SALMON STOCKS AND FISHERIES IN ENGLAND AND WALES, 1997

Preliminary assessment for ICES, April 1998

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FOREWORD

In order to fulfil its objectives of contributing to '*the conservation, restoration, enhancement and rational management of salmon stocks'*, the North Atlantic Salmon Conservation Organisation (NASCO) seeks scientific advice on the state of salmon stocks and fisheries from the International Council for the Exploration of the Seas (ICES). Each spring, information is compiled by the ICES Working Group on North Atlantic Salmon and then reviewed by the ICES Advisory Committee on Fisheries Management before being presented to NASCO at its annual meeting in June.

The Centre for Environment, Fisheries and Aquaculture Science (CEFAS) and the new National Salmon and Trout Fisheries Centre of the Environment Agency compile the data on salmon stocks and fisheries in England and Wales. In previous years, these data have been presented to the ICES Working Group as an informal Working Document. However, the information provides our earliest annual assessment of stocks and fisheries in England and Wales and may thus have a wider relevance to those with interests in salmon fisheries. It has therefore been decided that this year, for the first time, the report will be published and made more widely available to those involved in salmon management in England and Wales.

The full list of information requested by NASCO from ICES for its annual meeting in 1998 is given at Annex 1. However, for this report, the pertinent requests are to:

> '*provide an overview of salmon catches, including unreported catches, and catch and release, and world-wide production of farmed and ranched salmon in 1997'*;
>
> '*describe the events of the 1997 fisheries and the status of the stocks'*;
>
> *'provide age specific stock conservation limits for all stocks'*; and
>
> *'provide a compilation of microtag, finclip and external tag releases by ICES members countries'*

NASCO has previously indicated that they would like the information on the fisheries to relate to '*catches, gear, effort, composition and origin of the catch (including escapees and sea ranched fish), and rates of exploitation'*.

The format of the report reflects its primary purpose which is to provide data in a form appropriate for the ICES Working Group. However, an attempt has also been made to give sufficient explanation of the information for it to be of value for others. **It must be noted that much of the data relating to 1997 are provisional and will not be finalised until complete catch data are obtained and records can be fully validated.** Thus this report is not in any way meant to replace the Agency's annual publication of the Salmonid and Freshwater Fisheries Statistics or their annual Salmon Action Plan progress reports, which should be published in the summer.

CEFAS and the Agency would welcome comments on this first report which should be addressed to:
Ted Potter (CEFAS) or Dr Nigel Milner (Environment Agency) (contact addresses on inside cover).

EXECUTIVE SUMMARY

- This report presents a preliminary assessment of the state of salmon stocks and fisheries in England and Wales in 1997 to assist ICES in providing scientific advice to NASCO and to provide early feedback to fishery managers.

- The number of licences issued for nets and fixed engines has continued to decline as a result of measures taken to reduce levels of exploitation and to phase out mixed stock fisheries. Further measures have been taken to reduce rod exploitation of salmon, especially multi-sea-winter fish, in some rivers.

- In general, 1997 was a fairly wet year and angling conditions were considered to be not unfavourable. Despite this, rod catches were low in all Regions except the North East. Net catches were also very low.

- The provisional salmon catch for 1997 is estimated at 154.6 t, comprising 103.8 t by nets and fixed engines and 50.8 t by rods. The net catch was 39% below the 5 year mean and the rod catch (corrected for under-reporting) 41% below; both were the lowest recorded over this period, and the total was the lowest in recent decades.

- Rod catches of multi-sea-winter salmon remained fairly stable at around 5-7,000 fish from 1992 to 1996 but fell to about 4,000 in 1997. Rod catches of grilse were around 19-25,000 between 1992 and 1994 but have fallen to 10-12,000 in subsequent years. Grilse were estimated to make up 73% of the 1997 rod catch.

- The use of catch and release has continued to increase. In 1997, provisional estimates indicate 24% of salmon caught by anglers were released following capture, compared with 10% in 1993.

- The catch per unit of fishing effort (CPUE) for net fisheries was below the five-year average for all regions, but was particularly low for fisheries in the North West Region. CPUE data for rod fisheries are not yet available for 1997.

- The total unreported and illegal catch of salmon in England and Wales in 1997 is estimated at about 40 tonnes.

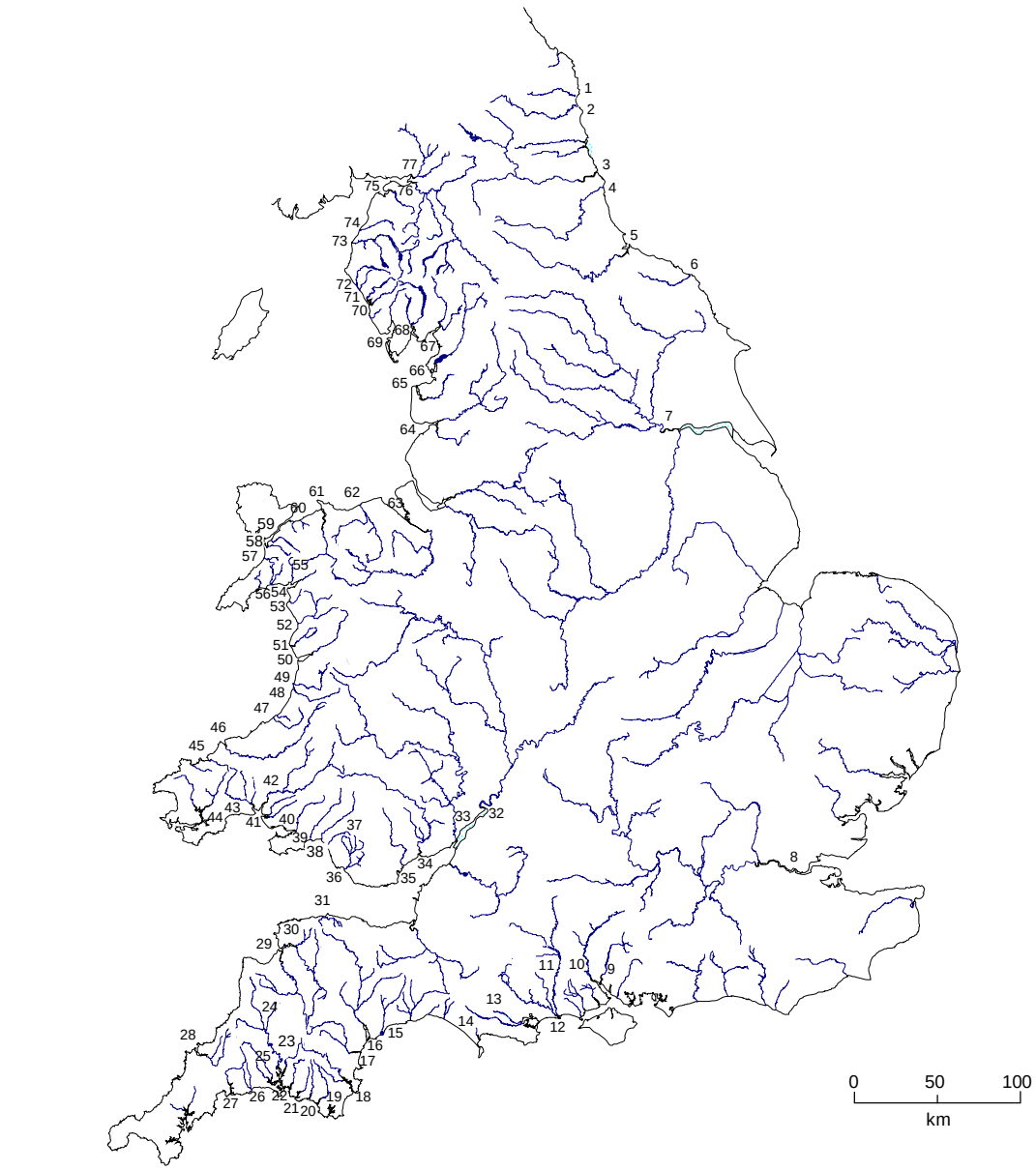
- Exploitation rates for fisheries in England and Wales in 1997 were well below average in 9 monitored rod fisheries, possibly reflecting reduced effort and increased use of catch and release.

- Data from counters and traps in England and Wales show a significant downward trend in runs for rivers in the south over the past 5 and 10 years but no common trends for the monitored rivers in the north and west.

- Spawning escapement was above the provisional target levels in 13 rivers (20%) in 1997; between 50% and 100% of the targets in 22 rivers (34%) and less than 50% of the target in 30 rivers (46%).

- The majority of salmon stocks in England and Wales therefore appear to be in a depleted state.

- In 1997, 174 k hatchery-reared salmon and 5.3 k wild salmon smolts were microtagged and released in England and Wales for assessment and enhancement investigations.



Key

No.	River	No.	River	No.	River	No.	River
1	Aln	21	Yealm	41	Gwendreath Fawr	61	Conwy
2	Coquet	22	Plym	42	Tywi	62	Clwyd
3	Tyne	23	Tavy	43	Taf	63	Dee
4	Wear	24	Tamar	44	E and W Cleddau	64	Ribble
5	Tees	25	Lynher	45	Nevern	65	Wyre
6	Esk (Yorkshire)	26	Looe	46	Teifi	66	Lune
7	Ouse	27	Fowey	47	Aeron	67	Kent
8	Thames	28	Camel	48	Ystwyth	68	Leven
9	Itchen	29	Torridge	49	Rheidol	69	Duddon
10	Test	30	Taw	50	Dyfi	70	Esk (Cumbria)
11	Avon (Hants)	31	Lyn	51	Dysynni	71	Irt
12	Stour (Dorset)	32	Severn	52	Mawddach	72	Ehen
13	Piddle	33	Wye	53	Artro	73	Derwent
14	Frome	34	Usk	54	Dwyryd	74	Ellen
15	Axe	35	Taff	55	Glaslyn	75	Wampool
16	Exe	36	Ogmore	56	Dwyfach and Dwyfawr	76	Eden
17	Teign	37	Afan	57	Llyfni	77	Esk (Border)
18	Dart	38	Neath	58	Gwyrfai		
19	Avon (Devon)	39	Tawe	59	Seiont		
20	Erme	40	Loughor	60	Ogwen		

Figure 1. Map of England and Wales showing the main salmon rivers

REPORT ON SALMON FISHERIES IN 1997

1. Gear and effort

1.1 Gear

There were no recorded changes in the types of gear used for the capture of salmon in England and Wales in 1997. Brief descriptions of these nets and fixed engines are included in Annex 2. The principal salmon rivers in England and Wales, for which data are presented in this report, are shown in Figure 1, and the types of gear used on each river are listed in Table 2.

1.2 Effort

Levels of exploitation of migratory salmonids by both rods and nets in England and Wales are regulated principally by Byelaws controlling the fishing gear that may be used, and where and when fishing may take place. Licences are required to use both rods and nets, and, in the case of net fisheries, the numbers of licences that may be issued are limited by Orders.

Within these restrictions on the allowed fishing effort, there will be annual variations in the amount of fishing actually undertaken due to factors such as the effects of prevailing weather (e.g. sea conditions or river flow) and local perceptions about the abundance of returning stocks.

In addition, the first sale price of salmon has decreased in real terms due to the rapid expansion in the production of farmed salmon, and the costs of both rod and net licences have increased. These factors may also have affected the take-up of licences and thus the fishing effort.

1.2.1 Allowable effort

The total numbers of netting licences issued for gill nets, sweep nets, hand-held nets and fixed engines has continued to decline (Table 1 and Figure 2) as a result of measures taken to reduce levels of exploitation. Overall, there has been a 37% reduction in the number of net licences issued between 1983 and 1997.

The numbers of licences issued for salmon and migratory trout angling (annual and short-term) are also included in Table 1 for the period 1994 to 1997 only; the data for 1997 are provisional (annual licences are valid from the date of purchase to the 31 March following). No comparable data are available for earlier years because of changes in licensing arrangements. The data indicate that the number of annual licences (considered to be the best indication of angler interest) has fallen by 17%, although there appears to be some increase in the number of short-term licences issued over this period. This change in the numbers and proportions of licences issued is likely to have affected fishing effort.

In 1997, there have been reductions in the amounts of netting effort allowed in 9 net fisheries (including the continuation of programmes to phase-out 2 mixed stock fisheries by natural wastage) and in the angling effort permitted on 11 rivers. These may be summarised as follows:

Netting: The phase out of the north east coast drift net fishery has continued. The number of licences issued fell to 81 in 1997, a 40% reduction since the initiation of the phase-out in 1993.

The phase out of the net fishery on the East Anglian coast continued with the number of nets falling to 56 in 1997, a 5% reduction since 1996. This fishery takes mainly sea trout.

Similar phase-outs have been authorised for three mixed stock net fisheries in Wales (Usk drift nets, Clwyd sling nets and SW Wales coastal wade nets), although there were no reductions in the numbers of licences issued in 1997.

Netsmen were compensated not to fish for parts of the season in four rivers in SW England in a scheme implemented by South West Water plc as an alternative to previous stocking arrangements carried out for mitigation. The following rivers were affected: River Lynher (21 April - 7 June; and August - the latter a voluntary measure); River Tavy (21 April - 7 June and 2 - 31 August - the latter funded by the Agency); River Tamar (21 April - 7 June); River Fowey (21 April - 15 June); River Exe (21 April - 31 May).

The close of the netting season on the Rivers Taf and Tywi was brought forward from the end of August to the end of July.

Angling: The opening of the salmon angling season was delayed until 1 April on the rivers in the West Wales Fisheries District from the Tywi (No. 42, Figure 1) to the Ystwyth (No. 48, Figure 1).

The closing date for angling was brought forward to 7 October on the rivers Tywi, Taf and East and West Cleddau. (Bait restrictions were introduced on the River Clwyd.)

1.2.2 Utilised effort

In general, 1997 was a fairly wet year throughout England and Wales, and river flows were relatively high and not unfavourable for angling for much of the fishing season. However, despite this, catch rates were generally poor, and the resultant perception of low stock abundance is believed to have reduced angling effort, particularly later in the season. It is also possible that extreme high flows late in the season, in October, may have reduced effort and angling success at this time.

Table 2 presents data on allowable and utilised effort for the principal salmon net fisheries in England and Wales in 1997. For fisheries in which utilised effort is recorded in terms of tides fished (Wales and NW Region) the proportion of the available effort used has been estimated by assuming that an average of 1.4 tides have been fished per day (based on a small sub-sample for fisheries in the NW Region). It should be noted, however, that the number of tides fished will vary between methods and at different times of the year and that this scaling factor should be regarded as an approximation. Noting this caveat, the data suggest that the percentage of effort utilised varied considerably between fisheries (range 5% to 74%) and was highest, on average, for fisheries in the SW Region (44%). It is recognised that it is virtually impossible for fisheries to utilise 100% of the available effort and, in practice, factors such as weather conditions, tide heights and available fishing stations will constrain the overall effort. In the north east coast fishery, for example, it is suggested that ~75% of the allowable effort represents a practical upper limit to actual effort in the summer months (Anon., 1997(a)).

Table 3 shows the average numbers of days fished by rod fishermen who made catch returns (where effort data were supplied) each year from 1994 to 1996. These data indicate remarkably little year to year variation within Regions, although the average number of days fished ranged from 10 days (Southern and South West Regions) to 23 days (Midlands Region), with an overall average of 13.4 days. However, as the number of annual rod licences issued and the number of returns submitted have both decreased by over 15% in this period, there would appear to have been a significant reduction in angling effort.

Table 1. Numbers of net and fixed engine licences (1983-97) and rod licences (1994-97) issued in England Wales

Year	Rod licences		Gear Type				Combined drift/T net licences	Total net licences
	Short-term	Annual	Gill	Sweep	Hand - Held	F.E.		
1983			232	209	333	74	(75)	848
1984			226	223	354	74	(75)	877
1985			223	230	375	69	(75)	897
1986			220	221	368	64	(75)	873
1987			213	206	352	68	(75)	839
1988			210	212	284	70	(75)	776
1989			201	199	282	75	(75)	757
1990			200	204	292	69	(75)	765
1991			199	187	264	66	(75)	716
1992			203	158	267	65	(75)	693
1993			187	151	259	55	(36)	652
1994	10637	26641	177	158	257	53	(30)	645
1995	9992	24949	163	156	249	47	(29)	615
1996	12508	22773	151	132	232	42	(29)	557
1997	**12374**	**22162**	**139**	**131**	**231**	**35**	**(27)**	**536**

Notes: Rod short-term licences are for 1 or 8 days; annual licences are valid from the date of issue to the 31 March following; the rod licence data for 1997 are provisional.
Gill nets include: drift, trammel, sling & coracle nets.
Sweep nets include: seine (draft and draw) and wade nets.
Hand-held nets include: haaf (heave) and lave/dip nets.
Fixed engines include: T-nets, J-nets, stop (compass) nets, putcher ranks, traps, weirs, cribs (coops) and fishing baulks.
Combined drift/T net licences (issued in Northumbria (northern area)) have been included in the gill net but not the F.E. totals.
East Anglian coastal nets (targeted primarily at sea trout) have been excluded.

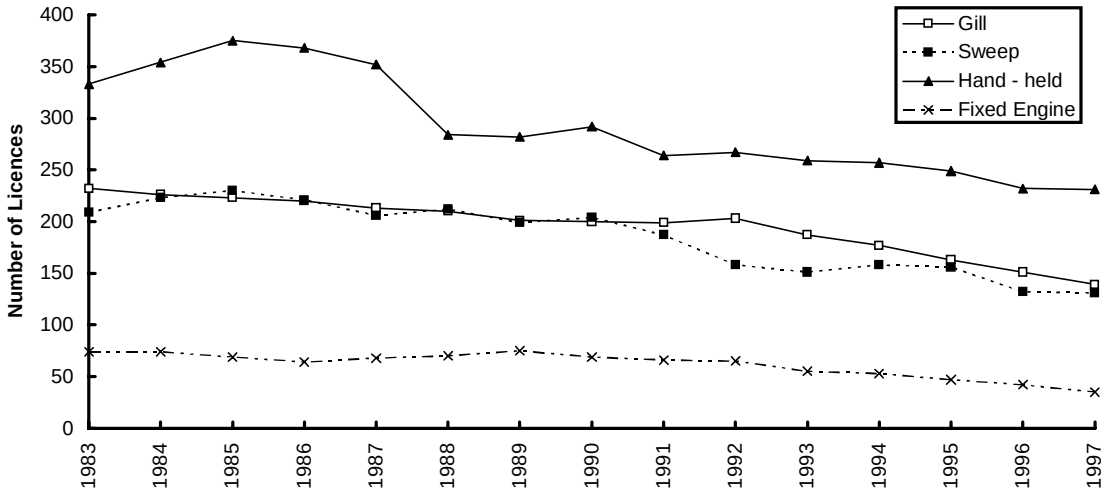


Figure 2. Numbers of salmon net and fixed engine licences issued in England and Wales, 1983-97

Table 2. Allowable and utilised effort for the principal salmon net fisheries in England and Wales in 1997

Region	River/ Fishery	Method	No. Lics	Days available	Allowable effort net. days	Utilised effort net. days	Utilised effort net. tides	% utilised	Av. day/lic
NE	N. Coastal (N)	Drift & T	51	113	5763	2393		42	46.9
	N. Coastal (S)	Drift	23	113	2599	900		35	39.1
	Y. Coastal	Drift	9	113	1017	357		35	39.7
	Y. Coastal	T or J	13	113	1469	487		33	37.5
	NE Region		**96**	**452**	**10848**	**4137**		**38**	
SW	Exe	Seine	15	130	1950	389		20	25.9
	Teign	Seine	6	120	720	450		63	75.0
	Dart	Seine	15	109	1635	758		46	50.5
	Camel	Drift	7	130	910	192		21	27.4
	Tavy	Seine	5	68	340	115		34	23.0
	Tamar	Seine	15	88	1320	769		58	51.3
	Lynher	Seine	5	68	340	44		13	8.8
	Fowey	Seine	2	83	166	53		32	26.5
	Taw/Torridge	Seine	14	104	1456	1072		74	76.6
	Lyn	FE	1	130	130	84		65	84.0
	SW Region		**85**	**1030**	**8967**	**3926**		**44**	
Wales	Usk	Drift	8	130	1040		489	34	61.1
	Tywi	Seine	4	99	396		239	43	59.8
	Tywi	Coracles	5	99	495		204	29	40.8
	Taf	Wade	1	99	99		26	19	26.0
	E&W Cleddau	Compass	8	117	936		116	9	14.5
	Teifi	Seines	4	98.5	394		257	47	64.3
	Teifi	Coracles	11	98.5	1083.5		214	14	19.5
	Dyfi	Seines	3	109	327		146	32	48.7
	Mawddach	Seines	2	109	218		118	39	59.0
	Dwyfawr	Seines	2	109	218		15	5	7.5
	Seiont	Seine	1	109	109		65	43	65.0
	Ogwen	Seines	2	109	218		30	10	15.0
	Conwy	Seines	3	109	327		155	34	51.7
	Clwyd	Slings	2	96	192		95	35	47.5
	Dee	Trammel	4	69	276		259	67	64.8
	Dee	Seines	15	69	1035		978	67	65.2
	Welsh Region		**75**	**1629**	**7363.5**		**3406**	**34**	
NW	Ribble	Drift	6	109	654		213	23	35.5
	Lune	Haaf	26	109	2834		1224	31	47.1
	Lune	Drift	10	109	1090		413	27	41.3
	Lune	Seine	1	109	109		31	20	31.0
	Kent	Lave	8	109	872		99	8	12.4
	Leven	Lave	6	109	654		282	31	47.0
	S&W Cumbria	Drift	4	109	436		156	26	39.0
	Eden & Esk	Haaf	155	141	21855		4807	16	31.0
	NW Region		**216**	**904**	**28504**		**7225**	**18**	

Note: The number of tides fished per day is known to vary for both different gears and at different times of the year. For the purposes of estimating utilised effort, a figure of 1.4 tides per day has been assumed (based on a sub-sample of data for fisheries in the NW).

Table 3. Average number of days fished by anglers per catch return for each EA Region, 1994-96

	NE	Thames	Southern	SW	Mids	Welsh	NW	Total
1994	15.9	18.5	10.9	10.7	21.8	14.8	14.3	14.2
1995	14.8	29.6	9.8	9.5	22.7	12.4	12.1	12.4
1996	16.9	14	10.2	10.5	24.8	13.5	12.6	13.4
Average	15.8	21.0	10.2	10.2	23.0	13.6	13.0	13.4

1.3 Catch limits

No national catch limit regulations apply to salmon fisheries in England and Wales, but there are bag limits in some rod fisheries. There is also increasing use of voluntary catch and release by anglers and this has been encouraged by the Agency. In 1997, provisional data indicate that 24% of the salmon caught by rods were released following capture, a proportion that has increased from 10% in 1993 (the first year for which such data are available).

Under a new Byelaw introduced in 1997, a daily bag limit of 2 salmon and a weekly bag limit of 5 salmon was imposed for rivers in the West Wales Fisheries District from the Tywi (No. 42, Figure 1) to the Ystwyth (No. 48, Figure 1). This is not expected to have had a significant effect on angling effort or catch.

2. Catches and CPUE

2.1 Catch

Catch data in England and Wales are derived from catch returns submitted by netsmen and anglers. Provisional net, rod and total catches for each Agency Region for 1997 are presented in Table 4. The total declared catch of salmon for England and Wales in 1997 is estimated at 45,190 fish (154.6 tonnes, round fresh weight), comprising 31,484 fish (103.8 tonnes) by nets and fixed engines and 13,706 fish (50.8 tonnes) by rods. The confirmed declared salmon catch for 1996, by comparison, was 50,124 fish (197.2 tonnes), of which 32,680 fish (125.7 tonnes) was by nets and fixed engines and 17,444 fish (71.5 tonnes) by rods. Details of the regional variation in catches over the past 5 years are given in Tables 5 and 6 and Figures 2 and 3.

For nets, the reporting procedures have been consistent over recent years. The 1997 data for nets and fixed engines are based on reasonably complete returns and are not expected to change significantly. The net and fixed engine catch for England and Wales in 1997 was very low (well below that recorded in 1996 in all regions except the North East and 39% below the average of the previous 5 years). Catches were well below the 5 year average in all areas, and the total catch was the lowest recorded over this period (Table 5, Figure 2) and in recent decades.

The data for rod fisheries (Table 4) are based largely on angler's returns received up until 9 February 1998; an allowance of 5% has been made for late returns (based on previous years' experience). However, for regions or rivers where the data from fishery owners' returns were considered to be more complete, these have been used in preference. The ability to provisionally estimate the annual rod catch from the returns received marks a substantial improvement over previous years; previously, best estimates were compiled on the basis of very incomplete catch information and anecdotal reports.

Table 4. Provisional declared salmon catches for England and Wales - 1997 season

Environment Agency Region	Net catch		Rod catch		Total catch	
	No.	Weight (kg)	No.	Weight (kg)	No.	Weight (kg)
North East	21,922	74,819	2,564	9,511	24,486	84,330
Thames	-	-	4	15	4	15
Southern	-	-	145	538	145	538
South West	2,491	7,677	2,488	9,229	4,979	16,906
Midlands	1,282	5,338	320	1,187	1,602	6,525
Welsh	2,628	8,964	3,825	14,189	6,453	23,153
North West	3,161	7,006	4,360	16,173	7,521	23,179
Total	**31,484**	**103,804**	**13,706**	**50,842**	**45,190**	**154,646**

Notes: Provisional rod catches have been increased by 5% to allow for late licence returns, with the exception of the rivers Wye, Thames, Test and Itchen which have more reliable data (e.g. owners returns) and have therefore not been incremented.

To enable comparison with catches in previous years, rod catch data have been corrected for under-reporting (Table 6, Figure 3). Due to changes in rod licence data collection procedures, data for 1992 and 1993 were heavily under-reported. Rod catch reporting arrangements were improved in 1994 and have subsequently remained more consistent, thus higher correction factors have been applied for 1992 and 1993 (Environment Agency, 1998).

The corrected catch data suggest that the catch by rods for England and Wales in 1997 is 21% below the 1996 catch and 38% below the average of the previous 5 years. The 1997 catch was also the lowest recorded over this period. However, there was some regional variability in catches. Rod catches in North East England were marginally above the five year average and well within the range for the period. However, in all other regions catches were well below the five-year average (>30% lower), this being particularly evident for the Southern Region chalkstream catchments where catches were estimated to be ~60% below the five-year average.

Within England and Wales there has been increasing use of catch-and-release by salmon anglers in recent years. Details of fish caught and released are published for each major salmon river in England and Wales in the annual catch statistics. The data are summarised below for each year from 1993 to 1997:

Year	No. salmon released	As % of declared rod catch
1993	1448	10.3
1994	3227	13.0
1995	3187	19.9
1996	3428	19.7
1997(provisional)	**3102**	**23.8**

The catch data presented above (and in Tables 4 and 6 and Figure 3) include fish that have been caught and released. Excluding these fish provides an estimate of the numbers and weight of fish caught and retained by anglers in England and Wales in 1997 of 10,604 fish (38.5 tonnes). Thus the total catch of fish (caught and killed) in England and Wales in 1997 by all methods is estimated at 42,088 fish (142.3 tonnes).

Table 5. Summary of declared regional salmon net and fixed engine catches, 1992-97

EA Region	NE	Anglian	Southern	SW	Mids.	Welsh	NW	Total
Year			(a)					
1992	20,144	11	6	5,521	2,117	2,927	3,123	33,849
1993	41,800	4	11	5,017	950	3,324	5,460	56,566
1994	46,554	3	4	6,437	2,321	4,995	6,143	66,457
1995	53,210	5	0	3,251	2,588	3,039	5,566	67,659
1996	18,581	3	0	5,093	1,608	2,931	4,464	32,680
1997 (provisional)	**21,922**	**0**	**0**	**2,491**	**1,282**	**2,628**	**3,161**	**31,484**
5 yr-mean (1992-96)	36,058	5	4	5,064	1,917	3,443	4,951	51,442
% change:								
1997 on 1996	+18			-51	-20	-10	-29	-4
1997 on 5-year mean	-39			-51	-33	-24	-36	-39

Key: (a) From 1992, the River Itchen seine net has been fished for scientific purposes only; salmon caught in this fishery were tagged for release.

Table 6. Summary of declared regional salmon rod catches, 1992-97

EA Region	NE	Thames	Southern	SW	Mids.	Welsh	NW	Total
Year			(a)					
1992	1,808	10	260	3,664	287	3,355	4,974	14,319
1993	1,696	16	545	3,922	336	5,986	6,241	18,742
1994	1,939	11	432	5,213	555	7,901	8,840	24,891
1995	2,201	13	302	2,554	442	4,146	6,348	16,006
1996	2,514	34	384	2,681	643	5,468	5,720	17,444
1997 (provisional)	**2,564**	**4**	**145**	**2,488**	**320**	**3,825**	**4,360**	**13,706**
Corrected catches (adjustment made for under-reporting: x 1.9 for 1992-93 and x 1.1 for 1994-97)								
1992	3,435	10	260	6,962	545	3,689	9,451	24,352
1993	3,222	16	545	7,452	638	8,406	11,858	32,138
1994	2,133	11	432	5,734	611	8,457	9,724	27,102
1995	2,421	13	302	2,809	486	4,456	6,983	17,471
1996	2,765	34	384	2,949	707	5,831	6,292	18,963
1997 (provisional)	**2,820**	**4**	**145**	**2,737**	**352**	**4,137**	**4,796**	**14,991**
5 yr-mean (1992-96)	2,795	17	385	5,181	598	6,168	8,861	24,005
% change:								
1997 on 1996	+2		-62	-7	-50	-29	-24	-21
1997 on 5-yr mean	+1		-61	-47	-41	-33	-46	-38

Most 1997 figures are returns to 9 February 1998 plus 5% to allow for the late returns.
The above rod catches include fish caught and subsequently released.
Data for the rivers Wye, Thames, Test and Itchen are based upon owners returns and have not been corrected.

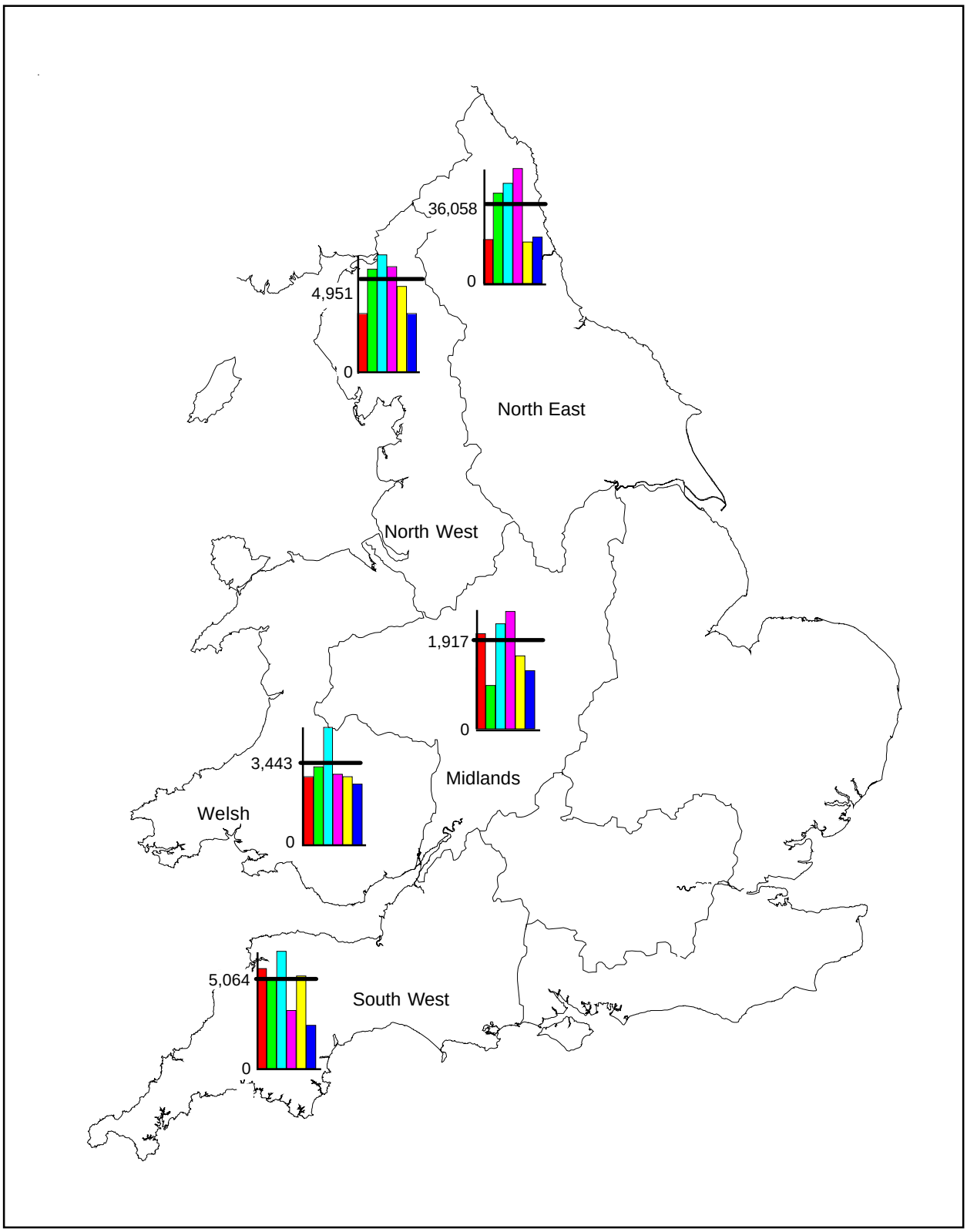


Figure 3. Regional declared salmon net and fixed engine catches. The histograms display data for the six years 1992 to 1997, together with the five-year mean for the period 1992-1996 (displayed as a horizontal line, with the mean value indicated against the y-axis) for comparison purposes. Note that the histograms are not drawn to the same scale. Data for 1997 are provisional.

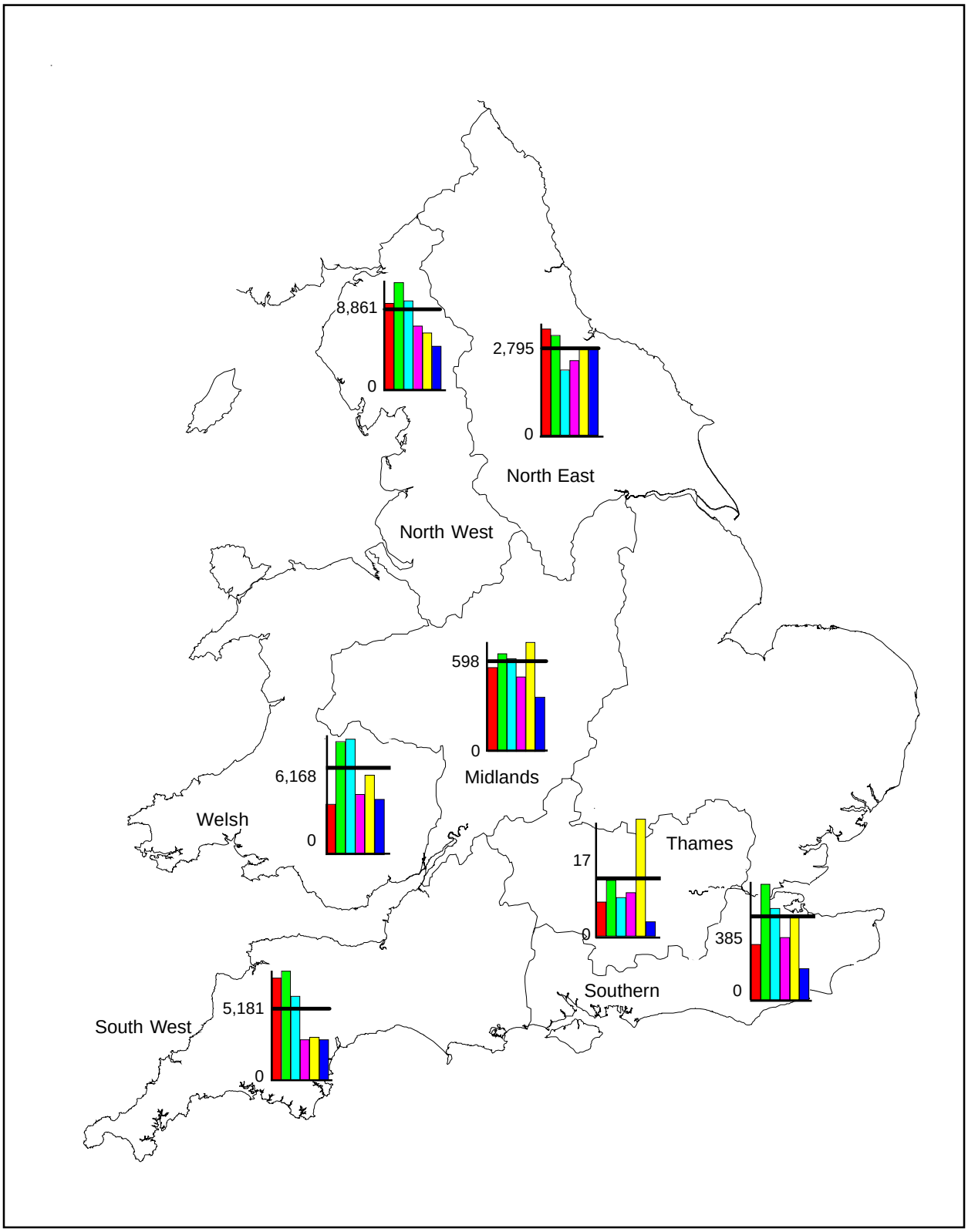


Figure 4. Regional salmon rod catches corrected for under-reporting (see Table 5). The histograms display data for the six years 1992 to 1997, together with the five-year mean for the period 1992-1996 (displayed as a horizontal line, with the mean value indicated against the y-axis) for comparison purposes. Note that the histograms are not drawn to the same scale. Data for 1997 are provisional.

2.2 Catch per unit effort

Catch per unit of fishing effort (CPUE) provides an alternative measure of the success of fisheries, and of the relative status of stocks, to the declared catch data. For net fisheries in England and Wales, regional CPUE data have been collated using the number of days fished (or in Wales and the North West the number of tides fished) as a measure of the amount of fishing undertaken by each licence holder. The CPUE is thus expressed as the catch per licence-day (or per licence-tide).

Regionally aggregated data for 1997, compared with previous years, are shown in Table 7 and Figure 5. It should be noted, however, that these data do not take any account of the differing fishing methods employed in the various regions, or of any changes in the relative proportions of different gears used within particular regions. In addition, CPUE is likely to vary with season. Thus cautious interpretation is required.

The regional CPUE data for nets and fixed engines in 1997 suggest that fisheries in Wales and the North East of England had capture rates close to the average of the previous 5 years and within the range for the period. This indicates that part of the reason for the reduction in net catches in these areas has been a reduction in fishing effort. For fisheries in the North West Region capture rates were almost half that of the five-year average and the lowest for the period. This suggests that fish availability in this region was low, at least during the period in which the fisheries were operating.

Table 7. Regional CPUE data for net and fixed engine salmon fisheries, 1988 - 97

Data expressed as catch per licence-day (catch per licence-tide for Wales and NW)

EA Region	NE	Southern (a)	SW	Mids.	Welsh (b)	NW (b)
1988	5.49	10.15			-	-
1989	4.39	16.8			0.90	0.82
1990	5.53	8.56			0.78	0.63
1991	3.2	6.40			0.62	0.51
1992	3.83	5.00	No data	No data	0.69	0.40
1993	6.43	-			0.68	0.63
1994	7.53	-			1.02	0.71
1995	7.84	-			1.00	0.79
1996	3.74	-			0.73	0.59
1997	**5.30**	**-**			**0.77**	**0.35**
Mean (1992 - 1996)	5.87	5.00			0.82	0.62

Key: (a) No net fishery from 1993.
(b) Catch per licence tide.

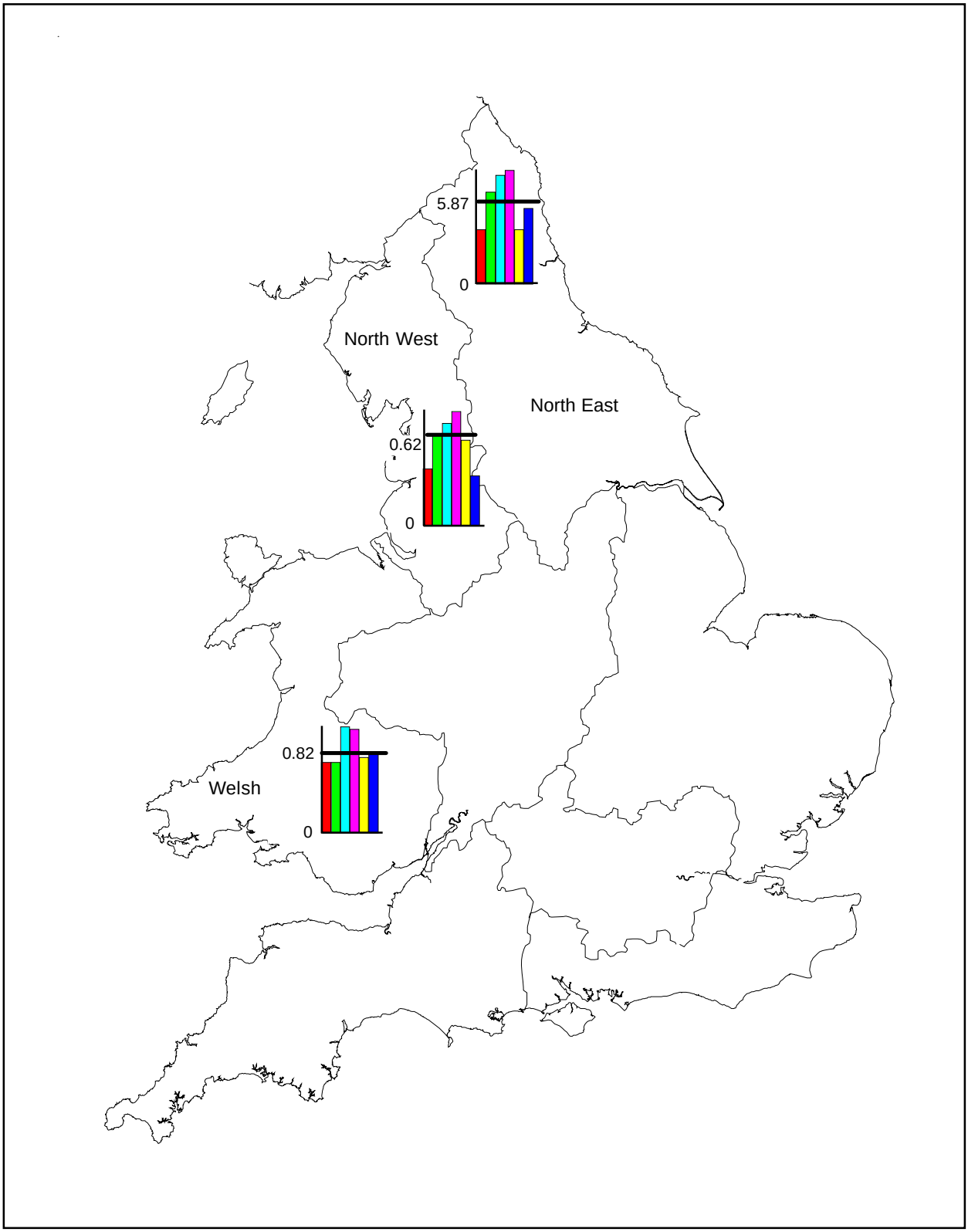


Figure 5. Regional CPUE data for net and fixed engine salmon fisheries. The histograms display data for the six years 1992 to 1997, together with the five-year mean for the period 1992-1996 (displayed as a horizontal line, with the mean value indicated against the y-axis) for comparison purposes. Note that the histograms are not drawn to the same scale. Data for 1997 are provisional.

Rod CPUE data (catch per licence day) are now reported annually for all major salmon rivers in England and Wales. However, data for 1997 are not yet available. Table 8 and Figure 6 show the average number of days fished per salmon caught (i.e. the inverse of CPUE) for anglers making returns in each Region from 1993 to 1996. (These figures will include returns from some anglers who fish primarily for sea trout.) The mean number of days fished per salmon caught over the four years ranged from 12.3 days for the North West Region to 39.0 days for the Midlands Region (River Severn).

A trend analysis of the data for all Regions shows a significant decrease (Bcrit = -0.15, p = 0.98), indicating that anglers making returns tended to catch fish more easily towards the end of this period. (NB This does not include data for 1997). Various factors may have contributed to this, including increased availability of fish and more favourable fishing conditions. It might also have been caused by the reduction in the number of anglers (Table 1) if it tended to be the less skilled individuals who gave up. (The trend is still significant if the Thames data are excluded.)

Table 8. Days fished per salmon caught for rod fisheries by region, 1993-97

EA Region	NE	Thames	Southern	SW	Mids.	Welsh	NW
1993	22.2	69.0	24.4	15.6	52.6	28.1	15.4
1994	24.6	-	14.1	10.1	36.4	21.3	10.1
1995	20.7	31.8	16.1	17.0	40.9	25.5	11.0
1996	16.6	30.8	10.9	13.9	26.0	21.0	12.6
1997	**.....**	**.....**	**not yet available**	**.....**	**.....**		
Mean (1993-96)	21.0	32.9	16.4	14.2	39.0	24.0	12.3

Key: Data not available for 1992 due to change in reporting procedures.

2.3 Unreported and illegal catches

If the full effects of fisheries upon stocks are to be assessed, account must be taken of unreported catches by net and rod licence holders and also the scale of illegal catches. In previous years, best 'guess-estimates' of the levels of under-reporting and illegal fishing (expressed as percentages of the declared regional catches) have been provided by regional fisheries staff. However, in an effort to improve these estimates, the methodology has been re-examined.

2.3.1 Under-reporting by licence holders

For the purpose of setting spawning targets under their Salmon Action Plan guidelines, the Environment Agency have estimated that declared salmon rod catches from 1994 should be increased by 10% to allow for under-reporting of the legal rod catch across England and Wales. This has been based on a study of catch returns made following reminders (Environment Agency, 1998). Exceptions to this apply for the River Wye in Wales, the Southern Region (Rivers Test and Itchen) and for the Wessex area of the South Western Region (Rivers Avon, Frome, Stour and Piddle) for which the fishery owners returns are regarded as more accurate. No scaling factor has been applied for catches in these rod fisheries to allow for under-reporting.

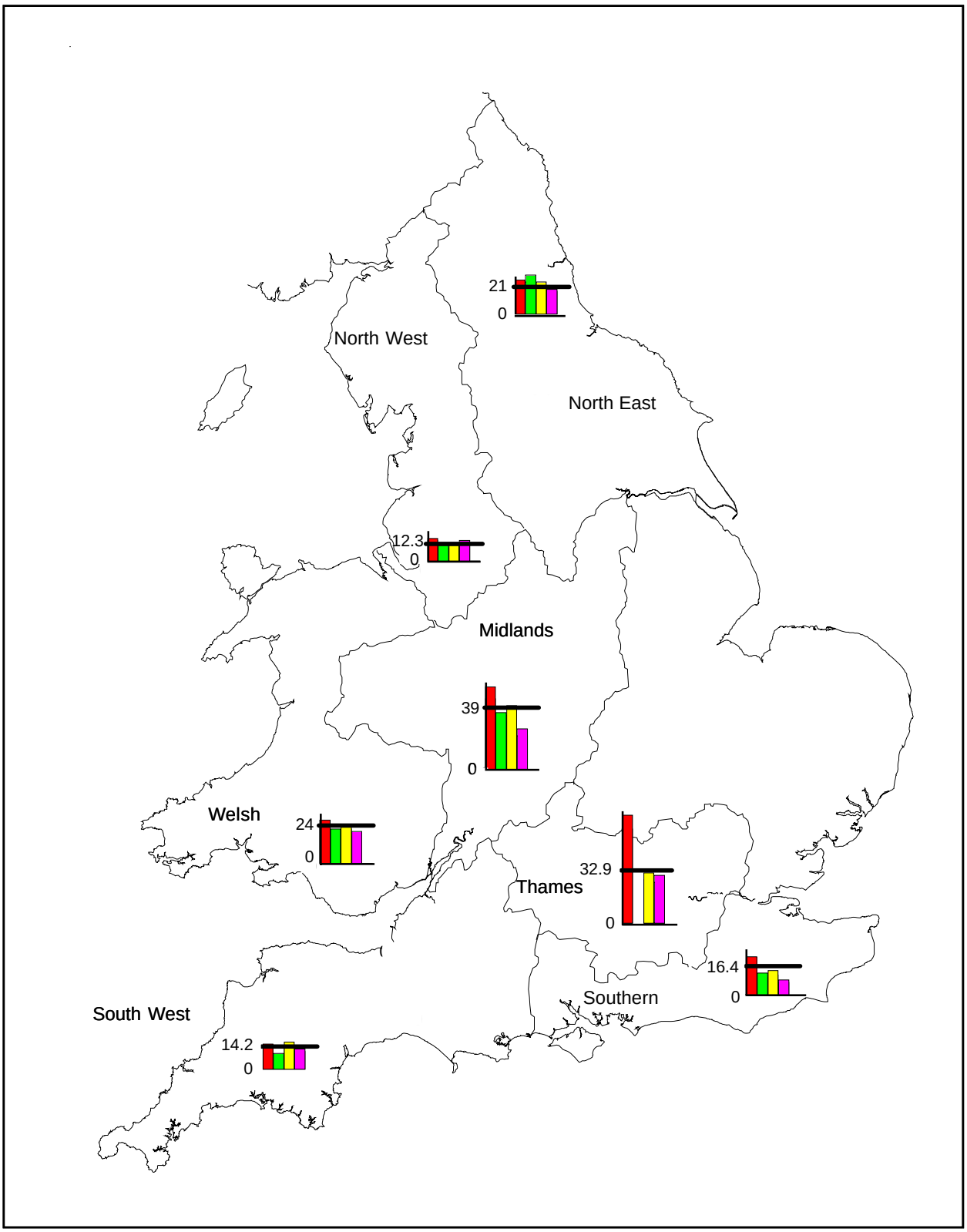


Figure 6. Days fished per salmon caught for rod fisheries by Region, 1993-96 (data for 1997 are not yet available), together with the four-year mean for the same period (displayed as a horizontal line, with the mean value indicated against the y-axis).

For net fisheries in England and Wales, the rate of reporting is generally considered to be high in most regions and this has been supported by the findings of two studies. In North East England, under-reporting in the coastal fishery has been estimated at about 7% (Anon., 1991). In the North West, comparison of the catches seen by the coxswain bailiff with those declared for that day, suggested that catches in the estuary net fishery on the River Lune were under-reported by around 8%. Opinions on the level of under-reporting in net fisheries in other regions of England and Wales were collected from Environment Agency regional fisheries personnel in February 1998; these fell in the range 0% to 15%. It has been suggested that over-reporting of catches may be occurring in the north east coast fishery, in response to continuing rumours about a potential future buy-out in that fishery (and the perception that compensation will be based on declared catches). For this report, a figure of 8% has been used for the level of under-reporting of the national net catch.

2.3.2 Illegal catches by unlicensed fishermen

By their nature, illegal catches are very difficult to quantify accurately. However, assessments can be made on the basis of enforcement activities. Consultation with Environment Agency regional fisheries personnel was used as the basis for an updated assessment in February 1998 and this provided 'guess estimates' of illegal catches in coastal waters and within rivers and estuaries. These estimates of illegal catches, expressed as a percentage of the regional declared catch, ranged from 5% to 18 % for different Regions.

2.3.3 Under-reporting and illegal catch estimate for 1997

On the basis of the above estimates, the non-reported and illegal catch for England and Wales is estimated at about 40 tonnes, which represents approximately 20% of the total weight of salmon caught in England and Wales in 1997.

2.4 Composition of catches

In England and Wales, insufficient scale samples have been collected and read to provide reliable estimates of the relative contributions of one-sea-winter (lSW) and multi-sea-winter (MSW) fish in the salmon catches in many regions since 1991. Therefore, monthly age/weight keys for salmon from the river Dee trap for the period 1992-96 have been used to estimate the age composition of catches for principal salmon rivers (recorded salmon rod catch in excess of 48 fish in 1997). These estimates were derived from the provisional declared catch where a weight and date of capture have been provided. These data are presented in Table 9.

It is not currently possible to provide estimates of the proportions of grilse and MSW salmon in most regional net fisheries, as the declared catch data do not report the sizes of individual fish and few scale samples are collected from net fisheries. Limited data (71 scales) are available from a scale reading programme in the Midlands Region; these indicate that grilse comprised 34% and MSW salmon 66% of the net and fixed engine catch on the River Severn in 1997.

A further indication of the age composition of net catches in 1997 is available for the Northumbria area of the north east coast fishery, based on the declared catches which are routinely reported by netsmen as either grilse or salmon based upon a weight split. These data indicate that 'salmon' made up only 33% of the catch in 1997 compared with a long-term average of 42% (1965-97). This emphasises the apparent low proportion of MSW salmon in returns in 1997.

For rods, the data in Table 9 indicate that there were four rivers, the Tyne, Torridge, Severn and Wye in which over 50% of the salmon rod catch was of MSW salmon in 1997. Of the remaining rivers, ten had between 25% and 49% MSW salmon in the rod catch and 22 had less than 25% MSW salmon. Rod catches of multi-sea-winter salmon remained fairly stable at around 5-7,000 fish from 1992 to 1996 but fell to about 4,000 in 1997. Rod catches of grilse were between 19,000 and 25,000 between 1992 and 1994 but have fallen to 10-12,000 in subsequent years.

Table 9. Proportions of grilse and MSW salmon in provisional 1997 rod catches, for rivers with a declared rod catch in excess of 48 fish (Data not corrected for incomplete returns)

Region	River	No. grilse	%	No. MSW	%
NE	Coquet	404	63	240	37
	Tyne	624	49	650	51
	Wear	118	64	66	36
	Whole Region	**1186**	**55**	**986**	**45**
Southern	Itchen	36	77	11	23
	Whole Region	**47**	**80**	**12**	**20**
SW	Frome	34	40	50	60
	Exe	555	86	93	14
	Teign	107	74	37	26
	Dart	117	76	36	24
	Tavy	78	92	7	8
	Tamar	124	73	47	27
	Fowey	114	88	15	12
	Camel	206	90	22	10
	Taw	155	71	62	29
	Torridge	22	48	24	52
	Lyn	113	72	45	28
	Whole Region	**1722**	**80**	**439**	**20**
Midlands	Severn	48	17	242	83
Wales	Wye	103	22	363	78
	Usk	321	67	160	33
	Ogmore	65	89	8	11
	Tawe	68	91	7	9
	Tywi	200	68	94	32
	Taf	62	83	13	17
	E&W Cleddau	41	85	7	15
	Teifi	374	76	117	24
	Dyfi	109	89	13	11
	Mawddach	106	91	10	9
	Ogwen	71	96	3	4
	Conwy	100	88	13	12
	Dee	329	80	82	20
	Whole Region	**2168**	**70**	**928**	**30**
NW	Ribble	228	82	51	18
	Lune	620	91	65	9
	Kent	269	91	25	9
	Leven	54	95	3	5
	Irt	79	99	1	1
	Ehen	109	92	9	8
	Derwent	491	87	74	13
	Eden	873	75	298	25
	Border Esk	528	87	77	13
	Whole Region	**3366**	**85**	**606**	**15**
Total	**All Regions**	**8537**	**73**	**3213**	**27**

Note: Whole region data include minor rivers not otherwise included in the Table.

Equivalent data for previous years, summarised on a regional basis, are presented in Table 10 and Figure 7. The table shows that there has been an increasing trend (Bcrit = 0.06, p = 0.99) in the proportion of MSW salmon in the catches over the period 1992-96. However, there was a reversal of the trend in 1997, with the proportion of MSW salmon being well below that in 1996 in all regions and below the 5-year average (1992-96) in all regions except the Midlands (River Severn) and the North East.

During the coming year, the catch data for nets and rods, for as many Regions as possible, will be analysed in more detail (as in Table 9 for 1997); this will provide a more reliable picture of long-term trends and enable more detailed examination of changes for individual catchments.

Table 10. The estimated percentage composition of grilse and MSW salmon in regional rod catches in England and Wales, 1992-97

Year	EA Region												All Regions	
	NE		Southern		SW		Mids.		Wales		NW			
	Grilse	MSW	Grilse	MSW	Grilse	MSW	Grilse	MSW	Grilse	MSW	Grilse	MSW	Grilse	MSW
1992	60	40	89	11	87	13	39	61	68	32	81	19	77	23
1993	57	43	85	15	82	18	43	57	80	20	84	16	78	22
1994	64	36	64	36	80	20	39	61	71	29	81	19	75	25
1995	54	46	77	23	69	31	15	85	65	35	83	17	70	30
1996	47	53	73	27	60	40	13	87	60	40	79	21	63	37
1997	**55**	**45**	**80**	**20**	**80**	**20**	**17**	**83**	**70**	**30**	**85**	**15**	**73**	**27**
Mean (1992-96)	56	44	78	22	76	24	30	70	69	31	82	18	73	27
% change (MSW only):														
1997 on 1996		-15.1		-25.9		-50.0		-4.6		-25.0		-28.6		-27.0
1997 on 5-year mean		+3.2		-10.7		-18.0		+18.2		-3.8		-18.5		0

The proportion of the catch taken by rod and net fisheries before June 1 also fell markedly in 1997 compared with 1996 (see below), providing further evidence of the low abundance of earlier running MSW salmon. The proportion of the catch taken before June 1 in 1997 was also below the average of the previous five years, and at the lower end of the range for the previous 10 years, for both rod and net fisheries. On average in recent years about 11% of the rod catch has been taken before June 1 compared with 6% of the net catch.

	% of catch before June 1	
	Rods	Nets
1988	8.1	6.1
1989	21.5	6.9
1990	16.1	10.2
1991	14.0	9.6
1992	9.4	7.4
1993	6.2	2.9
1994	10.5	7.3
1995	13.4	7.2
1996	15.4	8.9
1997	**10.2**	**4.9**
Average 1992-96	11.0	6.7

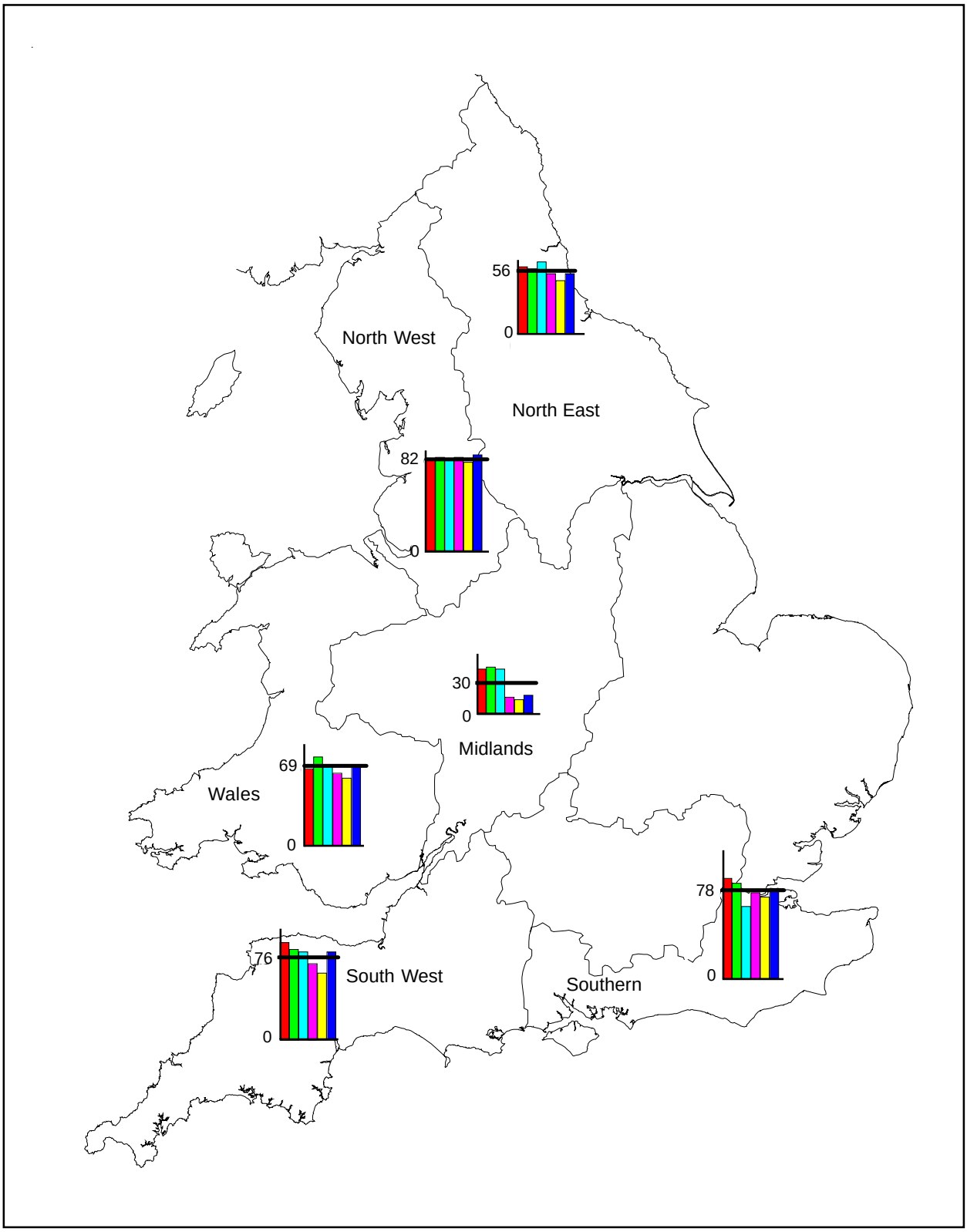


Figure 7. Estimated proportions of grilse in regional rod catches. The histograms display data for the six years 1992 to 1997, together with the five-year mean for the period 1992-1996 (displayed as a horizontal line, with the mean value indicated against the y-axis) for comparison purposes.

2.5 Origin of catches

There is currently no ranching and only one small salmon cage-rearing facility in England and Wales, and thus the contribution of farmed and ranched fish to the catches is thought to be negligible. In a number of catchments juvenile salmon are stocked from hatcheries for mitigation or enhancement purposes. Full details of the numbers and sizes of fish stocked in these programmes are included in the Salmonid and Freshwater Fisheries Statistics, published annually by the Agency. In most instances these fish cannot be distinguished on their return as adults from fish derived from natural spawning, although marking and tagging programmes are undertaken in some areas to assess the efficacy of these programmes (Annex 3).

Based upon studies conducted in the 1980s, approximately 80% of the salmon caught in the north east coastal fishery in England and Wales are estimated to be returning to rivers in Scotland; this represents ~17,500 fish in 1997. There are very few records of tagged salmon from other countries being taken in England and Wales.

2.6 Exploitation rates

2.6.1 Homewater exploitation

Exploitation rates have been estimated for fisheries on certain rivers in England and Wales for which reliable counts are available (Table 11 and Figure 8). The levels of exploitation in 1997 were well below average in all fisheries, and in most catchments were the lowest recorded over the years for which estimates are available. For the rod fisheries this may reflect the reductions in angling effort due to the perceived low abundance of fish and the increased use of catch and release. In addition, a smaller proportion of the returning fish may have been available to the fisheries during the 1997 fishing seasons. Although there is a general decreasing trend in the rod exploitation rates in these rivers over the past 10 years (Bcrit = -0.05, p = 0.98), no trend is apparent over the past 5 years.

Table 11. Estimated exploitation rates (%) for selected fisheries in England and Wales in 1997

	River	EA Region (river and fishery type)										
		North East	Southern			South West		Welsh		North West		
Year		Coquet rods	Test rods	Itchen rods	Itchen nets	Frome rods (a)	Tamar rods	Dee 1SW rods (b)	Dee MSW rods (b)	Leven rods	Lune rods	Lune nets
1988			39	33	-	9		-	-	-	-	-
1989			29	47	9	7		-	-	-	28	42
1990			36	47	20	10		-	-	-	43	34
1991			26	43	30	8		6 (d)	10 (d)	-	27	29
1992			25	29	(c)	9		14	18	-	42	28
1993			33	39		11		11	15	27	36	28
1994		14	32	39		13		15	21	28	35	33
1995		24	28	25		9		7	11	37	24	26
1996		22	23	36		13		9	11	45	22	23
1997		**19**	**14**	**14**		**7**	**7**	**8**	**9**	**26**	**25**	**27**
Mean (1992-96)		20	28	34		11		11	15	34	32	28
% change:												
1997 on 1996		-14	-40	-61		-46		-4	-18	-42	+14	+17
1997 on 5-yr mean		-5	-50	-58		-36		-26	-43	-24	-21	-2

Key: (a) Data based on IFE counter at Wareham, and supplied courtesy of IFE.
(b) Data derived from mark recapture experiment.
(c) Woodmill net fishery operated for scientific purposes only; all fish released alive.
(d) In-season not extant exploitation rate.

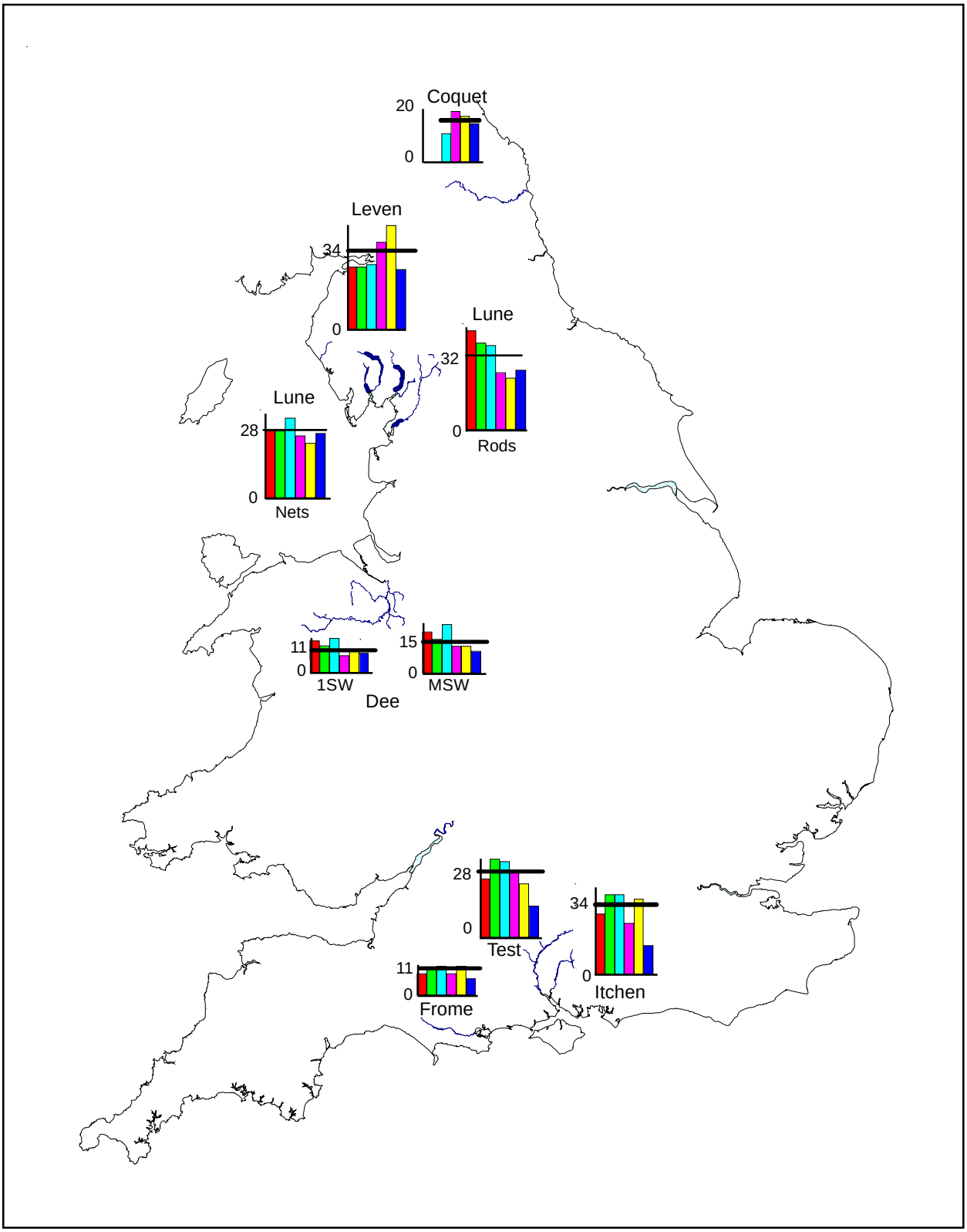


Figure 8. Exploitation rates (%) for selected rod fisheries (unless otherwise indicated) in England and Wales. The histograms display data for the six years 1992 to 1997, together with the five-year mean for the period 1992-1996 (displayed as a horizontal line, with the mean value indicated against the y-axis) for comparison purposes. Data for 1997 are provisional. Note also that estimates for the Dee have been split by age class (1SW and MSW), all other estimates are combined for all ages.

2.6.2 Exploitation in fisheries outside England and Wales

Salmon stocks in England and Wales are exploited in a number of fisheries other than those operating under the jurisdiction of the Agency within national waters. These include the distant water fisheries at Faroes and West Greenland, and other fisheries such as those operating off Ireland and in homewaters in other parts of the UK. Tagging studies have provided information on the levels of exploitation for English and Welsh stocks in many of these fisheries and this is summarised briefly below:

West Greenland

This fishery exploits only salmon that would have returned to Europe and North America as MSW fish. Prior to recent negotiated reductions in the quota for this fishery, the estimated exploitation rates on the MSW component of English and Welsh stocks was estimated to be in the region of 10 to 20%. However, following recent significant quota reductions, current levels of exploitation on MSW fish are likely to be low, possibly of the order of 2 to 3 %.

Faroes

The Faroes fishery exploits both 1SW and MSW salmon of largely northern European origin. Prior to the recent buy-out arrangements, few tags of English and Welsh origin were recovered in this fishery and estimated exploitation rates on English and Welsh stocks were very low (~1%). Currently, a buy-out arrangement is in place, with only a small research fishery operating, thus current levels of exploitation will be insignificant.

Ireland

Discussions are currently underway between scientists from CEFAS, the Agency and the Irish Marine Institute to agree estimates of exploitation in the Irish drift net fishery for selected English and Welsh stocks. Provisional data suggest that the levels of exploitation vary substantially between stocks in different regions and from year to year. Exploitation appears to be low (~1%) for stocks in the North East of England, higher (at around 5 to 10%) for rivers on the west coast and in Wales, but highest (perhaps 10 to 20%) for stocks from south coast rivers and possibly the South West.

Other homewater fisheries

Relatively small numbers of tags of English and Welsh origin have been recovered from homewater fisheries in Northern Ireland and Scotland. The exploitation rates in these fisheries have not been estimated but are thought to be low.

Marine by-catch

The potential catch of salmon post smolts in industrial fisheries, and particularly those for sandeels, has been a concern for some time. However, sampling of sandeel catches in Denmark and Scotland for over 40 years has failed to reveal a single smolt to date. More recent studies have suggested that post-smolts could be vulnerable to capture in surface trawls for mackerel in the Southern Norwegian Sea; efforts are being made to assess the possible extent of this by-catch, but there are no available data at the present time.

3. Status of stocks

3.1 Spawning targets

The Environment Agency are establishing stock reference levels for all rivers in England and Wales as part of a co-ordinated programme of Salmon Action Plans under the National Salmon Management Strategy. The term 'spawning escapement target' is used to describe this reference point, although the management objective is that spawning stocks should exceed this level; this is therefore consistent with the definition of a 'conservation limit' given by ICES (Anon., 1997(b)). The targets have been set using a nationally agreed methodology (Environment Agency, 1998) based on data from the River Bush (Northern Ireland); they have been derived from a composite stock-recruitment curve, weighted by the occurrence of basic habitat categories (different altitude and stream order classes) (Wyatt and Barnard, 1997). This provides different egg deposition rates per $100m^2$ for each river, and these are multiplied by the accessible wetted area of the river to provide egg deposition requirements. These figures are converted to adult numbers to provide a spawner escapement target; details of these targets are included in Table 12.

The Agency has also developed compliance criteria for these targets based on egg deposition estimates in 3 consecutive years. The extent to which spawning targets were met in 1997 are expressed as percentages in Table 12 and Figure 9, however these data must be treated with caution because most of the targets and compliance parameter estimates are provisional and because full compliance assessment will be based upon more than one year's data.

Figure 9 indicates wide variation in the levels to which spawning targets were met in 1997. There are few obvious regional trends, although spawning escapement tended to be below target levels in the rivers in South Wales and in the majority of the south coast chalkstream catchments (with the exception of the Frome). A number of rivers, such as the rivers Wear and Tees in the North East, and some catchments in South Wales are being restored from previous polluted conditions and may require interim rebuilding targets to be set.

The provisional nature of the targets should be noted. Many rivers, and particularly some of the smaller catchments on the west coast of Wales, support relatively small salmon stocks and are principally regarded as sea trout rivers. Currently, the Salmon Action Plan guidelines do not take account of this, and targets for such rivers may need to be refined in the future.

Table 12. Spawning targets and % of target attained in 1997 for the principal salmon rivers of England and Wales (all results are provisional)

River	Accessible wetted area hectares	Spawning target eggs / $100m^2$	Spawning target eggs (millions)	Egg deposition (millions)			
				Grilse	MSW	Total	% Target
** Coquet	144	316	4.5	-	-	6.9	153
Tyne	294	418	12.3	9.0	13.1	22.1	180
* Wear	226	330	7.4	1.7	1.3	3.0	40
Tees	319	302	9.6	0.4	0.4	0.8	8
Esk-Yorks	27	468	1.3	0.3	0.3	0.6	47
NE Region			**35.2**			**33.4**	**95**
Thames	-	-	0.0	-	-	-	-
** Test	80	425	3.4	-	-	0.8	23
* Itchen	70	234	1.6	-	-	0.5	31
S Region			**5.0**			**1.3**	**26**

Table 12. continued - Spawning targets and % of target attained in 1997

River	Accessible wetted area hectares	Spawning target eggs / 100m²	Spawning target eggs (millions)	Egg deposition (millions)			
				Grilse	MSW	Total	% Target
** Avon-Hants	360	237	8.5	3.6	1.2	4.9	57
Stour	-	-	-	-	-	-	-
Piddle	25	194	0.5	0.1	0	0.1	20
* Frome	90	235	2.1	1.5	0.7	2.2	105
Axe	-	-	-	-	-	-	-
Exe	205	343	7.0	8.8	2.1	10.9	155
* Teign	98	315	3.1	1.6	0.2	1.7	57
* Dart	132	297	3.9	1.4	0.3	1.7	44
Avon-Devon	18	294	0.5	0.3	0	0.3	57
Erme				-	-	-	-
Yealm	-	-	-	-	-	-	-
Plym	17	436	0.8	0.4	0	0.4	53
Tavy	23	312	0.7	0.9	0.1	1.0	142
** Tamar	197	293	5.8	1.9	1.1	2.9	50
* Lynher	28	266	0.7	0.6	0	0.6	81
Looe	13	207	0.3	-	-	-	-
Fowey	34	430	1.5	1.1	0.1	1.2	82
Camel	37	338	1.2	2.2	0.2	2.4	194
Taw	174	323	5.6	2.4	1.3	3.7	66
** Torridge	150	291	4.4	0.4	0.5	0.9	21
Lyn	27	556	1.5	1.6	0.7	2.3	154
SW Region			**48.1**			**37.2**	**77**
** Severn	898	190	17.1	1.1	8.8	9.9	58
** Wye	1653	281	46.4	1.6	8.5	10.1	22
Usk	242	423	10.2	4.5	3.1	7.6	74
Taff	72	436	3.1	0.2	0	0.2	6
Ogmore	35	253	0.9	0.9	0.1	1.0	115
Afan	17	450	0.8	0.1	0.1	0.2	26
Neath	37	419	1.6	0.3	0	0.3	19
Tawe	45	379	1.7	0.9	0.1	1.0	59
Loughor	35	289	1.0	0.1	0	0.1	10
Gwendraeth	-	-	-	-	-	-	-
Tywi	278	377	10.5	2.3	1.4	3.7	35
Taf	88	276	2.4	0.7	0.2	0.9	37
E&W Cleddau	122	402	4.9	0.6	0.1	0.7	14
Nevern	-	-	-	-	-	-	-
** Teifi	296	413	12.2	7.5	3.3	10.8	88
Aeron	35	417	1.4	0.1	0	0.1	7
Ystwyth	46	397	1.8	0.5	0.1	0.6	33
Rheidol	50	426	2.1	0.5	0.1	0.6	28
* Dyfi	179	311	5.6	1.5	0.2	1.7	31
Dysinni	45	287	1.3	0.1	0	0.1	8
** Mawddach	57	312	1.8	1.2	0.2	1.4	79
Artro	9	423	0.4	0.1	0.0	0.1	19
* Dwyryd	9	246	0.2	0.2	0	0.2	88
* Glaslyn	25	242	0.6	0.6	0.1	0.7	116
* Dwyfawr	33	322	1.1	0.2	0.1	0.3	28
Llyfni	-	-	-	-	-	-	-
Gwyrfai	11	372	0.4	0.0	0	0.0	10
* Seiont	21	288	0.6	0.3	0	0.3	50
* Ogwen	24	449	1.1	0.9	0.1	1.0	93
* Conwy	50	171	0.86	0.6	0.1	0.7	82
* Clwyd	84	312	2.6	0.3	0	0.3	12
** Dee	620	248	15.3	9.1	4.6	13.7	90
Welsh Region			**132.9**			**58.4**	**44**
Ribble	158	413	6.5	2.7	0.8	3.5	54
Wyre	46	264	1.2	0.1	0	0.1	8
** Lune	423	327	13.8	-	-	6.0	43
Kent	42	399	1.7	2.6	0.3	2.9	172
** Leven	46	249	1.1	0.4	0	0.4	35
** Crake	-	-	-	-	-	-	-
Duddon	11	402	0.4	0.2	0	0.2	45
Esk	14	401	0.6	0.3	0	0.3	54
Irt	20	317	0.6	0.6	0	0.6	96
Ehen	32	335	1.1	1.0	0.1	1.1	102
Derwent	135	369	5.0	6.2	1.2	7.4	148
Ellen	17	322	0.5	0.0	0	0.0	7
** Eden	437	464	20.3	8.7	4.3	13.0	64
Esk-Border	144	440	6.3	9.0	1.8	10.8	171
NW Region			**59.2**			**46.3**	**78**
Total			**297.5**			**186.5**	**63**

** *Refined target identified in Final Salmon Action Plans*
* *Refined target identified in Draft Salmon Action Plans*
Remaining targets are provisional only and require refinement through river specific inputs

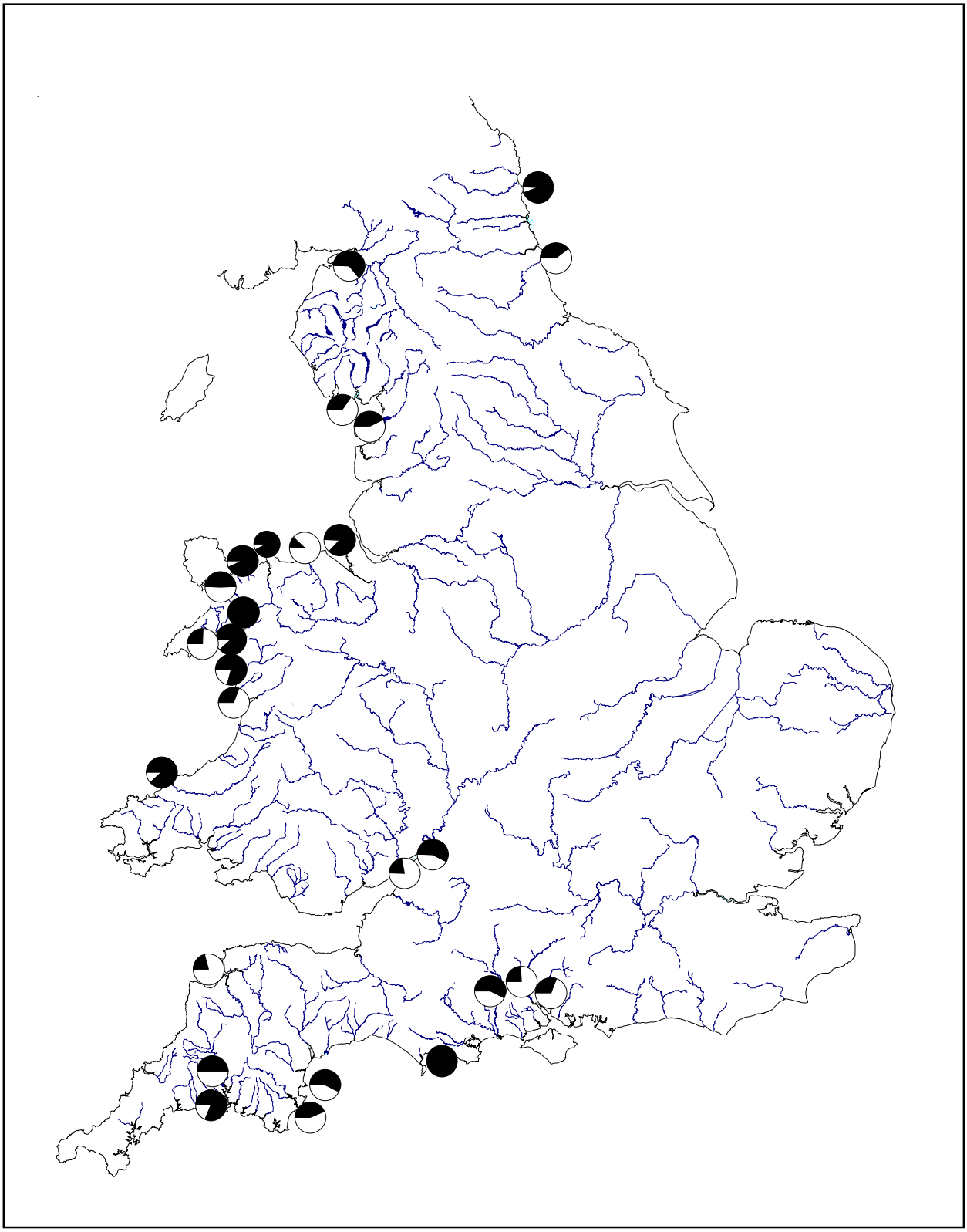


Figure 9. Pie charts for individual rivers for which refined targets have been set (marked * or ** in Table 12) showing the % of the spawning targets attained in 1997. A black circle indicates that the target was met or exceeded.

Table 13. Available time-series of data indicating estimated egg deposition and fraction of target attained

EA Region	River	Year	Eggs (millions)			Target attainment:
			1SW	MSW	Total	Eggs/Target
North East	Coquet			**Target**	**4.54**	
		1994			4.88	1.08
		1995			4.24	0.93
		1996			4.96	1.09
		1997			6.94	1.53
Southern	Test			**Target**	**3.40**	
		1989			3.04	0.89
		1990			1.24	0.36
		1991			1.00	0.29
		1992			1.16	0.34
		1993			2.13	0.63
		1994			1.37	0.40
		1995			1.08	0.32
		1996			1.19	0.35
		1997			0.77	0.23
Southern	Itchen			**Target**	**1.63**	
		1988			1.15	0.71
		1989			0.86	0.53
		1990			0.35	0.21
		1991			0.20	0.12
		1992			0.62	0.38
		1993			1.29	0.79
		1994			0.56	0.34
		1995			1.64	1.01
		1996			0.68	0.42
		1997			0.50	0.31
South West	Frome			**Target**	**2.10**	
		1987	5.61	5.27	10.88	5.18
		1988	7.22	5.85	13.07	6.22
		1989	5.24	4.21	9.45	4.50
		1990	3.24	2.53	5.77	2.75
		1991	1.06	1.28	2.34	1.11
		1992	1.45	1.23	2.68	1.28
		1993	1.94	1.48	3.42	1.63
		1994	1.59	1.46	3.05	1.45
		1995	1.59	1.51	3.10	1.48
		1996	2.19	1.66	3.85	1.83
		1997	**1.50**	**0.70**	**2.20**	**1.05**
Welsh	Dee			**Target**	**15.30**	
		1992	5.86	5.38	11.24	0.73
		1993	15.15	8.74	23.89	1.56
		1994	7.08	4.72	11.80	0.77
		1995	7.74	6.90	14.64	0.96
		1996	7.06	5.91	12.97	0.85
		1997	9.08	4.11	13.74	0.90
North West	Lune			**Target**	**13.80**	
		1989			9.30	0.67
		1990			7.80	0.57
		1991			10.00	0.72
		1992			5.90	0.43
		1993			12.60	0.91
		1994			10.10	0.73
		1995			8.80	0.64
		1996			9.20	0.67
		1997			6.00	0.43

There are relatively few rivers in England and Wales for which percentage spawning levels have been estimated for a series of years. The available data are summarised in Table 13; this includes information for the River Coquet (North East), Rivers Test and Itchen (Southern), River Frome (South West), River Dee (North Wales) and River Lune (North West). These data do not suggest a consistent national trend, although for most rivers the % compliance in 1997 is towards the bottom of the range for the period for which data are available, and for three rivers (Test, Frome, and Lune) is the lowest value in the series. This is in broad agreement with the low catches and below average stock sizes recorded in many Regions in 1997. By contrast, however, the % compliance for the Coquet in 1997 is the highest in the series; reflecting the above average catches and runs of fish on this river.

3.2 Measures of abundance/escapement

Various salmonid stock monitoring programmes are conducted on rivers in England and Wales. These include: counts of returning adults (counters and traps), smolt run estimates, juvenile surveys and redd counts. There are no good time-series of juvenile production estimates for rivers in England and Wales, and this is recognised as a cause for concern which needs to be addressed. Selected reliable and comparable time series of data, which can be used to assess trends in stocks, are included in Table 14.

Electronic fish counters are operated on an increasing number of catchments in England and Wales, and three new acoustic counters have recently been installed on the rivers Tavy, Wye and Teifi. However, some of these newer counters are still being validated, and some other counters, previously in use for a number of years, have become unreliable and have been decommissioned. Where possible, the counter data have been adjusted to provide estimates of the returning stock. Time-series of counts, or returning stock estimates, are presented in Figure 10.

In most instances, the measures of stock abundance were lower in 1997 than the previous five year averages (1992-96). This further confirms the indications from the catch data that salmon stock abundance in England and Wales was very low in 1997. The counts in Table 14 also show signifiant downward trends on southern rivers (Tamar, Frome, Test and Itchen) over the past 5 years (Bcrit = -0.23 , p = 0.99) and 10 years (Bcrit = -0.23, p > 0.99). The counts on the rivers in the north and west (Lune, Levern, Calder, Dee and Taff) show no significant common trends over these periods.

Although salmon have been returning to some historically polluted urban rivers (e.g. Tyne, Taff, Thames), there is concern about the degradation of many rural rivers. Changing land use has had a range of effects on river habitats which are limiting their capacity to support young salmon. For example, in some areas, it is believed that modern agricultural practices have caused siltation of the river bed and this prevents salmon eggs, which are laid in the gravel, from developing. Acidification, pesticides and changes in river flows are also concerns.

3.3 Survival indices

No data are available to evaluate long-term trends in marine survival for stocks in England and Wales at the current time. However, evidence from elsewhere in UK and Ireland suggests marine survival of salmon is currently low.

4. Microtag, fin clip and external tag releases

Details of all marking and tagging of salmon undertaken in England and Wales in 1997 are included at Annex 1.

Table 14. Available information on status of regional salmon stocks

Stage:	Smolts		Adults															
Region:	NE	S	NE	Thames	Southern					SW		Wales		NW				
River:	Wear	Test	Coquet	Thames	Test			Itchen		Frome	Tamar	Dee	Taff	Lune		Kent	Leven	Calder
Method:	Run estimate		RSE[1]	T	C (1)	C (2)	RSE[1]	C	RSE[1]	C	C	RSE[2]	T	C(>4lb)	RSE[1]	C(>4lb)	C(>4lb)	C(>4lb)
1988	63426						1507		1336	4093								
1989	52894			91	766	535	1730	556	791	3186				4985 *	4605	1137		
1990	28282			63	219	315	790	262	367	1880				5520	4437	2216		
1991	19959			27	175	241	538	145	152	805				5322	5970	1736	667 *	
1992	36690	11967		246	251	239	614	305	357	900		4643	161	4489	7586	1816	394	
1993	-	7131		264	584	319	1249	646	852	1182		9757	460	8294	3916	1526	469	
1994	55259	3381	2254	143	512	98	775	311	374	1078	6343	5285	409	8525 *	5277	2072	562	
1995	40576	6853	2508	167	335	144	647	798	880	1016	5623	5703	319	4994	5311	2762	329	379
1996	15338	4712	2509	122	214	283	623	389	437	1353	3975	4931	128	6520	4931	3246	387	212
1997	**-**	**7229**	**3913**	**29**	**178**	**138**	**361**	**232**	**246**	**1157**	**2813**	**5496**	**125**	**9137**	**3121**	**1473**	**233**	**224**
Mean (1992-96)	36966	6809	2424	188	379	217	782	490	580	1106	5314	6064	295	6564	5404	2284	428	296

Key to methods: *T = adult trap*
C = adult salmon count
C(>4lb) = Adult count (fish greater than 4 lb in weight)
RSE[1] = returning stock estimate (validated count + catch below counter)
RSE[2] = returning stock estimate (mark/recapture estimate)

* *Denotes incomplete record.*

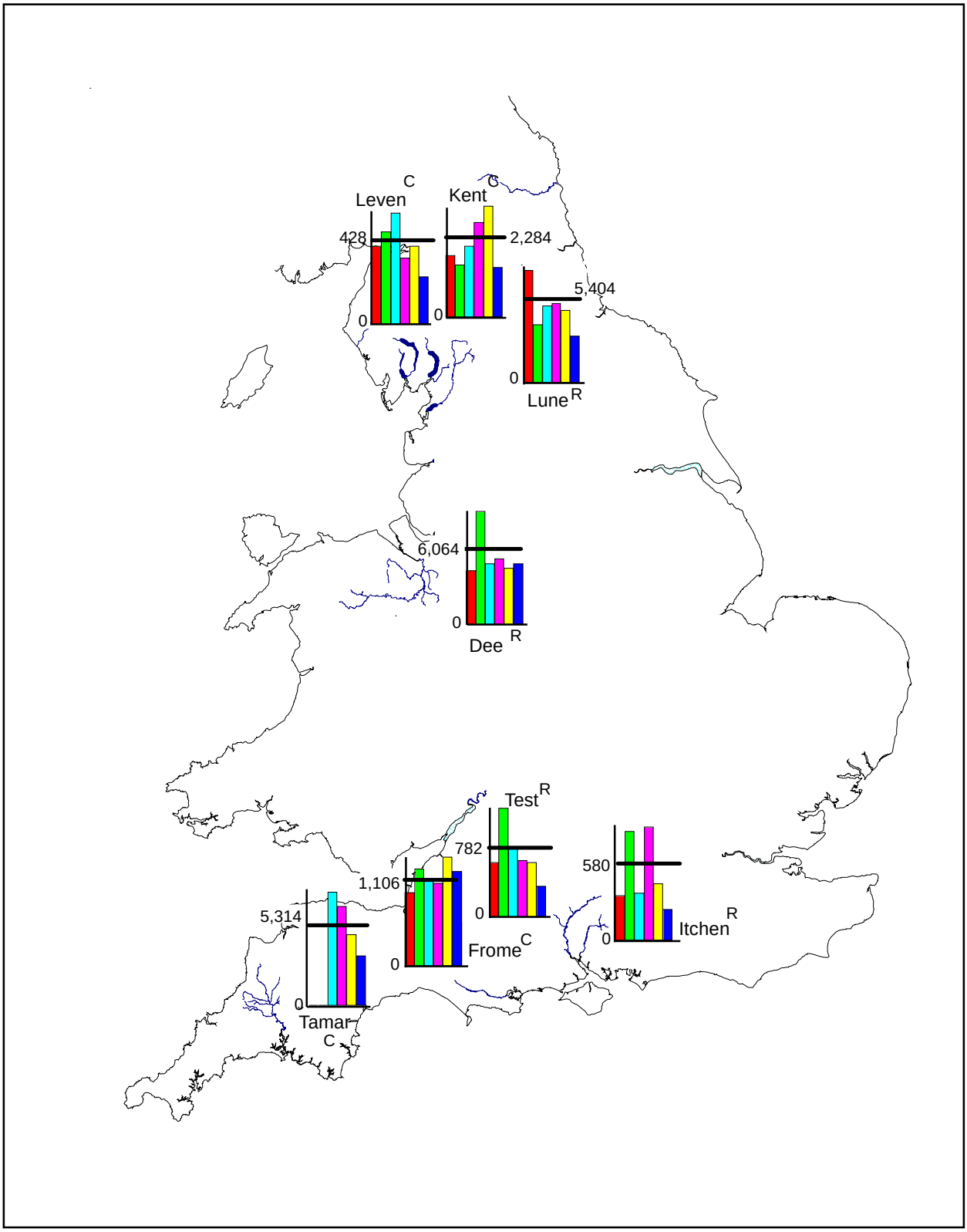


Figure 10. Counts (C) and returning stock estimates (R) for selected salmon stocks in England and Wales. The histograms display data for the six years 1992 to 1997, together with the five-year mean for the period 1992-1996 (displayed as a horizontal line, with the mean value indicated against the y-axis) for comparison purposes. Note that the histograms are not drawn to the same scale. Data for 1997 are provisional.

5. References

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NATIONAL OVERVIEW

Rod and net catches of salmon were very low in most Regions of England and Wales in 1997, with the exception of the North East Region rod fishery. The total declared catch is provisionally estimated at 154.6 t (78% of that in 1996), comprising 103.8 t by nets and fixed engines and 50.8 t by rods. The total net and rod catches were 39% and 41% below the five year averages respectively, and were also both the lowest recorded over this period. Rod catches of both grilse and multi-sea-winter salmon have fallen in 1997. In general, 1997 was a fairly wet year throughout England and Wales; this may have reduced the availability of fish to some net fisheries, but angling conditions were considered to be not unfavourable for much of the season. Thus the declines reflect both reduced fishing effort and low numbers of returning fish.

There have been further reductions in the netting and angling effort for salmon in 1997 as a result of fishing regulation, economic factors and the perceived low abundance of fish. The number of licences issued for nets and fixed engines has continued to decline; five coastal mixed stock fisheries are now being phased out; and netsmen on five rivers in south-west England are being compensated not to fish at the start of the season as an alternative to mitigation stocking schemes. Controls on various rod fisheries are aimed primarily at reducing levels of exploitation of earlier running multi-sea-winter fish. Exploitation rates in nine monitored fisheries in England and Wales in 1997 were all well below the five year averages, and in many instances were the lowest values recorded. This may reflect, in part, reduced fishing effort and the increased use of catch and release, which accounted for 24% of the rod catch in 1997.

The Environment Agency has set spawning targets for all rivers in England and Wales, although the majority of these are still provisional. Compliance with these targets is assessed over a series of years and so a single year's data must be viewed with caution. However, the data suggest that the spawning escapement was above the targets levels in 13 rivers (20%) in 1997; between 50% and 100% of the targets in 22 rivers (34%) and less than 50% of the target in 30 rivers (46%). Data from counters and traps in England and Wales show no common trends in the runs for the rivers in the north and west but a significant downward trend for rivers in the south over the past 5 and 10 years. It is therefore apparent that many salmon stocks in England and Wales are in a seriously depleted state.

ANNEX 1. NASCO's request for scientific advice from ICES (CNL(97)50)

1 With respect to Atlantic salmon in the North Atlantic area:

- 1.1 provide an overview of salmon catches, including unreported catches and catch and release, and worldwide production of farmed and ranched salmon in 1997;
- 1.2 report on significant developments which might assist NASCO with the management of salmon stocks;
- 1.3 provide any new information on the causes of changes in abundance of salmon;
- 1.4 comment and advise on the Report of the NASCO Working Group on the Precautionary Approach, as it relates to the work of ICES;
- 1.5 provide a compilation of microtag, finclip and external tag releases by ICES Member Countries in 1997.

2 With respect to Atlantic salmon in the North-East Atlantic Commission area:

- 2.1 describe the events of the 1997 fisheries and the status of the stocks;
- 2.2 update the evaluation of the effects on stocks and homewater fisheries of the suspension of commercial fishing activity at Faroes since 1991;
- 2.3 provide age specific stock conservation limits for all stocks occurring in the Commission area based on best available information;
- 2.4 estimate the expected abundance of salmon in the North-East Atlantic for 1998/1999;
- 2.5 provide catch options with an assessment of risks relative to the objective of exceeding stock conservation limits;
- 2.6 evaluate any new information on the potential by-catch of post-smolts in pelagic fisheries;
- 2.7 identify relevant data deficiencies and research requirements.

3 With respect to Atlantic salmon in the North American Commission area:

- 3.1 describe the events of the 1997 fisheries and the status of the stocks;
- 3.2 update the evaluation of the effects on US and Canadian stocks and fisheries of management measures implemented after 1991 in the Canadian commercial salmon fisheries;
- 3.3 update age-specific stock conservation limits based on new information as available;
- 3.4 provide catch options with an assessment of risks relative to the objective of exceeding stock conservation limits;
- 3.5 identify relevant data deficiencies and research requirements.

4 With respect to Atlantic salmon in the West Greenland Commission area:

- 4.1 describe the events of the 1997 fisheries and the status of the stocks;
- 4.2 evaluate the impact of the Reserve Quota at West Greenland on salmon stocks in relation to the goal of exceeding stock conservation limits (spawning targets);
- 4.3 provide a detailed explanation of any changes to the model used to provide catch advice and of the impacts of any changes to the model on the calculated quota;
- 4.4 provide age specific stock conservation limits (spawning targets) for all stocks occurring in the Commission area based on the best available information;
- 4.5 examine critically the model used to provide catch advice, looking at all the assumptions, and comment on the confidence limits on the output from the model;
- 4.6 provide catch options with an assessment of risks relative to the objective of exceeding stock conservation limits (spawning targets);
- 4.7 identify relevant data deficiencies and research requirements.

ANNEX 2. Glossary of fishing methods (nets and fixed engines) used for taking salmon and migratory trout in England and Wales.

A wide variety of nets and fixed engines are used to take salmon and sea trout. The term fixed engine is an ancient one used to describe a variety of stationary fishing gears. However, it should be noted that the following are generalised descriptions (for further details see Russell et al., 1995); in practice there is considerable regional variation in the precise mode of operation of specific gears and in the dimensions and mesh sizes of the nets. These criteria have generally evolved to suit local conditions and are regulated by local Byelaws.

Basket trap This is a type of fixed engine which is only used on the river Conwy in North Wales. It consists of a metal basket set between two boulders, which is designed to catch salmon and sea trout which fall back when attempting to ascend a small waterfall.

Coastal net A loose term used to describe the nets used in the fishery off the East Anglian coast. In practice, various methods of fishing have been employed, including seine nets, drift nets and nets pulled along the coast close to the shore (known locally as long-shoring).

Compass net These nets are operated from boats held stationary against the current. A net is hung between two long poles lashed together in a V-shape and held over the side of the boat so that the net streams out underneath the boat. When a fish strikes the net, the poles are pivoted upwards with the aid of counter-balancing weights. Similar nets were known as **stop** nets on the Wye and Severn (no longer in operation).

Coracle net These nets are only used in parts of Wales. Short lengths of trammel net are suspended between two coracles (small boats), which then drift downstream with the net strung across the current.

Crib (or Coop) These ancient fixed engines have been little used in England and Wales. They consist of stone buttresses set across a river, the gaps between the buttresses being filled by box-like traps made of either wood or metal with in-scale entrances. The river Eden cribs were built in 1133 A.D. by monks, although the Derwent cribs are of more recent construction.

Drift net The drift net consists of a sheet of netting which hangs from a floated head rope to a weighted foot rope and is designed to drift with the current or tide. Regional names include: **hang**, **whammel**, **sling** and **tuck** nets.

Fishing baulk This gear is another ancient fixed engine which has been used in the North West region only. It consists of two large, woven (traditionally wattle) fences supported on wooden stakes which are constructed in an estuary in the form of a right-angle. As the tide innundates the structure fish are able to move in via a hinged section, but as the tide ebbs and the water recedes, the fish are left stranded. the fishing baulk situated on the river Esk at Ravenglass is known locally as a garth. A similar **fish trap** operates at the mouth of the River Lyn in South West England.

Haaf or heave net These one-man-operated nets are operated exclusively in the North West region. The gear consists of a rectangular net hung from a horizontal wooden beam up to 5.5m wide. A central pole permits the netsmen to stand in the tideway holding the net facing the current with the netting streaming behind him. The net is lifted when a fish strikes the net. It is usual for several netsmen to work together line-abreast.

J-net (or P-net) The name sometimes used for the method of operating a drift net as a semi-fixed beach net, the nets being weighted to retard their drift. Set at right-angles to the beach, often with the end furthest from the shore turned back to form a hook.

Lave (or dip) net A variety of regional terms have been used to describe similar hand-held, one-man-operated nets, these include **stand**, **bow**, **click** and **topping** nets. Lave nets consist of a large Y-shaped wooden frame supporting a net, similar in design to an anglers landing net, but measuring up to 2m across. The netsman actively stalks fish in estuary pools or shallows at low tide.

Putts and Putchers Putts and putchers are wickerwork conical baskets which, when erected on stages, form putcher ranks (containing up to 800 putchers). This type of fixed engine is peculiar to the Bristol Channel and is dependent upon the high turbidity and large tidal range which occurs in this area. Each putcher has a mouth from 3 to 5 feet wide, tapering to a narrow point which will prevent fish of moderate size from passing through. Putts are larger and more closely woven conical baskets, which are less efficient for catching salmon, but will take smaller fish, shrimps and eels. Relatively few putts are used. A netting leader is often used also.

Seine net The seine net (also known as the **draft** or **draw** net) consists of a wall of netting with a weighted foot rope and floated head rope. One end is held on the shore while the rest is paid out from a boat to enclose an area of water between two points on the shore. The net is then retrieved and any fish enclosed drawn up onto the shore. Seine nets normally operate within estuaries, although some are also fished off coastal beaches.

Sling net The sling net is a type of drift net used exclusively on the river Clwyd in North Wales. The sling net differs from other drift nets only in so far as the nets are permitted to carry weights (not exceeding 9 lbs) at either end, designed to retard the drift.

T-net T-nets are fixed engines operated close to the shore. They comprise a ‘leader’, usually about 200 m in length, stretching out from the beach to a ‘headpiece’, which contains two traps with funnel entrances. Some fish may become enmeshed or entangled in the leader of the net, but the majority are taken, free-swimming, in the traps. T-nets are normally fished in specific berths.

‘T or J’-net ‘T or J’-nets are fixed engines operated close to the shore. The nets consist of plain sheets of netting on a floated head rope which hang vertically in the water by means of a weighted foot rope. These are held stationary by means of weights, anchors or stakes and are set from the shore usually in the shape of a ‘J’ or ‘P’. Fish can only be caught in a ‘T or ‘J’ net by becoming enmeshed or entangled in the walls of the net.

Trammel net Trammel nets are similar to drift nets but are modified by the addition of sheets of larger mesh netting on one or both sides of the net. Such nets are referred to as being ‘armoured’. A fish striking a trammel net pushes the small mesh net through one of the large meshes in the adjoining net and is caught in the resultant pocket. Sometimes known locally as **Tuck** nets.

Wade net A wade net consists of a short (~30 m) single sheet of netting which is attached to a pole at each end, and is pulled along the foreshore parallel to the beach by two men, one wading and the other on the beach. Nets are ‘beached’ at regular intervals, or when a fish strikes, in much the same way as a seine net.

ANNEX 1. ICES Compilation of microtag, fin clip and external tag releases

Marking Season: 1997
Country: UK (England & Wales)

Marking Agency	Age	Life Stage	H/W	Stock Origin	Tag Type or Mark	Number Marked	Code or Serial No.	Auxillary Clips/Marks	Release Date	Place of Release
EA North East	1+	Parr	H	Tyne	Microtag	7,564	20/42/06	Adipose	27-Jan-97	R.N.Tyne
EA North East	1+	Parr	H	Tyne	Microtag	7,538	20/42/07	Adipose	27-Jan-97	R.N.Tyne
EA North East	1+	Parr	H	Tyne	Microtag	7,544	20/42/05	Adipose	29-Apr-97	R.N.Tyne
EA North East	1+	Parr	H	Tyne	Microtag	7,538	20/42/10	Adipose	29-Jan-97	R.Rede
EA North East	1+	Parr	H	Tyne	Microtag	7,770	20/42/11	Adipose	29-Jan-97	R.Rede
EA North East	1+	Parr	H	Tyne	Microtag	7,560	20/42/08	Adipose	29-Jan-97	R.S.Tyne
EA North East	1+	Parr	H	Tyne	Microtag	7,581	20/42/09	Adipose	29-Jan-97	R.S.Tyne
EA Thames	1+	Smolt	H	Shannon	Microtag	9,866	23/42/06	Adipose	21-Mar-97	R.Thames
EA Thames	1+	Smolt	H	Shannon	Microtag	10,027	23/42/08	Adipose	21-Mar-97	R.Thames
EA Thames	1+	Smolt	H	Shannon	Microtag	10,043	23/42/07	Adipose	27-Mar-97	R.Thames
EA Thames	1+	Smolt	H	Shannon	Microtag	10,089	23/42/09	Adipose	27-Mar-97	R.Thames
EA Thames	1+	Smolt	H	Shannon	None	25,427		Adipose	17to24-Mar-97	R.Thames
EA Thames	Var	Adult	W	Thames	Floy	27	4454-4679	None	Var	R.Thames
EA Southern	Var	Adult	W	Test	Floy	4	106-109	None	Var	R.Test
EA Southern	0+	Parr	H	Test	None	194,500		Adipose	Jul-Nov 97	R.Test
CEFAS/EA Southern	Var	Smolt	W	Test	Microtag	2,987	01/42/17	Adipose	April/May 97	R.Test
EA South West	1+	Parr	H	Avon	Microtag	1,200	01/42/05	Adipose	Mar-97	R.Avon
EA Midland	1+	Parr	H	Tanat	Microtag	6,429	23/42/14	Adipose	28-May-97	R.Tanat
EA Midland	1+	Parr	H	Severn	Microtag	5,396	19/42/09	Adipose	30-Jun-97	R.Severn
EA Midland	1+	Parr	H	Severn	Microtag	1,130	19/42/17	Adipose	30-Jun-97	R.Severn
EA Midland	1+	Smolt	H	Severn	Microtag	2,382	21/42/53	Adipose	04-Mar-97	R.Severn
EA Midland	1+	Parr	H	Teme	Microtag	6,789	20/42/34	Adipose	22-May-97	R.Teme
EA Midland	1+	Smolt	H	Teme	Microtag	1,815	21/42/18	Adipose	25-Feb-97	R.Teme
EA Midland	1+	Smolt	H	Tanat	Microtag	1,391	21/42/20	Adipose	24-Feb-97	R.Tanat
EA Welsh	Var	Adult	W	Dee	Floy	1,240	3144-4388	None	Var	R.Dee
EA Welsh	1+	Smolt	H	Dee	Microtag	4,676	23/42/05	Adipose	04-Mar-97	R.Alwen
EA Welsh	1+	Smolt	H	Dee	Microtag	2,594	19/42/59	Adipose	03-Mar-97	R.Tryweryn
EA Welsh	1+	Parr	H	Dee	Microtag	6,907	20/42/32	Adipose	20-May-97	R.Alwen
EA Welsh	1+	Parr	H	Dee	Microtag	4,302	23/42/15	Adipose	05-Jun-97	R.Tryweryn
EA Welsh	1+	Parr	H	Dee	Microtag	1,163	20/42/32	Adipose	09-Jul-97	R.Alwen
EA Welsh	1+	Parr	H	Dee	Microtag	610	17/42/12	Adipose	09-Jul-97	R.Alwen
EA Welsh	1+	Parr	H	Dee	Microtag	913	21/42/09	Adipose	10-Jul-97	R.Alwen
EA Welsh	Var	Smolt	W	Dee	Microtag	1,812	21/42/51	Adipose	April/May 97	R.Dee
EA Welsh	2+	Smolt	H	Taff	Microtag	9,555	18/42/63	Adipose	05-Apr-97	R.Taff
EA Welsh	Var	Adult	W	Taff	Floy	260	G3440-G3700	None	Var	R.Taff
EA Welsh	Var	Adult	W	Taff	Floy	42	O1087-O1099 + 30 Var	None	Var	R.Taff
EA Welsh	Var	Adult	W	Var	Floy	180		None	Var	R.Taff
EA North West	1+	Parr	H	Eden	Microtag	11,000	01/42/??	Adipose	?	R.Caldew
EA North West	1+	Parr	H	Derwent	Microtag	5,500	01/42/??	Adipose	?	R.Derwent
EA North West	Var	Smolt	W	Kent	Microtag	486	20/42/58	Adipose	?	R.Kent
CEFAS/EA North West	1+	Parr	H	Lune	Microtag	7,134	01/42/20	Adipose	Apr-97	R.Wyre

Totals	Hatchery	Wild
Microtags	173,980	5,285
External tags	0	1,753
Fin clips	219,927	0
Other clips/marks	0	0