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SALMON AND TROUT FARMING IN SCOTLAND
REPORT OF DAFS ANNUAL SURVEY FOR 1987

Responses to a Departmental questionnaire from Scottish rainbow trout and salmon farming companies are summarised in the following paragraphs and attached Tables 1-8. The cooperation of the fish farming industry in completing these questionnaires is gratefully acknowledged.

RAINBOW TROUT

Returns received from 61 companies (59 in 1986) operating 83 farm sites (77 sites in 1986) show that trout production was 3,207 tonnes (2,317 tonnes in 1986) an increase on the previous year of 890 tonnes (38%). Some 1,088 tonnes (593 tonnes in 1986) of production were fish greater in weight than 1lb and 260 tonnes (207 tonnes in 1986) were used for restocking angling waters.

Comparison by system of production showed that ponds and raceways produced 1,169 tonnes (731 tonnes in 1986) of which 110 tonnes were fish greater than 1lb; fresh water tanks produced 117 tonnes (307 tonnes in 1986) of which 36 tonnes were fish greater than 1lb; freshwater cages produced 1,280 tonnes (1,022 tonnes in 1986) of which 363 tonnes were fish greater than 1lb; sea water cages and pump ashore units produced 641 tonnes (245 tonnes in 1986) of which 578 tonnes were fish greater than 1lb.

Purchase of fry and fingerlings were respectively 9.23 and 7.94 millions compared to 7.13 and 7.01 millions in 1986. Of the purchased fry and fingerlings 7.32 million were all female and 0.32 million were triploid females, ie sterile.

A total of 28.4 million ova were laid down for hatching in 1987 (23.0 million in 1986) comprising 1.7 million from own broodstock, 6.9 million from other UK sources and the rest imported under licence from foreign sources. Of these ova some 9.9 million (5.0 million in 1986) were "all female" and 0.39 million (1.06 million in 1986) were triploid females. The manpower employed was 145 full time and 71 part time.

ATLANTIC SALMON - SMOLTS AND OVA

Returns were received from 72 companies (57 in 1986) operating 131 sites (111 in 1986) of which 51 were cage sites and 80 were tank sites (45 and 66 respectively in 1986). Production of smolts was 13.294 million (7.03 million in 1986) of which 11.535 million were S1s and 1.759 million were S2s. Some 5,520 million (41.5% compared to 36% in 1986) were sold. Anticipated production in 1988 is 23,093 million and from these existing farms 28.213 million in 1989. Last year's estimates were 15.12 million for 1987 and 21.7 million for 1988. English production of smolts was estimated last year at 0.41 and 0.66 million respectively for 1987 and 1988 and the actual recorded figure from Scottish farms for 1987 was 0.248 million. Movements of fry and parr into and out of sites were 24,660 and 23.187 millions respectively.

Numbers of ova laid down in 1986-87 were 60.107 million (38.65 million in 1986) of which 50.302 million were from Scottish farmed broodstock, 7.240 million were from Scottish wild fish (4.926 million in 1986) and 2.565 million were from foreign sources (1.75 million in 1986). It was estimated that 67.475 million ova will be produced for hatching in 1988.

Total manpower employed was 338 (228 in 1986) of whom 248 were full time and 90 part time.

ATLANTIC SALMON PRODUCTION

Returns received from 126 companies operating 196 sites (113 and 168 respectively in 1986) showed that production was 12,721 tonnes (10,337 in 1986). The return showed that 7,200 tonnes comprising 3.285 million fish (av wt 2.193 kg) were from the 1986 smolt intake and 5,521 tonnes comprising 1.522 million fish (av wt 3.627 kg) were from the 1985 smolt intake.

Table 8 illustrates the performance data of the 1984, 85 and 86 smolt intakes. The 1984 and 85 intakes give good agreement (364 and 342 respectively) on the numbers of surviving smolts necessary to produce one tonne of marketable fish but survivals at 86.5 and 70.4% respectively are grossly different leading to difficulty in accurately forecasting future

trends in production. The estimates recorded in Table 8 were based on an intermediate figure of 78.5% survival and the averages of the mean individual fish weights in the years where data exist.

Some 11 sites reared fish in shore based tanks or raceways using pumped seawater the remaining 185 sites used cages. Brood fish were produced at 35 sites. Salmon production in the western and northern Isles was 14% and 17% respectively of the Scottish total.

The returns showed 13.106 million smolts (11.269 S1s and 1.649 S2s plus 0.248 smolts from England) were placed in sea water compared to 13.294 million recorded from the smolt production units in Scotland.

Total manpower employed was 806 (733 in 1986) of whom 608 were full time and 198 were part time.

Department of Agriculture and
Fisheries for Scotland

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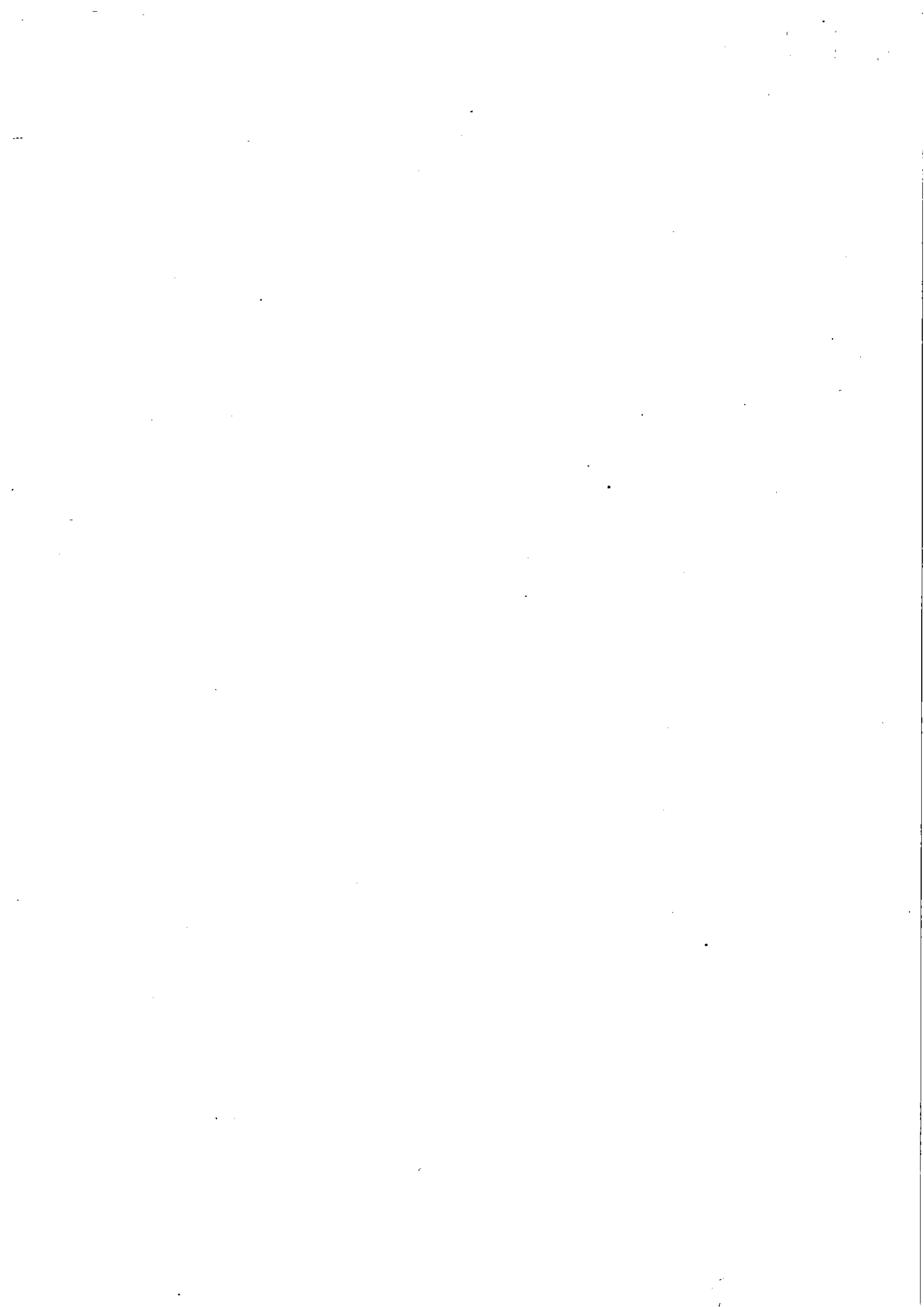


TABLE 1

RAINBOW TROUT - 1987 DATA

No of Companies	No of sites	Full time	Staff Part time	Total
61	74 freshwater; 9 seawater	145	71	216

Egg Sources and Numbers ('000)

Own broodstock	Other UK farms	Foreign	Total	Monosex	Triploid
1,720	6,889	19,806	28,421	9,907	385

Fry and Finglings ('000)

Bought	Sold	Monosex	Triploid
9,229	7,935	7,319	319

Production (tonnes)

Table	Restocking	Total	Fish >1 lb
2,947	260	3,207	1,088

Use of Vaccines

20 sites

TABLE 2

ANALYSIS OF RAINBOW TROUT FARM SITES BY SYSTEM AND SCALE OF PRODUCTION - 1987

System	PRODUCTION (TONNES)						TOTALS		% contribution	
	0	<10	10-25	26-50	51-100	100-200	>200	Number of sites		Tonnes
Ponds and Raceways	3	9	5	5	3	5	1	31	1,169	36
Tanks	13	7	5	1	0	0	0	26	117	4
FW cages	2	4	3	3	0	3	2	17	1,280	40
SW cages and pump ashore	0	4	2	1	0	1	1	9	641	20
	19	23	13	10	5	7	4	83	3,207	

TABLE 3

ATLANTIC SALMON SMOLTS - 1987 DATA

No of Companies	No of sites	Full time	Staff Part time	Total
72	80 tank, 51 cage	248	90	338

Egg Sources and Numbers ('000)

Own broodstock	Other UK farms	UK wild	Foreign	Total 86-87	Estimate 87-88
37,218	13,083	7,240	2,565	60,107	67,475

Movements of Fry and Parr ('000)

In	Out
24,660	23,187

Use of vaccines

8 sites

Smolt Production ('000)1987

S1	Produced as S2	Total	S1	Sold as S2	Total
11,535	1,760	13,294	4,822	698	5,520

Estimate 1988

S1	S2	Total
20,514	2,580	23,094

Estimate 1989

28,213

TABLE 4

ATLANTIC SALMON PRODUCTION - 1987 DATA

No of Companies	No of sites	Full time	Staff Part time	Total
126	196 cage, 11 tanks	608	198	806

Smolts and Broodfish

S1	Smolts to sea ('000)			Nos broodstock sites
	S2	Total	From England	
11,209	1,649	12,858	248	35

Production - from the 1986 smolt intake harvested in 1987

Nos ('000)	Jan-Aug		Nos ('000)	Sep-Dec	
	Tonnes	Av weight		Tonnes	Av weight
1,526.4	2,924.7	1.916	1,758.1	4,275.5	2.432 kg

Jan-Dec (totals)

Nos ('000)	Tonnes	Av weight
3,284.5	7,200.2	2.193

Production - from the 1985 smolt intake harvested in 1987

Nos ('000)	Tonnes	Av weight
1,522.3	5,520.8	3.627 kg

Total Production in 1987

Tonnes

12,721

TABLE 5

GROUPING OF SMOLT SITES BY THE SCALE OF THEIR PRODUCTION

Production (numbers '000)	<10	10-25	26-50	51-100	101-250	251-500	501-1000	>1000	No of sites	Annual No of smolts
No of sites in 1987	45	18	16	20	16	10	5	1	131	13,294
Same sites estimates for 1989	23	8	22	22	26	18	7	5	131	28,213

TABLE 6

GROUPING OF SEA FARM SITES BY THE SCALE OF THEIR PRODUCTION IN 1987

Production (tonnes)											Totals	
	0	<10	10-25	26-50	51-100	101-200	201-300	300-400	400-500	>500	Sites	Tonnes
Number of sites	49	21	41	15	24	26	13	5	1	1	196	12,721.4
% share of Production	0	0.9	5.5	4.4	13.9	30.5	24.2	12.9	3.4	4.3		

TABLE 7

SALMON AND SMOLT PRODUCTION IN VARIOUS REGIONS OF SCOTLAND

	Western Isles	Northern Isles	Rest of Scotland	Totals
1987 salmon (tonnes)	1,830	2,211	8,680	12,721
1987 smolts (numbers '000)	2,059	112.8	11,122.6	13,294.4

TABLE 8

ATLANTIC SALMON - PRODUCTION RECORD AND ESTIMATES OF FUTURE PRODUCTION

Year	Nos of smolts to sea ('000)	Year harvested	Nos of grilse and pre salmon ('000)	Wt (tonnes)	Mean fish wt (kg)	% of fish recovered	Year harvested	Nos of salmon ('000)	Wt (tonnes)	Mean fish wt (kg)	% of fish recovered	% total recovery	Total harvest (tonnes)	Nos of survivors to produce 1 tonne	Total Nos to produce 1 tonne	Grilse Nos ('000)	% grilse	Annual production (tonnes)	
1984	3,628	1985	1,970	4,262	2,163	54.3	1986	1,168	4,350	3,723	32.2	86.5	8,612	364	421	1,084	34.5	1985	6,921
1985	5,586	1986	2,409	5,988	2,486	43.1	1987	1,522	5,521	3,627	27.3	70.4	11,508	342	485	1,090	27.7	1986	10,333
1986	6,774	1987	3,285	7,200	2,193	48.5	1988	2,032	7,458	3,67	30	78.5	14,658					1987	12,721
1987	13,106	1988	6,370	14,526	2,281	48.6	1989	3,932	14,430	3,67	30	78.5	28,956					1988	21,984
1988	23,093	1989	11,223	25,600	2,281	48.6	1990	6,928	25,425	3,67	30	78.5	51,025					1989	40,030
1989	28,213	1990	13,711	31,275	2,281	48.6	1991	8,464	31,062	3,67	30	78.5	66,337					1990	56,700

Figures in this box are based on estimates of % fish recovered and mean fish weight