

Marine Scotland Science

Scottish Fish Farm Production Survey 2021



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SCOTTISH FISH FARM PRODUCTION SURVEY 2021

This report was prepared by Marine Scotland Science

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// Foreword

The annual production survey of fish farms in Scotland for 2021 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, <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 2021 are summarised in this report and returns are consistently received from 100% of companies. The questionnaires are given in Appendix 1a-d. The survey is structured to allow readers to follow industry trends within the rainbow trout, Atlantic salmon and other farmed species sectors. Data from previous years have been reassessed and updated where necessary. To allow direct comparison to data provided in previous surveys, production information by region is presented in defined areas.

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

The cooperation of the Scottish fish farming industry in completing the questionnaires is gratefully acknowledged. The author also acknowledges Liam Mason, Joanne Murphy, Sandy Murray, Keith Mutch, Ed Noble, 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 2021 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*)

| | | 2020 | 2021 |
|----------------------------------|-----------------|-------|-------|
| Total production | (tonnes) | 7,576 | 8,156 |
| Production for the table | (tonnes) | 7,032 | 7,655 |
| Production for restocking | (tonnes) | 544 | 501 |
| Number of staff employed | | 134 | 146 |
| Mean productivity | (tonnes/person) | 56.5 | 55.9 |
| Number of ova laid down to hatch | (millions) | 6.2 | 4.9 |
| Number of ova imported | (millions) | 4.7 | 3.6 |

In 2021, the production of rainbow trout increased by 580 tonnes. Employment increased by 12 staff and mean productivity decreased to 55.9 tonnes per person. The number of ova laid down to hatch decreased by 1.3 million and the number of ova imported decreased by 1.1 million.

Atlantic salmon (*Salmo salar*)

Ova and Smolts

| | | 2020 | 2021 |
|---|------------|-------|-------|
| Number of ova produced | (millions) | 20.0 | 46.3 |
| Number of ova laid down to hatch | (millions) | 78.6 | 72.8 |
| Number of ova exported | (millions) | 0 | 0 |
| Number of ova imported | (millions) | 57.3 | 32.9 |
| Number of smolts produced | (millions) | 50.5 | 51.2 |
| Number of smolts put to sea | (millions) | 52.5 | 51.1 |
| Number of staff employed | | 292 | 291 |
| Mean productivity (000's smolts/person) | | 172.9 | 175.9 |

The production of ova increased by 26.3 million in 2021 and the number of ova laid down to hatch decreased by 5.8 million. No ova were exported in 2021 and the number of ova imported decreased by 24.4 million from the 2020 figure. The number of smolts produced increased by 0.7 million. In 2021 the number of staff employed decreased by one and mean productivity increased by 3,000 smolts per person.

Production fish

| | | 2020 | 2021 |
|-----------------------------|---------------|---------|---------|
| Total production | (tonnes) | 192,129 | 205,393 |
| Production of 0-year fish | (tonnes) | 1,208 | 34 |
| Production of grilse | (tonnes) | 85,543 | 93,346 |
| Production of pre-salmon | (tonnes) | 56,232 | 51,349 |
| Production of year 2 salmon | (tonnes) | 49,146 | 60,664 |
| Mean fish weight 0-year | (kg) | 3.7 | 2.1 |
| Mean fish weight grilse | (kg) | 4.8 | 5.0 |
| Mean fish weight pre-salmon | (kg) | 5.3 | 4.6 |
| Mean fish weight salmon | (kg) | 5.5 | 5.7 |
| Number of staff employed | | 1,630 | 1,495 |
| Mean productivity | tonnes/person | 117.9 | 137.4 |

Production tonnage increased by 13,264 tonnes with an increase in the mean harvest weight of grilse and pre-salmon but a decrease in the mean weight of year 0 and year 2 salmon. Staff numbers decreased by 135 and mean productivity increased to 137.4 tonnes per person.

Smolt survival (percentage harvested)

| Survival (%) | Years 0+1 | Year 2 | Total |
|-----------------------|-----------|--------|-------|
| 2018 input year class | 58.0 | 19.5 | 77.5 |
| 2019 input year class | 54.4 | 20.0 | 74.4 |

The smolt survival rate for the 2019 input year class decreased to 74.4%. 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).

| | | 2020 | 2021 |
|----------------------------------|-------------|-------------------|-----------------|
| Total production | (tonnes) | 43 ^a | 61 ^a |
| Number of staff employed | (full-time) | 22 | 28 |
| | (part-time) | 13 | 13 |
| Number of ova laid down to hatch | (millions) | 20.7 ^b | 60.0 |
| Number of ova imported | (millions) | 0.7 | 0.7 |

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 2021, the production of other species increased by 18 tonnes from the 2020 total, although this figure does not include halibut production. Overall, employment increased by six in 2021. There was an increase in the number of ova laid down to hatch during 2021 but any halibut ova laid down to hatch in 2020 were not included in the 2020 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 | 1 | 1 | 52 |
| Atlantic salmon (freshwater stages) | 0 | 0 | 0 |
| Atlantic salmon (seawater stages) | 14 | 1 | 19,686 |

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

Production survey information was collected from all 22 companies actively involved in rainbow trout production, farming 48 active sites. This figure represents the entire industry operating in Scotland.

Production

Table 1a: Annual production (tonnes) of rainbow trout during 2007-2021 and projected production in 2022

| Year | Tonnes | Percentage difference | Year | Tonnes | Percentage difference |
|------|--------|-----------------------|------|---------|-----------------------|
| 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 | 7,576 | 2 |
| 2013 | 5,611 | -1 | 2021 | 8,156 | 8 |
| 2014 | 5,882 | 5 | 2022 | 10,631* | |

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

Production increased in 2021 by 580 tonnes, an increase of 8%, to 8,156 tonnes.

Table 1b: Production (tonnes) for the table trade during 2012-2021 according to weight category

| Year | <450 g <1 lb | 450-900 g 1-2 lbs | >900 g >2 lbs | Total Tonnes |
|------|-----------------|----------------------|------------------|-----------------|
| 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 |
| 2020 | 403 | 164 | 6,465 | 7,032 |
| 2021 | 384 | 154 | 7,117 | 7,655 |

Production for the table in 2021 was 7,655 tonnes, an increase of 623 tonnes (9%) on the 2020 total. This accounted for 94% of the total rainbow trout production, an increase on the proportion to that produced in 2020. Also, an increase in the number of fish in the large size range and a decrease in the number of fish in the small and medium size ranges were observed.

Table 1c: Production (tonnes) for the restocking trade during 2012-2021 according to weight category

| Year | <450 g <1 lb | 450-900 g 1-2 lbs | >900 g >2 lbs | Total Tonnes |
|------|-----------------|----------------------|------------------|-----------------|
| 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 |
| 2020 | 46 | 130 | 368 | 544 |
| 2021 | 14 | 128 | 359 | 501 |

In 2021, production for the restocking of angling waters decreased to 501 tonnes representing a decrease of 43 tonnes (8%) on the 2020 total. This accounted for 6% of total rainbow trout production in 2021. These figures represent the tonnage of fish supplied to angling waters for restocking purposes; they do not account for the catch taken by anglers. There was a decrease in production of fish from all the size categories.

Production by Site

Table 2: Number of sites grouped by tonnage produced during 2012-2021

| Year | Number of sites per production tonnage | | | | Total number of sites |
|------|--|--------|---------|------|-----------------------|
| | <1-25 | 26-100 | 101-200 | >200 | |
| 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 |
| 2020 | 6 | 13 | 2 | 11 | 32 |
| 2021 | 4 | 10 | 3 | 10 | 27 |

Production was reported from 27 of the 48 active sites. The number of producers in the 101-200 tonnes size bracket increased while those in the <1-25, 26-100 and >200 tonnes size brackets decreased. 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 2021 and comparison with production in 2020

| Production method | Production grouping (tonnes) in 2021 | | | | | Total tonnage and (%) by method | | Number of sites | |
|-------------------------|--------------------------------------|----------|----------|----------|-----------|---------------------------------|----------------|-----------------|-----------|
| | <10 | 10-25 | 26-50 | 51-100 | >100 | 2020 | 2021 | 2020 | 2021 |
| FW cages | 0 | 0 | 0 | 0 | 5 | 2,279 (30.1%) | 1,976 (24%) | 6 | 5 |
| FW ponds and raceways | 1 | 1 | 6 | 2 | 3 | 1,022 (13.5%) | 968 (12%) | 14 | 13 |
| FW tanks and hatcheries | 2 | 0 | 0 | 1 | 0 | 86 (1.1%) | 68 (1%) | 3 | 3 |
| SW cages | 0 | 0 | 1 | 0 | 5 | 4,189 (55.3%) | 5,144 (63%) | 9 | 6 |
| SW tanks | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 3 | 1 | 7 | 3 | 13 | 7,576 | 8,156 | 32 | 27 |

Seawater production accounted for 5,144 tonnes (63%) and freshwater production the remaining 3,012 tonnes (37%). Production from all freshwater facilities decreased while production from seawater cage facilities increased during 2021.

Company and Site Data

Table 4: Number of companies and sites in production during 2012-2021

| Year | No. of companies | No. of sites |
|------|------------------|--------------|
| 2012 | 25 | 48 |
| 2013 | 24 | 46 |
| 2014 | 24 | 46 |
| 2015 | 24 | 45 |
| 2016 | 24 | 44 |
| 2017 | 23 | 44 |
| 2018 | 23 | 53 |
| 2019 | 22 | 52 |
| 2020 | 21 | 50 |
| 2021 | 22 | 48 |

In 2021, 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 48.

Staffing and Productivity

Table 5: Number of staff employed and productivity per person during 2012-2021

| Year | Full-time Male | Full-time Female | Total Full-time | Part-time Male | Part-time Female | Total Part-time | Total Staff | Productivity (tonnes/person) |
|------|----------------|------------------|-----------------|----------------|------------------|-----------------|-------------|------------------------------|
| 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 |
| 2020 | 97 | 13 | 110 | 20 | 4 | 24 | 134 | 56.5 |
| 2021 | 107 | 16 | 123 | 19 | 4 | 23 | 146 | 55.9 |

The overall number of staff employed in 2021 increased by 12 to 146. The number of full-time staff increased by 13 while the number of part-time staff decreased by one. Productivity, measured as tonnes produced per person, decreased by 1% in 2021 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 2021

| Area | No. of sites | Table production (tonnes) | Restocking production (tonnes) | Total tonnes (tonnes) | Mean tonnes per site | Staffing | | | Productivity (tonnes/person) |
|--------|--------------|---------------------------|--------------------------------|-----------------------|----------------------|----------|-----|-------|------------------------------|
| | | | | | | F/T | P/T | Total | |
| North* | 10 | 454 | 33 | 486 | 48.6 | 13 | 4 | 17 | 28.6 |
| East | 11 | 515 | 266 | 781 | 71.0 | 33 | 11 | 44 | 17.6 |
| West | 17 | 6,290 | 8 | 6,298 | 370.5 | 53 | 3 | 56 | 112.5 |
| South | 10 | 396 | 194 | 591 | 59.1 | 24 | 5 | 29 | 20.4 |
| All | 48 | 7,655 | 501 | 8,156 | 169.9 | 123 | 23 | 146 | 55.9 |

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

Productivity was greatest in the West at 370.5 tonnes per site and 112.5 tonnes per person.

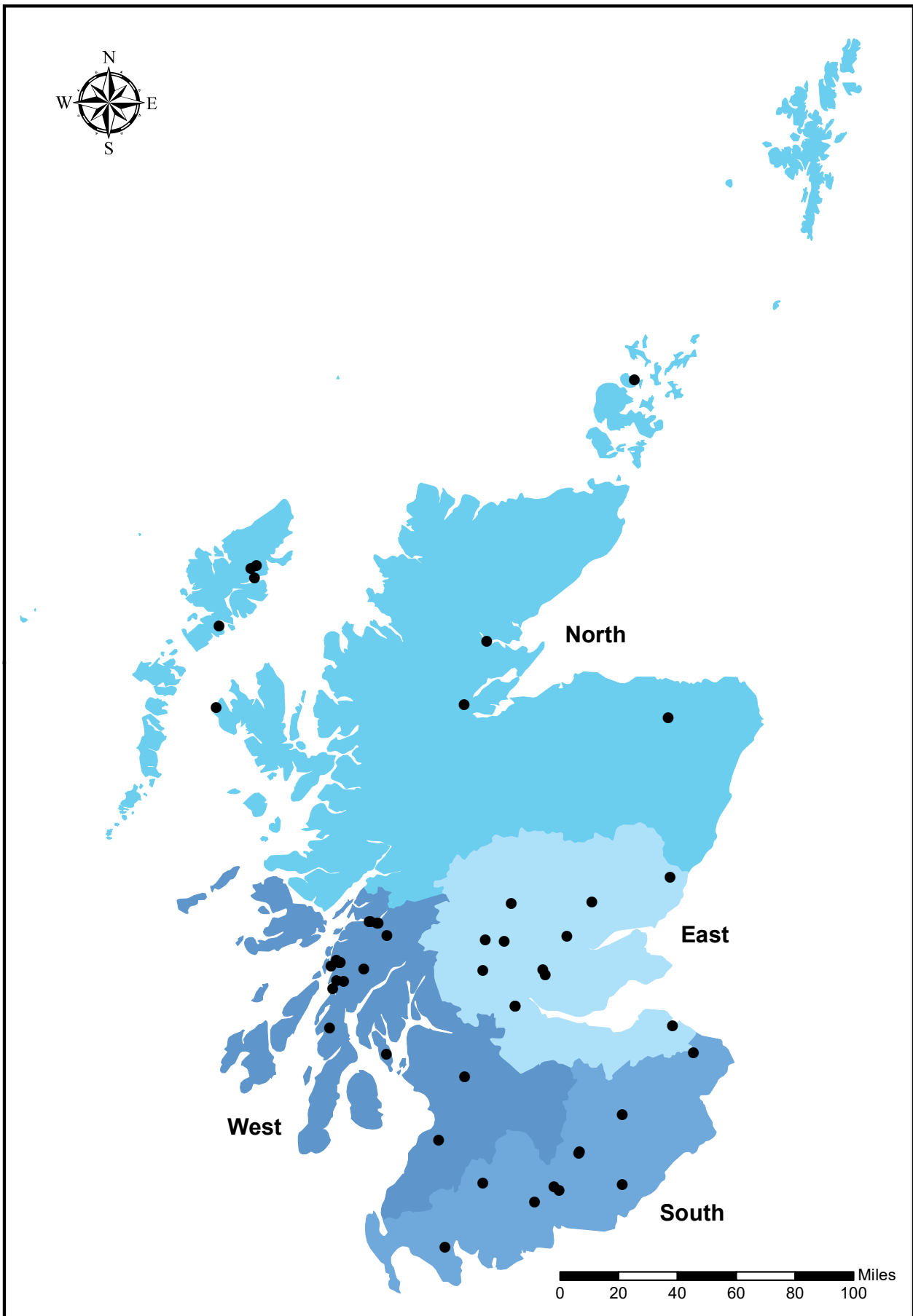


Figure 1: The regional distribution of active rainbow trout sites in 2021

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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 2012-2021

| Year | All female diploid no. (%) | Triploid no. (%) | Mixed sex diploid no. (%) | Total ova |
|------|----------------------------|------------------|---------------------------|-----------|
| 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 |
| 2020 | 286 (5) | 5,943 (95) | 15 (<1) | 6,244 |
| 2021 | 2 (<1) | 4,877 (<100) | 15 (<1) | 4,894 |

Source of Ova Laid Down

Table 8: Number (000's) and sources of eyed ova laid down to hatch in 2012-2021

| Year | Ova produced in Great Britain (GB) | | | Total imported ova | | Total | Total Ova Laid Down |
|------|------------------------------------|-------------|-------|---------------------|---------------------|--------|---------------------|
| | Own stock | Other stock | Total | Northern hemisphere | Southern hemisphere | | |
| 2012 | 14 | 230 | 244 | 12,735 | 0 | 12,735 | 12,979 |
| 2013 | 77 | 537 | 614 | 9,275 | 0 | 9,275 | 9,889 |
| 2014 | 9 | 655 | 664 | 10,376 | 0 | 10,376 | 11,040 |
| 2015 | 6 | 888 | 894 | 11,227 | 0 | 11,227 | 12,121 |
| 2016 | 35 | 349 | 384 | 9,550 | 0 | 9,550 | 9,934 |
| 2017 | 20 | 547 | 567 | 6,474 | 0 | 6,474 | 7,041 |
| 2018 | 15 | 495 | 510 | 5,808 | 0 | 5,808 | 6,318 |
| 2019 | 10 | 22 | 32 | 6,519 | 0 | 6,519 | 6,551 |
| 2020 | 15 | 1,552 | 1,567 | 3,712 | 965 | 4,677 | 6,244 |
| 2021 | 181 | 1,068 | 1,249 | 3,645 | 0 | 3,645 | 4,894 |

In 2021, the total number of eyed ova laid down to hatch decreased by 1.4 million (22%) on the 2020 figure. Imported ova came from only the Northern hemisphere during 2021. The proportion of ova from GB broodstock increased (26% 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 2012-2021

| Source | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|---------------|---------------|--------------|---------------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Denmark | 1,950 | 1,315 | 2,500 | 2,330 | 5,535 | 3,518 | 3,728 | 5,567 | 3,703 | 1,861 |
| Isle of Man | 300 | 800 | 1,000 | 175 | 20 | 300 | 0 | 0 | 0 | 0 |
| N. Ireland | 8,332 | 5,125 | 4,780 | 6,535 | 3,040 | 1,240 | 1,085 | 380 | 150 | 0 |
| Norway | 300 | 175 | 710 | 670 | 500 | 774 | 0 | 0 | 0 | 0 |
| South Africa | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1,225 | 0 |
| Spain | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60 | 180 | 828 |
| USA | 1,800 | 2,350 | 1,700 | 1,675 | 750 | 0 | 855 | 430 | 0 | 950 |
| Totals | 12,682 | 9,765 | 10,690 | 11,385 | 9,845 | 5,832 | 5,668 | 6,437 | 5,258 | 3,639 |

Table 9b: Seasonal variation in numbers (000's) and sources of ova imported into Scotland from outwith GB during 2021

| Month | Denmark | Spain | USA |
|---------------|--------------|------------|------------|
| January | 310 | 0 | 0 |
| February | 0 | 0 | 0 |
| March | 896 | 0 | 0 |
| April | 640 | 0 | 0 |
| May | 15 | 0 | 0 |
| June | 0 | 0 | 0 |
| July | 0 | 0 | 0 |
| August | 0 | 0 | 0 |
| September | 0 | 348 | 550 |
| October | 0 | 0 | 0 |
| November | 0 | 480 | 400 |
| December | 0 | 0 | 0 |
| Totals | 1,861 | 828 | 950 |

Table 9c: Number (000's) and sources of fish imported into Scotland from outwith GB during 2012-2022

| Source | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|------------|------|------|------|------|------|------|------|------|------|------|
| N. Ireland | 155 | 537 | 674 | 746 | 592 | 486 | 391 | 935 | 787 | 463 |

Suppliers within the European Union (EU) accounted for 74% of ova imported into Scotland during 2021 with the USA accounting for the remaining 26%. In recent years there has been a trend for producers to import part grown rainbow trout into Scotland from Northern Ireland.

Trade in Fry and Fingerlings

Table 10: Number (000's) of fry and fingerlings traded during 2012-2021

| Year | Fry and fingerlings bought | | | Total number bought | Total number sold |
|------|----------------------------|------------------|---------------------------|---------------------|-------------------|
| | All female diploid no. (%) | Triploid no. (%) | Mixed sex diploid no. (%) | | |
| 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 |
| 2020 | 937 (33) | 1,916 (67) | 0 | 2,853 | 2,544 |
| 2021 | 417 (13) | 2,711 (87) | 2 (<1) | 3,130 | 3,389 |

The established trade between hatcheries and on-growing farms continued in 2021. Some companies specialised in fry and fingerling production. The total number of fry and fingerlings bought increased by 10% while the number sold increased by 33%. 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 2012-2021

| Year | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|--------------|------|------|------|------|------|------|------|------|------|------|
| No. of sites | 24 | 19 | 21 | 17 | 18 | 18 | 17 | 21 | 18 | 19 |
| No. of fish | 20.4 | 9.9 | 10.0 | 8.3 | 7.3 | 5.4 | 3.4 | 3.4 | 2.8 | 3.1 |

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 3.1 million fish were vaccinated on 19 sites.

Organic Production

Of the 48 sites recorded as being active in rainbow trout production in 2021, none were certified as organic.

Escapes

There was one incident involving the loss of 52 fish from a rainbow trout site in 2021. There was one additional incident reported where the company confirmed there was no loss of fish.

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

Production survey information was collected from all 22 companies actively involved in the freshwater production of Atlantic salmon, farming 74 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 2012-2021

| Year | No. of companies | No. of sites |
|------|------------------|--------------|
| 2012 | 28 | 100 |
| 2013 | 27 | 102 |
| 2014 | 26 | 96 |
| 2015 | 25 | 87 |
| 2016 | 26 | 87 |
| 2017 | 24 | 79 |
| 2018 | 24 | 71 |
| 2019 | 23 | 76 |
| 2020 | 24 | 78 |
| 2021 | 22 | 74 |

In 2021, the number of companies authorised by the Scottish Government for freshwater production of Atlantic salmon decreased by two to 22. A total of 74 sites were actively engaged in commercial production, a decrease of four from the 2020 figure.

Production and Staffing

Table 13: Number (000's) of smolts produced, staff employed and smolt productivity during 2012-2021

| 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 |
|------|-----------------------------------|----------------|------------------|-----------------|----------------|------------------|-----------------|-------------|---|
| 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 |
| 2020 | 50,492 | 233 | 30 | 263 | 23 | 6 | 29 | 292 | 172.9 |
| 2021 | 51,198 | 229 | 33 | 262 | 18 | 11 | 29 | 291 | 175.9 |

Smolt production in 2021 increased by 1% compared to 2020. The number of staff employed in 2021 decreased by one and productivity increased by 2% to a figure of 175,900 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 2012-2021

| Year | S½ | S1 | S1½ | Total |
|------|--------|--------|-----|--------|
| 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 |
| 2020 | 22,872 | 27,620 | 0 | 50,492 |
| 2021 | 30,175 | 20,709 | 314 | 51,198 |

In 2021, there was an increase of 32% in the number of S½ smolts produced and a decrease of 25% in the number of S1 smolts produced. In 2021 there was also production of S1½ smolts which accounted for less than 1% of all smolts produced.

Production Systems

Table 15: Number and capacity of production systems during 2017-2021

| System | No. of sites with system | | | | | Total capacity, 000's cubic metres | | | | |
|--------------------|--------------------------|------|------|------|------|------------------------------------|------|------|------|------|
| | 2017 | 2018 | 2019 | 2020 | 2021 | 2017 | 2018 | 2019 | 2020 | 2021 |
| Cages | 36 | 27 | 27 | 27 | 26 | 357 | 346 | 351 | 379 | 374 |
| Tanks and Raceways | 43 | 44 | 49 | 51 | 48 | 55 | 54 | 68 | 62 | 65 |
| Total | 79 | 71 | 76 | 78 | 74 | 412 | 400 | 419 | 441 | 439 |

The types of facility used for the production of smolts in freshwater are cages or tanks and raceways. In 2021, the number of farms using cages decreased by one and the number of farms using tanks and raceways decreased by three. In terms of volume, cage capacity decreased by 5,000 m³ and tank and raceway capacity increased by 3,000 m³. This resulted in a net decrease in volume of 2,000 m³ available for the production of smolts in Scotland during 2021.

Table 16: Number (000's) of smolts produced and stocking densities by production system during 2017-2021

| Year | Number of smolts produced (000's) | | | | | Stocking densities (smolts/m ³) | | | | |
|------------|-----------------------------------|--------|--------|--------|--------|---|------|------|------|------|
| | 2017 | 2018 | 2019 | 2020 | 2021 | 2017 | 2018 | 2019 | 2020 | 2021 |
| Cages | 17,207 | 21,771 | 18,964 | 18,331 | 19,344 | 48 | 63 | 54 | 48 | 52 |
| All others | 28,945 | 25,326 | 32,466 | 32,161 | 31,854 | 526 | 469 | 477 | 519 | 490 |
| Total | 46,152 | 47,097 | 51,430 | 50,492 | 51,198 | - | - | - | - | - |

The average stocking densities of cages increased from 48 to 52 smolts per m³ in 2021 compared to 2020, while densities in tanks and raceways decreased from 519 to 490 smolts per m³.

Ova Production

Table 17: Number (000's) of salmon ova produced during 2012-2021

| Year | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| No. of ova | 57,489 | 56,904 | 33,450 | 11,605 | 13,689 | 12,631 | 15,228 | 11,618 | 20,021 | 46,255 |

In 2021, over 46 million ova were stripped, an increase of 131% from the number of ova produced in 2020.

Table 18: Source, number (000's), previous year's estimate of ova laid down to hatch during 2012-2021 and projected production for 2022

| Year | In-house broodstock | Out-sourced GB broodstock | GB wild broodstock | Foreign ova | Total | Previous year's estimate |
|------|---------------------|---------------------------|--------------------|-------------|--------|--------------------------|
| 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 | 5,195 | 4,480 | 258 | 68,685 | 78,618 | 70,598 |
| 2021 | 6,383 | 22,581 | 124 | 43,707 | 72,795 | 68,588 |
| 2022 | | | | | | 77,306 |

The number of ova laid down to hatch was 72.8 million, a decrease of 5.8 million (7%) on the 2020 figure. The majority of the ova (60%) were derived from foreign sources, this being a decrease of 25 million (36%) on the 2020 figure. Supplies derived from GB broodstock (excluding wild origin ova) increased by 19.3 million, a 199% increase on the 2020 figure. In 2021, 124,000 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 2012-2023

| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|------|------|------|------|------|------|------|------|------|------|------|------|
| Actual smolts put to sea | 41.1 | 40.9 | 48.1 | 45.5 | 43.0 | 46.1 | 45.5 | 53.0 | 52.5 | 51.1 | | |
| Smolts produced | 44.3 | 40.5 | 45.0 | 44.6 | 42.9 | 46.2 | 47.1 | 51.4 | 50.5 | 51.2 | | |
| Estimated production | 31.3 | 28.1 | 39.9 | 43.4 | 36.6 | 39.3 | 46.1 | 38.6 | 52.1 | 55.6 | 54.1 | 55.6 |
| Ratio of ova laid down to smolts produced | 1.4 | 1.6 | 1.6 | 1.5 | 1.5 | 1.4 | 1.5 | 1.4 | 1.6 | 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 54.1 million smolts to sea in 2022. The ratio of ova laid down to hatch to smolts produced in 2021 was less than the ratio in 2020.

Scale of Production

Table 20: Smolt-producing sites grouped by numbers (000's) of smolts produced during 2012-2021

| 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 | | |
| 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 |
| 2020 | 1 | 1 | 0 | 4 | 4 | 5 | 10 | 16 | 41 | 50,492 |
| 2021 | 1 | 0 | 0 | 2 | 6 | 5 | 9 | 16 | 39 | 51,198 |

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 2021 was 39. The number of sites producing less than 101,000 smolts decreased by three while the number of sites producing between 101,000 and one million smolts per year increased by one. The number of sites producing in excess of one million smolts per year remained at 16 sites.

Production of Ova and Smolt by Production Area

Table 21: Staffing in 2021, ova laid down to hatch in 2020-2021, smolt production in 2020-2021 and estimated production in 2022-2023 by region

| Region | Number of staff employed in 2021 | | Ova laid down to hatch (000's) | | Smolt production (000's) | | Estimated smolt production (000's) | |
|----------------|----------------------------------|-----|--------------------------------|--------|--------------------------|--------|------------------------------------|--------|
| | F/T | P/T | 2020 | 2021 | 2020 | 2021 | 2022 | 2023 |
| | North West | 142 | 12 | 42,702 | 39,077 | 26,308 | 28,369 | 30,517 |
| Orkney | 1 | 3 | 100 | 175 | 97 | 111 | 0 | 130 |
| Shetland | 25 | 1 | 5,948 | 4,239 | 3,804 | 2,905 | 2,865 | 4,300 |
| West | 66 | 6 | 23,810 | 24,766 | 16,213 | 16,063 | 17,529 | 17,564 |
| Western Isles | 24 | 4 | 5,738 | 4,493 | 3,247 | 2,695 | 2,210 | 2,235 |
| East and South | 4 | 3 | 320 | 45 | 823 | 1,055 | 930 | 700 |
| All Scotland | 262 | 29 | 78,618 | 72,795 | 50,492 | 51,198 | 54,051 | 55,586 |

In 2021, 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.

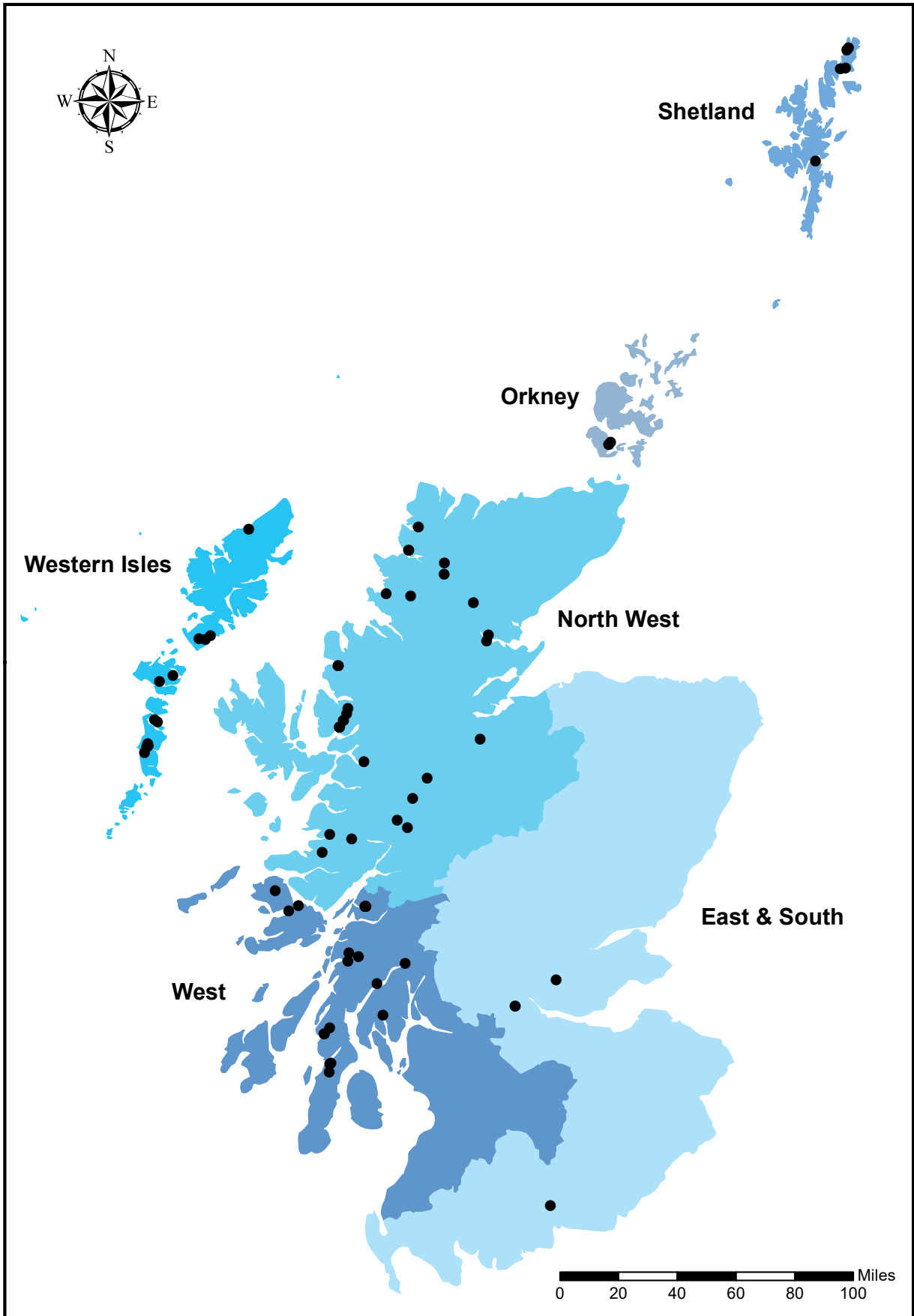


Figure 2: The regional distribution of active atlantic salmon smolt sites in 2021

International Trade

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

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

Imports and Exports

Table 22a: Source and number (000's) of salmon ova, fry, parr and smolts imported during 2012-2021 derived from health certificates

| Import Year | Ova | | | | Fry, Parr and Smolts | | |
|-------------|---------|--------|---------------------|--------|----------------------|---------------------|-------|
| | Iceland | Norway | Republic of Ireland | Total | Norway | Republic of Ireland | Total |
| 2012 | 0 | 23,849 | 10,134 | 33,983 | 0 | 0 | 0 |
| 2013 | 2,719 | 35,044 | 10,700 | 48,463 | 0 | 55 | 55 |
| 2014 | 3,813 | 49,831 | 5,218 | 58,862 | 1,748 | 1,602 | 3,350 |
| 2015 | 8,978 | 45,926 | 4,815 | 59,719 | 365 | 2,118 | 2,483 |
| 2016 | 5,324 | 38,602 | 5,444 | 49,370 | 0 | 1,956 | 1,956 |
| 2017 | 13,883 | 37,025 | 7,000 | 57,908 | 0 | 2,012 | 2,012 |
| 2018 | 10,116 | 48,430 | 7,250 | 65,796 | 0 | 1,700 | 1,700 |
| 2019 | 26,352 | 23,673 | 10,184 | 60,209 | 0 | 297 | 297 |
| 2020 | 41,756 | 220 | 15,296 | 57,272 | 0 | 1,130 | 1,130 |
| 2021 | 31,276 | 160 | 19,260 | 50,696 | 0 | 300 | 300 |

The numbers of ova imported decreased by 11% in 2021. The number of fry, parr and smolts imported also decreased, with 300,000 fish imported from the Republic of Ireland during 2021.

Table 22b: Destination and number (000's) of salmon ova, fry, parr and smolts exported during 2012-2021 derived from health certificates

| Export year | Farmed origin ova | Fry, Parr and Smolts |
|-------------|-------------------|----------------------|
| 2012 | 0 | 55 |
| 2013 | 650 | 404 |
| 2014 | 0 | 259 |
| 2015 | 95 | 8 |
| 2016 | 358 | 173 |
| 2017 | 339 | 206 |
| 2018 | 23 | 71 |
| 2019 | 0 | 263 |
| 2020 | 0 | 389 |
| 2021 | 0 | 371 |

In 2021, no ova were exported. Fry, parr and smolt exports decreased by 18,000 fish on the 2020 figure.

Vaccines

Table 23: Number of sites using vaccines and number (millions) of fish vaccinated during 2012-2021

| Year | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|-----------------------------------|------|------|------|------|------|------|------|------|------|------|
| No. of sites | 63 | 63 | 56 | 55 | 47 | 46 | 43 | 46 | 43 | 43 |
| No. of fish (millions) vaccinated | 48.1 | 47.5 | 44.7 | 48.0 | 42.6 | 58.4 | 51.0 | 52.4 | 59.2 | 54.9 |

Vaccines were used to provide protection against furunculosis, infectious pancreatic necrosis (IPN), ERM, vibriosis and salmonid alphavirus (SAV). The majority of fish were vaccinated against furunculosis, IPN and SAV, with smaller numbers of fish being vaccinated against ERM and vibriosis. A total of 54.9 million fish were vaccinated across 43 sites.

Escapes

In 2021, there were no reported escapes from sites rearing freshwater Atlantic salmon.

// 3. Atlantic salmon - Production

Production

Production survey information was collected from all 12 companies actively involved in Atlantic salmon production, farming 213 active sites. This figure represents the entire industry operating in Scotland.

Table 24: Annual production of salmon (tonnes) 2001-2021 and projected production in 2022

| Year | Tonnes | Percentage difference | Year | Tonnes | Percentage difference |
|------|---------|-----------------------|------|----------|-----------------------|
| 2001 | 138,519 | 7 | 2012 | 162,223 | 3 |
| 2002 | 144,589 | 4 | 2013 | 163,234 | 1 |
| 2003 | 169,736 | 17 | 2014 | 179,022 | 10 |
| 2004 | 158,099 | -7 | 2015 | 171,722 | -4 |
| 2005 | 129,588 | -18 | 2016 | 162,817 | -5 |
| 2006 | 131,847 | 2 | 2017 | 189,707 | 17 |
| 2007 | 129,930 | -1 | 2018 | 156,025 | -18 |
| 2008 | 128,606 | -1 | 2019 | 203,881 | 31 |
| 2009 | 144,247 | 12 | 2020 | 192,129 | -6 |
| 2010 | 154,164 | 7 | 2021 | 205,393 | 7 |
| 2011 | 158,018 | 3 | 2022 | 189,693* | |

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

The total production of Atlantic salmon during 2021 was 205,393 tonnes, an increase of 13,264 tonnes (7%) on the 2020 total. This was the highest 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 2012-2021

| | 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) | 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 |
| | 2020 | 2020 | 323 | 1,208 | 3.7 |
| | 2021 | 2021 | 16 | 34 | 2.1 |
| Harvest in year 1 | 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 |
| | 2019 | 2020 | 28,529 | 141,775 | 5.0 |
| | 2020 | 2021 | 29,697 | 144,695 | 4.9 |
| Harvest in year 2 | 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 |
| | 2018 | 2020 | 8,883 | 49,146 | 5.5 |
| | 2019 | 2021 | 10,602 | 60,664 | 5.7 |

Table 26: Number (000's) and production (tonnes) of grilse and pre-salmon harvested during 2012-2021

| Year | Grilse (January-August) | | | Pre-salmon (September-December) | | |
|------|-------------------------|--------|---------------------|---------------------------------|--------|---------------------|
| | Number | Tonnes | Average weight (kg) | Number | Tonnes | Average weight (kg) |
| 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 |
| 2020 | 17,855 | 85,543 | 4.8 | 10,674 | 56,232 | 5.3 |
| 2021 | 18,512 | 93,346 | 5.0 | 11,185 | 51,349 | 4.6 |

Table 27: Percentage (by weight) of annual production by growth stage harvested during 2012-2021

| Year | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|-----------------|------|------|------|------|------|------|------|------|------|------|
| Growth stage | - | - | - | - | - | - | - | - | - | - |
| Input year fish | <1 | 0 | <1 | <1 | <1 | 0 | <1 | <1 | <1 | <1 |
| Grilse | 33 | 29 | 26 | 31 | 37 | 36 | 34 | 35 | 45 | 45 |
| Pre-salmon | 27 | 36 | 31 | 35 | 31 | 31 | 36 | 29 | 29 | 25 |
| Year 2 salmon | 39 | 35 | 42 | 33 | 31 | 33 | 29 | 35 | 26 | 30 |

Survival and Production in Smolt Year Classes

Table 28: Survival and production in smolt year classes during 2002-2021

| Year of smolt input | Harvest year 0 | | | | Harvest year 1 | | | | Harvest year 2 | | | | Yield per smolt (kg) | | | |
|---------------------|---------------------|----------------|-----------------|------------------|----------------|----------------|-----------------|------------------|----------------|----------------|-----------------|------------------|----------------------|-----------|--|----------------------------|
| | Smolt input (000's) | 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 | Total % of year class harvested (survival) | Year class weight (tonnes) |
| 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 | 45,513 | 84 | 247 | 2.9 | 0.2 | 26,324 | 132,090 | 5.0 | 57.8 | 8,883 | 49,146 | 5.5 | 19.5 | 77.5 | 181,483 | 3.99 |
| 2019 | 52,990 | 319 | 931 | 2.9 | 0.6 | 28,529 | 141,775 | 5.0 | 53.8 | 10,602 | 60,664 | 5.7 | 20.0 | 74.4 | 203,370 | 3.84 |
| 2020 | 52,492 | 323 | 1,208 | 3.7 | 0.6 | 29,697 | 144,695 | 4.9 | 56.6 | | | | | | | |
| 2021 | 51,131 | 16 | 34 | 2.1 | 0.03 | | | | | | | | | | | |

In 2019, the last year for which survival can be calculated, the survival rate from smolt input to harvest decreased to 74.4%. Of the 2020 year class, 57.2% of the input has been harvested, 2.8% higher than the average harvest of fish one year after input in the 2019 year class. In 2021, 0.03% of the fish were harvested from the 2021 input. This was a decrease compared with the proportion of fish harvested from the same year class in 2020.

Smolts to Sea

Table 29: Number (000's) and origin of smolts put to sea during 2012-2021

| Year | Smolts put to sea (000's) | | | Total (000's) | Scottish Origin % | English Origin | | Other Origin | |
|------|---------------------------|--------|-----|---------------|-------------------|----------------|---|--------------|----|
| | S½ | S1 | S1½ | | | (000's) | % | (000's) | % |
| 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 | 21,767 | 23,746 | 0 | 45,513 | 96 | 1,318 | 3 | 364 | <1 |
| 2019 | 24,525 | 28,465 | 0 | 52,990 | 98 | 751 | 1 | 297 | <1 |
| 2020 | 24,809 | 27,683 | 0 | 52,492 | 96 | 1,070 | 2 | 1,130 | 2 |
| 2021 | 29,421 | 21,396 | 314 | 51,131 | 97 | 1,016 | 2 | 300 | <1 |

The total number of smolts put to sea in 2021 was over 51.1 million. This smolt input comprised S½s (58%), S1s (42%) and S1½s (<1%). Just under 3% 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 just under 2% compared with the proportion observed in 2020.

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 2010-2021

| 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 | 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 | 2020 | 1,852 | 12.2 | 12,883 | 84.9 |
| | 2019 | 15,071 | 2019 | 205 | 1.4 | 2020 | 7,838 | 52.0 | 2021 | 1,976 | 13.1 | 10,019 | 66.5 |
| | 2020 | 19,075 | 2020 | 126 | 0.7 | 2021 | 12,443 | 65.2 | | | | | |
| | 2021 | 13,868 | 2021 | 10 | 0.1 | | | | | | | | |
| Orkney | 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 | 3,616 | 2018 | 0 | 0 | 2019 | 2,068 | 57.2 | 2020 | 1,382 | 38.2 | 3,450 | 95.4 |
| | 2019 | 4,670 | 2019 | 0 | 0 | 2020 | 2,230 | 47.8 | 2021 | 1,970 | 42.2 | 4,200 | 89.9 |
| | 2020 | 4,578 | 2020 | 0 | 0 | 2021 | 2,162 | 47.2 | | | | | |
| | 2021 | 4,469 | 2021 | 0 | 0 | | | | | | | | |
| Shetland | 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 | 2020 | 2,527 | 22.3 | 6,957 | 61.5 |
| | 2019 | 7,613 | 2019 | 114 | 1.5 | 2020 | 4,241 | 55.7 | 2021 | 2,186 | 28.7 | 6,541 | 85.9 |
| | 2020 | 10,072 | 2020 | 84 | 0.8 | 2021 | 5,246 | 52.1 | | | | | |
| | 2021 | 10,090 | 2021 | 0 | 0 | | | | | | | | |
| South West | 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 | 2020 | 1,150 | 16.0 | 5,949 | 82.9 |
| | 2019 | 11,100 | 2019 | 0 | 0 | 2020 | 6,126 | 55.2 | 2021 | 2,094 | 18.9 | 8,220 | 74.1 |
| | 2020 | 9,485 | 2020 | 112 | 1.2 | 2021 | 5,248 | 55.3 | | | | | |
| | 2021 | 10,013 | 2021 | 0 | 0 | | | | | | | | |
| Western Isles | 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 | 2020 | 1,972 | 24.0 | 6,052 | 73.5 |
| | 2019 | 14,536 | 2019 | 0 | 0 | 2020 | 8,094 | 55.7 | 2021 | 2,377 | 16.4 | 10,471 | 72.0 |
| | 2020 | 9,282 | 2020 | 0 | 0 | 2021 | 4,599 | 49.5 | | | | | |
| | 2021 | 12,691 | 2021 | 6 | <0.1 | | | | | | | | |

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

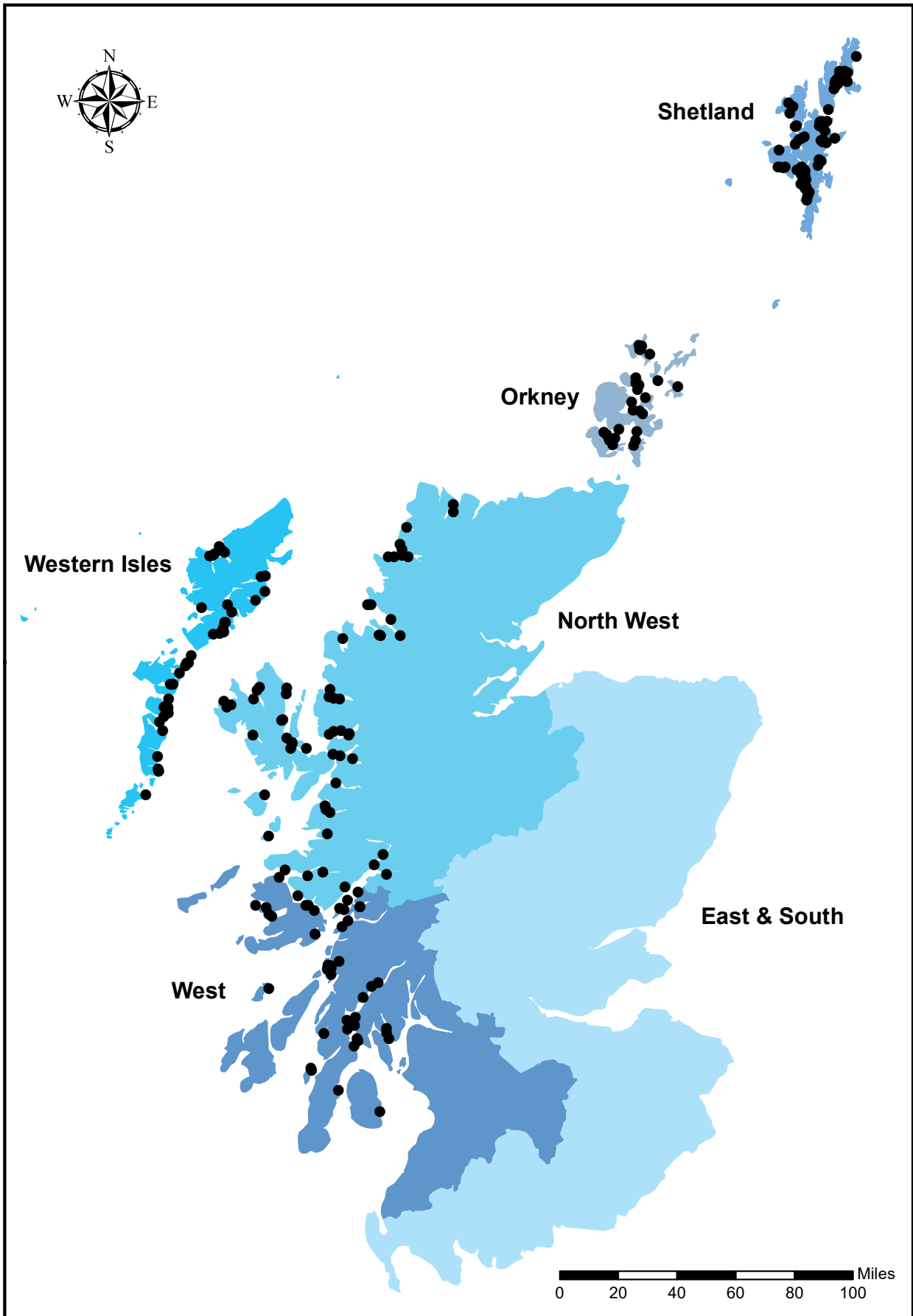


Figure 3: The regional distribution of active atlantic salmon production sites in 2021

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Staffing

Table 31: Number of staff employed in the production of salmon during 2012-2021

| Year | Full-time Male | Full-time Female | Total Full-time | Part-time Male | Part-time Female | Total Part-time | Total Staff | Productivity (tonnes/person) |
|------|----------------|------------------|-----------------|----------------|------------------|-----------------|-------------|------------------------------|
| 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 |
| 2020 | 1,412 | 145 | 1,557 | 45 | 28 | 73 | 1,630 | 117.9 |
| 2021 | 1,308 | 133 | 1,441 | 27 | 27 | 54 | 1,495 | 137.4 |

In 2021, the total number of staff employed in salmon production was 1,495, a decrease of 135 compared with 2020. 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 117.9 to 137.4 tonnes produced per person.

Production Methods

Table 32: Production methods, capacity, tonnage and average stocking densities (kg/m³) during 2019-2021

| Method | Number of sites | | | Total capacity (000's cubic metres) | | | Production (tonnes) | | |
|---|-----------------|------|------|-------------------------------------|--------|--------|---------------------|---------|---------|
| | 2019 | 2020 | 2021 | 2019 | 2020 | 2021 | 2019 | 2020 | 2021 |
| Seawater tanks | 2 | 1 | 1 | 6.3 | 5.1 | 5.6 | 28 | 18 | 14 |
| Seawater cages | 224 | 231 | 212 | 21,628 | 22,818 | 22,187 | 203,853 | 192,111 | 205,379 |
| For cage sites: ratio of production (kg) to cage capacity (m ³) | | | | | | | 9.4 | 8.4 | 9.3 |

In 2021, the majority of fish were produced in seawater cages. There were 14 tonnes of production from seawater tank sites in 2021. 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 decreased by 631,000 m³ during 2021 and the number of sea cage sites in production decreased by 19. Production efficiency in sea cages, measured as the ratio of fish weight in kilograms produced per cubic metre, increased from 8.4 kg/m³ in 2020 to 9.3 kg/m³ in 2021.

Scale of Production by Site

Table 33: Number of sites shown in relation to their production grouping and percentage share of production 2012-2021

| Production grouping (tonnes) | 0 | 1-500 | 501-1,000 | 1,001-2,000 | 2001-3,000 | 3001-4,000 | >4,000 | Total | |
|------------------------------|-----|-------|-----------|-------------|------------|------------|--------|--------|---------|
| | | | | | | | | Sites* | Tonnes |
| 2012 | 115 | 42 | 33 | 42 | 19 | 6 | 0 | 257 | 162,223 |
| 2013 | 112 | 42 | 36 | 50 | 8 | 7 | 2 | 257 | 163,234 |
| 2014 | 117 | 44 | 29 | 37 | 22 | 9 | 2 | 260 | 179,022 |
| 2015 | 115 | 38 | 26 | 56 | 11 | 6 | 2 | 254 | 171,722 |
| 2016 | 117 | 37 | 26 | 50 | 18 | 4 | 1 | 253 | 162,817 |
| 2017 | 91 | 25 | 33 | 50 | 20 | 4 | 3 | 226 | 189,707 |
| 2018 | 100 | 31 | 26 | 39 | 21 | 2 | 2 | 221 | 156,025 |
| 2019 | 80 | 33 | 24 | 60 | 17 | 9 | 3 | 226 | 203,881 |
| 2020 | 101 | 32 | 18 | 43 | 27 | 7 | 4 | 232 | 192,129 |
| 2021 | 73 | 28 | 25 | 50 | 25 | 9 | 3 | 213 | 205,393 |
| 2012 | 0 | 6 | 15 | 38 | 28 | 13 | 0 | - | - |
| 2013 | 0 | 5 | 17 | 45 | 11 | 16 | 6 | - | - |
| 2014 | 0 | 6 | 12 | 29 | 30 | 18 | 5 | - | - |
| 2015 | 0 | 6 | 12 | 50 | 15 | 12 | 5 | - | - |
| 2016 | 0 | 5 | 12 | 44 | 27 | 9 | 3 | - | - |
| 2017 | 0 | 4 | 14 | 40 | 26 | 7 | 9 | - | - |
| 2018 | 0 | 4 | 14 | 39 | 32 | 5 | 6 | - | - |
| 2019 | 0 | 3 | 10 | 45 | 20 | 15 | 7 | - | - |
| 2020 | 0 | 3 | 7 | 34 | 34 | 12 | 10 | - | - |
| 2021 | 0 | 3 | 9 | 37 | 28 | 15 | 8 | - | - |

*Includes farms stocked but having no production.

For the 2021 survey report production grouping categories were re-evaluated to give better resolution of the data. In 2021, the number of sites with no production decreased by 28 and the number producing 1 to 1,000 tonnes increased by three. The number of sites producing 1,000 to 4,000 tonnes increased by seven and sites producing over 4,000 tonnes decreased by one. The trend towards production in larger sites continued, with 87% 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 2020-2021

| Total Tonnage | | 0-1,000 | 1,001-5,000 | 5,001-10,000 | 10,001-30,000 | >30,000 | Total |
|------------------------------|------|---------|-------------|--------------|---------------|---------|---------|
| No. of companies | 2020 | 4 | 1 | 1 | 2 | 3 | 11 |
| | 2021 | 3 | 3 | 1 | 2 | 3 | 12 |
| No. of tonnes | 2020 | 18 | 1,722 | 5,862 | 47,194 | 137,333 | 192,129 |
| | 2021 | 14 | 5,213 | 6,149 | 43,388 | 150,629 | 205,393 |
| Staff (total) | 2020 | 36 | 40 | 78 | 511 | 965 | 1,630 |
| | 2021 | 16 | 75 | 93 | 466 | 845 | 1,495 |
| Productivity (tonnes/person) | 2020 | 0.5 | 43 | 75 | 92 | 142 | 118 |
| | 2021 | 0.9 | 70 | 66 | 93 | 178 | 137 |

For the 2021 survey report production categories were re-evaluated to give better resolution of the data. The greatest productivity of 178 tonnes per person was achieved in the companies producing over 30,000 tonnes. The least productivity of 0.9 tonnes per person was from the companies producing between 0-1,000 tonnes. In comparison with 2020, the average company productivity increased from 118 to 137 tonnes per person. Overall, production was dominated by three companies in 2021 which between them accounted for 73% of Scotland's farmed Atlantic salmon production.

Staff and Production by Production Area

Table 35: Staff and production (tonnes) by area 2012-2021 and projected production in 2022

| 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 | 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 | 546 | 19 | 48,762 | 86 | 539 | 4.2 | 24,065 | 4.7 | 13,852 | 5.2 | 10,306 | 5.7 |
| | 2021 | 442 | 18 | 70,062 | 156 | 21 | 2.2 | 42,463 | 5.0 | 17,151 | 4.3 | 10,427 | 5.3 |
| 2022 | | | 48,596* | | | | | | | | | | |
| Orkney | 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 | 138 | 13 | 21,612 | 143 | 0 | - | 4,383 | 5.8 | 8,875 | 6.0 | 8,354 | 6.0 |
| | 2021 | 136 | 3 | 24,407 | 176 | 0 | - | 3,565 | 5.4 | 8,066 | 5.4 | 12,776 | 6.5 |
| 2022 | | | 19,518* | | | | | | | | | | |
| Shetland | 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 | 280 | 12 | 40,749 | 140 | 356 | 4.2 | 13,970 | 5.7 | 11,167 | 6.3 | 15,256 | 6.0 |
| | 2021 | 276 | 10 | 43,770 | 148 | 0 | - | 15,644 | 5.7 | 14,074 | 5.6 | 14,052 | 6.4 |
| 2022 | | | 47,194* | | | | | | | | | | |
| South West | 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 | 331 | 17 | 36,367 | 105 | 313 | 2.8 | 16,394 | 4.9 | 13,519 | 4.8 | 6,141 | 5.3 |
| | 2021 | 340 | 7 | 36,085 | 104 | 0 | - | 18,830 | 5.3 | 5,965 | 3.5 | 11,290 | 5.1 |
| 2022 | | | 38,711* | | | | | | | | | | |
| Western Isles | 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 | 262 | 12 | 44,639 | 163 | 0 | - | 26,731 | 4.3 | 8,819 | 4.6 | 9,089 | 4.6 |
| | 2021 | 247 | 16 | 31,069 | 118 | 13 | 2.1 | 12,844 | 5.0 | 6,093 | 4.6 | 12,119 | 5.1 |
| 2022 | | | 35,674* | | | | | | | | | | |
| Scotland Total | 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 | 1,557 | 73 | 192,129 | 118 | 1,208 | 3.7 | 88,025 | 4.8 | 57,808 | 5.3 | 45,088 | 5.5 |
| | 2021 | 1,441 | 54 | 205,393 | 137 | 34 | 2.1 | 93,346 | 5.0 | 51,349 | 4.6 | 60,664 | 5.7 |
| 2022 | | | 189,693* | | | | | | | | | | |

*Estimated production for 2022.

Company and Site Data

Table 36: Number of companies and sites engaged in the production of Atlantic salmon during 2012-2021

| Year | Number of companies | | | Number of sites | | |
|------|---------------------|---------------|-------|-----------------|---------------|-------|
| | Producing | Non-producing | Total | Producing | Non-producing | Total |
| 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 |
| 2020 | 8 | 3 | 11 | 131 | 101 | 232 |
| 2021 | 10 | 2 | 12 | 140 | 73 | 213 |

The number of companies authorised and actively producing Atlantic salmon in 2021 was 10, two more than in 2020. Two companies remained active and authorised, although not producing salmon for harvest in 2021. These 12 companies had 213 registered active sites, although not all these sites produced fish for harvest in 2021.

Fallowing

Table 37: Number of seawater cage sites employing a fallow period during 2012-2021

| Year | Fallow Period (weeks) | | | | | | Total |
|------|-----------------------|----|-----|------|-------|----|-------|
| | 0 | <4 | 4-8 | 9-26 | 27-51 | 52 | |
| 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 |
| 2020 | 57 | 8 | 33 | 74 | 14 | 45 | 231 |
| 2021 | 29 | 11 | 32 | 85 | 29 | 26 | 212 |

Of the 212 seawater cage sites recorded as being active in 2021, 26 sites were fallow for the entire year whilst 157 sites were fallow for a variable period. There were 29 sites that did not fallow in 2021. 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 2012-2021

| Year | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|------------------|------|------|------|------|------|------|------|------|------|------|
| Broodstock sites | 7 | 8 | 8 | 4 | 3 | 4 | 4 | 3 | 4 | 4 |

In 2021, the number of freshwater and seawater sites holding broodstock remained at four 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 4,335 fish were stripped, yielding 46.3 million ova, giving an average yield of 10,670 ova per fish.

Organic Production

Table 39: Organic production of Atlantic salmon during 2012-2021

| Year | Number of active cage sites | Number of cage sites certified as organic | Production (tonnes) |
|------|-----------------------------|---|---------------------|
| 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 |
| 2020 | 231 | 9 | 12,528 |
| 2021 | 212 | 12 | 18,285 |

Of the 212 active Atlantic salmon seawater cage sites in 2021, 12 were certified as organic, producing 18,285 tonnes.

Escapes

There was one incident involving the loss of 19,686 fish from seawater Atlantic salmon sites in 2021. There were 14 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 2021. The production of brown/sea trout (*Salmo trutta*) showed a small decrease, with the majority of production being for the angling restocking market. In 2021 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 2021. The production of lumpsucker and wrasse are targeted at the marine Atlantic salmon industry where they are used as a biological control for parasites. Lumpsucker and wrasse figures were amalgamated into a single cleaner fish category as separate publication of lumpsucker data would reveal the production of an individual company.

Company, Site and Production Data

Table 40: Number of companies and sites producing other species in 2021, annual production of other species (tonnes) during 2018-2021 and projected production in 2022

| Species | No. of companies | No. of sites | 2018 Production tonnage | 2019 Production tonnage | 2020 Production tonnage | 2021 Production tonnage | 2022 Production tonnage* |
|-----------------|------------------|--------------|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------|
| Brown/sea trout | 8 | 9 | 20 | 25 | 24 | 23 | 20 |
| Halibut | 1 | 3 | † | † | † | † | ‡ |
| Cleaner fish▲ | 2 | 4 | 20 | 16 | 19 | 38 | 23 |

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

† Production occurred but this cannot be shown without revealing the figure for an individual company.

‡ Estimate provided but cannot be shown without revealing the figure for an individual company.

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

Staffing

Table 41: Number of staff employed in farming other species during 2012-2021

| Year | Full-time Male | Full-time Female | Total Full-time | Part-time Male | Part-time Female | Total Part-time | Total Staff |
|------|----------------|------------------|-----------------|----------------|------------------|-----------------|-------------|
| 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 |
| 2020 | 19 | 3 | 22 | 9 | 4 | 13 | 35 |
| 2021 | 22 | 6 | 28 | 11 | 2 | 13 | 41 |

In 2021, the overall number of staff employed in the production of other species increased by six, to 41.

Production of Cleaner fish

Table 42: Number (000's) of cleaner fish (lumpsucker and wrasse) produced during 2015-2021

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

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

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

Ova Laid Down to Hatch

Table 43: Source of ova from other species laid down to hatch during 2021

| Species | Source of ova laid down to hatch (000's) | | |
|-----------------|--|---------------------|-------------|
| | Own broodstock | Other GB broodstock | Foreign ova |
| Brown/sea trout | 10 | 88 | 0 |
| Halibut | 0 | 0 | 0 |
| Cleaner fish▲ | 59,204 | 0 | 700 |

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

Trade in Small Fish

Table 44: Trade in small fish of other species in 2021

| Species | Bought (000's) | Sold (000's) |
|-----------------|----------------|--------------|
| Brown/sea trout | 26 | 17 |
| Halibut | # | 0 |
| Cleaner fish▲ | 900 | 60,104 |

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

During 2021 there was trade of small halibut but figures cannot be shown without revealing the figure for an individual company.

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

Organic Production

Of the 16 sites recorded as producing other species in 2021, no organic production was reported.

Escapes

There were no reported escapes from sites rearing other species during 2021.

// 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.

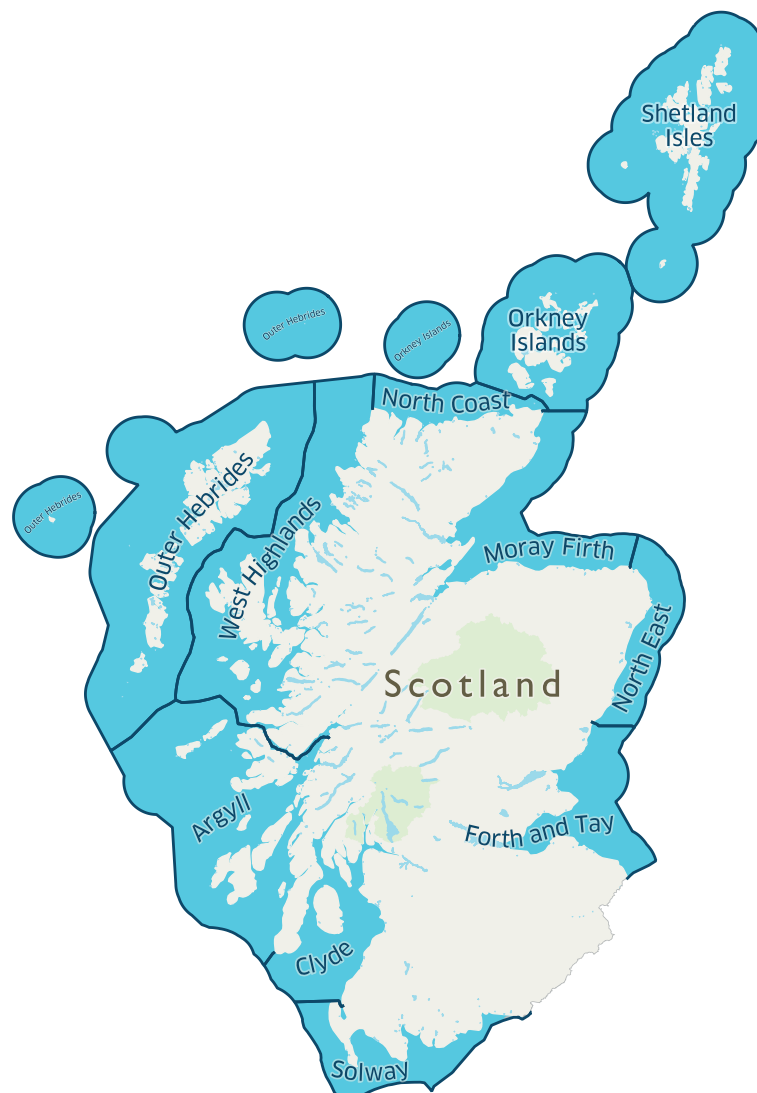


Figure 4: Scottish marine regions

// 6.Summary

Rainbow trout

The production of rainbow trout increased by 8% in 2021 to 8,156 tonnes and was directed at the table (94%) and restocking (6%) markets. The total numbers of staff employed by the sector increased by 12 to 146. There was an overall decrease in the productivity of the industry to 55.9 tonnes per person.

In 2021, the number of eyed ova laid down to hatch (4.9 million) decreased by 1.4 million and was mainly triploid stock (99.7%). The proportion of ova from GB broodstock increased to 26%. Denmark was the largest source of imported ova with 52% of the total, this was a decrease proportionally from 2020. 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 2021.

Atlantic salmon

In 2021, the total production of Atlantic salmon increased by 13,264 tonnes to 205,393 tonnes, a 7% increase on the 2020 production total and the highest level of production recorded in Scotland. The survey showed increases in the production of grilse and year 2 salmon but a decrease in the production of year 0 salmon and pre-salmon during 2021. The number of staff directly employed on the farms decreased by 135. Overall, there was an increase in the productivity of tonnes produced per person from 117.9 to 137.4. The estimated harvest forecast for 2022 is 189,693 tonnes. The trend towards concentrating production in larger sites was maintained with 87% of production being concentrated in the sites producing over 1,000 tonnes per annum.

During 2021, there was an increase in the number of ova produced to 46.3 million. The number of ova laid down to hatch decreased by 7% to 72.8 million. 2021 saw 60% of ova supplied from foreign sources with remaining 40% being derived from GB broodstock (an increase of 199% on the 2020 figure). Smolt production increased to 51.2 million, with 59% being produced as S½ smolts, 40% as S1 smolts and less than 1% as S1½ smolts. The number of staff directly employed on freshwater sites decreased by one in 2021 to 291 staff while productivity decreased to 175,900 smolts per person. Projections for 2022 suggest that more smolts will be produced than was seen in 2021, followed by a further increase in 2023.

Other Species

There was a decrease in the production of brown/sea trout from 24 tonnes in 2020 to 23 tonnes in 2021. Halibut production occurred in 2021 but the figure cannot be shown without revealing the production of individual companies. Lump sucker and wrasse continued to be produced for use as biological controls for parasites in the marine Atlantic salmon farming industry. In 2021, the total number of staff employed in the production of other species increased by six to 41.

// Appendix 1

Questionnaires sent to Fish Farmers

ANNUAL RETURN OF INFORMATION FROM SCOTTISH FISH FARMS FOR THE PERIOD 1 JANUARY TO 31 DECEMBER 2021 RAINBOW TROUT – DATA

Please complete and return by 31 January 2022 to L A Munro, Marine Scotland Science
375 Victoria Road, Aberdeen, AB11 9DB

Business No:

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 1 | How many staff were employed in rainbow trout production (company total) | Full time male Full time female | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | Part time male Part time female Other/Prefer not to say/Unknown | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 2 | Please detail any accreditation schemes this company is a member of; _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | How many eyed ova were laid down for hatching in 2021 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a | from own broodstock | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | |
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| b | from other GB broodstock | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | |
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| c | from abroad (Northern Hemisphere) | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | |
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| 4 | How many of the above ova were | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a | all female diploid | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | |
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| 6 | How many bought fry/fingerlings were | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 7 | How many of these fish were vaccinated against ERM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a | vaccinated on site | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | |
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| 8 | What was your total production in TONNES for the TABLE TRADE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a | <450 g (<1 lb) | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | |
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| b | 450-900 g (1-2 lb) | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | |
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| 9 | What was your total production in TONNES for the RESTOCKING TRADE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a | <450 g (<1 lb) | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | |
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| b | 450-900 g (1-2 lb) | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | |
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| 10 | From the total production what amount in TONNES was certified as organic | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 11 | What is your predicted production in 2022 in TONNES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 12 | What is the fish holding capacity of the holding units for each site in cubic metres | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a | Tanks | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | |
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| c | Raceways | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | | <table border="1" style="display: inline-table;"><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td><td> </td><td> </td><td> </td></tr></table> | | | | | | | | | | | | |
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ANNUAL PRODUCTION SURVEY 2021

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

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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 2022 to allow the Annual Survey Report for 2021 to be produced.

**ANNUAL RETURN OF INFORMATION FROM SCOTTISH FISH FARMS
FOR THE PERIOD 1 JANUARY TO 31 DECEMBER 2021
ATLANTIC SALMON - SMOLT DATA**

Please complete and return by 31 January 2022 to L A Munro, Marine Scotland Science
375 Victoria Road, Aberdeen, AB11 9DB

Business No:

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

Full time male
Full time female

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

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

3 How many ova were produced in the winter
of 2020-2021 (company total)

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4 How many eyed ova were laid down for
hatching in winter of 2020-2021

- a From own farmed broodstock
- b From other GB farmed broodstock
- c From GB wild broodstock
- d From foreign sources

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5 How many eyed ova do you expect to
hatch this winter (2021-2022)

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- 6 How many fry or parr were
- a Transferred into the site
- b Transferred out of the site

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- 7 How many smolts were produced as
- a S¹/₂s (ie from 2021 hatch)
- b S¹s (ie from 2020 hatch)
- c S¹/₂s or S²s (ie from 2020 or 2019 hatch)

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- 8 How many smolts were sold as
- a S¹s (incl S¹/₂s)
- b S²s (incl S¹/₂s)

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- 9 How many smolts do you expect to
produce for sea winter on-growing
in 2022 as
- a S¹s (incl S¹/₂s)
- b S²s (incl S¹/₂s)

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10 How many smolts do you plan to
produce in 2023

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

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12 Duration of FALLOW PERIOD in
WEEKS (cage sites; MAX = 52)

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- 13 How many fish did you vaccinate
- a against furunculosis
- b against ERM
- c against IPN
- d against *Vibrio* spp.
- e against SAV (PD)

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ANNUAL PRODUCTION SURVEY 2021

GUIDANCE NOTES FOR QUESTIONNAIRE ATLANTIC SALMON SMOLTS

GENERAL NOTES

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

| | | | | | |
|--|--|--|--|--|---|
| | | | | | 0 |
|--|--|--|--|--|---|
4. If the numbers for any box exceeds 6 figures please indicate the total number clearly in margin beside the appropriate box

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

Q1. How many staff

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

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

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

Q2. Accreditation Schemes

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

Q3. Number of ova produced

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

Q7. How many smolts produced as S^{1/2} or S1 etc

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 year post hatch
- S^{1 1/2} 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 S^{1/2}s with S1s and
- Q9. } For S2s - combine numbers of S^{1 1/2}s 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 2021 (maximum = 52)

It will be appreciated if the questionnaires are returned promptly and not later than 31 January 2022 to allow the Annual Survey Report for 2021 to be produced

**ANNUAL RETURN OF INFORMATION FROM SCOTTISH FISH FARMS
FOR THE PERIOD 1 JANUARY TO 31 DECEMBER 2021
ATLANTIC SALMON - PRODUCTION DATA**

Please complete and return by 31 January 2022 to L A Munro, Marine Scotland Science
375 Victoria Road, Aberdeen, AB11 9DB

Business No:

| | | | | | | | | | | | | | | | | | | | | |
|----|--|------------------------------------|---|--------|--|--|--|--|--|---|---|--|--|--|--|--|--|--|--|--|
| 1 | How many staff were employed in salmon production (company total), excluding post-harvest processing staff | Full time male Full time female | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table> | | | | | | | Part time male Part time female Other/Prefer not to say/Unknown | <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </table> | | | | | | | | | |
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| 2 | Please detail any accreditation schemes this company is a member of; _____ | | | | | | | | | | | | | | | | | | | |
| 3 | How many smolts were put into the site in 2021 as: | | | | | | | | | | | | | | | | | | | |
| a | S ¹ / ₂ s (ie from 2021 hatch) | | | | | | | | | | | | | | | | | | | |
| b | S1s (ie from 2020 hatch) | | | | | | | | | | | | | | | | | | | |
| c | S ¹ / ₂ s or S2s (ie from 2020 or 2019 hatch) | | | | | | | | | | | | | | | | | | | |
| 4 | How many of above came from England | | | | | | | | | | | | | | | | | | | |
| 5 | Total smolt input proposed in 2022 | | | | | | | | | | | | | | | | | | | |
| 6 | HARVEST of 2021 SMOLT INPUT in 2021 | | | | | | | | | | | | | | | | | | | |
| a | Number of tonnes (wet weight at harvest) | | | | | | | | | | | | | | | | | | | |
| b | Number of fish | | | | | | | | | | | | | | | | | | | |
| 7 | HARVEST of 2020 SMOLT INPUT from 1 JANUARY to 31 AUGUST | | | | | | | | | | | | | | | | | | | |
| a | Number of tonnes (wet weight at harvest) | | | | | | | | | | | | | | | | | | | |
| b | Number of fish | | | | | | | | | | | | | | | | | | | |
| 8 | HARVEST of 2020 SMOLT INPUT from 1 SEPTEMBER to 31 DECEMBER | | | | | | | | | | | | | | | | | | | |
| a | Number of tonnes (wet weight at harvest) | | | | | | | | | | | | | | | | | | | |
| b | Number of fish | | | | | | | | | | | | | | | | | | | |
| 9 | HARVEST of 2019 SMOLT INPUT | | | | | | | | | | | | | | | | | | | |
| a | Number of tonnes (wet weight at harvest) | | | | | | | | | | | | | | | | | | | |
| b | Number of fish | | | | | | | | | | | | | | | | | | | |
| 10 | From the total production what amount in TONNES was certified as organic | | | | | | | | | | | | | | | | | | | |
| 11 | How many tonnes of fish do you expect to harvest in 2022 | | | | | | | | | | | | | | | | | | | |
| 12 | BROODSTOCK PRODUCTION | | | | | | | | | | | | | | | | | | | |
| a | Were brood fish produced in 2021 | YES/NO | YES/NO | YES/NO | | | | | | | | | | | | | | | | |
| b | How many fish were stripped | | | | | | | | | | | | | | | | | | | |
| 13 | What is the current fish holding capacity of each site in cubic metres | | | | | | | | | | | | | | | | | | | |
| 14 | Duration of FALLOW PERIOD in WEEKS (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:

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 the year post hatch

S¹/₂ 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 2021 (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 2022 to allow the Annual Survey Report for 2021 to be produced.

**ANNUAL RETURN OF INFORMATION FROM SCOTTISH FISH FARMS
FOR THE PERIOD 1 JANUARY TO 31 DECEMBER 2021
OTHER SPECIES – DATA**

Please complete and return by 31 January 2022 to L A Munro, Marine Scotland Science
375 Victoria Road, Aberdeen, AB11 9DB

Business No:

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

Full time male
Full time female

| | | |
|--|--|--|
| | | |
| | | |
| | | |

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

| | | |
|--|--|--|
| | | |
| | | |
| | | |

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

3 How many eyed ova were laid down for hatching in 2021

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

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

4 How many fry/small fish were

- a bought
- b sold

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
| | | | | | | | | | |

5 What was your total production for the market in 2021

- a Number of tonnes
- b Number of fish

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
| | | | | | | | | | |

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

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|

7 What is your predicted production for the market in 2022

- a Number of tonnes
- b Number of fish

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
| | | | | | | | | | |

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

- a Tanks
- b Ponds
- c Raceways
- d Cages

| | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

ANNUAL PRODUCTION SURVEY 2021

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 2022 to allow the Annual Survey Report for 2021 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. |
| S2 | Salmon or sea trout smolting at approximately two years 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 | 2012 | | 2013 | |
|------------------------------|----------------|--------------------|----------------|--------------------|
| | Tonnage | Value (£) | Tonnage | Value (£) |
| Argyll & Clyde | 26,850 | 108,124,950 | 34,924 | 172,873,800 |
| Orkney Islands | 11,694 | 47,091,738 | 11,479 | 56,821,050 |
| Outer Hebrides | 29,682 | 119,531,025 | 36,817 | 182,244,150 |
| Shetland Isles | 43,010 | 173,201,270 | 36,694 | 181,635,300 |
| North Coast & West Highlands | 50,987 | 205,324,649 | 43,320 | 214,434,000 |
| All Scotland | 162,223 | 653,273,632 | 163,234 | 808,008,300 |

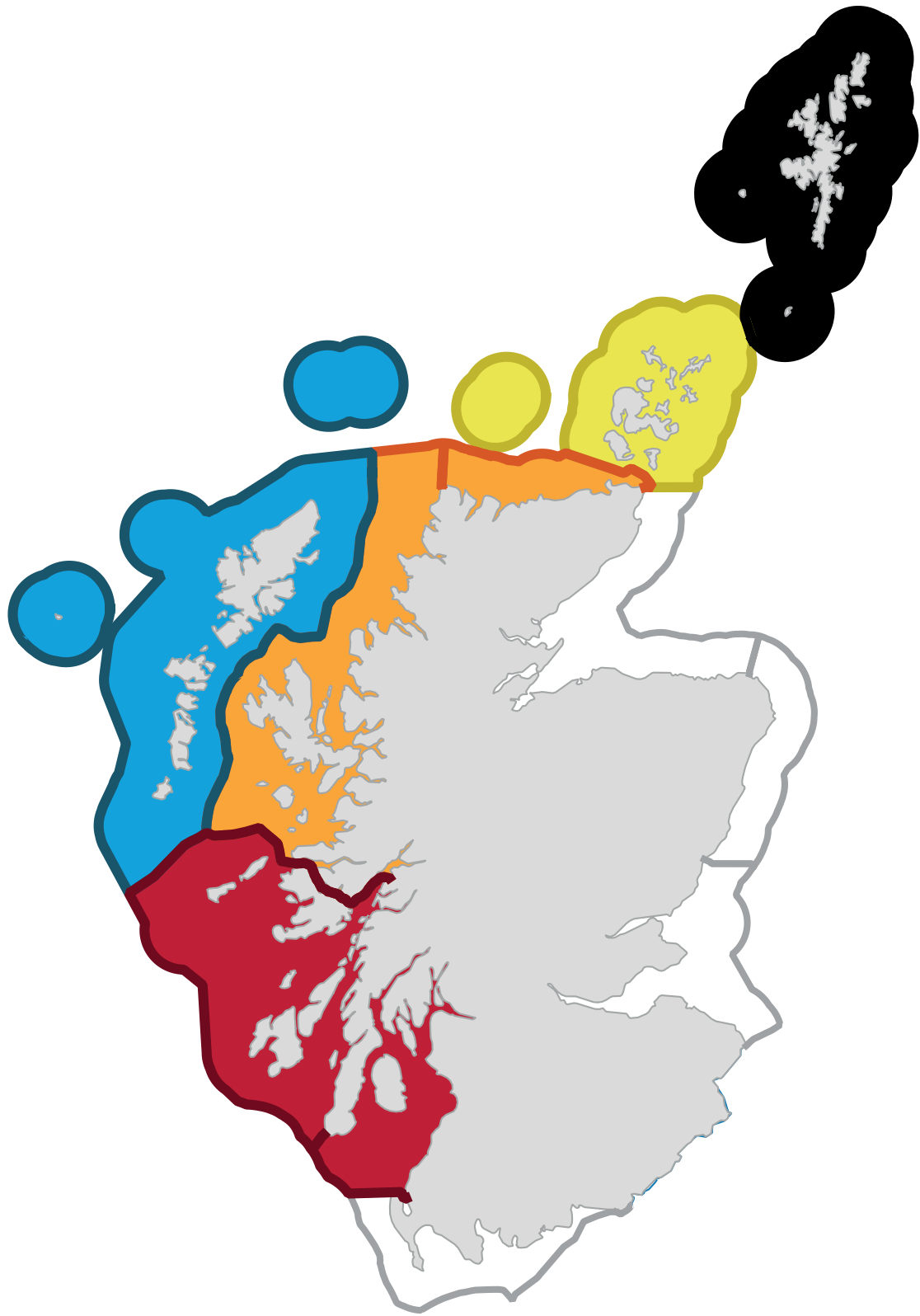
| Region | 2014 | | 2015 | |
|------------------------------|----------------|--------------------|----------------|--------------------|
| | Tonnage | Value (£) | Tonnage | Value (£) |
| Argyll & Clyde | 34,976 | 163,547,776 | 35,911 | 153,555,436 |
| Orkney Islands | 13,029 | 60,923,604 | 11,074 | 47,352,424 |
| Outer Hebrides | 33,775 | 157,931,900 | 27,210 | 116,349,960 |
| Shetland Isles | 46,369 | 216,821,444 | 42,786 | 182,952,936 |
| North Coast & West Highlands | 50,873 | 237,882,148 | 54,741 | 234,072,516 |
| All Scotland | 179,022 | 837,106,872 | 171,722 | 734,283,272 |

| Region | 2016 | | 2017 | |
|------------------------------|----------------|--------------------|----------------|----------------------|
| | Tonnage | Value (£) | Tonnage | Value (£) |
| Argyll & Clyde | 31,022 | 167,022,448 | 44,575 | 276,721,600 |
| Orkney Islands | 14,752 | 79,424,768 | 16,756 | 104,021,248 |
| Outer Hebrides | 32,662 | 175,852,208 | 33,778 | 209,693,824 |
| Shetland Isles | 37,464 | 201,706,176 | 38,908 | 241,540,864 |
| North Coast & West Highlands | 46,917 | 252,601,128 | 55,690 | 345,723,520 |
| All Scotland | 162,817 | 876,606,728 | 189,707 | 1,177,701,056 |

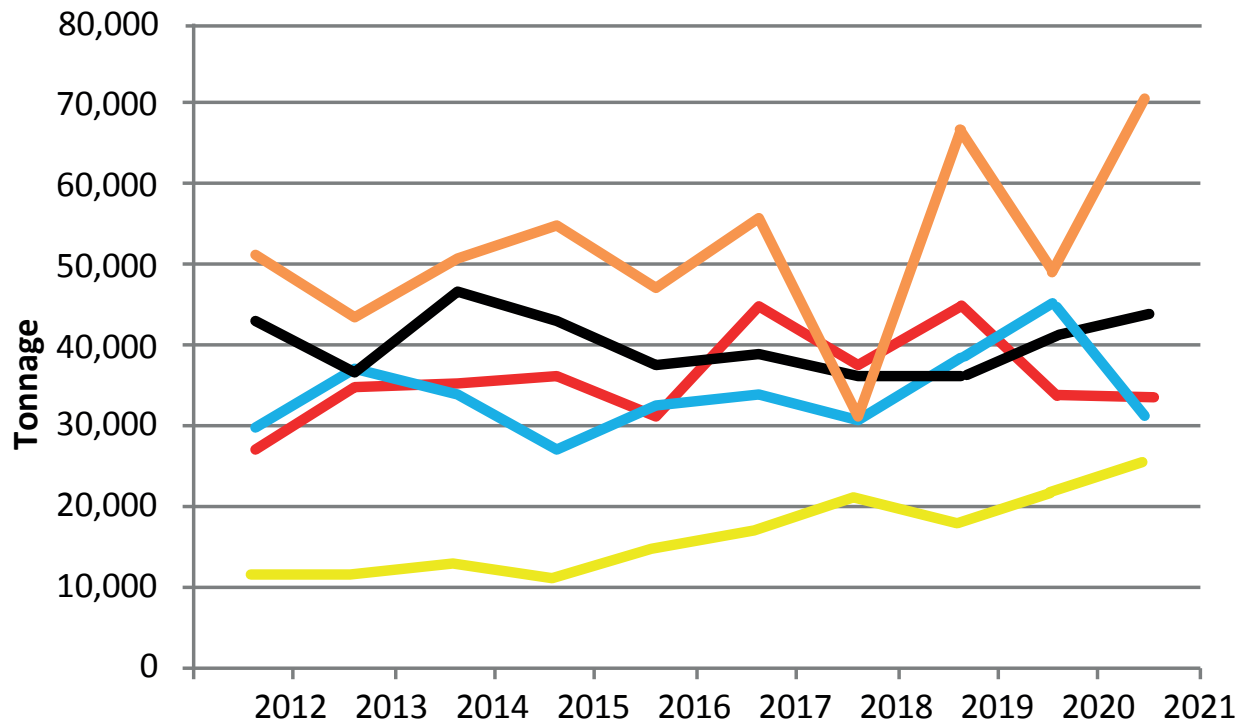
| Region | 2018 | | 2019 | |
|------------------------------|----------------|--------------------|----------------|----------------------|
| | Tonnage | Value (£) | Tonnage | Value (£) |
| Argyll & Clyde | 37,506 | 232,612,212 | 44,881 | 255,552,414 |
| Orkney Islands | 20,956 | 129,969,112 | 17,758 | 101,114,052 |
| Outer Hebrides | 30,668 | 190,202,936 | 38,468 | 219,036,792 |
| Shetland Isles | 35,947 | 222,943,294 | 36,141 | 205,786,854 |
| North Coast & West Highlands | 30,948 | 191,939,496 | 66,633 | 379,408,302 |
| All Scotland | 156,025 | 967,667,050 | 203,881 | 1,160,898,414 |

| Region | 2020 | | 2021 | |
|------------------------------|----------------|--------------------|----------------|----------------------|
| | Tonnage | Value (£) | Tonnage | Value (£) |
| Argyll & Clyde | 36,367 | 186,344,508 | 36,085 | 187,281,150 |
| Orkney Islands | 21,612 | 110,739,888 | 24,407 | 126,672,330 |
| Outer Hebrides | 44,639 | 228,730,236 | 31,069 | 161,248,110 |
| Shetland Isles | 40,749 | 208,797,876 | 43,770 | 227,166,300 |
| North Coast & West Highlands | 48,862 | 250,368,888 | 70,062 | 363,621,780 |
| All Scotland | 192,129 | 984,468,996 | 205,393 | 1,065,989,670 |

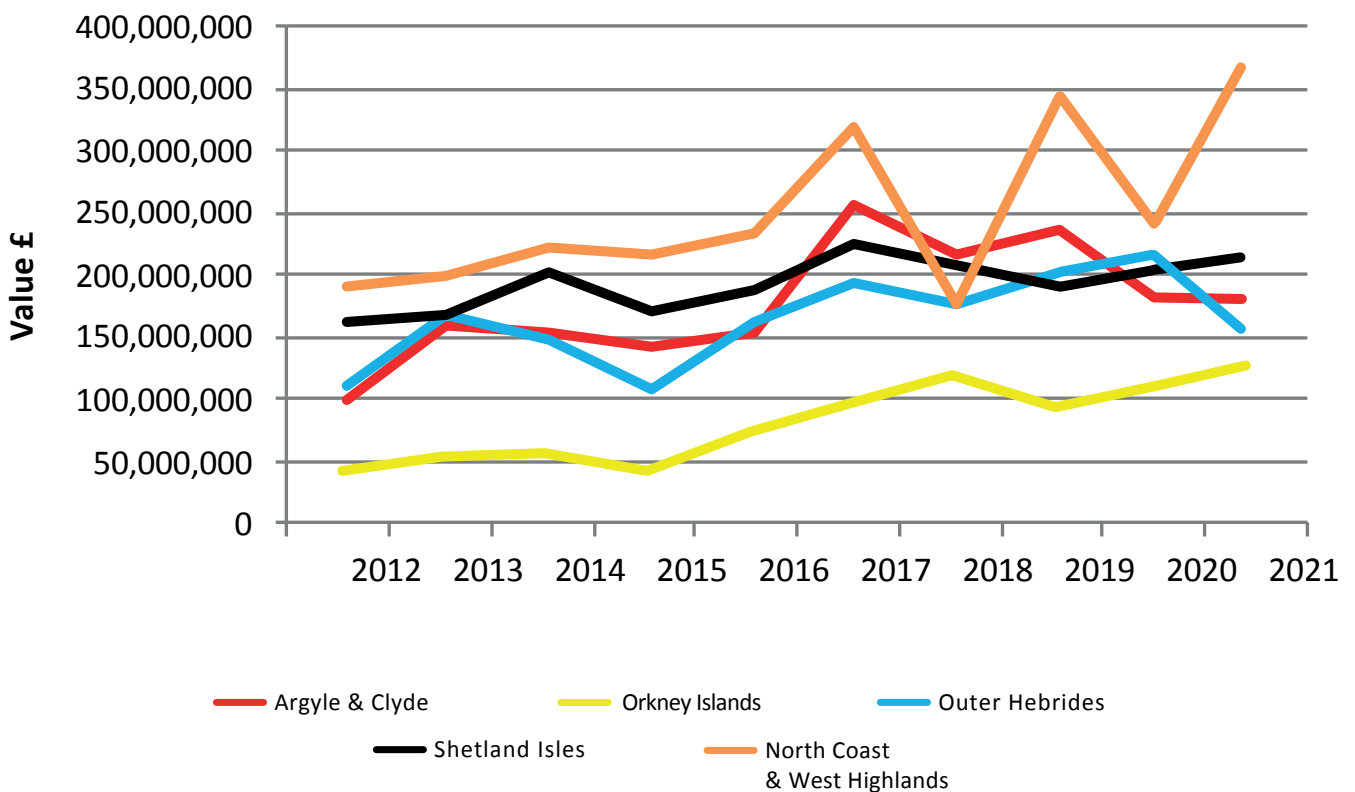
Footnote: Figures for Argyll & Clyde and the North Coast & West Highlands have been merged due to commercial confidentiality. Other finfish species including brown/sea trout, rainbow trout, halibut and cleaner fish were produced but cannot be attributed to Scottish Marine Regions due to commercial confidentiality. Average price (real) have been adjusted for inflation based on 2021 price estimates.



Salmon Tonnes



Value £ real price (inflation adjusted on 2021 Price estimates)





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