SALMON STOCKS AND FISHERIES IN ENGLAND AND WALES, 2000

Preliminary assessment prepared for ICES, April 2001

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CONTENTS Page

FOREWORD

This is the fourth annual report on the state of salmon stocks in England and Wales prepared by the Centre for Environment, Fisheries and Aquaculture Science (CEFAS) and the National Salmon and Trout Fisheries Centre (NSTFC) of the Environment Agency. Each annual report is designed to stand alone so that the reader does not need to refer back to previous reports for background information. This means that much of the descriptive information in this report is the same as previous years.

The main purposes of the report are to provide early feedback to managers and fishermen on the status of stocks and fisheries in England and Wales and to supply this information to the International Council for the Exploration of the Seas (ICES). The information submitted to ICES is used, in turn, to provide advice to the North Atlantic Salmon Conservation Organisation (NASCO). The objectives of NASCO are to contribute to *'the conservation, restoration, enhancement and rational management of salmon stocks*'. In particular, they are responsible for negotiating the quotas for the salmon fisheries at West Greenland and Faroes (Annex 1 gives further information on NASCO and ICES).

The full list of information requested by NASCO from ICES for its annual meeting in 2001 is given at Annex 2. However, for this report, the pertinent requests relating to events in 2000 are to:

> *provide an overview of salmon catches and landings, including unreported catches by country, and catch and release, and production of farmed and ranched salmon;*
>
> *describe the events of the 2000 fisheries and the status of the stocks;*
>
> *evaluate the effects of significant management measures introduced since 1991;*
>
> *provide age specific stock conservation limits for all stocks;*
>
> *evaluate non-catch fishing mortality for all salmon gear; and*
>
> *provide a compilation of tag releases.*

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*. These headings have therefore been used in the appropriate sections of the report.

It must be noted that much of the data relating to 2000 are provisional and will not be finalised until complete catch data are obtained and records can be fully validated. Final data will be published in the Agency's annual publication of the Salmonid and Freshwater Fisheries Statistics and their annual Salmon Action Plan progress reports (Annex 3), which will be published later in the year.

EXECUTIVE SUMMARY

- This report presents a preliminary assessment of the state of salmon stocks and fisheries in England and Wales in 2000 to assist ICES in providing scientific advice to NASCO and to provide early feedback to fishery managers. (Foreword)

- The declared salmon catch for 2000 (including released fish) is provisionally estimated to be 243.8 t, comprising 178.1 t by nets and fixed engines and 65.7 t by rods. The total retained catch (excluding released fish) was 215.9 t, of which 37.9 t was by rods. (Section 2.1.1)

- The number of licences issued for nets and fixed engines fell by a further 11% in 2000, although the number of days fished by netsmen increased compared with 1999 in the North East Region. The total number of licences issued has fallen by 50% since 1990. (Section 1.2.1 and 1.2.3)

- The declared net catch, which is dominated by the North East Region, was 49% higher than that in 1999, and was also above the previous 5yr mean. (Section 2.1.1)

- The declared catch per unit of fishing effort (CPUE) for net fisheries was well above the previous 5yr mean in all Regions except Wales; CPUE for the NE Region was the highest recorded value in the series (since 1988) suggesting in-season availability of fish was particularly high providing reporting rates have not changed. (Section 2.2.1)

- The number of salmon rod licences issued in 2000 was very similar to that in 1999, while the number of days fished that were declared by anglers showed a further 7% decline. (Section 1.2.2 and 1.2.4)

- The rod catch (including released fish) was markedly higher than that in 1999 and 14% above the previous 5yr mean. Rod catches of grilse in 2000 were higher than in 1999 in all Regions, and 22% above the previous 5yr mean overall. Rod catches of multi-sea-winter (MSW) salmon in 2000 were better than those in 1999 in some Regions, but were below the 5yr mean in most Regions with the exception of the North East and North West Regions. (Section 2.1.1 and 2.5.2)

- The CPUE for the rod fisheries was much higher in 2000 than in 1999 and was well above the previous 5yr mean for all Regions except Southern, where there was a small decrease. (Section 2.2.2)

- The proportion of salmon released by anglers increased steadily from 1993 (10%) to 1999 (44%) but remained at this level in 2000 (provisional estimate, 42%). (Section 2.1.2)

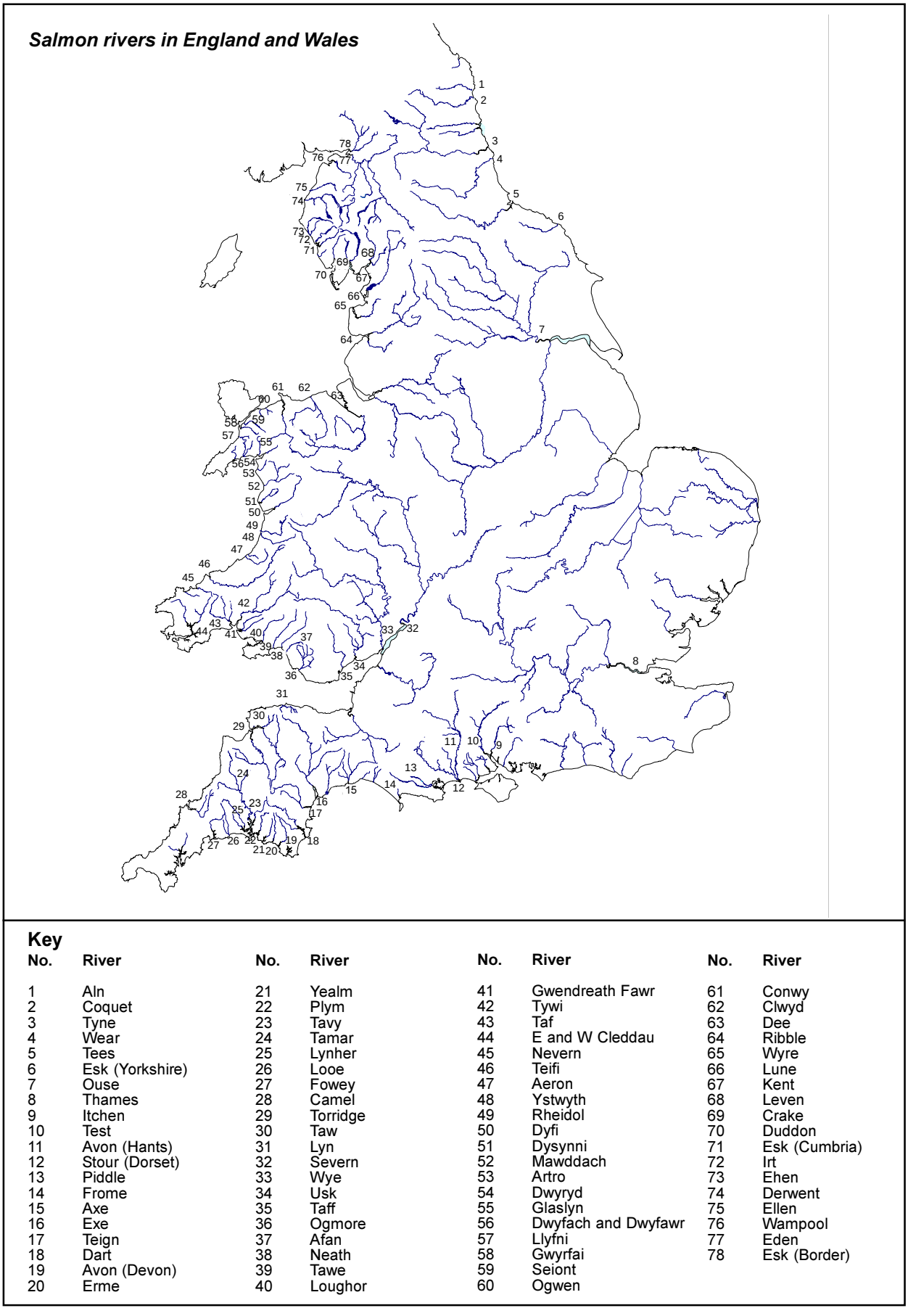
- The total unreported and illegal catch of salmon by all methods in 2000 is estimated to have been about 38 tonnes, approximately 18% of all fish killed. (Section 2.3)

- Exploitation rates in most of the monitored rod fisheries in England and Wales in 2000 were well below the average of the previous 5yr mean. (Section 2.7.1)

- Data from counters and traps in England and Wales in 2000 show that runs into freshwater were generally similar to or above those in 1999; values for the NW Region, in particular, were well above the 5 yr mean. (Section 3.2)

- Spawning escapement was above the conservation limits (including provisional limits) in 22 rivers (32%), between 50% and 100% of the limits in 17 rivers (25%) and less than 50% of the limits in 30 rivers (43%). This represents an improvement over recent years. However, despite the improvements in runs of grilse in 2000, the majority of salmon stocks in England and Wales continue to be in a depleted state. (Section 3.1)

- 101,000 hatchery-reared salmon parr and 4,100 wild salmon smolts were marked and released in England and Wales in 2000 for assessment or enhancement investigations; a total of 937 adult salmon were tagged for assessment or radio tracking studies. (Section 4)



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	Crake
10	Test	30	Taw	50	Dyfi	70	Duddon
11	Avon (Hants)	31	Lyn	51	Dysynni	71	Esk (Cumbria)
12	Stour (Dorset)	32	Severn	52	Mawddach	72	Irt
13	Piddle	33	Wye	53	Artro	73	Ehen
14	Frome	34	Usk	54	Dwyryd	74	Derwent
15	Axe	35	Taff	55	Glaslyn	75	Ellen
16	Exe	36	Ogmore	56	Dwyfach and Dwyfawr	76	Wampool
17	Teign	37	Afan	57	Llyfni	77	Eden
18	Dart	38	Neath	58	Gwyrfai	78	Esk (Border)
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 2000

1. Gear and effort

1.1 Gear

Brief descriptions of all the nets and fixed engines used in England and Wales are included in Annex 4. The principal salmon rivers for which data are presented in this report are shown in Figure 1, and the types of gear used in each net fishery operating in 2000 are listed in Table 2.

There were no recorded changes in the types of gear used for the capture of salmon in England and Wales in 2000. One T-net has been operated experimentally in the southern area of the Northumbria coastal fishery (NE Region) since 1996.

1.2 Effort

The restrictions on fishing introduced in England and Wales in 1999 to protect early-running 'spring' salmon remained in force in 2000. Details of the restrictions imposed on net and rod fisheries are provided in Sections 1.2.1 and 1.2.2 below.

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. Separate licences are required to use rods and nets. There is no restriction on the number of rod licences that may be issued, but, for most net fisheries, the number of licences is limited by Order (Table 2).

The regulatory measures provide an overall limit on the 'allowable' fishing effort. However, within these restrictions there will be annual variations in the amount that both netsmen and anglers actually fish (the 'utilised' effort), due to factors such as prevailing weather conditions (e.g. sea conditions or river flow) and local perceptions about the abundance of returning stocks. Netting effort is also likely to be affected by the price of salmon, which has decreased in real terms over the past two decades due to the rapid expansion in the production of farmed salmon, while the costs of net licences have increased. Increasing costs and unwillingness on the part of some anglers to practice compulsory catch-and-release may also have affected the take-up of rod licences and the angling effort.

For rod fisheries, river flow is a key factor affecting angler effort; England and Wales experienced substantially higher than average rainfall in 2000. Figure 2 shows the monthly river flows for 13 rivers in England and Wales expressed as a percentage of the monthly long-term average. Flows were low in August, but were at or above average in the rest of the year which generally provided good conditions for angling. However, flows were particularly high in the autumn, notably October and November, which would have resulted in the loss of some fishing opportunities.

Table 1. Numbers of rod licences (1994-2000) and net and fixed engine licences (1983-2000) issued in England and Wales

Year	Rod licences		Net and fixed engine licence type					Total net licences
	Short-term	Annual	Gill	Sweep	Hand-held	F.E.	Combined drift/T net	
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	10,637	26,641	177	158	257	53	30	645
1995	9,992	24,949	163	156	249	47	29	615
1996	12,508	22,773	151	132	232	42	29	557
1997	11,640	21,146	139	131	231	35	27	536
1998	11,364	21,161	130	129	196	35	26	490
1999	10,709	18,423	120	109	178	30	26	437
2000	**10,286**	**18,807**	**110**	**101**	**150**	**28**	**25**	**389**

Notes: Rod short-term licences are for 1 or 8 days; annual licences are valid from the date of issue to 31 March following; the rod licence data for 2000 are provisional.
Gill nets include: drift, trammel, sling and coracle nets.
Sweep nets include: seine (draft and draw) and wade nets.
Hand-held nets include: haaf/heave and lave/dip nets.
Fixed engines (FE) 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.

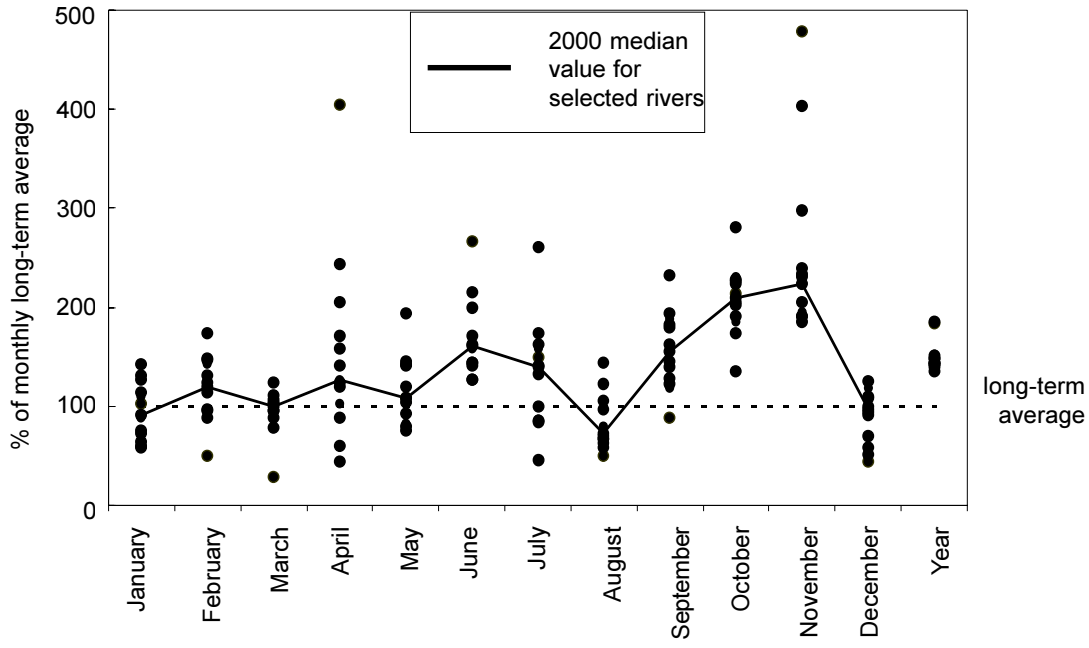


Figure 2. Monthly river flows in 2000 for 13 rivers in England and Wales expressed as a percentage of the monthly long-term average. (EA data processed by the Centre for Ecology and Hydrology)

1.2.1 Allowable effort in net fisheries

The various fishing gears used to catch salmon in England and Wales have been grouped into broad categories based on their method of capture (see definitions in footnote to Table 1 and Annex 4). The numbers of netting licences issued for gill nets, sweep nets, hand-held nets and fixed engines have continued to decline as a result of measures taken to reduce levels of exploitation and the declining commercial viability of some fisheries. The total number of licences issued fell by a further 11% in 2000 (Table 1 and Figure 3). Overall, the number of net licences issued between 1983 and 2000 has decreased by an average of about 3% per year (total decrease, 54%).

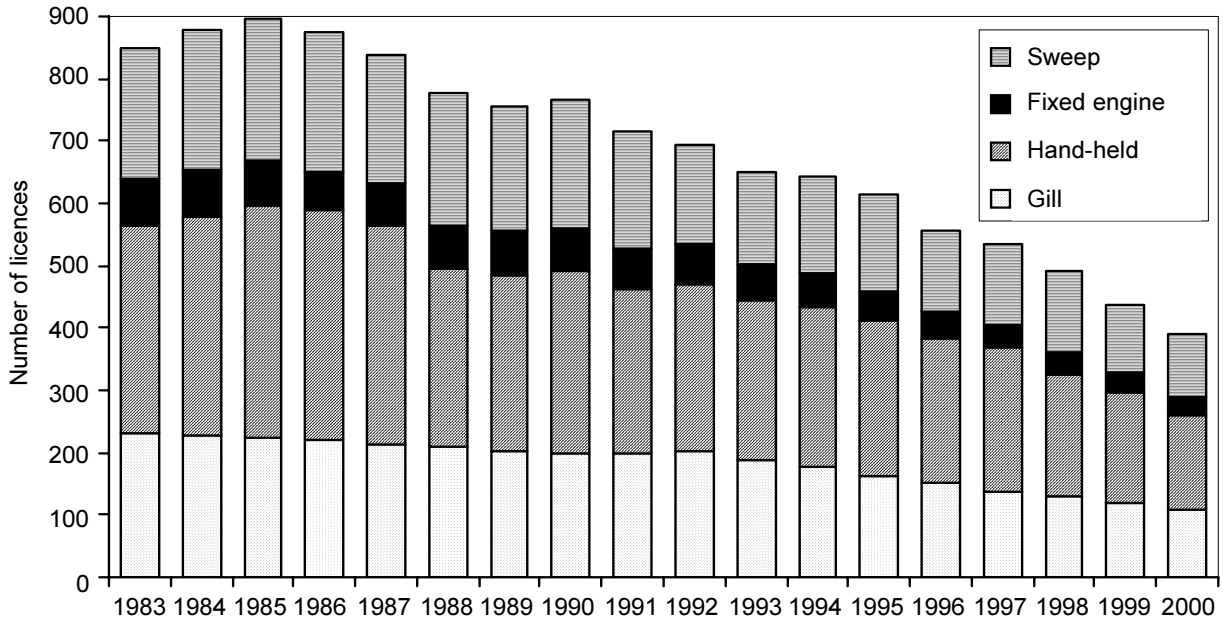


Figure 3. Numbers of salmon net and fixed engine licences issued in England and Wales, 1983-2000

Under the national measures to protect spring salmon, introduced in 1999, netsmen are banned from killing, and in most cases fishing for, salmon before 1 June. There are derogations which allow fishing in some areas where netting is predominantly for sea trout, on the basis that any salmon caught are returned alive (see Table 2).

A number of net fisheries in England and Wales are being (or have been) phased out because they exploit salmon returning to several rivers (i.e. mixed stock fisheries). Licence numbers are being reduced as fishermen retire from the fishery. Progress with those phase-outs that were incomplete in 1999 is summarised in the text table below:-

Fishery	Netting Method	Start of phase out	Number of nets		Reduction
			before start	2000	%
North East Coast	drift nets	1993	142	71	50%
Anglian Coast	coastal nets	1996	59	46	22%
Severn Estuary (Usk)	drift nets	1997	8	0	100%
River Ogwen	seine nets	1997	2	1	50%

New net limitation orders (NLOs) were introduced in some fisheries in NW and SW England, which reduced the number of nets permitted; details were as follows:

Region	Fishery	Method	Number of nets	
			Previous NLO	New NLO
NW	River Lune	drift nets	10	7
NW	River Lune	haaf nets	26	12
NW	River Lune	seine nets	1	0
NW	S&W Cumbria	drift nets	4	1
SW	River Dart	seine nets	18	15
SW	River Teign	seine nets	10	9

Arrangements have also been made to reduce netting effort in the following fisheries by compensating netsmen not to fish for the periods shown:

Fishery	Method	Period without netting	Funding agency
River Tavy	seine nets	1 July - 7 August	South West Water plc
River Tamar	seine nets	8 August - 31 August	and
River Lynher	seine nets	8 August - 31 August	Environment
River Fowey	seine nets	1 June - 15 June (salmon only)	Agency
Cumbrian coast	drift nets (3 out of 4 nets only)	complete season (in perpetuity)	Derwent Owners Association
Avon and Stour (Christchurch Harbour)	seine nets	152 of the 153 fish caught were released	Wessex Salmon Rivers Trust & Tescos
Severn Estuary (Usk)	drift nets	complete season (in perpetuity)	Local owners/angling
Severn Estuary (Usk)	1 putcher rank	complete season (for 5 years)	interests, NASF & CCW
Severn Estuary (Wye)	1 putcher rank	complete season	Environment Agency

Note: NASF = North Atlantic Salmon Fund; CCW = Countryside Council for Wales

1.2.2 Allowable effort in rod fisheries

There are no statutory restrictions on the numbers of rod licences that may be issued.

The national measures to safeguard spring salmon, introduced in 1999, continued to apply in 2000. These banned the killing of salmon caught by anglers prior to 16 June and restricted the methods that they could use at this time to artificial flies or lures.

No other statutory effort restrictions were imposed on rod fisheries in 2000. Non-statutory restrictions on methods and fishing areas are known to be imposed by fishery owners and angling associations, but there is no national record of these. For example, anglers on a number of the southern chalkstream rivers are encouraged to return all rod caught fish (or donate them as broodstock for enhancement purposes).

1.2.3 Utilised effort in net fisheries

Table 2 presents data on utilised effort for salmon net fisheries in England and Wales in 2000. In comparison to 1999, the numbers of days/tides fished decreased in Wales (down 17%), South West (down 4%) and North West (down 1%), but increased in the Midlands and North East Regions (up 4% and 6% respectively). These increases occurred despite a small reduction in the number of licences issued in both areas.

As in previous years, the proportion of the allowable effort that was utilised varied considerably between fisheries and was highest on average for the North East Region (53%). It is virtually impossible for most fisheries to utilise 100% of the allowable effort and, in practice, factors such as weather conditions, tide heights and availability of fishing stations will constrain the overall effort. In the north east coast fishery, for example, it has been suggested that a maximum of about 75% of the allowable effort could be used in the summer months under normal weather conditions (Anon., 1997).

Table 2. Allowable and utilised effort for the principal salmon net fisheries in England and Wales in 2000

Region	River/ Fishery	Method	No. Lics	NLO	Days available	Allowable effort net. days*	Utilised effort net. days	Utilised effort net. tides	% utilised	Av. utilised effort day/lic
NE	N Coastal (N)	Drift & T	25	X	114	2,850 }				
	N Coastal (N)	Drift	21	X	66	1,386 }	2,208		51	47
	N Coastal (N) [1]	T	1		114	114 }				
	N Coastal (S)	Drift	18	X	66	1,188	898		76	50
	N Coastal (S) [1]	T	1		114	114	44		39	44
	Y Coastal	Drift	7	X	66	462	291		63	42
	Y Coastal [1]	T or J	11		114	1,254	464		37	42
	NE Region		**84**			**7,368**	**3,905**		**53**	
SW	Avon & Stour	Seine	4	6	53	318	160		50	40
	Poole Harbour [2]	Seine	0	1	0	0	0		0	0
	Exe	Seine	10	18	65	1,170	328		28	33
	Teign [1]	Seine	4	9	126	1,134	121		11	30
	Dart [1]	Seine	11	15	126	1,890	434		23	39
	Camel	Drift	6	7	66	462	104		23	17
	Tavy [3]	Seine	5	5	88	440	48		11	10
	Tamar [4]	Seine	15	15	78	1,170	473		40	32
	Lynher [4]	Seine	5	5	78	390	9		2	2
	Fowey [1,5]	Seine	2	2	133	266	56		21	28
	Taw/Torridge	Seine	14	14	66	924	552		60	39
	Lyn [2]	FE	0	n/a	0	0	0		0	0
	SW Region		**76**			**8,164**	**2,285**		**28**	
Midlands	Severn	Putchers	7		76	532	532		100	14
	Severn	Seine	4	4	78	312		37	9	7
	Severn	Lave	20	n/a	78	1,560		578	27	21
	Midlands Region		**31**			**2,404**	**532**	**615**	**40**	
Wales	Tywi [1]	Seine	5	9	113	1,017		384	27	55
	Tywi [1]	Coracles	5	12	113	1,356		356	19	51
	Taf	Coracles	1	1	113	113		51	32	36
	E/W Cleddau	Compass	8	6	78	624		172	20	15
	Nevern [1]	Seine	1	1	113	113		22	14	16
	Teifi [1]	Seine	2	4	113	452		90	14	32
	Teifi [1]	Coracles	10	11	113	1,243		298	17	21
	Dyfi [1]	Seine	3	3	113	339		156	33	37
	Mawddach	Seine	2	2	78	156		62	28	22
	Glaslyn	Seine	1	1	78	78		22	20	16
	Ogwen	Seine	1	X	78	78		38	35	27
	Conwy	Seine	2	3	78	234		53	16	19
	Dee	Trammel	4	2	54	216		249	82	45
	Dee	Seine	10	8	54	540		449	59	32
	Welsh Region		**55**			**6,559**		**2,402**	**26**	
NW	Ribble	Drift	6	6	78	468		232	35	28
	Lune	Haaf	12	12	78	936		1,364	104	81
	Lune	Drift	6	7	78	546		255	33	30
	Lune	Seine	0	0	0	0		0		0
	Kent	Lave	8	8	78	624		126	14	11
	Leven	Lave	6	6	78	468		298	46	36
	S & W Cumbria [6]	Drift	1	1	78	312		18	4	13
	Eden & Esk	Haaf	104	155	87	13,485		4,071	22	28
	NW Region		**143**			**16,839**		**6,364**	**27**	

Notes: *National spring salmon byelaws apply - all net fisheries closed until June1.*
(Note several sea trout fisheries exempted from byelaws, but all salmon caught before June 1 to be returned).
NLO refers to number of nets allowed under the terms of the net limitation order for that fishery.
In calculating the days available, any day, or part day, on which fishing has been allowed is included.
*For fisheries in which utilised effort is recorded in terms of tides fished (Wales, Midlands and NW Regions) the proportion of the available effort used has be*en estimated by assuming that an average of 1.4 tides have been fished per day.

Key: * *Allowable effort is calculated by multiplying the days available by the number of nets permitted under the NLO, except where the number of licences exceeds the NLO in which case the higher figure is used.*
X Denotes reducing NLO - fishery being phased out as existing licensees leave the fishery.
[1] *Sea trout fisheries - exempted from national byelaws (all salmon caught before 1 June to be released).* [2] *Not fished.*
[3] *Buy-out 1 July to 7 August.* [4] *Buy-out 8 August to 31 August.* [5] *Buy-out 1 June to 15 June.* [6] *Partial buy-out operating in 2000.*

1.2.4 Utilised effort in rod fisheries

The numbers of licences purchased for salmon and migratory trout angling (annual and short-term) between 1994 and 2000 are shown in Table 1; the data for 2000 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 total number of rod licences issued has fallen by 22% over this seven year period and the number of annual licences has fallen by 29%. The number of short-term (one day and eight day) licences issued has remained relatively consistent, but the proportion they represent of the total has increased from about 28% in 1994-5 to about 36% in 1997-2000. These changes in the numbers and proportions of licence types issued are thought to have been influenced by the decline in salmon stocks and the increase in licence prices in 1996.

Table 3 shows the total declared number of rod days fished by anglers in each of the regions in each year from 1995 to 2000. Overall, most of the salmon and sea trout angling has taken place in Wales (37%) and NW Region (28%), as in 1999, and there was relatively little angling for these species in Thames and Southern Regions (total 1%). However, in all Regions, except the North East, there was a substantial reduction in the number of days fished compared with 1999. In the North East Region the number of days fished in 2000 was very similar to that in 1999. In all Regions the number of days fished in 2000 (as in most Regions in 1999) was well below the average of the previous five years, with a 25% reduction overall. This is likely to reflect both the fall in the number of licences issued over recent years and the introduction of the national measures in 1999. It is likely that much of the reduction in fishing effort occurred before 16 June, the period when catch-and-release was compulsory. The above average river flows during the autumn will also have reduced night-time fishing for sea trout (declared rod effort data do not differentiate between salmon and sea trout fishing) but probably improved fishing opportunities for salmon.

Table 3. Total and average number of declared rod days fished per angler (catch return) for each EA Region, 1995-2000

Total days	NE	Thames	Southern	SW	Mids	Wales	NW	Total
1995	38,724	414	2,696	35,853	14,893	85,107	65,601	243,288
1996	34,726	154	1,928	32,504	13,056	84,922	64,454	231,744
1997	40,345	181	2,332	38,809	14,886	102,930	70,222	269,705
1998	38,229	145	2,095	31,285	11,493	85,906	64,248	233,401
1999	31,474	311	1,957	24,708	7,034	69,620	50,398	185,502
2000 (provisional)	**31,876**	**143**	**1,770**	**21,901**	**5,241**	**64,936**	**48,823**	**174,690**
Mean (1995-99)	36,740	241	2,214	32,819	12,270	85,905	63,038	233,227
% change:								
2000 on 1999	+1	-54	-12	-15	-25	-8	-4	-7
2000 on 5-year mean	-13	-41	-20	-33	-57	-24	-23	-25

1.3 Catch limits

No national catch limit regulations apply to salmon fisheries in England and Wales, but a number of restrictions have been introduced under local byelaws. Details of the bag limits currently in force are listed below; new measures were introduced in the 2000 season on the River Lune in the North West Region.

Non-statutory restrictions have also been introduced in some areas by fishery owners and angling associations, but there is no national record of these.

Region	River	Salmon Bag Limit			Other constraints
		per day	per week	per season	
Thames	Thames	2			
South West	Taw	2	3	10	) No fish > 70 cm to be
	Torridge	2	2	7	) retained after August 1
Wales	Tywi	2	5		
	Taf	2	5		
	E&W Cleddau	2	5		
	Nevern	2	5		
	Teifi	2	5		
	Aeron	2	5		
	Ystwyth	2	5		
	Rheidol	2	5		
North West	Lune			4	

2. Catches and CPUE

2.1 Catches

The provisional catch statistics for 2000 are based upon returns received up until 18 February 2001. The rod catch data are based largely on anglers' returns, except for a few rivers where the data from fishery owners' returns are considered to be more complete (Rivers Wye, Test & Itchen). There are expected to be a small number of late rod returns, but based on previous years' experience the increase in the declared catch will be very small. The catch returns for the nets and fixed engines are also not expected to change significantly.

2.1.1 Catches in 2000

Table 4 presents the provisional total salmon catch for England and Wales for 2000, compared with confirmed catches for the previous 5 years. A breakdown of the provisional 2000 rod and net catches for each Region is provided in Table 5.

Table 4. Declared catch of salmon for England and Wales for 1995-2000

Year	Nets & FE		Rods (inc. released fish)		Total caught		Total retained	
	No.	Wt (t)	No.	Wt (t)	No.	Wt (t)	No.	Wt (t)
1995	67,659	245.7	16,006	61.0	83,665	306.7	80,478	294.6
1996	32,680	125.7	17,444	71.5	50,124	197.2	46,696	183.2
1997	31,459	107.2	13,047	48.4	44,506	155.6	41,374	141.8
1998	25,179	84.7	17,109	59.1	42,288	143.9	36,917	122.9
1999	34,167	124.4	12,492	49.8	46,659	174.2	41,094	150.0
2000*	**50,975**	**178.5**	**17,354**	**65.7**	**68,329**	**244.2**	**60,801**	**214.1**

* *Provisional*

Table 5. Provisional regional salmon catches (including released fish) for England and Wales - 2000 season

Region	Net catch		Rod catch		Total catch	
	No.	Weight (kg)	No.	Weight (kg)	No.	Weight (kg)
North East	43,332	151,536	3,567	16,628	46,899	167,764
Anglian	0	0	0	0	0	0
Thames	0	0	0	0	0	0
Southern	0	0	316	409	316	409
South West	2,215	6,842	2,419	7,740	4,634	14,582
Midlands	971	3,964	321	1,380	1,292	5,344
Welsh	1,002	3,480	4,002	15,016	5,004	18,496
North West	3,455	12,642	6,726	24,557	10,181	37,199
Unknown	0	0	3	13	3	13
Total	**50,975**	**178,464**	**17,354**	**65,743**	**68,329**	**244,207**

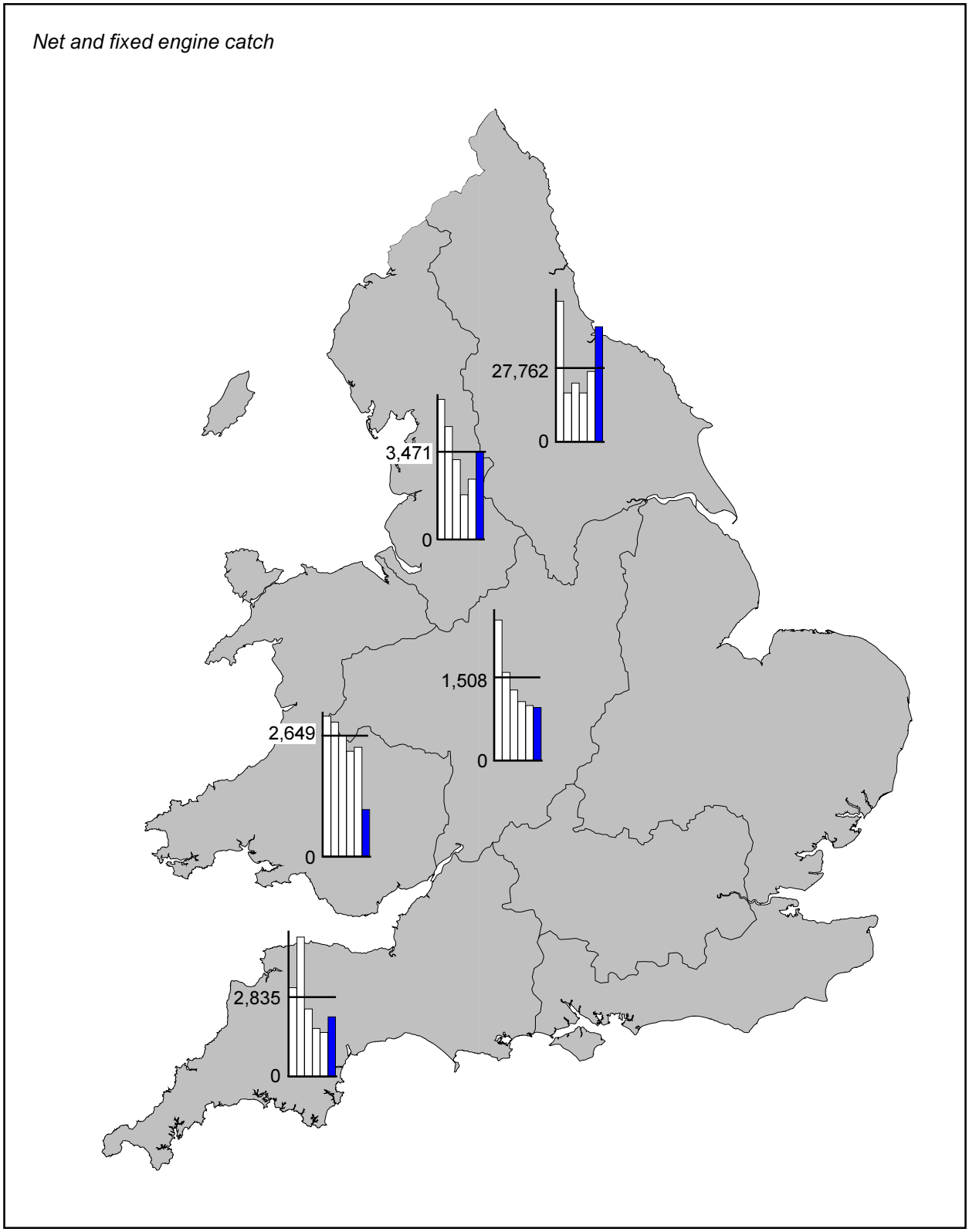


Figure 4. Regional declared salmon net and fixed engine catches. The histograms display data for the six years 1995 to 2000, together with the five-year mean for the period 1995-1999 (displayed as a horizontal line, with the mean value indicated against the y-axis). Note that the histograms are not drawn to the same scale. Data for 2000 are provisional.

The total declared catch for nets and fixed engines in 2000 (Table 6, Figure 4) was 49% greater than in 1999, and 33% higher than the average for the previous 5 years. These figures are dominated by the north east coast fishery which has accounted for between 57% and 85% of the national annual net catches during this period (85% in 2000). Because of the variability in catches from year to year, care must be taken in comparing figures for a single year. A more reliable picture of catch trends may therefore be obtained by comparing data aggregated over a period of years. Between 1995-97 and 1998-2000, there has been a substantial decline in the average net catches in most Regions; the greatest reductions have occurred in the South West (48%), the Midlands (45%), and the North West (42%) with a slightly smaller reduction in Wales (34%). However, only a marginal reduction in the average catches between these two periods (6%) is evident for the North East, despite the fact that the north east coast fishery is being phased out. This may reflect the better status of the main river stocks in the north east compared with other Regions. It is possible that the declared catch might have been influenced by the prospect of an accelerated phase out as recommended by the Review of Salmon and Freshwater Fisheries.

Table 6. Summary of declared regional salmon and grilse net and fixed engine catches (including released fish), 1995-2000

Year	Region						
	NE	Anglian	SW	Mids	Wales	NW	Total
1995	53,210	5	3,251	2,588	3,039	5,566	67,659
1996	18,581	3	5,093	1,608	2,931	4,464	32,680
1997	21,922	0	2,466	1,282	2,628	3,161	31,459
1998	18,265	3	1,759	1,074	2,300	1,778	25,179
1999	26,833	6	1,605	989	2,347	2,387	34,167 *
2000 (provisional)	**43,332**	**0**	**2,215**	**971**	**1,002**	**3,445**	**50,975** *
Mean (1995 - 1999)	27,762	3	2,835	1,508	2,649	3,471	38,229
% change:							
2000 on 1999	+61		+38	-2	-57	+45	+49
2000 on 5-yr mean	+56		-22	-36	-62	0	+33

* *catch includes a small number of fish caught and released (Wales and SW Region only)*

The rod catches for recent years are shown in Table 7 and Figure 5. The rod catches in 2000 were better than those in 1999 in all Regions and up 39% overall; catches were also substantially up on the previous five-year average in the North East (up 40%) and North West (up 26%). In other regions catches were fairly close to the five-year average. Comparison of the data for 1998-2000 with that for 1995-97 indicates virtually no change overall between these two periods, although rod catches have increased in the North East (up 28%), Southern (up 12%), and North West (up 6%) and have reduced elsewhere. The reduction has been between 5% - 12% in the South West and Welsh Regions, but 51% in the Midlands.

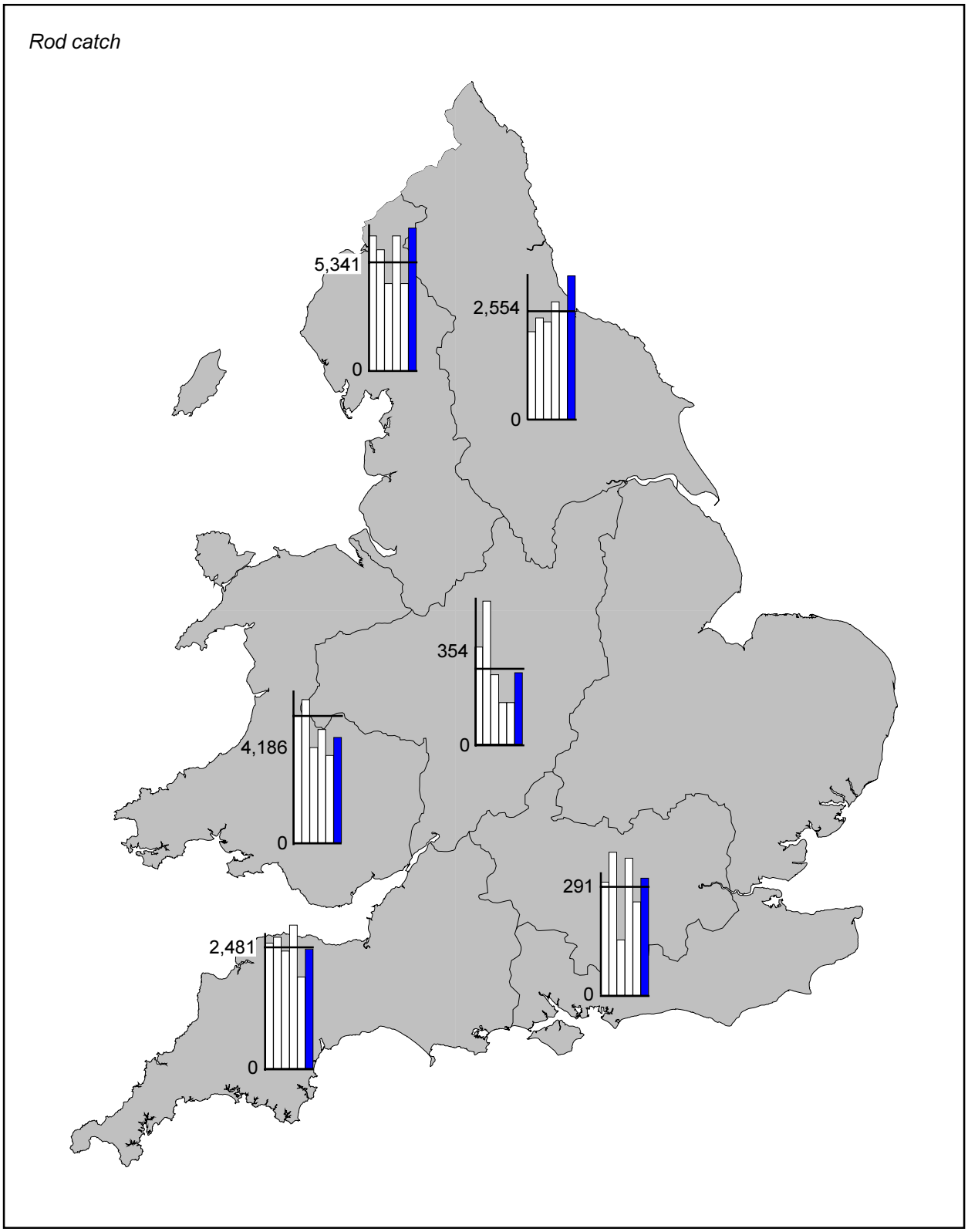


Figure 5. Regional declared salmon rod catches. The histograms display data for the six years 1995 to 2000, together with the five-year mean for the period 1995-1999 (displayed as a horizontal line, with the mean value indicated against the y-axis). Note that the histograms are not drawn to the same scale. Data for 2000 are provisional.

Table 7. Summary of declared regional salmon and grilse rod catches, 1995-2000 - including details of fish caught and released and fish caught and killed

Year	Region							
	NE	Thames	Southern	SW	Midland	Welsh	NW	Total
Declared catch (including fish caught and released)								
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	2,445	2	150	2,372	312	3,622	4,144	13,047
1998	2,941	0	366	2,919	186	4,325	6,359	17,096 *
1999	2,670	1	253	1,881	185	3,369	4,133	12,492
2000 (provisional)	**3,567**	**0**	**316**	**2,419**	**321**	**4,002**	**6,726**	**17,354 #**
Declared catch (fish released)								
1995	555	7	83	526	32	593	1,393	3,189
1996	732	25	88	510	57	684	1,332	3,428
1997	797	1	107	586	30	480	1,131	3,132
1998	1,037	0	222	1,077	31	979	2,019	5,365
1999	1,348	1	137	898	65	1,203	1,795	5,447
2000 (provisional)	**1,869**	**0**	**247**	**1,106**	**103**	**1,244**	**2,786**	**7,355**
Declared catch (fish caught and retained)								
1995	1,646	6	219	2,028	410	3,553	4,955	12,817
1996	1,782	9	296	2,171	586	4,784	4,388	14,016
1997	1,648	1	43	1,786	282	3,142	3,013	9,915
1998	1,904	0	144	1,842	155	3,346	4,340	11,731
1999	1,322	0	116	983	120	2,166	2,338	7,045
2000 (provisional)	**1,698**	**0**	**69**	**1,313**	**218**	**2,758**	**3,940**	**9,999**
Mean caught & retained (1995-1999)	1,660	3	164	1,762	311	3,398	3,807	11,105
% change:								
2000 on 1999	+28		-41	+34	+82	+27	+69	+42
2000 on 5-yr mean	+2		-58	-25	-30	-19	-3	-10

** Includes 13 fish of unknown Region of capture.*
 # Includes 3 fish of unknown Region of capture.
Most 2000 figures are angler's catch returns received up to 18 February 2000; data for the Rivers Wye, Test and Itchen are based upon owners returns.

2.1.2 Catches in coastal, estuarine and riverine fisheries

The catches (fish caught and retained only) for the years 1995 to 2000 have been divided between coastal, estuarine and riverine fisheries in Table 8. The catch for the coastal fisheries is mainly made up by the nets in the North East, but also include the following smaller coastal fisheries: the nets on the Anglian coast (primarily targeted at sea trout), the drift nets on the Cumbrian coast (NW Region) and a number of nets and fixed engines fished around the Welsh coast and in the Bristol Channel. A full list of the fisheries included in the coastal category appears in the footnote to Table 8. The riverine fisheries comprise catches in freshwater and represent the rod catch data plus the catches in two ancient fixed engines, the River Conwy basket trap and River Eden coops, which also operate in freshwater. The catch from the latter instruments is very small. The estuarine category includes all the other net and fixed engine fisheries (Table 2) not covered by the above.

On average, over the period 1995-99, coastal catches have comprised 59% of the total (fish caught and retained), estuarine catches 18% and riverine catches 23%. In 2000, the coastal catch comprised 71% of the total, the highest proportion in the six-year time series.

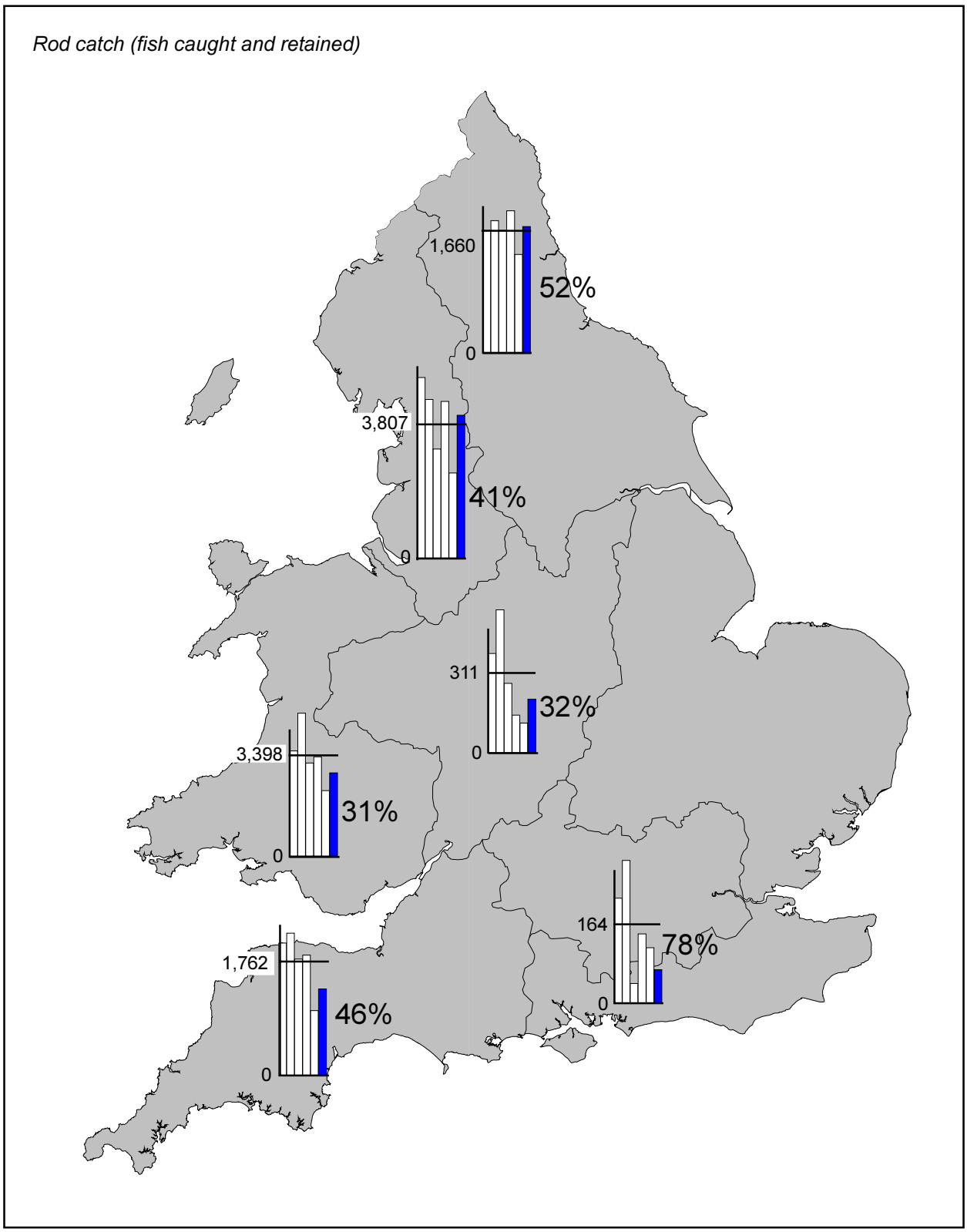


Figure 6. Regional rod catch (fish caught and retained). The histograms display data for the six years 1995 to 2000, together with the five-year mean for the period 1995-1999 (displayed as a horizontal line, with the mean value indicated against the y-axis) and the percentage of fish released in 2000. Note that the histograms are not drawn to the same scale. Data for 2000 are provisional.

Table 8. Declared catch of salmon (fish caught and retained only) in coastal, estuarine and riverine fisheries, 1995-2000

Year	Coast		Estuarine		Riverine		Total
	Wt (t)	%	Wt (t)	%	Wt (t)	%	Wt (t)
1995	200.3	68	45.4	15	48.9	17	294.6
1996	83.3	45	42.3	23	57.5	31	183.2
1997	80.5	57	26.7	19	34.6	24	141.8
1998	65.2	53	19.4	16	38.2	31	122.9
1999	101.0	67	23.1	15	26.0	17	150.0
2000*	**152.4**	**71**	**25.3**	**12**	**36.3**	**17**	**214.1**
Mean (1995-99)	106.1	59	31.4	18	41.0	23	178.5

* *Provisional*

Notes: Coastal catches include: North East coast nets, Anglian coastal nets, River Parrett putcher rank, River Usk drift nets & putcher rank, SW Wales coastal wade & seine nets, River Ogwen seine nets, River Seiont/Gwyrfai seine nets, River Dwyfawr seine nets, N. Caernarvonshire seine nets, River Clwyd sling (drift) nets and the SW Cumbria drift nets.
Riverine fisheries include: rod catches, River Conwy basket trap and River Eden coops.
Estuarine fisheries include all other nets and fixed engines not mentioned above.

2.1.3 Effects of significant management measures on catches

Catch and release: Within England and Wales there has been increasing voluntary use of catch and release by salmon anglers in recent years and this has been encouraged by the Agency and other organisations. Details of fish caught and released are published for each major salmon river in England and Wales in the annual catch statistics and these data are summarised in Tables 7 and 9 and in Figure 6; in 2000, this amounted to 9,999 fish (37.9 tonnes). The proportion of rod caught salmon released increased from 10% in 1993 to 44% in 1999, but remained at about this level (42%) in 2000. In each of the years up to 1998, a smaller proportion of the catch was released before the beginning of June than later in the year. In April 1999, national measures were introduced, closing net fisheries before 1st June and requiring all salmon caught by rod before 16 June to be released.

Table 9. Number and proportion of declared salmon rod catch released by anglers, 1993-2000

Year	No. salmon released	% of declared rod catch
1993	1,448	10.3
1994	3,227	13.0
1995	3,189	19.9
1996	3,428	19.7
1997	3,132	24.0
1998	5,365	31.4
1999	5,447	43.6
2000*	**7,355**	**42.4**

* *Provisional values*

Under the new national measures, a small number of net fisheries (primarily targeted at sea trout) are allowed to operate prior to 1 June, provided any salmon caught prior to that date are released. Thus, low levels of catch and release also apply for net fisheries. In 2000, a total of 21 salmon, weighing 76 Kg, were reported to have been caught and released, all of these in the Welsh Region. A further 152 salmon (577 Kg) were released by netsmen on the Avon as part of a compensation scheme (see Section 1.2.1).

National measures to protect spring salmon: There are well-publicised and ongoing concerns about the decline in the numbers of multi-sea-winter (MSW) salmon and particularly those returning early in the year ('spring salmon'). The introduction of the national measures resulted in a large reduction in the proportion of the net catch taken before June, from a five-year average of 6.7% to 0.3% in 1999 and 0.04% in 2000 (Table 10). For rods, the proportion of the catch taken before June fell from 11% prior to the introduction of the national measures (1994-98) to 7.6% in 1999 and 4.2% in 2000; as already indicated, the measures require these fish to be release. The contribution of MSW salmon to catches, in recent years, is covered in Section 2.4.

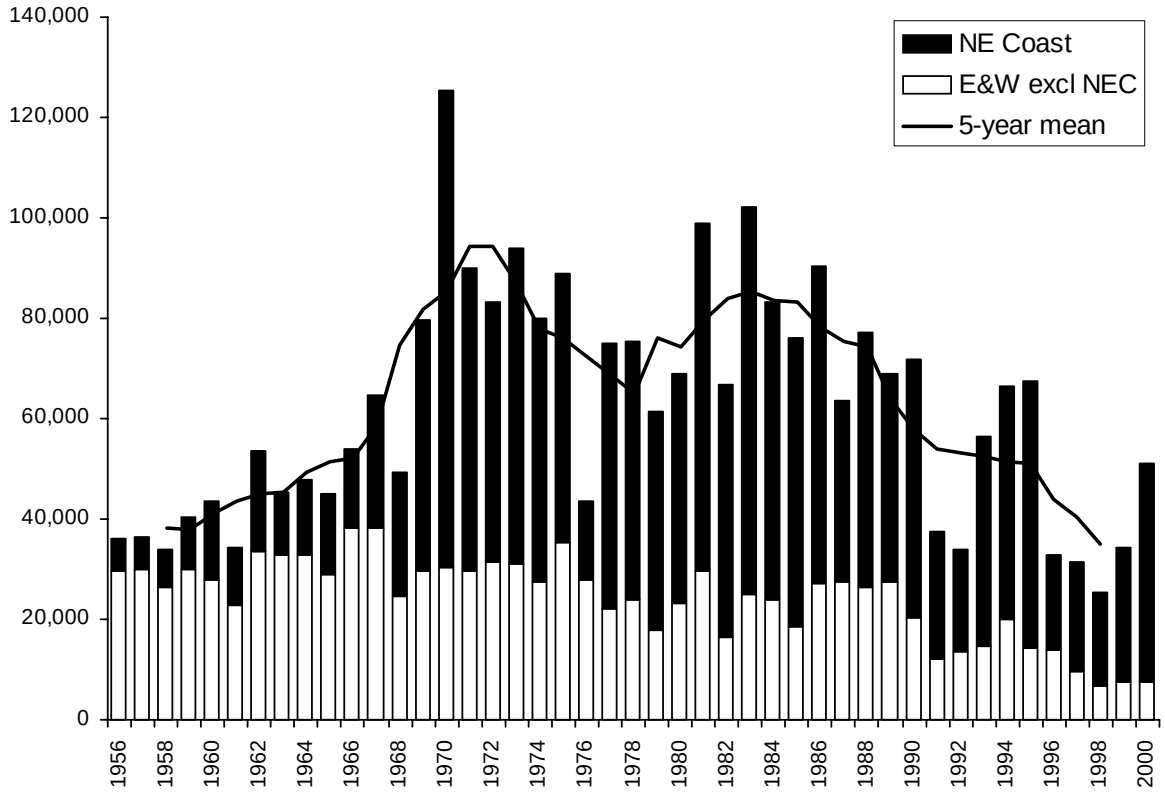


Figure 7. Total declared salmon net and fixed engine catch for England and Wales 1956-2000, with a five-year running mean; shaded area indicates the catch in the north-east coast fishery.

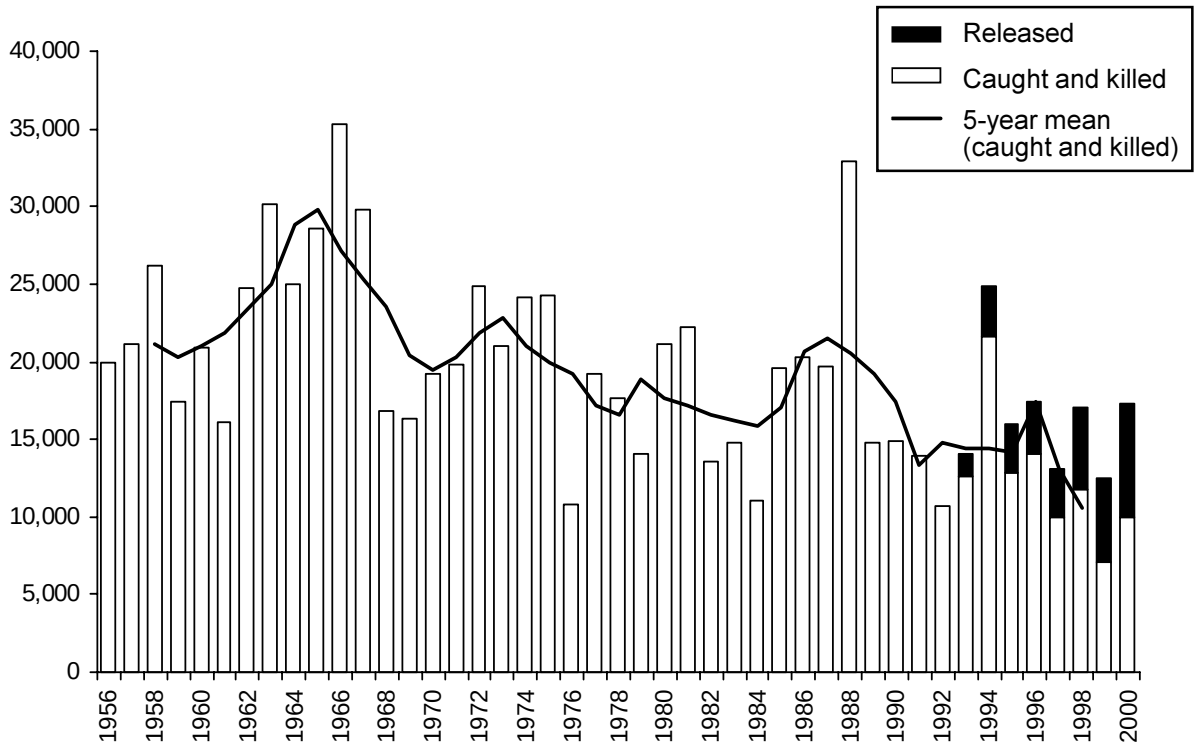


Figure 8. Total declared salmon rod catch for England and Wales 1956-2000, with a five-year running mean of fish caught and killed; shaded area indicates fish caught and released.

Table 10. Number and proportion of declared salmon net and rod catch taken before and after 1 June, 1989-2000

Year	Net catch				Rod catch (including released fish)			
	Numbers			%	Numbers			%
	< 1 June	> 1 June	Total	< 1 June	< 1 June	> 1 June	Total	< 1 June
1989	4,742	64,198	68,940	6.9	3,199	11,529	14,728	21.7
1990	7,339	64,488	71,827	10.2	2,397	12,290	14,687	16.3
1991	3,637	34,038	37,675	9.7	2,240	11,496	13,736	16.3
1992	2,497	31,352	33,849	7.4	1,012	9,725	10,737	9.4
1993	1,630	54,936	56,566	2.9	865	13,194	14,059	6.2
1994	4,824	61,633	66,457	7.3	2,609	22,282	24,891	10.5
1995	4,888	62,771	67,659	7.2	2,141	13,865	16,006	13.4
1996	2,913	29,767	32,680	8.9	2,691	14,753	17,444	15.4
1997	1,528	29,931	31,459	4.9	1,335	11,278	12,613	10.6
1998	832	24,335	25,167	3.3	712	15,275	15,987	4.5
1999	116	34,043	34,159	0.3	920	11,211	12,131	7.6
2000*	**21**	**50,954**	**50,975**	**0.04**	**735**	**16,619**	**17,354**	**4.2**
Mean (1995-99)	2,055	36,169	38,225	5	1,560	13,276	14,836	10

** Provisional values*

Note: National measures to protect 'spring' salmon introduced on April 15 1999 - required compulsory catch and release of all rod caught salmon prior to June 16, and closed most net fisheries prior to June 1.

Mixed stock fisheries: Since 1993, there has been a policy to phase out coastal mixed stock fisheries in England and Wales as existing licensees retire. The largest of these fisheries is on the North East coast, where the number of drift net licences issued has now been reduced by 50%. Nine other small coastal fisheries have also been identified, 6 of which have now been removed, while the remaining 3 are in the process of been phased out. In some cases fishermen have been paid to give up their licences early, and in December 2000 the Government offered up to £750,000, subject to matching funds from interested parties, to launch compensation arrangements designed to accelerate the phase out of mixed stock fisheries on a voluntary basis. The effect of the phase-outs to date has been to reduce the catches in these coastal fisheries from an average of about 41,000 for the period 1988-92 to just over 27,000 for the period 1996-2000, although there have been large annual fluctuations in the declared catches.

2.1.4 Long term catch trends

Figure 7 shows the declared net catch for England and Wales since 1956 and distinguishes the catch in the NE coast fishery from that in all other areas. The catch in the NE coast fishery increased rapidly in the late 1960s with the introduction of synthetic nets and has comprised well over 50% of the total net catch in England and Wales in most subsequent years; a phase-out of the drift net fishery began in 1993. Despite a 50% reduction in the number of licences issued, the reported catch in 2000 was similar to that recorded in 1993, though the 5 year mean catch shows a declining trend.

The catch in the other net fisheries has also been declining since the late 1960s and in 1998 fell to its lowest level in the past 40 years; the catches in 1999 and 2000 have been only slightly higher than that in 1998. The decline reflects the steady reductions in both fishing effort (see Table 1) and stock size.

The declared rod catch of salmon has been declining gradually since the late 1960s (Figure 8). This trend probably underestimates the true rate of decline in catches because reporting rates have improved and catch data for the past seven years are the most complete in the time series. Although angling effort appears to have declined substantially since 1995 (Table 3), we do not know how this relates to the level of fishing activity in earlier years.

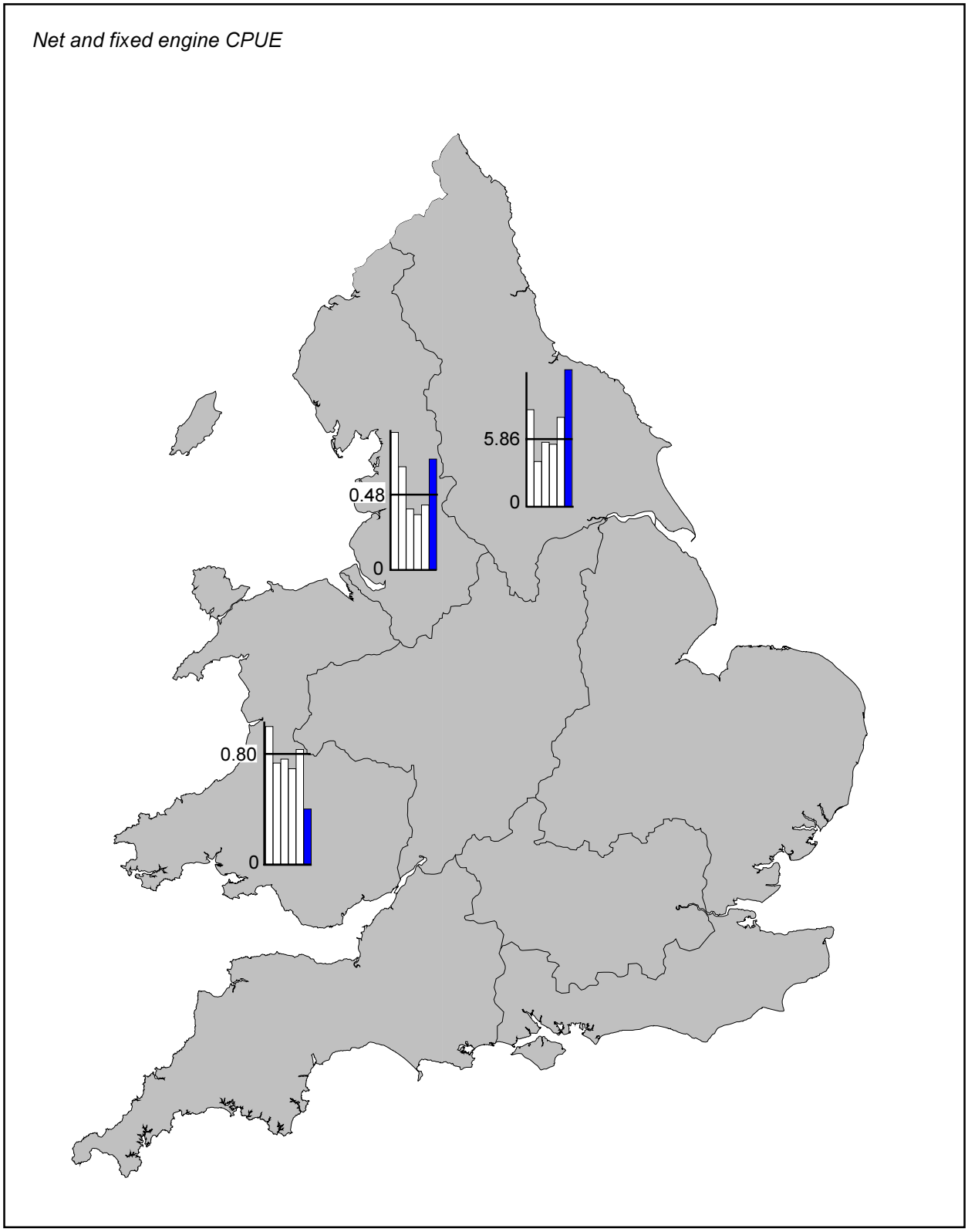


Figure 9. Regional CPUE data for net and fixed engine salmon fisheries. The histograms display data for the six years 1995 to 2000, together with the five-year mean for the period 1995-1999 (displayed as a horizontal line, with the mean value indicated against the y-axis). Note that the histograms are not drawn to the same scale. Data for 2000 are provisional.

Table 11. Regional CPUE data for net and fixed engine salmon fisheries, 1988-2000

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

Year	Region					
	NE	Southern	SW	Midlands (a,b)	Wales (b)	NW (b)
1988	5.49	10.15	No data	No data	-	-
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	"	"	0.69	0.40
1993	6.43	No fishing	"	"	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	"	0.59	"	0.77	0.35
1998	5.12	"	0.78	0.25	0.69	0.32
1999	7.28	"	0.67	0.36	0.83	0.37
2000	**11.10**	"	**0.96**	**0.43**	**0.4**	**0.64**
Mean (1995 - 1999)	5.86	-	0.68	0.31	0.80	0.48

Key: (a) Seine nets and lave nets only.
(b) Catch per licence tide.

2.2 Catch per unit effort (CPUE)

Much of the reason for changes in catches is the variation in the time anglers and netsmen spend fishing. Catch per unit of fishing effort (CPUE) therefore 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, the Midlands and the North West the number of tides fished) as a measure of the amount of fishing undertaken by each licence holder. Rod CPUE data (catch per licence day) are now reported annually for all major salmon rivers in England and Wales in the annual catch statistics reports.

2.2.1 CPUE in net fisheries

Regionally aggregated CPUE data for 2000, compared with previous years, are shown in Table 11 and Figure 9. 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. In addition, CPUE is likely to vary within the season. Thus cautious interpretation is required.

In 2000, the CPUE for nets and fixed engines in Wales was below the mean of the previous five years. However, the CPUE for all the other Regions was above the recent average, notably for the NE Region, where CPUE was the highest recorded value in the series (since 1988). Although this may reflect increased abundance of salmon, it has also been suggested that the catch reporting rate may have been higher. A trend analysis (B_{crit}) of CPUE for the net fisheries in the three Regions for which there are time series of data (NE, NW and Wales) now shows a significant upward trend over the past five years ($B_{crit} = 0.17$, $p = 0.02$), but no trend over the past 10 years ($B_{crit} = 0.04$, $p < 0.07$). This suggests that there has been an overall increase in the availability of salmon to these net fisheries (or in their catchability) in recent years. However, it is also possible that measures to reduce fishing effort have tended to result in the least efficient netsmen leaving the fisheries. This would tend to mask the effects of reduced availability on the CPUE. (The B_{crit} analysis is explained in Annex 1).

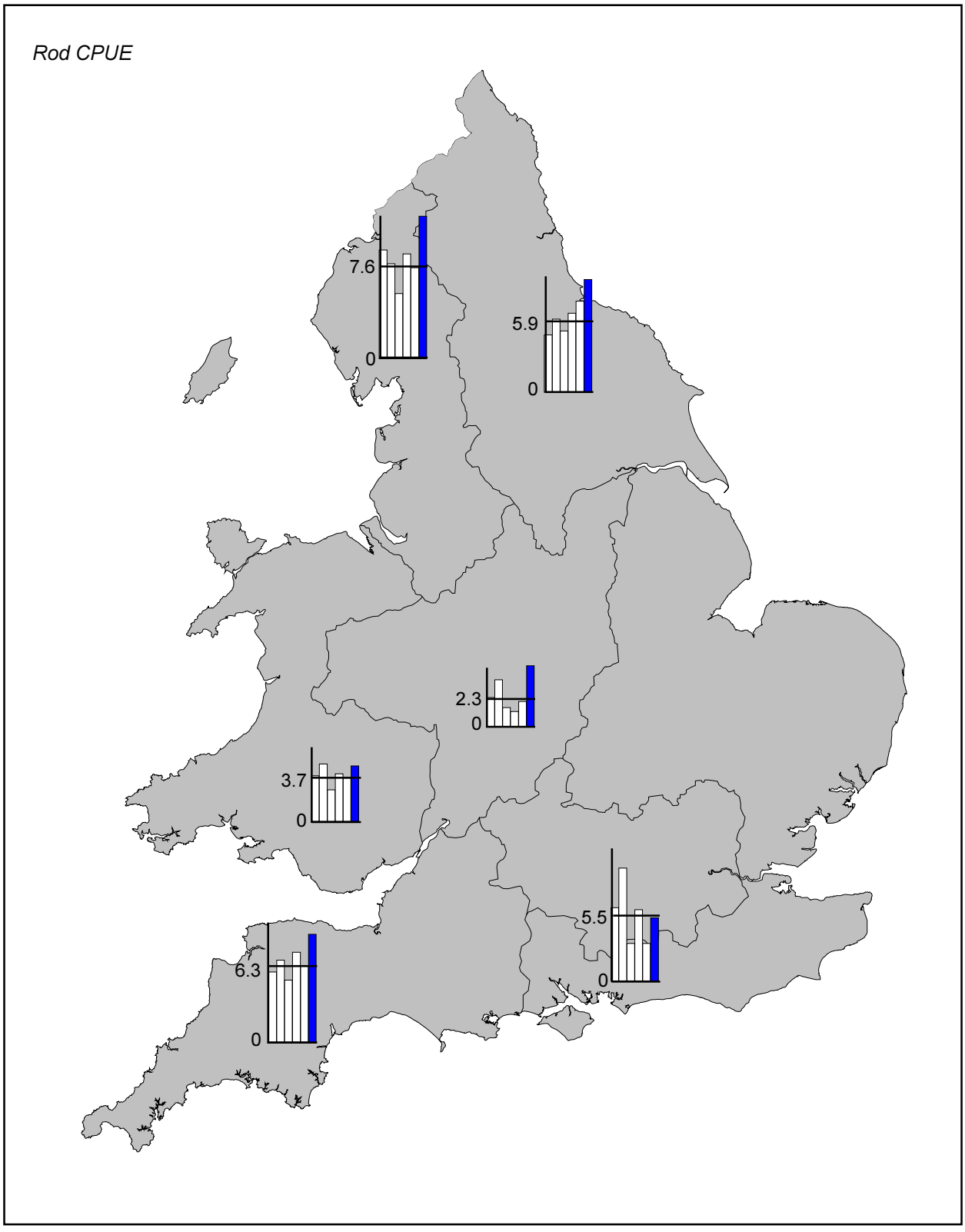


Figure 10. Regional rod catch of salmon per 100 days fished. The histograms display data for the six years 1995 to 2000, together with the five-year mean for the period 1995-1999 (displayed as a horizontal line, with the mean value indicated against the y-axis). Data for 2000 are provisional.

Table 12. Rod CPUE - number of salmon caught per 100 days fished for regional rod fisheries, 1995-2000 (Catches shown in Table 7)

Year	Region						
	NE	Thames	Southern	SW	Midlands	Wales	NW
1995	4.7	3.1	6.0	5.8	2.4	3.8	8.9
1996	6.0	3.2	9.2	6.9	3.9	4.7	7.8
1997	5.0	0.6	3.1	5.2	1.7	2.6	5.3
1998	6.5	0.0	5.9	7.5	1.3	3.9	8.6
1999	7.4	0.3	3.1	6.3	2.1	3.5	7.4
2000 (provisional)	**9.3**	**0.0**	**5.2**	**9.0**	**5.0**	**4.5**	**11.7**
Mean (1995 - 1999)	5.9	1.4	5.5	6.3	2.3	3.7	7.6
% change:							
2000 on 1999	+26		+68	+43	+138	+29	+58
2000 on 5-year mean	+57		-5	+42	+119	+22	+54

Note: Based only on catch returns for which effort data have been reported.

2.2.2 CPUE in rod fisheries

Regional summaries of rod CPUE data for anglers making returns (expressed as number of salmon caught per 100 days fished) are presented in Table 12 and Figure 10 for the period 1995 to 2000. These figures include returns from some anglers who fish primarily for sea trout; this may result in the CPUE for salmon being underestimated for some Regions. The mean number of salmon caught per 100 days fished varies from 1.4 for the Thames Region to 7.6 for the North West Region. The rod CPUE for 2000 was well above the average for the previous five years in all regions with the exception of Southern Region, which was close to the average. In a number of Regions the CPUE in 2000 was the highest recorded over the period, suggesting in-season availability of fish was particularly high.

A trend analysis of the rod CPUE data for all Regions now shows an overall upward trend over the past 8 years, the period for which data are available ($B_{crit} = 0.04$, $p = 0.02$). This suggests an overall improvement in angling success, either due to increased abundance of fish or better fishing conditions in more recent years.

2.3 Unreported and illegal catches

If the full effects of fisheries upon stocks are to be assessed, managers must take account of unreported catches by net and rod licence holders and also the scale of illegal catches. In earlier 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 was re-examined in 1997 and a similar approach has been used for estimating the extent of unreported and illegal catches since 1998.

2.3.1 Under-reporting by licence holders

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 previously been estimated at about 7% (Anon., 1991). In the North West, comparison of the catches seen by the 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 occur in some fisheries, in response to rumours about potential future buy-outs (and the perception that

compensation will be based on declared catches). This may have applied to the north east coast fishery in 2000. For this report, a figure of 8% has been used for the level of under-reporting of the national net catch, except for the north east coast where, for this year, the level of under-reporting is taken as zero.

For the purpose of setting conservation limits under their Salmon Action Plan guidelines (see Section 3 and Annex 3), the Environment Agency have estimated that declared salmon rod catches since 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 and the Southern Region (Rivers Test and Itchen) 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.

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. For this report, a figure of 12% has been used to estimate the total illegal catch for England and Wales.

2.3.3 Under-reporting and illegal catch estimate for 2000

On the basis of the above estimates, the non-reported and illegal catch for England and Wales in 2000 is estimated at about 38 tonnes, which represents approximately 18% of the total weight of salmon caught and killed.

2.4 Other sources of non-catch fishing mortality

Non-catch fishing mortality (NCFM) includes all sources of mortality generated directly or indirectly by fishing which are not included in the recorded catch. It includes the illegal and unreported catches, discussed above, in addition to losses caused by: fish that are removed from the gear by predators; fish that fall out of the net; fish that escape and die later; and dead or dying fish that are released or discarded.

The extent of the likely losses will vary between fisheries because of the type of gear used and its method of operation. In addition, the impact of predators, particularly seals, varies between areas. However, in most net fisheries in England and Wales the netsmen remain with their gear and remove any fish caught quite quickly; thus relatively few fish will drop out and losses to predators can usually be limited. Sweep and hand-held nets cause very little damage to the fish and so losses of fish that may escape are likely to be minimal. However, small losses may occur from gilling nets, and predation losses may be significant in the NE Coast fishery, which is close to a large grey seal colony.

No data are available on the NCFM during normal angling activities. The use of catch-and-release, however, is likely to result in some fish dying as a result of being exhausted or damaged; studies suggest that such losses can be minimal if fish are handled carefully.

2.5 Composition of catches

2.5.1 Age composition of net catches

Estimates of the proportions of one-sea-winter (1SW) and multi-sea-winter (MSW) salmon taken have not been available in all regional net fisheries because some netsmen have not been required to report the sizes of individual fish caught and few scale samples have been collected. However, data collection procedures have now been standardised for all fisheries (except the North East), and this will permit age composition of catches to be reported in the future.

Catches in some net fisheries are reported as 'grilse' or 'salmon' based upon weight splits. Such data are available for 2000 for the North East, North West and Midlands Regions and Wales and are shown in the text table below. Where the reporting systems have been consistent these data provide an indication of changes in the age-composition of the catches. For the North East Region, 'salmon' made up 33% of the catch in 2000, similar to 1999 (35%) and 1998 (34%), but below the long-term average of 42% (1965-99).

	Grilse (< 8 lbs)	%	Salmon (> 8 lbs)	%	Total
NE	29,000	67	14,332	33	43,332
NW	2,254	65	1,201	35	3,455
Midlands	475	49	496	51	971
Wales	605	60	397	40	1,002

Some 1SW fish are classed as 'salmon' by this method and some MSW salmon as grilse. The proportions are affected by changes in the mean weight of fish of different ages. The proportion of 'salmon' recorded in 2000 is expected to have been reduced by the introduction of the national measures restricting netting effort in the early part of the season when MSW salmon comprise the majority of the catch.

2.5.2 Age composition of rod catches

Insufficient scale samples have been collected and read to provide reliable estimates of the relative contributions of 1SW and MSW fish in the rod catches in many Regions of England and Wales. Monthly age/weight keys for salmon from the River Dee trap for the period 1992-2000 have therefore been used to estimate the age composition of catches for principal salmon rivers (Table 13). These estimates were derived from the declared catches where a weight and date of capture have been provided.

In 2000, three of the principal salmon rivers listed at Table 13 (Tyne, Torridge and Wye) had over 50% MSW salmon in the rod catch (including released fish). This is less than in 1999 (6 rivers). Of the remaining rivers, seven had between 25% and 49% MSW salmon in the rod catch (9 in 1999) and 31 had less than 25% MSW salmon (26 in 1999). These changes may reflect an increase in the number and proportion of grisle compared with the previous year.

The estimated numbers of 1SW and MSW salmon, and the proportion of MSW fish, in regional rod catches (including fish caught and released) over the period 1995 to 2000 are provided in Table 14 and Figure 11.

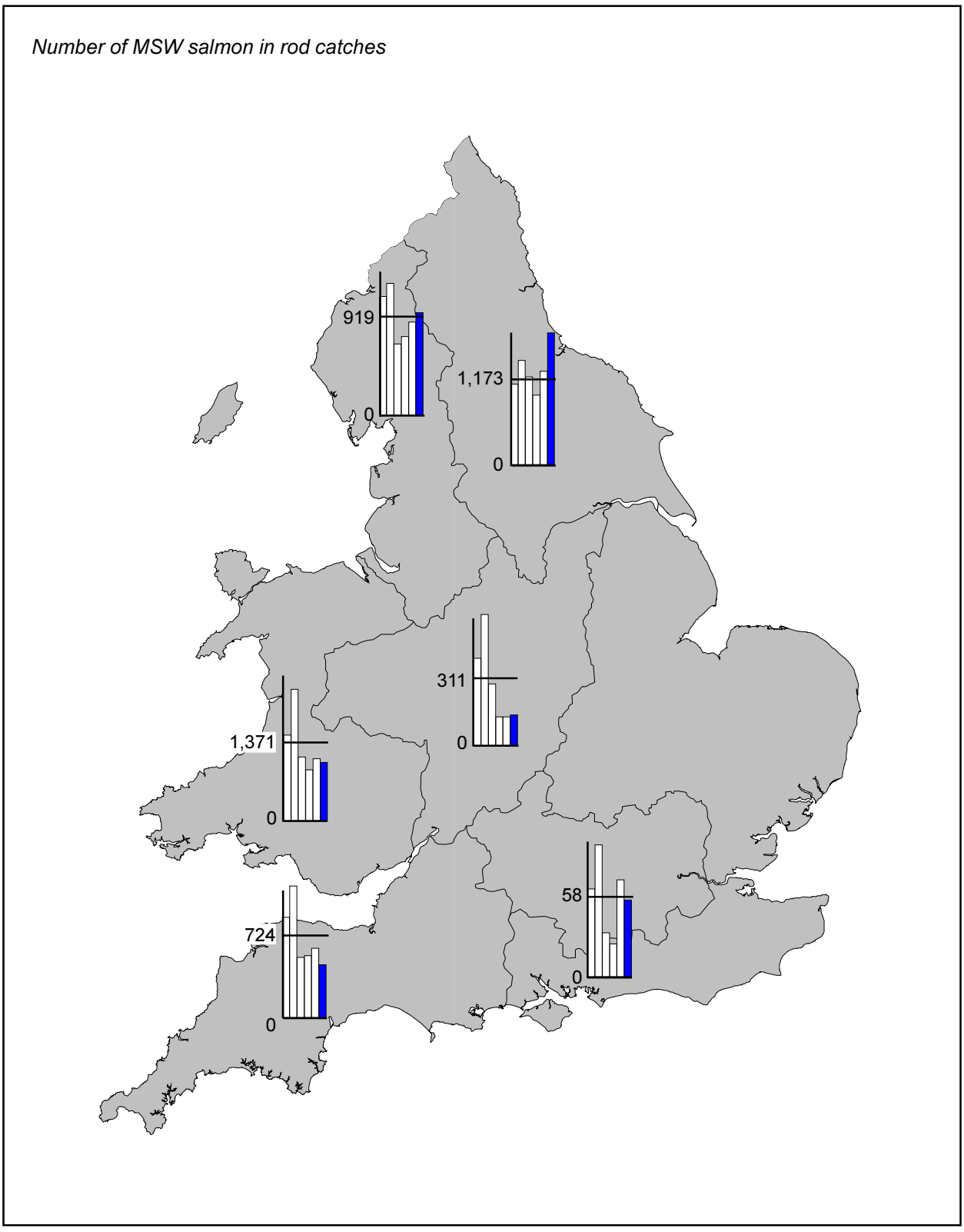


Figure 11. Estimated number of MSW salmon in regional rod catches. The histograms display data for the six years 1995 to 2000, together with the five-year mean for the period 1995-1999 (displayed as a horizontal line, with the mean value indicated against the y-axis). Note that the histograms are not drawn to the same scale. Data for 2000 are provisional.

Table 13. Proportions of 1SW and MSW salmon in provisional declared 2000 rod catches, including fish released (Data not corrected for incomplete returns).

Region	River	No. grilse	%	No. MSW	%
NE	Coquet	435	72	168	28
	Tyne	1,028	47	1,143	53
	Wear	422	81	101	19
Southern	Itchen	57	92	5	8
	Test	24	71	10	29
SW	Hants Avon	7	54	6	46
	Frome	48	60	32	40
	Exe	588	91	60	9
	Teign	85	90	9	10
	Dart	85	85	15	15
	Tavy	63	95	3	5
	Tamar	200	83	42	17
	Lynher	53	85	9	15
	Fowey	140	93	10	7
	Camel	217	97	7	3
	Taw	251	64	141	36
	Torridge	40	42	56	58
	Lyn	177	92	16	8
Midlands	Severn	179	59	123	41
Wales	Wye	146	46	171	54
	Usk	615	72	234	28
	Ogmore	64	89	8	11
	Tywi	359	85	62	15
	Tawe	41	87	6	13
	Taf	75	94	5	6
	E & W Cleddau	51	93	4	7
	Teifi	442	86	69	14
	Dyfi	117	87	17	13
	Mawddach	98	88	13	12
	Ogwen	96	95	5	5
	Conwy	174	91	18	9
	Dee	268	76	86	24
NW	Ribble	680	85	117	15
	Lune	1,243	89	152	11
	Kent	526	96	24	4
	Leven	17	100	0	0
	Irt	102	98	2	2
	Ehen	403	94	25	6
	Derwent	1,121	88	158	12
	Eden	927	86	149	14
	Border Esk	623	88	81	12
Total		**12,287**	**79**	**3,362**	**21**

Note: Data only included for fish for which weight data provided on catch return; these data do not represent the total catch for the season.

The numbers of MSW salmon taken by rods in 2000 were higher than the numbers in 1999 in the NE, Midlands and NW Regions, but fell elsewhere. Overall, the MSW catch was up 10% on 1999, although it remained below the five-year mean (down 4%). The proportion of MSW salmon in the 2000 catch was well below that in 1999 in most Regions, except the NE. Overall, MSW salmon comprised 23% of the catch nationally, compared with 30% in 1999; this reflects the improved grilse catch (see below). Catches in the NE Region are likely to have been affected by the phase-out of the coastal drift net fishery; in the other Regions there has been an overall downward trend in the MSW catches over the past 8 years (B_{crit} = -0.08, p = 0.98) and 5 years (B_{crit} = -0.11, p = 0.97).

Rod catches of grilse in 2000 were well above those in 1999 in all Regions, and were up 57% overall. Catches were also well above the mean of the previous five years in all Regions, and were up by 22% overall. The increase in the numbers of grilse taken by rods relative to the five-year mean, ranged from 7% in Wales to 169% in the Midlands Region. There has been no significant overall trend in the grilse catches (excluding catches in NE) over the past 8 years (B_{crit} = -0.06, p = 0.93) or 5 years (B_{crit} = 0.0002, p = 0.49) .

Table 14. The estimated number of grilse and MSW salmon (corrected for under-reporting) and the percentage composition of MSW salmon in regional rod catches in England and Wales, 1995-2000 (including fish caught and released)

Numbers

Year	Region												All Regions	
	NE		Southern		SW		Midlands		Wales		NW			
	Grilse	MSW	Grilse	MSW	Grilse	MSW	Grilse	MSW	Grilse	MSW	Grilse	MSW	Grilse	MSW
1995	1,339	1,082	237	65	1,949	860	84	402	3,070	1,491	5,881	1,102	12,560	5,002
1996	1,360	1,405	287	97	1,833	1,116	104	603	3,728	2,287	5,064	1,228	12,376	6,736
1997	1,501	1,189	118	32	2,092	517	58	285	2,865	1,119	3,899	659	10,533	3,801
1998	2,295	940	342	24	2,679	532	69	136	3,863	895	6,261	734	15,509	3,261
1999	1,676	1,247	179	72	1,422	594	71	131	2,339	1,065	3,651	871	9,338	3,980
2000	**2,158**	**1,766**	**292**	**56**	**2,209**	**452**	**208**	**145**	**3,390**	**1,012**	**6,437**	**962**	**14,694**	**4,393**
Mean (1995-99)	1,634	1,173	233	58	1,995	724	77	311	3,173	1,371	4,951	919	12,063	4,556
% change:														
2000 on 1999	+29	+42	+63	-22	+55	-24	+193	+11	+45	-5	+76	+10	+57	+10
2000 on 5-year mean	+32	+51	+25	-3	+11	-38	+169	-53	+7	-26	+30	+5	+22	-4

Percentage MSW

Year	Region						All
	NE	Southern	SW	Midlands	Wales	NW	Regions
1995	45	21	31	83	33	16	28
1996	51	25	38	85	38	20	35
1997	44	21	20	83	28	14	27
1998	29	7	17	66	19	10	17
1999	43	29	29	65	31	19	30
2000	**45**	**16**	**17**	**41**	**23**	**13**	**23**
Mean (1995-99)	42	21	27	76	30	16	27

2.6 Origin of catches

2.6.1 Reared fish

There is currently no ranching in England and Wales and only one small salmon cage-rearing facility. This facility is believed to be primarily run for research purposes (e.g. feed trials). The contribution of farmed and ranched fish to the catches is therefore 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 of fish stocked in these programmes, and the stage of release, are included, on a catchment by catchment basis in the Salmonid and Freshwater Fisheries Statistics published annually by the Agency. In most instances, when they return as adults these fish cannot be distinguished from fish derived from natural spawning, although marking and tagging programmes are undertaken in some areas to assess the efficacy of these programmes (Annex 5).

2.6.2 Salmon from other countries

Based upon studies conducted in the 1980s, approximately 80% of the salmon caught in the North East Coast Fishery in England and Wales were estimated to be returning to rivers in Scotland. On this basis, this would represent ~35,000 fish in 2000, although given the continued improvement in the status of the stocks in the NE Region, and the River Tyne in particular, this is likely to be an over-estimate. The fishery operating in the Solway Firth is also thought to exploit some salmon returning to rivers in Scotland, but the proportion of such fish in the Solway net catch has not been estimated. There are very few records of tagged salmon from other countries being taken in England and Wales.

2.7 Exploitation rates

2.7.1 Homewater exploitation

Exploitation rates have been estimated for fisheries on certain rivers in England and Wales for which reliable counts are available (Table 15 and Figure 12). The levels of exploitation in 2000 were below the average of the previous five years in all the rod fisheries for which data are available, with the exception of the MSW component on the Dee for which a substantial increase was noted. This indicates that despite the increased rod catches of grilse observed in many rivers in 2000, levels of exploitation were relatively low possibly as a result of less favourable angling conditions and decreased fishing effort. Exploitation rates are available for two net fisheries, the Dee and the Lune and both of these were below the average of the previous five years.

Table 15. Estimated exploitation rates (%) for selected fisheries in England and Wales, 1988-2000 (rates exclude released fish unless specified in footnotes).

	Region	Southern		SW			Welsh				NW			
	River Fishery	Test rods	Itchen rods	Frome rods	Tamar rods	Fowey rods	Dee rods 1SW	Dee rods MSW	Dee nets	Taff rods	Leven rods	Kent rods	Lune rods	Lune nets
Year		(c)	(c)	(a)			(b)	(b)			(d)			
1988		39		10										
1989		29	45	8										44
1990		36	51	11										36
1991		26	45	9										30
1992		25	27	11			14	18	15	5			23	30
1993		26	41	12			11	15	11	6			16	30
1994		25	44	14	13		15	21	22	5			29	35
1995		23	21	9	7	11	7	11	18	4	35	35	17	27
1996		19	47	13	7	8	9	11	17	3	21	31	17	24
1997		12	22	6	5	8	8	9	17	1	58	50	18	29
1998		18	18	6	6	7	10	10	15		43	65	12	14
1999		10	13	n/a	4	3	11	9	21	12	2	15	12	14
2000		**9**	**9**	**n/a**	**4**	**5**	**6**	**17**	**14**	**n/a**	**2**	**16**	**8**	**15**
Mean (1995 - 1999)		16	24	9	6	7	9	10	18	5	32	39	15	22
% change:														
2000 on 1999		-10	-31		0	+67	-45	+89	-33		0	+7	-33	+7
2000 on 5-yr mean		-45	-63		-31	-32	-32	+75	-20		-94	-59	-47	-31

Key: (a) Data based on CEH counter at Wareham, and supplied courtesy of CEH.
(b) Data derived from mark recapture experiment.
(c) Includes rod caught fish retained for broodstock.
(d) Local restrictions on fishing imposed in 1999.

Notes: Estimates for Dee and Lune net fisheries are based on declared catches and are minimum estimates.
Estimates for Dee rod fisheries include fish caught and released.

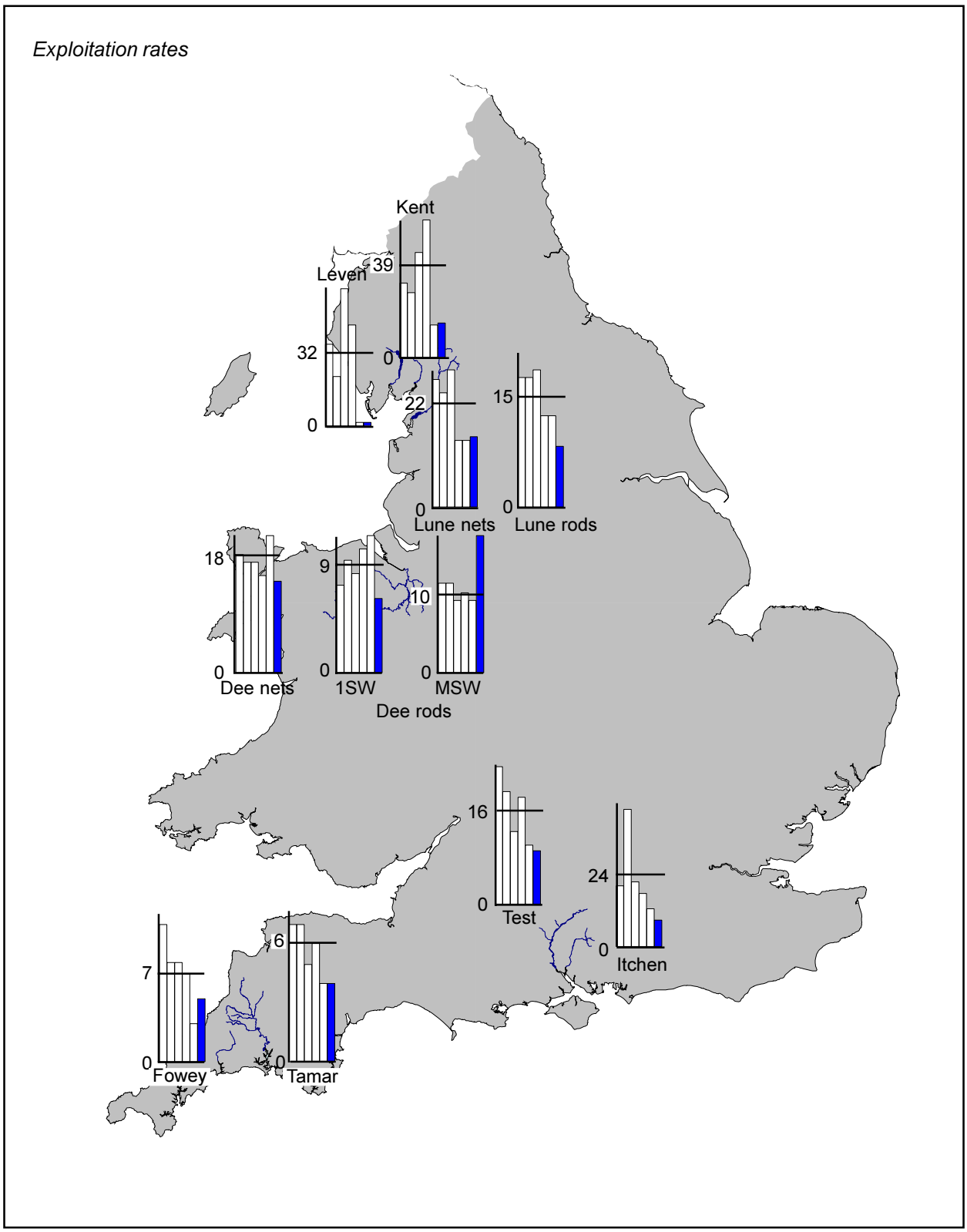


Figure 12. ***Exploitation rates (%) for selected rod and net salmon fisheries in England and Wales. Where available, the histograms display data for the six years 1995 to 2000, together with the five-year mean for the period 1995-1999 (displayed as a horizontal line, with the mean value indicated against the y-axis). Data for 2000 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.***

2.7.2 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 have probably fallen to very low levels.

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%). Between 1991 and 1998, the Faroes salmon quota was bought out, and only a small research fishery operated taking upto 23 t per year; commercial fishing began again in 2000 and a catch of 8 t was reported.

Ireland

Discussions are currently underway between scientists from CEFAS, the Environment Agency and the Irish Marine Institute to agree estimates of exploitation in the Irish drift net fishery for selected English and Welsh stocks. Provisional estimates of the levels of exploitation, prior to the introduction of new fisheries regulations in 1997, vary substantially between stocks in different Regions and from year to year. Exploitation rates were 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. More recent data suggest that levels of exploitation have been significantly reduced following the introduction of the new measures in Ireland in 1997.

Other homewater fisheries

Few tags of English and Welsh origin have been returned 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 continues to be a matter of concern and efforts are being made through ICES to investigate this issue.

No new data are available on the possible effects of sandeel fisheries on salmon post-smolts. An area in the fishing grounds off the Firth of Forth and the Grampian Coast is closed to sandeel fishing from April to August. This is principally to protect certain bird species, but it might also benefit stocks of salmon and sea trout.

REPORT ON STATUS OF STOCKS IN 2000

3. Status of stocks

3.1 Conservation Limits and Management Targets

3.1.1 Progress with setting conservation limits

The use of conservation limits in England and Wales has developed in line with the requirements of ICES and NASCO and the need to manage and conserve individual river stocks. Provisional conservation limits have been set for all principal salmon rivers (Table 16) and these are being refined as Salmon Action Plans are prepared (Annex 3).

> **Conservation Limits** demarcate undesirable spawning stock levels. When stocks fall below the conservation limit the number of adult fish produced in the next generation will be significantly reduced. It is therefore the level below which stocks should not be allowed to fall. It is currently defined by ICES and NASCO as the spawning stock level that produces maximum sustainable yield (synonymous with maximising the surplus recruits or the gain over a number of years).

Compliance of the spawning escapement with the conservation limits is not normally assessed for individual years but in three-year blocks. Compliance is based upon rules relating to 'episodes' (periods of years) when the escapement falls below the limit (Environment Agency, 1998). These rules state that episodes may last no longer than two years, and that there should be a clear gap between episodes of at least two years. Failure cannot distinguish between a real deterioration in the egg deposition and a chance (1-in-20 year) false alarm, and so the circumstances have to be investigated to determine which was the more likely explanation and corrective action taken if necessary. A river classed as failing would remain classified as such until a reassessment, for a subsequent three-year period, showed a pass. Recent history of English and Welsh SAP rivers is also shown in Table 16, in which the timing of each three-year block is determined by the particular Salmon Action Plan; compliance according to the above criteria is shown in the right hand column for those rivers for which conservation limits have been finalised

Conservation limits form only one part of the assessment of the status of a stock, and management decisions are never based simply on a compliance result alone. Because stocks are naturally variable, the fact that a stock is exceeding its conservation limit does not mean that there will be no need for any management action. Similarly, the fact that a stock may fall below its conservation limit for a small proportion of the time may not mean there is a problem. Thus, a range of other factors are taken into account, particularly the structure of the stock and any evidence concerning the status of particular stock components, such as tributary populations or age groups, based for example on patterns of run timing and the production of juveniles in the river sub-catchments.

The Agency is continuing to review and revise its scheme with the aim of incorporating more extensive statistical descriptions of the risks and uncertainties in reference points and assessments.

Table 16. Conservation Limits (CL) and the proportion of CL attained for the period 1994-2000 for the principal salmon rivers of England and Wales. Compliance estimates are shown for those rivers where CLs have been refined and published externally. Compliance failure is indicated by shaded blocks based on 3 year assessment periods - see Section 3.1.1 (all results are provisional).

Region	River	Accessible wetted area hectares	Conservation Limit eggs/100m²	Conservation Limit eggs (millions)	2000 egg deposition (millions) ***			Proportion of Conservation Limit attained (%)							Current compliance #
								1994	1995	1996	***1997	***1998	***1999	***2000	
					1SW	MSW	All	All	All	All	All	All	All	All	
NE	** Coquet	144	316	4.54	-	-	8.20	107	93	109	159	131	117	181	Pass
	** Tyne	542	289	15.65	-	-	39.99	115	129	177	157	173	212	255	Pass
	** Wear	232	336	7.81	-	-	7.01	41	52	60	38	62	52	90	Fail
	** Tees	620	330	20.46	0.51	2.96	3.47	8	15	5	4	20	18	17	Fail
	* Esk-Yorks	86	322	2.76	0.42	0.15	0.57	77	21	9	31	17	9	21	Fail
	Total			**51.22**			**59.25**	-	-	-	**71**	**83**	**91**	**116**	
Southern	** Test	138	246	3.40	-	-	1.31	40	32	35	23	57	65	39	Fail
	** Itchen	69	234	1.63	-	-	0.48	34	101	42	31	63	27	29	Fail
	Total			**5.03**			**1.79**	-	-	-	**25**	**59**	**53**	**36**	
SW	** Avon-Hants	360	237	8.53	-	-	4.13	25	32	61	13	22	30	48	Fail
	* Stour	199	142	2.82	-	-	0.30	9	6	5	8	5	6	11	Fail
	Piddle	25	194	0.49	0.01	0.00	0.01	-	-	-	22	12	36	3	n/a
	** Frome	90	223	2.00	Data unavailable			127	128	153	147	187	200	-	Pass
	Axe	57	247	1.40	0.11	0.01	0.12	-	-	-	6	9	11	9	n/a
	Exe	210	343	7.20	-	-	8.51	-	-	-	129	137	85	118	n/a
	* Teign	98	352	3.47	-	-	1.87	-	-	-	53	54	24	54	n/a
	* Dart	132	294	3.87	-	-	1.78	-	-	-	46	42	18	46	n/a
	Avon-Devon	18	294	0.52	0.27	0.08	0.35	-	-	-	44	50	31	67	n/a
	Erme	10	300	0.31	0.07	0.00	0.07	-	-	-	32	19	43	22	n/a
	Yealm	8	297	0.25	0.20	0.02	0.22	-	-	-	57	144	13	89	n/a
	Plym	17	436	0.75	0.15	0.10	0.25	-	-	-	52	43	19	33	n/a
	** Tavy	79	257	2.02	-	-	0.75	139	48	39	64	124	44	37	Pass
	** Tamar	197	293	5.77	-	-	8.16	236	241	186	128	176	155	141	Pass
	** Lynher	29	294	0.86	-	-	0.88	152	27	31	60	124	50	103	Pass
	Fowey	34	430	1.47	1.17	0.27	1.44	-	-	-	83	78	49	98	n/a
	* Camel	56	243	1.35	-	-	1.88	216	208	192	131	138	94	139	Pass
	* Taw	273	299	8.16	-	-	7.59	65	40	71	45	77	71	93	Fail
	* Torridge	200	284	5.69	-	-	1.62	79	36	29	15	25	16	28	Fail
	Lyn	27	556	1.50	1.93	0.11	2.04	-	-	-	114	103	69	136	n/a
	Total			**58.45**			**41.98**	-	-	-	**63**	**79**	**60**	**74**	
Midlands	* Severn	898	190	17.06	-	-	11.98	184	194	257	104	55	54	70	Fail
	Total			**17.06**			**11.98**	-	-	-	**104**	**55**	**54**	**70**	

Wales	** Wye	1402	245	34.50	3.58	6.20	9.79	44	46	92	40	34	38	28	Fail
	* Usk	407	350	14.25	-	-	18.24	-	-	-	87	105	110	128	n/a
	* Taff & Ely	15	314	0.46	-	-	0.55	-	-	-	122	123	239	120	n/a
	Ogmore	35	253	0.87	0.63	0.13	0.76	-	-	-	82	85	76	87	n/a
	Afan	17	450	0.76	0.05	0.00	0.05	-	-	-	16	25	8	6	n/a
	Neath	37	419	1.55	0.61	0.13	0.74	-	-	-	15	35	45	47	n/a
	* Tawe	76	312	2.36	-	-	0.44	81	68	34	35	38	32	19	Fail
	Loughor	35	289	1.02	0.11	0.06	0.17	-	-	-	7	7	9	16	n/a
	* Tywi	500	314	15.70	-	-	20.18	110	96	91	43	65	103	128	Fail
	** Taf	90	256	2.31	-	-	1.81	127	23	39	61	40	63	79	Fail
	* E&W Cleddau	87	236	2.04	-	-	0.82	62	27	22	35	38	26	40	Fail
	* Teifi	296	401	11.89	-	-	12.40	135	56	160	101	96	105	104	Pass
	Aeron	35	417	1.44	0.06	0.00	0.06	-	-	-	2	1	4	4	n/a
	Ystwyth	46	397	1.83	0.29	0.04	0.33	-	-	-	24	29	10	18	n/a
	Rheidol	50	426	2.14	0.23	0.05	0.28	-	-	-	21	18	14	13	n/a
	* Dyfi	179	311	5.57	2.24	0.80	3.05	115	66	100	45	62	44	55	Fail
	* Dysinni	-	-	0.88	0.11	0.05	0.16	43	6	19	22	31	6	18	Fail
	** Mawddach	57	312	1.77	0.75	0.17	0.92	170	73	81	76	83	91	52	Fail
	Artro	9	423	0.37	0.02	0.00	0.02	-	-	-	9	18	8	5	n/a
	* Dwyryd	9	246	0.23	0.15	0.00	0.15	334	242	229	229	230	114	65	Pass
	* Glaslyn	25	242	0.61	0.09	0.02	0.11	126	137	86	107	57	31	19	Fail
	** Dwyfawr	33	322	1.07	0.43	0.01	0.44	105	42	47	48	28	28	41	Fail
	** Seiont	21	288	0.61	0.94	0.08	1.02	148	115	115	124	155	87	168	Pass
	** Ogwen	24	449	1.07	2.16	0.26	2.42	273	187	145	209	271	133	225	Pass
	** Conwy	50	171	0.85	1.70	0.47	2.18	316	288	298	168	198	128	256	Pass
	** Clwyd	84	312	2.62	1.08	0.16	1.24	127	51	36	21	97	58	47	Fail
	** Dee	617	248	15.30	-	-	9.28	77	96	85	91	106	86	61	Pass
	Total			**124.08**			**87.60**	-	-	-	**61**	**68**	**69**	**71**	
NW	** Ribble	351	242	8.49	-	-	6.87	81	29	52	26	63	63	81	Fail
	Wyre	46	264	1.22	0.06	0.00	0.06	-	-	-	5	34	5	5	n/a
	** Lune	423	280	11.84	-	-	16.01	85	74	78	51	105	86	135	Pass
	* Kent	68	314	2.14	-	-	4.12	219	178	155	99	261	83	193	Pass
	** Leven	46	249	1.14	-	-	0.77	62	56	33	36	44	23	68	Fail
	** Crake	16	243	0.40	-	-	0.20	64	73	40	12	64	26	51	Fail
	Duddon	11	402	0.45	0.13	0.04	0.17	-	-	-	30	104	39	38	n/a
	Esk	14	401	0.55	1.14	0.34	1.47	-	-	-	50	154	181	266	n/a
	Irt	20	317	0.63	0.65	0.06	0.72	-	-	-	88	151	46	114	n/a
	* Ehen	41	283	1.16	-	-	3.22	182	156	119	83	244	42	279	Fail
	* Calder	13	326	0.41	-	-	0.58	72	86	90	123	99	21	141	Pass
	* Derwent	208	269	5.60	-	-	11.77	-	-	-	96	102	100	210	n/a
	Ellen	17	322	0.54	0.23	0.00	0.24	-	-	-	6	61	16	44	n/a
	** Eden	688	300	20.63	-	-	13.95	181	148	125	84	75	74	68	Fail
	Esk-Border	144	440	6.31	8.26	3.72	11.98	-	-	-	166	159	116	190	n/a
	Total			**61.51**			**72.13**	-	-	-	**76**	**100**	**78**	**117**	
Total				**317.36**			**274.73**	-	-	-	**67**	**78**	**72**	**87**	

* *Refined conservation limit identified in draft or published SAP Consultation Document or Local Environment Agency Plan (LEAP).*

** *Refined conservation limit identified in Final Salmon Action Plan (SAP).*
Remaining conservation limits and compliance estimates are provisional only and require refinement through river specific inputs.

*** *All estimates include eggs contributed by rod released fish.*

\# *Basis for current compliance explained in Section 3.1.1.*
Compliance data are not included for the rivers: Teign, Dart, Usk, Taff & Ely and Derwent as these have yet to be published externally in SAP or LEAP documents.

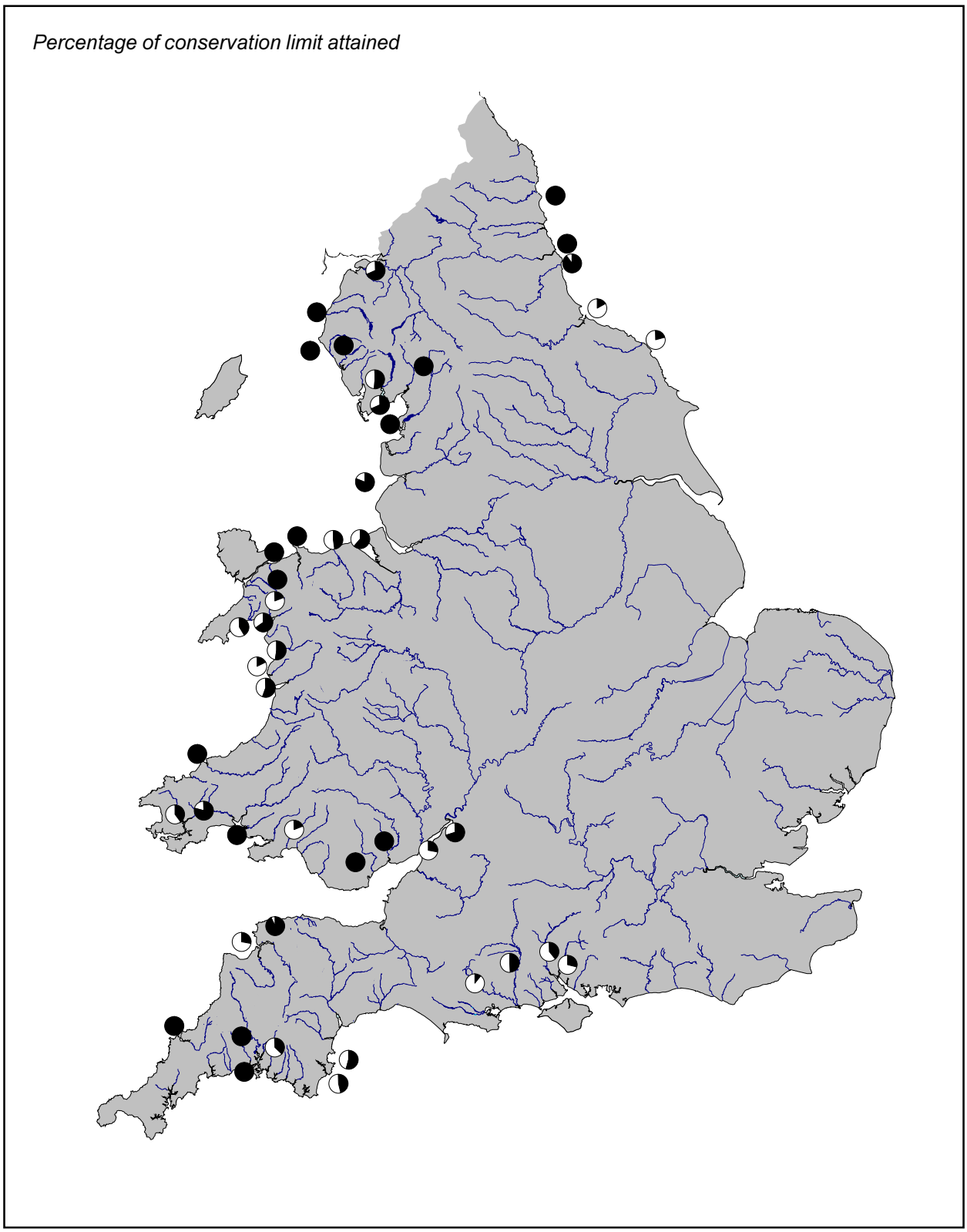


Figure 13. Pie charts for individual rivers for which refined limits have been set (Table 16) showing the % of the conservation limit attained in 2000. A black circle indicates that the target was met or exceeded

3.1.2 Spawning escapement in 2000

Table 16 and Figure 13 indicate wide variation in the levels to which conservation limits were met in 2000. There are few obvious regional trends, although spawning escapement remained well below the limits in the south coast chalkstream catchments. A number of rivers, such as the river 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.

There were improvements in the spawning escapement in 2000, with more rivers exceeding the conservation limits (including rivers with provisional conservation limits) than in the previous four years (Table 17).

Table 17. Summary of the number and percentage of rivers above their conservation limits (CL), between 50% and 100% of the CL, and less than 50% of the CL, 1997-2000.

Year	>CL		50-100% CL		<50% CL	
	No.	%	No.	%	No.	%
1997	17	24	18	26	35	50
1998	19	27	17	24	34	49
1999	14	20	18	26	38	54
2000	**22**	**32**	**17**	**25**	**30**	**43**

This suggests a modest improvement in the status of stocks compared with recent years. However, despite the improvements in runs of grilse in 2000, the majority of salmon stocks in England and Wales continue to be in a depleted state.

The provisional nature of the conservation limits 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 limits for such rivers may need to be refined in the future.

There are 42 rivers in England and Wales for which refined conservation limits have been set and for which egg deposition has been estimated for a series of years (Table 16). Compliance assessments (see section 3.1.1) for these stocks indicate that 26 (62%) have shown compliance failure over the most recent three year assessment period. The compliance failures are fairly evenly distributed in different Regions.

For Wales and the Southern Region the egg deposition in 2000 was estimated to be towards the lower end of the range observed in the past 6 years for most rivers. In South West and Midlands Regions estimated egg deposition was, on average, around the middle of the range and in the North East and North West Regions it was towards the upper end of the range.

3.2 Measures of abundance/escapement

Electronic fish counters are operated on a number of catchments in England and Wales to provide estimates of the upstream run of adult salmonids. Where possible, the counts have been adjusted to provide estimates of the returning salmon stock. Time-series of counts, or returning stock estimates, are presented in Table 18 and Figure 14.

The available measures of adult stock abundance in 2000 were mostly at or above the levels recorded in 1999, although the returning stock estimate for the River Test (Southern Region) was markedly lower. The measures of adult stock abundance for rivers in the NW Region were very much higher than those recorded in 1999. In comparison with the averages for the previous five years (1995-99), half of the adult stock abundance values for 2000 were higher and half were lower. This conforms with the indications from the rod catch data and estimates of exploitation, which suggest that salmon stock abundance in England and Wales was relatively good in 2000 in some areas. The counts in Table 18 now show no overall trends on southern rivers (Tamar, Frome, Test and Itchen) over the past five years (B_{crit} = -0.15 , p = 0.65) or 10 years (B_{crit} = -0.18, p > 0.77). The counts on the rivers in the north and west (Lune, Leven, Caldew, Kent and Dee) also show no significant overall trend over the past 5 years (B_{crit} < 0.001, p = 0.33), but a decline over the past 10 years (B_{crit} = -0.001, p = 0.98).

Although salmon have been returning strongly to some historically polluted rivers (e.g. Tyne, Wear, Ogmore), there is concern about chronic environmental degradation in others, mainly in rural areas, driven by changing land use practices, especially agriculture and forestry. Issues of particular concern are siltation resulting from soil erosion, pesticides from sheep dip chemicals, acidification and changes in river flows. The relative importance of these effects vary around the country, but clusters of high pesticide levels have been found in Welsh upland streams, and acidification is still extensive in the uplands of Wales and the North West. Salmon catches in the chalk rivers of Southern Region have suffered simultaneous decline in recent years, but the full reasons for this are not yet clear. The extent and nature of soil erosion impacts are being investigated and national water abstraction licence legislation is under review.

Table 18. Validated counts and run estimates of salmon smolts and adults in rivers in England and Wales.

	Stage:	Smolts	Adults													
	Region:	S	NE	Thames	Southern		SW			Wales		NW				
	River:	Test#	Coquet	Thames#	Test	Itchen	Frome	Tamar	Fowey	Dee	Wye	Lune	Kent	Leven	Calder	Caldew
	Method:	Run estimate	RSE[1]	T	RSE[1]	RSE[1]	C	C	C	RSE[2]	C	RSE[1]	C(>4lb)	C(>4lb)	C(>4lb)	T
1987																
1988				288	1,507	1,336	4,093									
1989				91	1,730	791	3,186					8,785	1,137			
1990				63	790	367	1,880					8,261	2,216			
1991				36	538	152	805					7,591	1,736			
1992		11,967		247	614	357	900			4,643		4,066	1,816			
1993		7,131		259	1,155	852	1,182			9,757		7,883	1,526	101		
1994		3,381	2,254	143	775	378	1,078	6,359		8,285		6,254	2,072	102		1,590
1995		6,853	2,508	162	647	880	1,016	5,637	890	5,703		4,589	1,396	123	379	1,417
1996		4,712	2,509	122	623	433	1,353	3,988	1,187	4,931		4,739	1,219	155	212	1,289
1997		7,229	n/a	25	361	246	1,157	2,989	1,075	5,495	4,451	3,121	491	41	224	889
1998		14,672	n/a	6	898	453	1,210	4,176	882	6,661	4,712	7,457	800	39	n/a	1,106
1999		4,138	n/a	36	867	213	n/a	3,588	1,262	3,664	2,686	4,936	1,018	98	n/a	1,022
2000		**3,516**	**n/a**	**57**	**583**	**208**	**n/a**	**3,539**	**1,692**	**3,751**	**4,913**	**8,383**	**2,354**	**322**	**n/a**	**1,566**
Mean (1995-99)		7,521		70	679	445	1,184	4,076	1,059	5,291	3,950	4,968	985	91	272	1,145

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)

Key: *# Denotes stock supported by large-scale stocking from hatchery programme.*

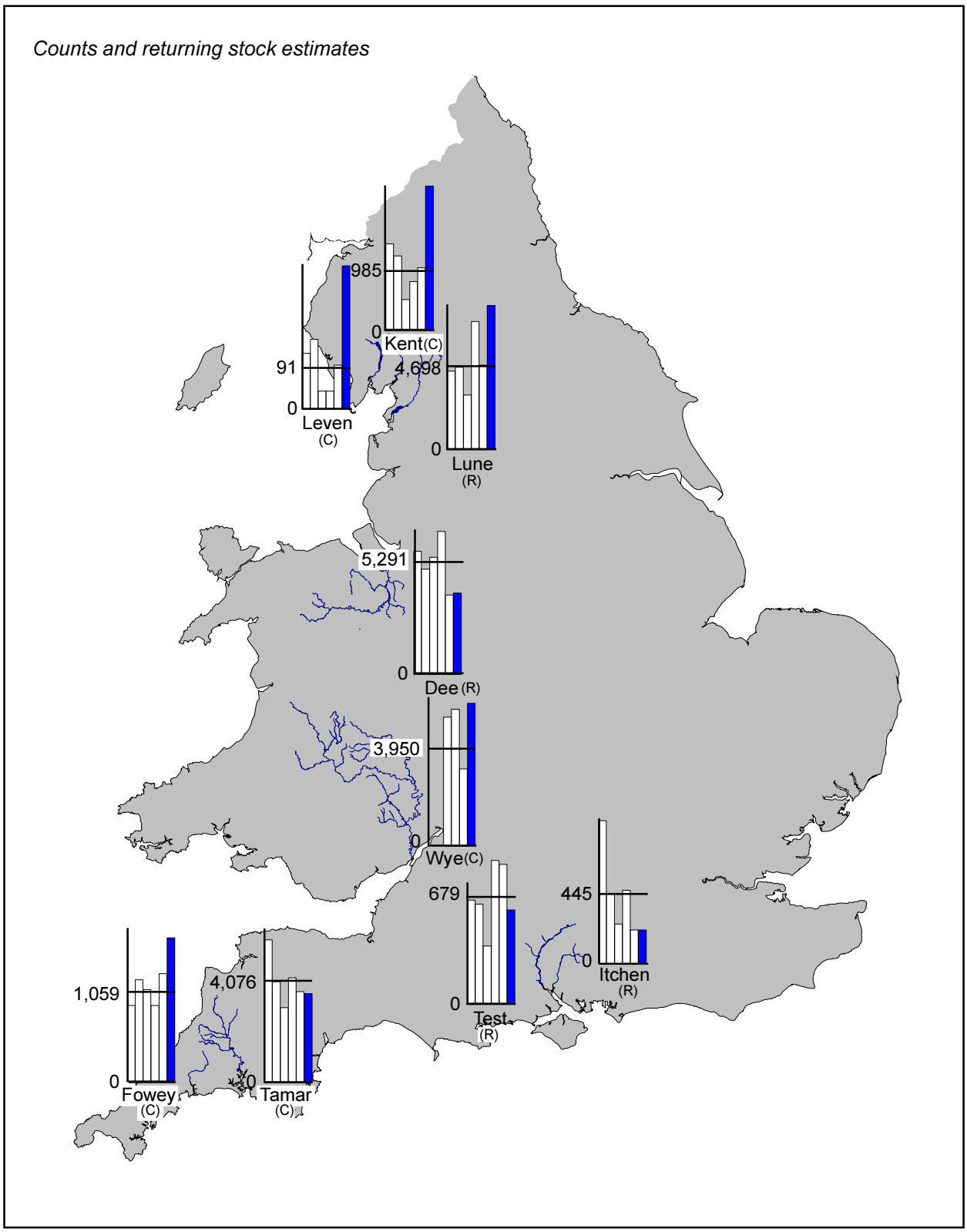


Figure 14. Counts (C) and returning stock estimates (R) for selected salmon stocks in England and Wales. The histograms display data for the six years 1995 to 2000, together with the five-year mean for the period 1995-1999 (displayed as a horizontal line, with the mean value indicated against the y-axis). Note that the histograms are not drawn to the same scale. Data for 2000 are provisional. Data for River Wye are partial hydroacoustic counts.

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. Marine survival estimates for the River Corrib (Ireland), River Bush (Northern Ireland) and River North Esk (Scotland) are shown in Table 19. These data confirm patterns seen elsewhere in the North Atlantic which indicate that marine survival can be quite variable between stocks and between years. In the North East Atlantic most stocks experienced low marine survival for smolts emigrating in 1989 and 1990, and for some stocks, this pattern has continued in the 1990s.

Table 19. Estimated survival of wild smolts (%) to return to homewaters (prior to coastal fisheries) for index rivers in the UK and Ireland (from Anon., 2000)

Smolt migration year	Ireland River Corrib		UK (N. Ireland) River Bush	UK (Scotland) River North Esk	
	1SW	2SW	1SW	1SW	2SW
1987	13.2	1.0	35.1	13.9	3.4
1988	7.5	0.6	36.2	-	-
1989	5.3	2.1	25.0	7.8	4.9
1990	4.1	1.4	34.7	7.3	3.1
1991	5.6	1.1	27.8	11.2	4.5
1992	5.9	-	29.0	-	-
1993	9.0	1.6	-	-	-
1994	8.4	1.1	27.1	17.2	2.3
1995	7.4	0.1	n/a	11.5	5.1
1996	4.9	0.9	31.0	10.7	3.5
1997	9.7	0.3	19.8	10.3	6.3
1998	2.9		13.4	n/a	n/a
Mean (1994-98)	6.7	0.6	22.8	12.4	4.3

4. Microtag, fin clip and external tag releases

Details of all marking and tagging of salmon undertaken in England and Wales in 2000 are included at Annex 5.

In 2000, 101k hatchery-reared salmon parr and smolts and 4.1k wild salmon smolts were microtagged and adipose fin-clipped and released in England and Wales to assess levels of exploitation and marine survival and to investigate the efficacy of enhancement programmes. A further 71k hatchery parr were marked with adipose fin clips, around 6k of which also had other tags or marks (elastomer & PIT tags). A total of 937 adult salmon were tagged for the assessment of returning stocks and in conjunction with the use of radio tags.

5. References

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RAGO, P.J. 1993 Two randomisation tests for the estimation of regional changes in fish abundance indices: application to North Atlantic Salmon. ICES C.M. 1993/D:35 Ref M, 26 pp

RUSSELL, I. C., IVES, M. J., POTTER, E. C. E., BUCKLEY, A. A. AND DUCKETT, L., 1995. Salmon and migratory trout statistics for England and Wales, 1951-1990. MAFF Direct. Fish. Res., Data Report No. 38, 252pp.

ANNEX 1. Additional information

North Atlantic Salmon Conservation Organisation

The North Atlantic Salmon Conservation Organisation (NASCO) was established in 1984 following calls for international co-operation on the management of salmon stocks. It is an international body with the objective of contributing through consultation and co-operation to the conservation and rational management of salmon stocks taking account of the best scientific evidence available to it. NASCO therefore seeks scientific advice on the status of salmon stocks and fisheries, and their management from the International Council for the Exploration of the Sea (ICES) (Annex 2). The Contracting Parties to the NASCO Convention are: Canada; Denmark (in respect of the Faroe Islands and Greenland); European Union; Iceland; Norway; the Russian Federation; and USA. Much of the business of the organisation is conducted by three regional Commissions: the North American Commission; the North East Atlantic Commission; and the West Greenland Commission. One of the main functions of these Commissions is to propose regulatory measures for fisheries of one Party to the NASCO Convention which exploit salmon originating in the rivers of other Parties. The main fisheries of relevance for the management of European stocks are those operated on the west coast of Greenland and within Faroese waters. In 1998 NASCO adopted the Agreement on the Adoption of a Precautionary Approach; this requires that more caution be exercised when information is uncertain, unreliable or inadequate, and that the absence of adequate scientific information is not be used as a reason for postponing or failing to take conservation and management measures.

International Council for the Exploration of the Sea

The International Council for the Exploration of the Sea (ICES) provides biological information and advice on a wide range of fish stocks in order to help fisheries managers maintain viable fisheries within sustainable ecosystems. Information is compiled and assessments are conducted by Working Groups which are comprised of national experts on the specific fish stocks. The Working Group reports are passed to the Advisory Committee on Fisheries Management (ACFM) for peer review and to compile the advice to managers. Their advice may take many forms, but in general it involves: assessments of stock dynamics; evaluation of the status of the stocks; projections of various stock parameters into the future; and management options. For Atlantic salmon, ICES provides advice relating to the list of questions posed by NASCO (Annex 2). The assessment of salmon stocks and fisheries presents particular problems to the ICES scientists both because of the highly migratory nature of the fish and because they comprise a large number of distinct river stocks which must, to some extent at least, be managed separately.

B_{crit} analysis

The B_{crit} analysis is a randomisation test developed by Rago (1993). Randomisation tests are useful for assessing changes in stock status because: they require few assumptions; the results are readily interpretable; and the sampling distribution of the test statistic can be easily approximated on a portable computer. The B_{crit} test allows inferences to be made about the composite trend in data from multiple sites. The composite trend is estimated as a weighted average of the slope of log transformed count data versus time. In the randomisation model, the problem is stated as follows: '*Under the null hypothesis that the observations are randomly ordered within each series, what is the probability of obtaining a value of B greater than or equal to the observed* B_0*?*' B_{crit} values are given in the text along with this probability; $p < 0.05$ indicates a significant upward trend while $p > 0.95$ indicates a significant downward trend.

ANNEX 2. NASCO's request for scientific advice from ICES (CNL(00)60)

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

    1.1. provide an overview of salmon catches and landings, including unreported catches by country and catch and release, and worldwide production of farmed and ranched salmon in 2000;
    1.2. report on significant developments which might assist NASCO with the management of salmon stocks;
    1.3. use case studies to illustrate options for taking account of risk in the provision of catch advice and comment on the relative merits of each option;
    1.4. assess the possible reasons for the differences in occurrence of escaped farmed salmon in fisheries and stocks in different areas;
    1.5. advise on potential biases in catch advice resulting from the inclusion of fish farm escapees in the assessment models;
    1.6. provide compilation of tag releases by country in 2000.

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

    2.1. describe the events of the 2000 fisheries and the status of the stocks;
    2.2. update the evaluation of the effects on stocks and homewater fisheries of significant management measures introduced since 1991;
    2.3. further develop the age-specific stock conservation limits where possible based upon individual river stocks;
    2.4. provide catch options or alternative management advice with an assessment of risks relative to the objective of exceeding stock conservation limits.
    2.5. update information on by-catch of salmon post-smolts in pelagic fisheries;
    2.6. identify relevant data deficiencies, monitoring needs and research requirements.

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

    3.1. describe the events of the 2000 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 or alternative management advice with an assessment of risks relative to the objective of exceeding stock conservation limits;
    3.5. identify relevant data deficiencies, monitoring needs and research requirements.

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

    4.1. describe the events of the 2000 fisheries and the status of the stocks;
    4.2. update the evaluation of the effects on European and North American stocks of the Greenlandic quota management measures and compensation arrangements since 1993;
    4.3. provide a detailed explanation and critical examination 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 catch options or alternative management advice with an assessment of risks relative to the objective of exceeding stock conservation limits;
    4.5. evaluate potential causes for changes in the Continent of origin of salmon captured in the West Greenland fishery, including potential changes in marine migration patterns;
    4.6. identify relevant data deficiencies, monitoring needs and research requirements.

Notes:

1. *With regard to question 1.3, ICES is requested to provide information that will assist with the implementation of and evaluation by NASCO and its Contracting Parties of the decision structure (Annex 4 of document CNL(00)18) provisionally adopted by the Council.*
2. *In response to questions 2.1, 3.1 and 4.1, ICES is asked to provide details of catch, gear, effort, composition and origin of the catch and rates of exploitation. For homewater fisheries, the information provided should indicate the location of the catch in the following categories: in-river; estuarine; and coastal. Any new information on non-catch fishing mortality of the salmon gear used and on the by-catch of other species in salmon gear and of salmon in any new fisheries for other species is also requested.*
3. *In response to question 4.1, ICES is requested to provide a brief summary of the status of the North American and North-East Atlantic salmon stocks. The detailed information on the status of these stocks should be provided in response to questions 2.1 and 3.1.*
4. *With regard to question 4.3, "changes to the model" would include the development of any new model.*

ANNEX 3. Status of Salmon Action Plans (SAPs)

SAPs are the means by which the Agency aims to meet the objectives of its National Salmon Management Strategy (launched in 1996) at a local level. Each SAP comprises two documents:

- The Consultation Document reviews stock and fishery status (including the use of conservation limits), identifies factors limiting performance and lists a series of costed options to address these. This is circulated to outside interests to seek their opinion and support for the plan.

- The Final Plan follows consultation and contains an agreed list of actions which the Agency, in partnership with others, is committed to address in the five year lifetime of the plan. Progress against these actions is reviewed annually at both regional and national levels.

A Ministerial Direction issued to the Agency in September 1998 requires all SAPs to be completed by the year 2002. The schedule below identifies the timetable for production of final plans on individual rivers to comply with the 2002 deadline. However, it should be noted that the Agency will be unable to carry out any work on SAPs in England in 2001-02 due to cuts in funding (grant-in-aid). The SAP schedule is therefore expected to be delayed.

Environment Agency's schedule for production of SAPs for salmon rivers in England and Wales (at 27 March 2001)

	Scheduled date for completion of Final SAPs - given as calendar year ending:					
Region	1997	1998	1999	2000	2001	2002
North East	Coquet**	Wear** Esk*	Tyne** Tees**			
Thames			Thames			
Southern	Test**	Itchen**				
South West	Tamar** Avon (Hants)**	Frome**	Taw* Torridge* Lynher**	Teign Axe Dart Tavy** Camel* Stour*	Exe Erme Avon (Devon) Lyn Yealm Plym Fowey Piddle	
Midlands	Severn*			Severn Estuary		
Welsh	Dee** Mawddach** Teifi* Wye**	Ogwen** Seiont** Dwyfawr** Tywi*	Clwyd** Conwy** Taf** Taff	Dyfi Tawe* *Loughor* Cleddau* Nevern Usk	Ogmore *Neath* *Afan* Glaslyn/Dwyryd	Rheidol *Aeron* *Ystwyth* Dysynni
North West	Eden** Leven (& Crake)** Lune**		Ehen (& Calder)*	Derwent Kent* Ribble**	Duddon Wyre	Border Esk Irt Cumbrian Esk
Total	**12**	**8**	**11**	**16**	**14**	**7**

Note: Rivers in italics are those where there is no Ministerial requirement to produce a plan but where Regions have elected to do so to support Local Environment Agency Plans.

*** Rivers with completed Final SAPs*

* *Rivers with completed SAP Consultation Documents*

ANNEX 4. Description 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 has only been 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 2 m 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 5. ICES Compilation of microtag, fin clip and external tag releases

Marking Season: 2000

Country: England and Wales

Totals:

Juveniles	Hatchery	Wild	**Adults**	All
Microtags	100,537	4,139		104,676
External tags			937	937
Adipose clip (no CWT)	66,831			66,831
Other clips, external	5,061			5,061
Total fish marked	**172,429**	**4,139**	**937**	**177,505**

Marking Agency	Age	Life stage	H/W	Stock Origin	Primary tag or mark	Number marked	Code or serial	Auxiliary clip	Release date	Place of release	River Catchment
EA North East	1+	Parr	H	Tyne	Microtag	7,076	20/42/20	Adipose	Mar-00	Rede	Tyne
EA North East	1+	Parr	H	Tyne	Microtag	6,918	20/42/22	Adipose	Mar-00	S Tyne	Tyne
EA North East	1+	Parr	H	Tyne	Microtag	7,150	20/42/21	Adipose	Mar-00	Kielder Burn	Tyne
EA North East	Various	Adult	W	Tyne	Radio tag	23	Orange, various	Floy tag	Spring-00	Tyne	Tyne
EA North East	Various	Adult	W	Tyne	Ext. tag	66	Red, various	Needle tag	Spring-00	Tyne	Tyne
EA North West	Various	Adult	W	Eden	Radio tag	106	Various	Floy tag	Various	Various	Eden
EA North West	1+	Smolt	H	Lune	None	22,000		Adipose	Various	Various	Lune
EA Wales	1+	Smolt	H	Alwen	Microtag	4,873	22/42/55	Adipose	Mar-00	Brenig	Dee
EA Wales	1+	Smolt	H	Alwen	Microtag	6,836	23/42/12	Adipose	Mar-00	Brenig	Dee
EA Wales	1+	Smolt	H	Tryweryn	Microtag	2,857	21/42/43	Adipose	Mar-00	Tryweryn	Dee
EA Wales	1+	Smolt	H	Tryweryn	Microtag	908	23/42/15	Adipose	Mar-00	Tryweryn	Dee
EA Wales	1+	Smolt	H	Tanat	Microtag	2,501	23/42/24	Adipose	Mar-00	Tanat	Severn
EA Wales	1+	Smolt	H	Teme	Microtag	1,471	23/42/24	Adipose	Mar-00	Teme	Severn
EA Wales	2+	Smolt	H	Taff	Microtag	10,237	01/42/57	Adipose	Mar-00	Taff	Taff
EA Wales	1+	Parr	H	Mawddach	Microtag	5,000	19/42/06	Adipose	Feb-00	Mawddach	Mawddach
EA Wales	1+	Smolt	H	Mawddach	Microtag	5,000	21/42/46	Adipose	Mar-00	Wnion	Mawddach
EA Wales	1+	Smolt	H	Conwy	Microtag	5,000	20/42/26	Adipose	Mar-00	Lledr	Conwy
EA Wales	Various	Adult	W	Dee	Floy	580	Various	Floy tag	Various	Dee	Dee
EA Wales	Various	Adult	W	Taff	Floy	95	Various	Floy tag	May - Oct-00	Taff	Taff
EA Wales	Various	Adult	W	Taff	CART	14	Various	Floy tag	May - Sep-00	Taff	Taff
CEFAS/EA Wales	Various	Smolt	W	Dee	Microtag	3,176	01/42/22	Adipose	May - Jun-00	Dee	Dee
CEFAS/EA Wales	Various	Smolt	W	Ceiriog	Microtag	222	01/42/34	Adipose	May - Jun-00	Ceiriog	Dee
CEFAS	Various	Smolt	W	Inny	Microtag	505	01/42/33	Adipose	Apr-00	Inny	Tamar
CEFAS	Various	Smolt	W	Lyd	Microtag	236	01/42/32	Adipose	Apr-00	Lyd	Tamar
CEFAS	Various	Parr	W	Itchen	PIT	150		Adipose	Sep-00	Brandy	Itchen
CEFAS	Various	Parr	W	Ceiriog	PIT	823		Adipose	Oct-00	Ceiriog	Dee
EA South West	1+	Smolt	H	Exe	None	10,500		Adipose	May-00	Axe	Axe
EA Thames	2+	Smolt	H	Delphi	None	7,463		Adipose	Mar-00	Kennet	Thames
EA Thames	1+	Smolt	H	Shannon	Microtag	5,370	23/42/18	Adipose	Mar-00	Kennet	Thames
EA Thames	1+	Smolt	H	Shannon	Microtag	9,230	23/42/19	Adipose	Mar-00	Kennet	Thames
EA Thames	1+	Smolt	H	Shannon	Microtag	10,050	23/42/17	Adipose	Mar-00	Kennet	Thames
EA Thames	1+	Smolt	H	Shannon	Microtag	10,060	23/42/16	Adipose	Mar-00	Kennet	Thames
EA Thames	1+	Smolt	H	Delphi	Elastomer	911		Adipose	Mar-00	Kennet	Thames
EA Thames	1+	Smolt	H	Delphi	Elastomer	4,150		Adipose	Mar-00	Thames	Thames
EA Thames	1+	Smolt	H	Delphi	None	4,082		Adipose	Mar-00	Kennet	Thames
EA Thames	1+	Smolt	H	Delphi	None	3,613		Adipose	May-00	Kennet	Thames
EA Thames	Various	Adult	W	Thames	Radio tag	46		Floy tag	Various	Thames	Thames
EA Thames	Various	Adult	W	Thames	Floy	7	Yellow, various	Floy tag	Various	Thames	Thames
EA Southern	0+	Parr	H	Test	PIT	500		Adipose	Various	Test	Test
EA Southern	0+	Parr	H	Test	None	17,700		Adipose	Various	Test	Test