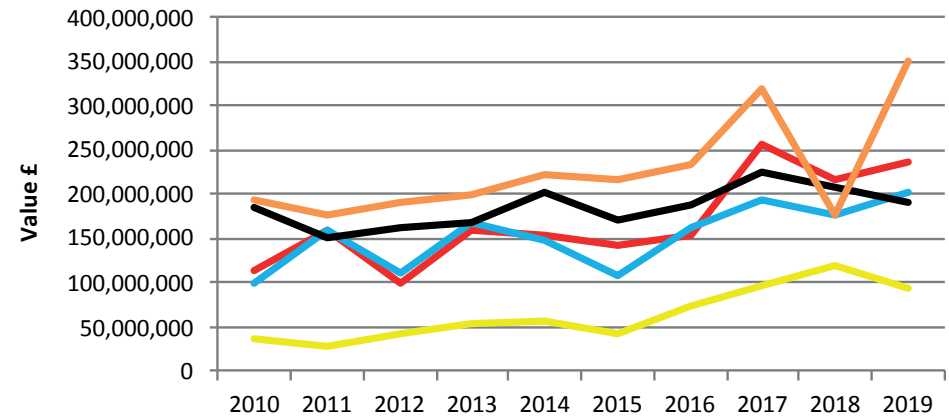
Orkney Island

Outer Hebrides

Shetland Isles

West Highlands & North Coast

Value £ real price (inflation adjusted on 2019 Price estimates)





Scottish Government
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