

REPORT OF THE DAFS ANNUAL SURVEY OF FISH FARMS FOR 1988

Responses to a Departmental questionnaire from Scottish rainbow trout and salmon farming companies are summarised in the following paragraphs and attached Tables 1-11. The cooperation of the fish farming industry in completing these questionnaires is gratefully acknowledged.

RAINBOW TROUT

A total of 68 returns (100%) were received including 11 from companies which had no trout production in 1988. Returns received from the remaining 57 companies (61 in 1987) operating 83 farm sites (83 sites in 1987) show that trout production was 3,556 tonnes (3,207 tonnes in 1987) an increase on the previous year of 349 tonnes (11%). Some 1,231 tonnes (1,088 tonnes in 1987) of production were fish greater in weight than 1 lb and 298 tonnes (260 tonnes in 1987) were used for restocking angling waters.

Comparison by system of production showed that ponds and raceways produced 1,062 tonnes (1,169 tonnes in 1987) of which 131 tonnes were fish greater than 1 lb; fresh water tanks produced 335 tonnes (117 tonnes in 1987) of which 72 tonnes were fish greater than 1 lb; fresh water cages produced 1,450 tonnes (1,280 tonnes in 1987) of which 331 tonnes were fish greater than 1 lb; sea water cages and pump ashore units produced 709 tonnes (641 tonnes in 1987) of which 697 tonnes were fish greater than 1 lb.

Purchase and sale of fry and fingerlings were 8.54 and 8.19 millions respectively compared to 9.23 and 7.94 millions in 1987. Of the purchased fry and fingerlings 5.80 million were all female, 0.20 million were mixed sex triploids, ie sterile and 0.30 million were all female triploids.

A total of 26.9 million ova were laid down for hatching in 1988 (28.4 million in 1987) comprising 5.5 million from own broodstock, 8.5 million from other UK sources and the rest imported under licence from foreign sources. Of these ova some 12.8 million (9.9 million in 1987) were "all female" and 1 million (0.39 million in 1987) were triploid females. The manpower employed was 146 full time and 83 part time.

ATLANTIC SALMON - SMOLTS AND OVA

A total of 91 returns (98%) were received including one from a company which had no production in 1988. Returns received from the remaining 90 companies (72 in 1987) showed that of 176 sites (131 in 1987) in operation 72 were cage sites and 104 were tank sites (51 and 80 respectively in 1987). Production of smolts was 22.499 million (13.294 million in 1987) of which 19.76 million were S1s and 2.739 million were S2s. Some 8.173 million (36.3% compared to 41.5% in 1987) were sold. Anticipated production in 1989 is 28.740 million and from these existing farms 33.621 million in 1990. Last year's estimates were 23.094 million for 1988 and 28.213 million for 1989. Movements of fry and parr into and out of sites were 44.202 and 49.993 millions respectively.

Numbers of ova laid down in 1987-88 were 80.386 million (60.107 million in 1987) of which 77.158 million were from Scottish farmed broodstock (50.302 million in 1987), 3.228 million were from Scottish wild fish (7.24 million in 1987) and none from foreign sources (2.565 million in 1987). It was estimated that 85.077 million ova will be produced for hatching in 1989.

The number of sites using a vaccine or vaccinated fish increased to 29 in 1988 (8 in 1987).

ATLANTIC SALMON PRODUCTION

A total of 159 returns (99.4%) were received including six from companies which had no production in 1988. Returns received from the remaining 153 companies operating 258 sites (126 and 196 respectively in 1987) showed that production was 17,951 tonnes (12,721 in 1987). The return showed that 11,866 tonnes comprising 5.167 million fish (av wt 2.30 kg) were from the 1987 smolt intake and 6,086 tonnes comprising 1.750 million fish (av wt 3.48 kg) were from the 1986 smolt intake.

Table 11 illustrates the performance data of the 1985, 1986 and 1987 smolt intakes. The 1985 and 1986 intakes give reasonable agreement (342 and 379 respectively) on the numbers of surviving smolts necessary to produce one tonne of marketable fish as do survivals at 70.4 and 74.3% respectively. The estimates of mean weight and recovery recorded in Table 11 are based on recent trends on these figures. The 1989 and 1990 smolt figures are adjusted by adding one million, as an estimate for smolts introduced from England, less 10% to account for differences between smolt producers estimates and the number placed in sea water by the salmon growers.

The returns showed 20.921 million smolts (18.378 S1s and 2.543 S2s including 0.649 smolts from England) were placed in sea water compared to 22.499 million recorded from the smolt production units in Scotland.

Some 14 sites reared fish in shore based tanks or raceways using pumped sea water while the remaining 244 sites used cages. Brood fish were produced at 31 sites. Salmon production in the western and northern Isles was 13 and 26% respectively of the Scottish total.

TABLE 1

Rainbow trout - 1988 data

No of Companies	No of sites	Staff		
		Full time	Part time	Total
57	72 fresh water 11 sea water	146	83	229

Egg Sources and Numbers ('000)

Own broodstock	Other UK farms	Foreign	Total	Monosex	Triploid
5,547	8,523	12,788	26,858	12,808	1,005

Fry and Fingerlings ('000)

Bought	Monosex	Triploid	Sold
8,545	5,796	501	8,186

Production (tonnes)

Table	Restocking	Total	Fish >1 lb
3,258	298	3,556	1,231

Use of Vaccines

21 sites

TABLE 2

Analysis of rainbow trout farm sites by system and scale of production - 1988

System	Production (tonnes)							Totals		
	0*	<10	10-25	26-50	51-100	101-200	>200	Number of sites	Tonnes	% contribution
Ponds and raceways	3	6	7	4	4	4	0	28	1,062	30
Tanks	13	5	7	1	1	1	0	28	335	9
FW cages	2	4	3	1	0	2	4	16	1,450	41
SW cages and pump ashore	1	4	2	1	2	0	1	11	709	20
	19	19	19	7	7	7	5	83	3,556	

* Includes sites with no recorded tonnage, eg egg, fry or fingerling producing sites but not companies/sites out of production, fallow sites and sites undergoing rebuilding programmes of which there were a total of 17 sites

TABLE 3

Atlantic salmon smolts - 1988 data

No of Companies	No of sites	Staff		
		Full time	Part time	Total
90	104 tank 72 cage	344	119	463

Egg Sources and Numbers ('000)

Own broodstock	Other UK farms	UK wild	Foreign	Total 1987-88	Estimate 1988-89
51,930	25,228	3,228	-	80,386	85,077

Movements of Fry and Parr ('000)

In	Out
44,202	49,993

Use of Vaccines

29 Sites

Smolt Production ('000)

Produced as			Sold as		
S1	S2	Total	S1	S2	Total
19,760	2,739	22,499	8,173	1,232	9,405

Estimate 1989

S1	S2	Total
26,414	2,326	28,740

Estimate 1990

33,621

TABLE 4

Atlantic salmon production - 1988 data

No of Companies	No of sites	Staff		
		Full time	Part time	Total
153	244 cage 14 tank	991	329	1,320

Smolts and Broodfish

Smolts to sea ('000)				Nos broodstock sites
S1	S2	Total	From England	
18,378	2,543	20,921	649	31

Production - from the 1987 smolt intake harvested in 1988

Jan-Aug			Sept-Dec		
Nos ('000)	Tonnes	Av weight	Nos ('000)	Tonnes	Av weight
2,247	4,296	1.91 kg	2,920	7,570	2.59 kg

Jan-Dec (totals)		
Nos ('000)	Tonnes	Av weight
5,167	11,866	2.30 kg

Production - from the 1986 smolt intake harvested in 1988

Nos ('000)	Tonnes	Av weight
1,750	6,086	3.48 kg

Total Production in 1988

17,951 tonnes

TABLE 5

Grouping of smolt sites by the scale of their production

Production (Nos '000)	0*	<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 1988	66	6	18	23	28	30	13	12	1	197	22,499
Same sites estimates for 1989	61	5	12	27	20	35	21	13	3	197	28,740
Some sites estimates for 1990	55	1	12	26	30	30	24	15	4	197	33,621

*Includes 21 sites not in production during 1988

TABLE 6

Fish holding capacity and production of smolts in 1988

	No of sites	Total capacity (m ³)	Production (nos '000)
Tanks	104	39,487	10,370
Cages	72	236,976	12,129

TABLE 7

Fallow periods recorded for smolt and salmon cage sites

Period (weeks)	0	<4	4-8	9-26	27-51	≥52*
No of smolt sites	36	7	7	13	8	13
No of salmon sites	200	4	13	24	3	10

*Includes sites with no production in 1988

TABLE 8

Grouping of sea farm sites by the scale of their production in 1988

Production (tonnes)	0	<10	10-25	25-50	51-100	101-200	201-300	301-400	401-500	>500	Totals	
											Sites	Tonnes
No of sites	97	14	46	37	29	37	13	6	3	2	284	17,951
% share of production	-	0.32	4.39	7.47	12.96	29.26	17.72	12.28	7.45	8.14		

TABLE 9

Salmon and smolt production in various regions of Scotland

	Western Isles	Northern Isles	Rest of Scotland	Total
1988 salmon (tonnes)	2,336	4,718	10,897	17,951
1988 smolts (nos '000)	3,396	328	18,775	22,499

TABLE 10

Fish holding capacity and production of salmon in 1988

	No of sites	Total capacity (m ³)	Production (tonnes)
Tanks	14	68,575	434
Cages	244	4,215,378	17,517