



A survey of freshwater angling in England

Phase 1: angling activity, expenditure and economic impact

Chief Scientist's Group report

October 2018

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Professor Doug Wilson
Chief Scientist

Executive summary

This report presents the findings of a survey commissioned by the Environment Agency on licensed anglers fishing freshwaters in England. The aim was to ask anglers about their angling activities and expenditure in order to develop estimates of the market value of freshwater angling in England, expressed as household income (gross value added, GVA) and full-time equivalent (FTE) jobs supported. The survey was conducted between May and June 2016, and consisted of an online survey and computer-assisted telephone interviews covering anglers' behaviour in 2015. The Environment Agency's rod licence database was used to select a representative sample of anglers. The survey examined angling effort by:

- total days by type of fishing and by species
- participation in matches and competition
- type of water body
- trip destination and origin of anglers by river basin district (RBD)
- distance travelled to fish

Three types of fishing were considered:

- coarse or eels
- brown trout, rainbow trout or grayling
- salmon and sea trout

Where possible, the 2015 findings are compared in the report with those from a similar survey in 2005.

Key findings

- The total number of angling days in 2015 (22.3 million) was down 22% from 2005 (28.5 million).
- The largest proportion of angling days was spent coarse fishing (over three-quarters of the total). Carp was the most sought after coarse fish.
- Most of the angling activity took place in lakes, reservoirs and ponds.
- The Humber and Thames were the RBDs where the most angling effort was conducted (both by destination and origin of trips). This is to be expected as together the 2 RBDs have nearly 50% of total licences sold in 2015. The Anglian RBD was also a favourite destination.
 - Most salmon and sea trout days were spent in the Northumbria and the South West RBDs, followed by the North West RBD.
 - Most angling days for both coarse fishing and for trout took place in the Thames, Humber and Anglian RBDs.
- Total non-trip related expenditure in 2015 is estimated at around £680 million. This included items such as clothing, media, tackle and club memberships. More than half of this expenditure was on tackle and equipment (56% of the

total). Non-trip related expenditure supported over 10,700 FTE jobs and contributed £583 million to household incomes in 2015.

- Across all types of fishing, the total trip-related expenditure in 2015 is estimated at £1.06 billion. The highest percentages were spent on bait and transport (25% and 20% of total expenditure respectively). In 2015, trip-related expenditure supported 16,150 FTE jobs and contributed £882 million to household incomes. The current survey indicates that, on average, anglers spent £10 more per trip in 2015 compared with the 2005 survey.

Main findings from 2015 angler expenditure survey

	2015
Total number of angling days in 2015	22.3 million
Total number of days spent:	
coarse fishing	19.7 million
carp fishing	7.44 million
fishing for brown trout, rainbow trout or grayling	2.4 million
fishing for salmon and sea trout	134,000
Total number of days spent fishing in:	
lakes, reservoirs and ponds	15.5 million
rivers or streams	5.4 million
canals	1.4 million
Total non-trip related expenditure in 2015	£680 million
GVA from anglers' non-trip related expenditure	£583 million
FTEs from anglers' non-trip related expenditure	10,700
Total trip-related expenditure in 2015	£1.06 billion
Total trip-related expenditure by:	
coarse anglers	£944 million
trout and grayling anglers	£115 million
salmon and sea trout anglers	£7.3 million
GVA from anglers' trip-related expenditure	£882 million
FTEs from anglers' trip-related expenditure	16,150
Income supported (GVA) from total anglers' expenditure	£1.46 billion
Employment (FTE jobs) supported by total anglers' expenditure	27,000

Notes: ¹ Across anglers who stated that they fished for coarse fish

Although measures were taken (including as setting quotas and weighting) to avoid specific survey bias, a few aspects remain that could affect the interpretation of the results.

These include the tendency of consumer surveys to overestimate expenditure and the significant diversity of behaviour exhibited by anglers, with some being frequent anglers and others occasional anglers who make only a few trips each year.

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1 Background

The Environment Agency has a number of statutory duties relating to angling and fisheries under the Salmon and Freshwater Fisheries Act 1975 and the Environment Act 1995.

This report presents the findings of a survey of anglers in England commissioned by the Environment Agency and carried out in spring to early summer 2016. This project provided information on angling activity in 2015 and the contribution it made to the economy – essential for future management of fisheries and for the recognition of freshwater fisheries as part of our Natural Capital (the ecosystem services that land, water and air provide and which keep our society healthy and prosperous). This was the third valuation of freshwater angling undertaken by the Environment Agency, following similar surveys in 1999 and 2005.

1.1 Project phases and objectives

The main objective (Objective 1) of Phase 1 was to develop estimates of the market value of freshwater angling in England, expressed as household income (gross value added, GVA) and jobs supported in 2015.

Objective 2 was to produce estimates of the economic value of improvements in the water environment to anglers, based on willingness to pay (WTP) estimates. This involved a second survey, the findings of which will be presented in the separate Phase 2 report.

1.2 Phase 1 approach

1.2.1 Literature review

A literature review was conducted prior to drafting the survey questionnaire (see Appendix A). The main sources identified by this literature review included:

- 'Economic Evaluation of Inland Fisheries: The Economic Impact of Freshwater Angling in England and Wales' (Environment Agency 2007)
- 'Public Attitudes to Angling 2005' (Environment Agency 2005)
- 'Public Attitudes to Angling 2010' (Environment Agency 2010)
- 'Sea Angling 2012 – A Survey of Recreational Sea Angling Activity and Economic Value in England' (Armstrong et al. 2013)

A survey about inland fisheries in 2005 found that anglers spent a total of over £1.18 billion across England and Wales, with coarse angling responsible for £971 million of this¹ (Environment Agency 2007). The survey also found that household income of £980 million and 37,386 jobs were generated across

¹ Values given as those reported in 2005.

England and Wales. These findings were based on surveys carried out online and by telephone to collect information across the combinations of regions and fish species. The 2005 survey was used as a primary source in the development of the survey at the heart of this study. However, the scope of the current project is only for English anglers fishing in England (the previous survey included Welsh anglers and also took account of Scottish and other visiting anglers). This important difference should be born in mind when comparing results from the 2 surveys. Section 5 of this report presents estimates of the value of angling for the different regions as reported in the 2007 report for comparison with the results of the current study.

Although the other reports listed above were used to a lesser extent, they were inspirational in developing the range of outputs produced under this study. The findings of these and other reports are given in the annotated bibliography presented in Appendix B. Other sources of literature on angling participation are given in the reference list.

The literature review covered other recreational activities in addition to specific freshwater angling studies. The 2012 Sea Angling survey conducted for Defra estimated that:

‘there are 884,000 sea anglers in England. ... These anglers make a significant contribution to the economy - in 2012, sea anglers resident in England spent £1.23billion on the sport ... sea angling supported £2.1billion of total spending, a total of over 23,600 jobs, and almost £980 million of GVA’ (Environment Agency 2013).

The figures (reported in £ 2012) are comparable to the value of freshwater angling presented in this report.

Figures from 2012 for the South West South West Coast Path show that walkers using England’s longest National Trail spent around £436 million during 2012. This expenditure supported 9,771 full-time equivalent (FTE) jobs and the GVA estimates were nearly £350 million (South West Research Company 2014).

Other evidence shows that the outdoors makes a significant contribution to the UK’s economy. The Sport and Recreation Alliance’s Reconomics report (Comley and Mackintosh 2014) found that:

- in 2012 to 2013, the 42.4 million adults who visited the natural environment spent £21 billion
- of all overnight trips taken in Britain in 2012, 37% related to trips involving outdoor recreation, equating to a figure of £10 billion
- in 2012, the outdoor specialist market was estimated to be worth £1.43 billion
- walking tourism alone supported up to 245,000 FTE jobs and contributed up to £2.76 billion to the English economy

Furthermore, ‘So Much More than the View’ (National Parks England 2015), found that the 260 million people who visited national parks and areas of outstanding natural beauty spent in excess of £6 billion and supported over 85,500 businesses and more than 120,000 jobs.

1.2.2 The survey

The survey consisted of both an online survey and computer-assisted telephone interviews (CATIs). The following targets were set:

- 10,500 online surveys
- 500 CATIs

Participants for both were drawn from the Environment Agency's database of fishing licence holders. This database contained approximately 250,000 records where an email had been provided. Previous surveys conducted by the Environment Agency suggested that the likely response rate was around 4–5%. It was therefore concluded that it would be necessary to invite all licence holders who had provided an email address to complete the online survey in order to obtain the desired 10,500 responses. This meant it was not possible to set any target quotas for the online survey.

It is also worth noting that online surveys can suffer from self-selection bias and thus they may misrepresent specific groups. In the current survey, it was the youngest age groups (17–24) and the oldest (over 75) who were most underrepresented by the internet survey. This was anticipated and the telephone survey included a greater quota for this group (see Table 2.2). Interestingly, it was not just the very young who were significantly underrepresented in the online survey but also the 25–34 age group. The 2015 survey excluded those under 17.

CATI participants were drawn from a random sample of 50,000 fishing licence holders who had provided phone numbers but not email addresses.

The questionnaires used for the online survey and the CATIs had a similar content to help with the analysis. The main difference between them was site selection:

- the online questionnaire allowed respondents to click on a map to show where they fish
- for the telephone survey, respondents were given a choice of ceremonial counties

Pilot surveys were conducted before launching the full questionnaire. The results of the pilot confirmed a 4% response rate to the invitations. Once minor changes had been made and approved, the link to the final questionnaire was sent by email to anglers. A total of 3 reminders were sent out during the duration of the online survey process.

Section 2 describes the survey in more detail.

1.3 The economic impacts

The main objective of the study was to develop estimates of the market value of freshwater angling in England, expressed as household income (GVA) and jobs supported as FTEs. These estimates represent the level of economic activity supported by this recreational activity (impacts from policy interventions and substitution were not part of the scope of the Objective 1 survey).

The basis for calculating these estimates of value is the use of multipliers. The Leontief Inverse provides the central tool for multiplier analysis, which studies the effect of changes in final demand on output and related aspects of the economy. These effects have 3 different economic drivers:

- **Direct.** This is the immediate effect caused directly by the change in final demand. 'For example, the direct income effect of angler accommodation expenditure is the wages and profits paid by the hotels to households in the region' (Environment Agency 2007, p. 3).
- **Indirect.** This is the subsequent effect caused by the consequent changes in intermediate demand. 'For example, a hotel may purchase butcher supplies from within the region. This supports the wages of the local butcher's staff, the butcher's own income and perhaps the rent charged by the shop owner' (Environment Agency 2007, p. 3).
- **Induced.** This is the effect attributable to the ensuing change in compensation of employees and other incomes, which may cause further spending and hence further changes in final demand. For example, the butcher may spend some of the extra income he receives from the hotel on local goods or services unrelated to his business.

Type I multipliers cover direct and indirect effects only. Type II multipliers cover induced effects as well. The I–O tables produced by the Office for National Statistics (ONS) at national level were used in this study; however, these include only the Type I multipliers and hence direct and indirect impacts only.

The report on the findings of the 2005 survey also considered the outcomes of Type II multiplier analysis. Consultation with ONS during this study revealed that Type II multipliers are not produced any more for England because they are based on the assumption that consumers do not change their final consumption patterns in response to changes in income, and this assumption is now considered highly unrealistic (personal communication, email dated 26 September 2016). Thus, only Type I multipliers were considered appropriate for calculating the economic impacts in this study.

Multipliers are available for England, but they are not produced at a smaller scale (that is, regional level). To disaggregate the multipliers to enable a refined local-based analysis, the national or regional multipliers often need to be re-scaled to the local level (D'Hernoncourt et al. 2011). The current study used the breakdown of industry composition at regional level, combined with the outputs of expenditure at NUTS² level (trip destination) to examine and re-scale the impacts at river basin district (RBD) level.

The approach included the development and use of location quotients. A location quotient (LQ) quantifies the concentration of an industry in a region compared with the nation. This is calculated as follows:

$$LQ_{ir} = \frac{E_{ir}/E_r}{E_{in}/E_n}, \quad (1.1)$$

² Nomenclature of Territorial Units for Statistics (Eurostat 2016)

where:

E_{ir} = employment in industry i and region r

E_r = total employment in the region

E_{in} = employment in industry i for the nation

E_n = total employment for the nation

LQs were then applied to national output multipliers for the specific type of industry and expenditure to derive regional multipliers for the expenditure at destination level. The results show the impacts (or contribution) to the regional economy (in terms of GVA) and employment (in terms of FTE) as a result of anglers' expenditure in each particular region.

Because the expenditure was estimated on the basis of RBDs, it was necessary to link the RBDs to the NUTS classification for which regional multipliers have been calculated. Some adjustments were necessary, however, for the Humber and the Thames RBDs, as these include the East Midlands and part of south-east England respectively.

Table 1.1 shows the allocation of regional LQ and multipliers to the RBD. Because this was based on the greatest part of the region falling within a RBD, care is needed when interpreting the figures as there is not a 100% match between the 2 types of geographical units.

Only those parts of the Dee, Severn and the Solway Tweed RBDs in England were included in the survey; some 84% of the area of the Dee RBD is in Wales and 82% of the Solway Tweed RBD is in Scotland. As a result, the findings for these RBDs should not be interpreted as the results for the whole basins but only for their English part.

Table 1.1 Correspondence between RBD and regional multipliers

RBD	Regional multipliers/NUTS2
Anglian	East of England
Thames ¹	London
Northumbria	North East
North West, Dee and Solway Tweed	North West
South East	South East
South West	South West
Severn	West Midlands
Humber ¹	Yorkshire and the Humber East Midlands ¹

Notes: The names of the regions in the right-hand column are those of the 9 official regions of England at the first level of NUTS for statistical purposes.

Adjustments were needed based on the percentage of expenditure in different regions.

¹ Thames RBD calculations include the regional multipliers from the South East region and the Humber RBD includes the regional multipliers from the East Midlands.

Caution is needed when interpreting the estimates of GVA at the regional level. There is empirical evidence that conventional LQs tend to underestimate imports from other regions (known as cross-hauling) and hence tend to overstate regional multipliers (Bonfiglio and Chelli 2008, cited in Flegg and Tohmo 2013). There is abundant academic research on the use of LQs and multipliers. Flegg and Tohmo (2013) re-examined the Finnish evidence presented by Lehtonen and Tykkyläinen³ on the use of LQs in estimating regional input coefficients and multipliers. Despite the different methods for applying LQs, they concluded that SLQ_i – the simple LQ and the one applied in this study – outperformed some other approaches. The Regional Input–Output Modeling System (RIMS II) developed and maintained by the US Bureau of Economic Analysis uses a very similar approach (Bess and Ambargis 2011) to that adopted here.

Spending on Environment Agency licences and the impacts on the economy resulting from this were not included in this study.⁴ The impacts from unlicensed anglers were also not included. Although there are many unlicensed anglers, the 2005 survey estimated that they may contribute only about 5% of fishing trips and thus the impacts are expected to be negligible.

Non-trip related expenditure is not linked to any regional expenditure and, as a result, national multipliers were used to calculate the impacts from non-trip specific related expenditure across England. These were then added to the trip-related expenditure, taking account of national multiplier effects, to estimate the economic value of angling in England as a whole.

Finally, unlike the earlier 2005 survey, this study did not specifically ask anglers how they would respond to the loss of angling in a particular region (and consequent loss of GVA and employment). As a result, substitution possibilities are not part of the scope of this expenditure survey. The Objective 2 survey (linked to WTP) will investigate these substitution possibilities in greater detail (also linked to a number of attributes affecting angling choices).

1.4 Structure of the report

Section 2 describes the sample demographics.

Section 3 presents the overall findings on angling effort.

³ Lehtonen and Tykkyläinen (2014) – first published online on 1 March 2012

⁴ This was £21 million by English residents for the 2015 to 2016 licence year. Some of this expenditure will be attributable to fishing in Wales. Note that Environment Agency ‘regional angling expenditure’ (that is, not only rod licence income) was included in the previous study (see Section 5.1.3 of Environment Agency 2007). This will also contribute to differences between the 2 studies.

Section 4 examines the economic impacts of angling across RBDs and for England as a whole.

Section 5 sets out a comparison by region between the findings of this recent survey and the earlier survey conducted in 2005.

2 Survey method and demographics

2.1 The Environment Agency database

A rod licence is required in England and Wales to fish in freshwater. Anglers can buy a licence online, in person or by phone from the Post Office, or by annual direct debit with the Environment Agency. There are 2 types of licence:

- trout, coarse fish and eel licences for non-migratory trout, char, coarse fish, eel and smelt
- salmon and sea trout licences – these also allow fishing for all of the fish listed in the licence above

In addition to full annual licences, there are concessionary annual licences for senior, disabled or junior anglers, and short duration licences within each of these 2 broad categories.

The Environment Agency holds a database with records of unique anglers, including the name and address of each licence holder and the type of licence held. This database was used to select a sample for both the online and telephone surveys. However, the level of completeness varies across the database, with some entries lacking both an email address and a telephone number. The full set of data for 2015 includes over 900,000 entries for England, but only around 780,000 records had email or telephone contact details. Records with an email address are limited to around 250,000.

In order to interpret the responses, it was necessary to apply weights to the responses to aggregate up to the total number of unique anglers in the Environment Agency database. The *ipfraking* package in Stata, which implements a weight–calibration procedure known as iterative proportional fitting or raking of complex survey weights, was used to do this. This was used to adjust for age, gender and licence type (trout/coarse, salmon and sea trout, and duration). Because the total number of unique anglers in the Environment Agency database is greater than those for which telephone or email contact details were available, it was necessary to assume the same distribution across the full population of anglers.

2.2 Survey method

The questionnaires (see Section 1.2.2) were piloted for a period of 3 weeks in April 2016. The online pilot showed 30 complete responses from 700 online invitations, giving a response rate of 4–5% (as expected; see Section 1.2.2). The average time to complete the online questionnaire was estimated to be less than 15 minutes. For the telephone survey, 20 pilot interviews were conducted.

Following the test and after an analysis of responses on a question by question basis, some questions were modified slightly to maximise response rates and to avoid confusion (for example, those concerning the type of species fished). The final list of questions is given in Appendix A.

Quotas were set for the CATIs to account for the underrepresentation of specific groups in the online survey (as identified in the pilot). These included respondents aged over 75, salmon licence holders and short licence holders. Quotas were also set for regions. The quotas for the telephone survey are given in Table 2.1.

The final questionnaire was launched in May 2016, with the survey running from 23 May to 13 June. The Stata package was used to produce the findings.

Table 2.1 Quotas for CATIs: (A) breakdown by age and (b) breakdown of licence type by region

(A) Breakdown by age

Age group	Quota
Total 17–24	37
Total 25–34	64
Total 35–44	53
Total 45–54	84
Total 55–64	87
Total 65–74	90
Total 75+	86

(B) Breakdown by licence type and region of England

Licence type	Total	Salmon areas	Non-salmon areas ¹	North ²	Midlands ³	South ⁴
Total trout and coarse – full	150	No quota	No quota	100	100	100
Total trout and coarse – short	150	No quota	No quota			
Total salmon and sea trout –full	100	50	50	No quota	No quota	No quota
Total salmon and sea trout –short	100	50	50	No quota	No quota	No quota

Notes: ¹ Lincolnshire and Northamptonshire; Cambridgeshire and Bedfordshire; Essex, Norfolk and Suffolk; Derbyshire, Nottinghamshire and Leicestershire; Hertfordshire and north London; and Kent and south London. Salmonid areas everywhere else.

² North East, North West, and Yorkshire and the Humber

³ East Midlands and West Midlands

2.3 Sample demographics

2.3.1 Age

Table 2.2 compares the age distribution from the online and telephone surveys with those from the Environment Agency database for which contact details were available (note that the same distribution was assumed for the wider database). The numbers are those as given by applicants but should be treated with caution due to people not recording their ages accurately or entering false ages. Further investigation of the data revealed that the >75 age group may be underrepresented in this subset of data compared with the full dataset of ~980,000 unique anglers, while some other groups may be slightly overrepresented. The potential impact of this difference on the calculated values for mean annual expenditure per angler was examined and was concluded to be unlikely to be greater than 1%.

Table 2.2 Distribution of respondents by age

Age group	Environment Agency database ¹	% of total	Online survey	% of total online	CATI	% of total CATI
17–24	66,442	8.5%	248	2.4%	43	8.2%
25–34	119,706	15.3%	749	7.2%	68	12.9%
35–44	102,634	13.1%	1,266	12.1%	58	11.0%
45–54	157,439	20.2%	2,321	22.2%	89	16.9%
55–64	149,303	19.1%	3,040	29.0%	92	17.5%
65–74	136,159	17.4%	2,536	24.2%	95	18.1%
>75	49,418	6.3%	286	2.7%	81	15.4%
Prefer not to say	n/a	n/a	22	0.21	0	0.0%
Total	781,101	100%	10,468	100%	526	100.00

Notes: ¹ All data for which contact details given; email addresses were not available for all.
n/a = not available

2.3.2 Gender

Table 2.3 shows the distribution by gender for the online survey.

No quotas on gender were set for the telephone survey. Since female licence holders are such a small proportion of the total number, it was agreed that there was not an urgent need to set quotas for this. It was also anticipated that the

online survey would provide sufficient female responses (as found in the pilot). Indeed, the responses to the online survey show a very similar distribution to those of the total Environment Agency licence database concerning gender.

Table 2.3 Distribution of respondents by gender

Gender	Environment Agency database	% of total	Online survey	% of total online
Male	747,960	96%	10,205	97%
Female	33,141	4%	263	3%
Total	781,101	100%	10,468	100%

2.4 Sample by type of licence

Table 2.4 table shows the type of licence held by survey respondents.

Table 2.4 Distribution of respondents by type of licence

Type of licence	Environment Agency database (licence type)	% of total	Online survey	% of total online	CATI	% of total CATI
T&C – annual	599,880	76.8%	9,210	88%	165	31%
T&C – short	163,482	20.9%	705	7%	148	28%
S&S – annual	14,143	1.8%	509	5%	108	21%
S&S – short	3,596	0.5%	44	0%	105	20%
Total	781,101	100%	10,468	100%	526	100%

Notes: T&C = trout, coarse fish and eel licences (allow fishing for non-migratory trout, char, coarse fish, eel and smelt)
S&S = salmon and sea trout licences (also allow fishing for all of the fish in T&C)

2.5 Sample by RBD origin

Table 2.5 shows the number of data points from the survey by origin and type of licence, and the distribution of responses.

For the online survey, most of the observations for coarse licences are from the Thames and Humber RBDs, particularly from those holding full licences. Most of the observations for salmon licences are from the North West RBD, followed closely by the Northumbria, Thames and Humber RBDs. The telephone survey had a more even distribution in order to capture those groups that may be at risk of being underrepresented.

Table 2.5 Number of telephone and online observations by type of licence

RBD	Online survey				Telephone survey			
	Coarse		Salmon		Coarse		Salmon	
	Annual	Short	Annual	Short	Annual	Short	Annual	Short
Anglian	1,583	114	22	6	25	16	15	17
Dee	17	1	7	0	2	0	0	1
Humber	1,966	138	72	5	38	53	21	18
Northumbria	308	27	87	2	4	15	10	11
North West	948	56	94	2	18	19	12	7
Severn	770	63	51	5	9	9	4	9
Solway Tweed	24	1	9	1	1	0	1	1
South East	736	63	27	2	12	4	6	10
South West	538	43	59	4	12	8	6	5
Thames	2,303	199	76	17	29	10	18	19
Total	9,193	705	504	44	150	134	93	98

Notes: The totals do not add up to those given in Table 2.4 (distribution by type of licence), as some of the survey responses could not be mapped against a specific RBD and/or in a few cases respondents had clicked on places in Wales, Scotland or in the sea. In addition, telephone survey respondents could not give their full postcodes; participants were asked the first part of their postcode but in several cases they gave 'first parts' that did not exist. All this meant that some records could not be geocoded.

2.6 Main differences between online and telephone survey findings

Two types of analysis were performed to compare the results of the online and telephone surveys.

The first involved a separate analysis, where both survey and interviews were analysed individually and a different set of weights was applied.

The second was a combined analysis, where a set of combined weights were generated and applied to responses from the online survey and CATI respondents. Because the telephone survey did not provide fishery location-

specific data to a four- digit postcode, not all questions from both surveys could be combined.

The main findings are summarised below. Generally, it can be said that the difference in results reflects the degree of uncertainty on the key statistics.

The telephone interviews yielded a greater number of days for angling in England than the online survey responses. An analysis of the main results with combined weights (both online and CATI combined) showed a 1% variation in the number of total days against the online survey (22.5 million days when combining telephone and online results and 22.27 million from the online survey alone). Therefore, incorporating the results from the telephone survey would bias the number of angling days significantly upwards and potentially exaggerate the expenditure and economic value of freshwater fishing (as shown in the trip-related expenditure).

The results of the online surveys are closer to the results of the combined analysis in terms of both the number of days and expenditure and therefore appear to carry a lower level of uncertainty than the telephone interview findings. Despite the weighting, this may be due to the setting of quotas for the telephone survey and the bias in telephone responses. Estimates from the online survey therefore appear to be more robust than those from the telephone interviews. This is not unreasonable due to the sizes of the samples alone.

Table 2.6 Comparison of main findings from online and telephone surveys

	Online	Telephone	Variation in online and telephone results	Combined questions results
Total number of angling days in 2015	22.27 million	26.25 million	18%	22.5 million
Total non-trip related expenditure in 2015	£680.5 million	£691.3 million	2%	£689 million
Total trip-related expenditure	£1.07 billion	£1.14 billion	7%	n/a*

Notes: * These questions could not be combined. This is because the telephone survey did not provide location-specific data to the same level of accuracy as the online survey (where residence and fisheries location were each assigned a postcode) and thus could not be geocoded against RBD without introducing further uncertainty to the estimates.

3 Angling effort in England and by RBD

3.1 Key findings

- **Time spent freshwater fishing in 2015.** English rod-licence holders spent a total of about 22.3 million days fishing in England .
- **Angling effort by type of fishing.** Most of the angling was coarse angling (19.7 million of the total days spent in 2015). On average, a coarse angler spent 26 days fishing in 2015.
- **Angling effort by type of species.** Carp was the most sought after coarse fish, with 7.4 million days spent carp fishing in England in 2015. However, nearly 50% of coarse anglers did not target specific species; this group spent around 6.5 million days fishing for anything rather than for any specific species.
- **Participation in angling matches and competitions.** Those coarse anglers who went match fishing spent an average of 14 days on matches and a total of 1.27 million match days in 2015. It is estimated that around 12% of coarse licence anglers take part in match fishing. Trout fishing competition days accounted for just over 29,000 days.
- **Angling effort by type of water body.** Stillwaters (that is, lakes, reservoirs and ponds) were the predominant type of freshwater body fished by anglers in 2015, with a total of 15.5 million days spent fishing there across all types of fishing (69% of total days).
- **Angling effort by destination of trip.** The Humber and Thames RBDs were the RBDs in 2015 with the most angling activity by both anglers living in the RBD and visitors to it. Most anglers fished within their home district, travelling distances of between 5 and 25 miles. Salmon and sea trout fishers travelled longer distances, with the Northumbria RBD seeing most of the salmon and sea trout fishing activity followed by the South West and the North West RBDs. The survey covered only the English part of the Solway Tweed RBD, but this RBD is also popular among salmon and sea trout anglers.

3.2 Angling effort by type of fishing

3.2.1 Total days by type of fishing

Table 3.1 shows the number of days spent in 2015 for different types of fishing, as well as the average number of days spent in the year by each type of angler. The number of days spent in 2015 is estimated at 22.3 million.

The number of angling days fished in 2015 was largest for those fishing for coarse fish or eels (Figure 3.1). Salmon and sea trout anglers spent an average

of 12.3 days fishing for these species in 2015. On average, English anglers spent 25.4 days in 2015 fishing in England (across all types of freshwater angling) (Table 3.1).

Table 3.1 Total days spent fishing in 2015 by type of fishing

Type of fishing	Total angling days	Average days per angler	Number of anglers	Mode – days per angler
Coarse or eels	19,700,000	26	758,000	1
Brown trout, rainbow trout or grayling	2,440,000	12.5	195,000	1
Salmon and sea trout	134,000	12.3	11,000	2
Total days	22,300,000	25.4		1

Notes: See Table D.1 in Appendix D for a more detailed analysis of the angling patterns by number of days.

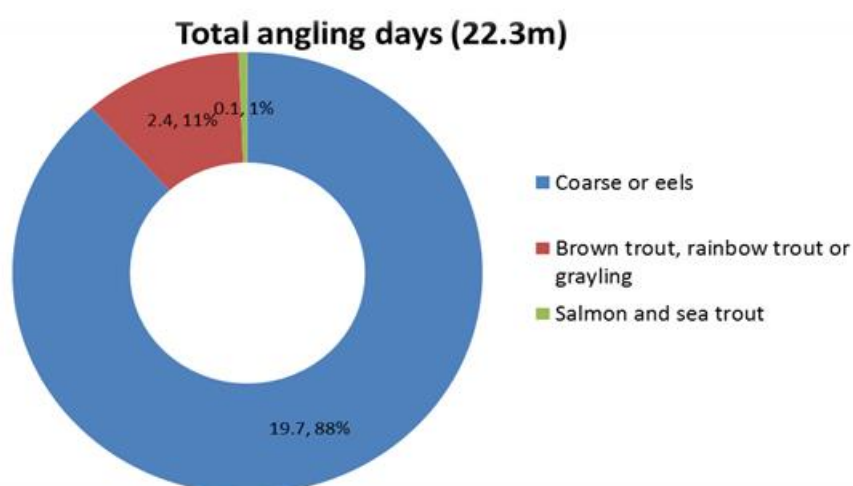


Figure 3.1 Total days spent fishing in 2015 by type of fishing (online survey)

A quarter of anglers spent up to 4 days fishing for any type of fish in 2015 and half of all anglers spent less than 14 days. The majority of anglers (95%) spent up to 87 days fishing and only 1% of anglers spent more than 175 days fishing (Table D.1). This suggests that anglers tend to fall into different categories – those fishing occasionally and those fishing more regularly throughout the year.

Figure 3.2 shows the frequency distribution for angling days for coarse fish and eels: the distribution for the number of days per angler displayed in the graph includes several peaks. In other words, the most frequently reported number of days by coarse angler is one day in 2015 (7.2% of coarse anglers reported this), but this is followed by 2 and 20 days (in descending order of frequency). This would explain why the average days fishing in 2015 across coarse anglers differs from the mode to a significant extent. The mean number of days is 26

days in 2015, with 50% of the coarse anglers spending up to 15 days fishing (as reflected by the median). The median number of days is reported here, as it is a more appropriate measure of the typical number of angling days per angler in this particular case because it is less sensitive to the presence of outliers and a multimodal distribution of angling days.

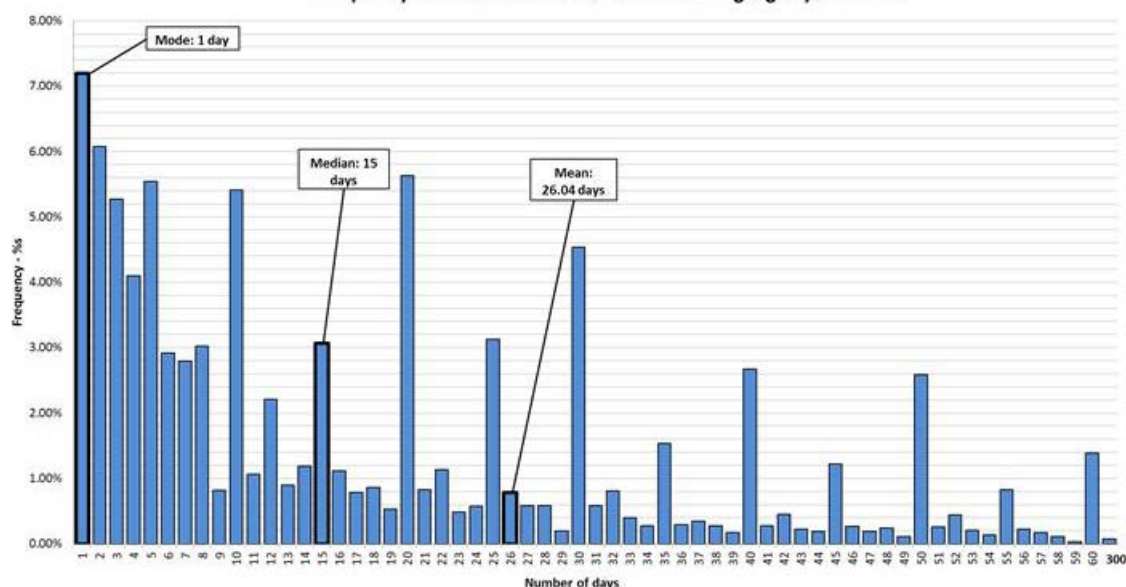


Figure 3.2 Frequency distribution of total days spent fishing for coarse fish or eels in 2015

Notes: The number of days in the range from 61 to 300 was reported by <1% of anglers who fished for coarse fish or eels. Their frequency distribution is not shown in the histogram to ensure a clear graphical presentation of other statistically important data.

The most frequently reported number of days angling by trout and grayling anglers is also one (13.65% of anglers noted this), but other significant frequencies are 2, 3 and 10 days (Figure 3.3). Trout and grayling anglers spent an average of 12.5 days fishing in 2015. This is also explained by the fact that 50% of the anglers spent more than 5 days fishing for trout and grayling in 2015 (as reflected by the median). Thus, the frequency distribution of trout and grayling angling days is also asymmetrical. The median number of days seems to be a better representative of central tendency, but it would be misleading to say there is a typical number of days that an angler goes fishing. Anglers are clearly diverse in their behaviour.

In 2015, there were about 134,000 angling days for salmon and sea trout, of which 109,000 were for salmon fishing. This is close to the 109,000 days declared by salmon and sea trout licence holders on their mandatory catch returns for days fishing for salmon and sea trout in 2015 in the Environment Agency's former regions (Cefas et al. 2016).

Most salmon and sea trout anglers fished for these species for only 2 days in 2015, but a significant percentage also fished for 7 days (Figure 3.4). This may reflect taking a week's holiday to fish a salmon river in the north or west of the country. The distribution of total angling days is similar to the ones above. The

average number of days fishing for salmon and sea trout in 2015 is 12.3. The median number of days is 7.

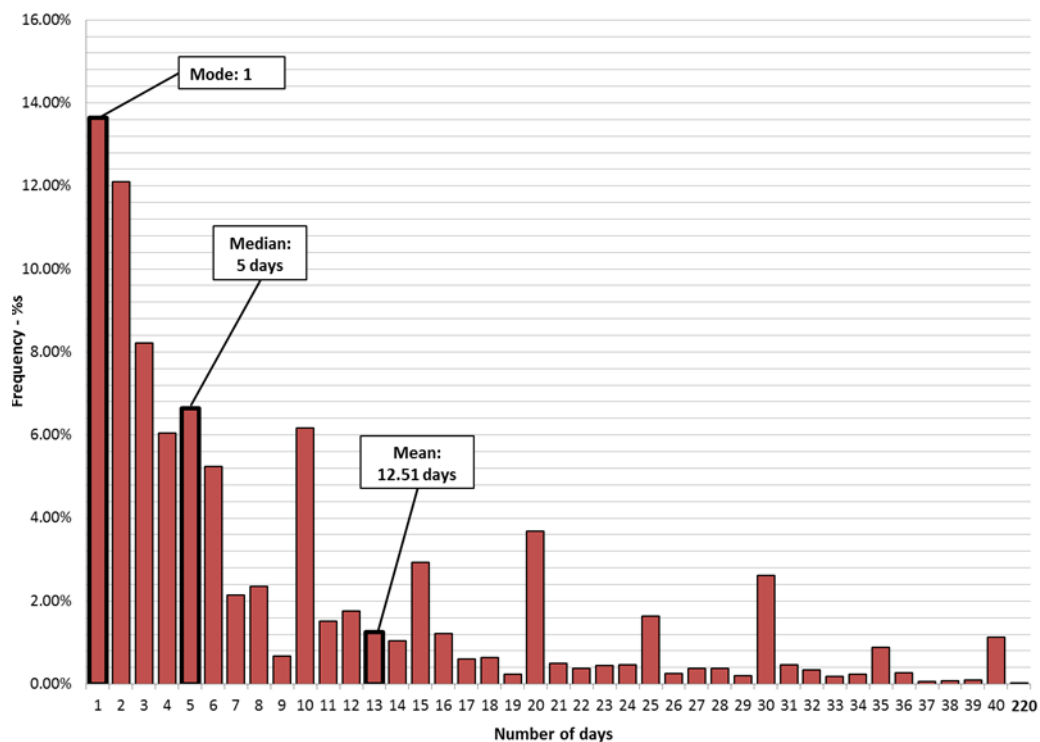


Figure 3.3 Frequency distribution of total days spent fishing for trout and grayling in 2015

Notes: The number of days in the range from 41 to 220 was reported by <1% of anglers who fished for trout or grayling. Their frequency distribution is not shown in the histogram to ensure a clear graphical presentation of other statistically important data.

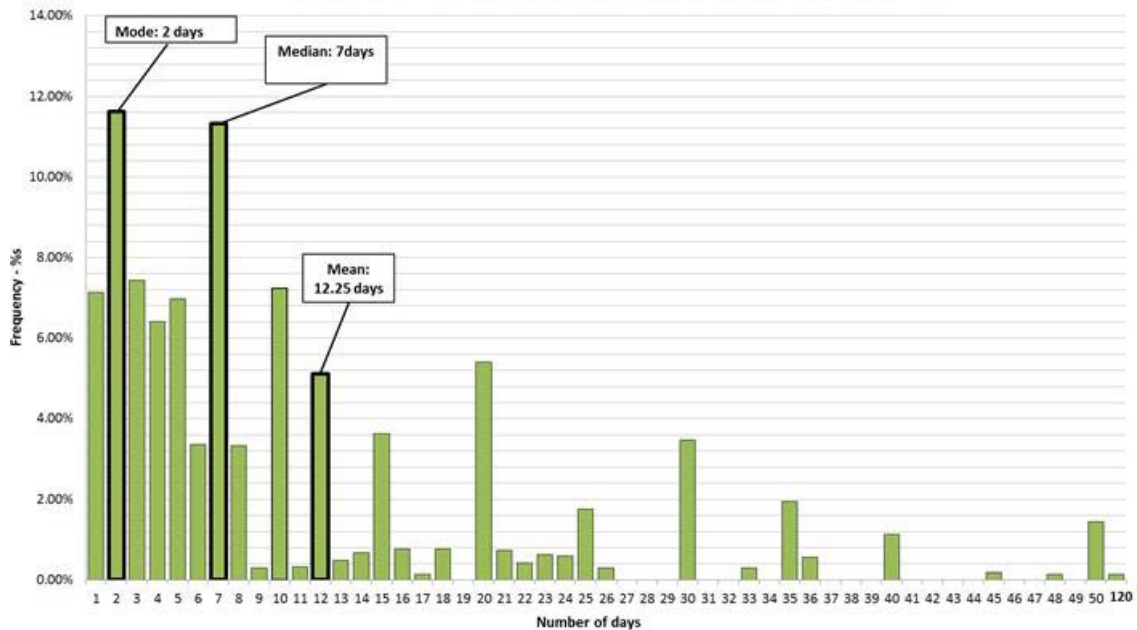


Figure 3.4 Frequency distribution of total days spent fishing for salmon and sea trout in 2015

Notes: The number of days in the range from 51 to 120 was reported by <1% of anglers who fished for salmon or sea trout. Their frequency distribution is not shown in the histogram to ensure a clear graphical presentation of other statistically important data.

3.2.2 Total number of days fished by species

The online survey showed that, in 2015, 49% of coarse anglers were not targeting specific species (Table 3.2). Around 6.5 million days were spent when anglers were fishing for anything (that is, not targeting any specific species). It can thus be concluded that the 51% of anglers spent the remaining 15.8 million days targeting specific species, showing a considerably higher level of angling effort in comparison.

Table 3.2 Anglers and days not targeting specific species

Number of coarse anglers not fishing for anything specific	449,224 (49%)
'Days I was fishing for anything' (total days)	6,478,000

Analysis by species shows that the greatest number of days spent was on carp. The main results by species can be summarised as follows (Table 3.3).

- The total number of days spent **carp fishing** in 2015 is estimated at over 7.4 million.⁵
- **Bream and roach fishing** accounted for nearly 5.5 million angling days in 2015.
- **Stocked rainbow trout** accounted for around 1.6 million days in 2015.
- **Wild trout days** accounted for an estimated 839,000 days in 2015.
- **Salmon** accounted for 109,000 days in 2015.
- **Sea trout** accounted for 71,000 days in 2015.

Appendix D provides more detailed statistics on frequencies of fishing by type of species. Most anglers fishing for carp spent 10 days a year in 2015. The share of carp anglers fishing more than 10 days is significant, pushing the average upwards (as shown by the 95 percentile).

Table 3.3 Total days spent fishing in 2015 by type of fishing and species

Coarse fishing	Total days	Average days per angler per year
Carp	7,440,000	17
Bream	2,980,000	11
Roach	2,470,000	10
Perch	1,810,000	7
Pike	1,720,000	7
Tench	1,630,000	6
Barbel	1,550,000	6
Chub	1,230,000	5
Rudd	1,168,000	6
Crucian carp	1,013,000	5
Catfish	453,000	3
Eel	425,000	3
Dace	347,000	2
Zander	262,000	2

⁵ A 2001 survey conducted by the Environment Agency also reported a significant percentage of anglers wanting to fish for carp (55% of total anglers). Carp was the preferred species well above rest of coarse species, including roach and tench (in second and third position respectively (Environment Agency 2001)).

Coarse fishing	Total days	Average days per angler per year
Other (bleak, gudgeon and so on)	580,000	4
Trout and grayling		
Stocked rainbow trout	1,608,000 ¹	10
Stocked brown trout	1,059,000	8
Other types of stocked trout	323,000	4
Wild trout	839,000	6
Grayling	383,000	4
Salmon and sea trout		
Salmon	109,000	11
Sea trout	71,000	8

Notes: For more detailed statistics see Table D.2 in Appendix D.
More than one species can be targeted in one day and so totals in this table may exceed the total number of days given in Table 3.1.
¹ The total exceeds the one given in Table 3.1 since these days or part days include those when anglers fish for more than one type of stocked trout, namely stocked rainbow trout, stocked brown trout and other types of stocked trout.

3.2.3 Participation in matches and competitions

Anglers were asked whether they had taken part in coarse fishing matches and trout or grayling angling competitions. Around 12% of the sample stated that they had taken part in matches in 2015. The total number of match days across the whole sample was estimated at around 1.3 million; for trout and grayling, the number of days in competitions was significantly smaller. On average, coarse anglers who fished in matches spent 14 days at matches in 2015 (Table 3.4).

Table 3.4 Number of matches and competitions fished in 2015

	Matches (coarse fishing)	Competitions (trout and grayling)
Total days	1,270,000	29,100
Mean days per angler (across anglers participating)	13.7	2.4
Number of anglers in sample taking part	1,263	195
Number of anglers in angler population taking part	92,522	12,106

3.3 Angling effort by type of water body

In 2015, anglers spent a total of 22.3 million days fishing across all types of freshwater fishing and all types of water body (Table 3.5).

Table 3.5 Days spent fishing by water body type and species in 2015

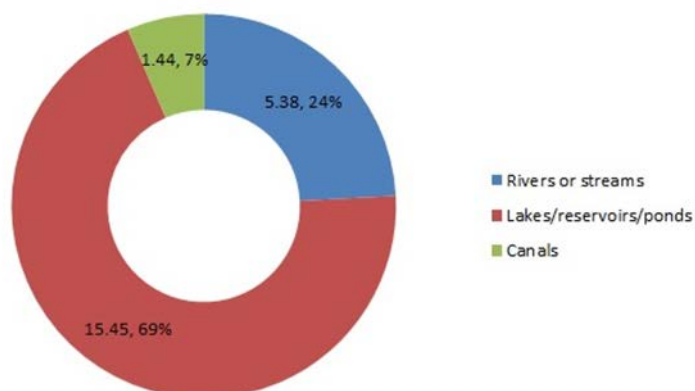
	Total days
Coarse fish or eels	
Rivers or streams	4,310,000
Lakes/reservoirs/ponds	14,000,000
Canals	1,440,000
Brown trout, rainbow trout or grayling	
Rivers	938,000
Lakes/reservoirs/ponds ¹	1,490,000
Salmon or sea trout	
Rivers or streams	133,000
Total	22,300,000

Notes: ¹ There is no grayling fishing in lakes or reservoirs in England and so these days relate to trout fishing.

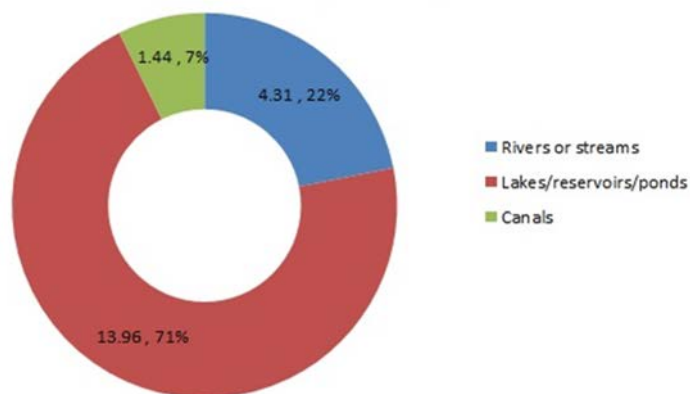
In 2015, almost 15.5 million (69% of total angling days) were spent on stillwaters (that is, lakes, reservoirs and ponds) (Figure 3.5a). Note that salmon and sea trout fishing in England takes place only on rivers.

Most of the coarse fishing in 2015 took place on stillwaters, with around 14 million days spent there (71% of the total for coarse fishing) (Figure 3.5b). This percentage is smaller for trout and grayling fishing (61% of angler days, 1.5 million days spent on stillwaters) (Figure 3.5c).

(a) Total angling days by type of water body (total 22.3 million days)



(b) Coarse fishing (total days 19.7 million)



(c) Trout and grayling (total days 2.4 million)

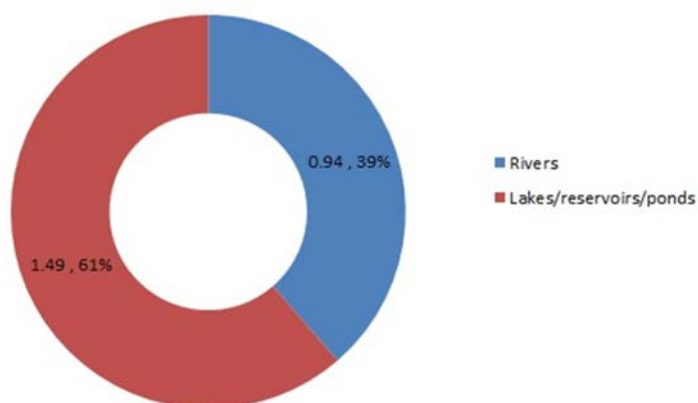


Figure 3.5 Angling effort in 2015 on different water bodies by type of fishing

Notes: The figures for stillwaters in Figure 3.5c relate only to trout fishing, as no grayling fishing takes place in lakes or reservoirs in England.

Table D.3 in Appendix D presents summary statistics on angling effort by water body type. The analysis reveals that the greatest number of coarse anglers

fishing in stillwaters spent 10 days fishing in 2015; 95% of all coarse anglers fishing in lakes spent 70 days or less.

3.4 Angling effort by origin of anglers

Total angling days by anglers' origin are given in Table 3.6. Across the whole sample, most of the days were spent in the RBD of residence (Figure 3.6).

Table 3.6 Total angler days by angler origin (all types of fishing)

Home RBD	Total days	Home days		Away days	
		Number	% of total	Number	% of total
Anglian	3,828,000	3,395,000	89%	433,000	11%
Dee ¹	70,000	33,000	47%	38,000	53%
Humber	5,127,000	4,220, 000	82%	907,000	18%
North West	2,410,000	2,005,000	83%	406,000	17%
Northumbria	643,000	375,000	58%	268,000	42%
Severn ¹	1,876,000	1,445,000	77%	430,000	23%
Solway Tweed ¹	57,000	40,000	70%	17,000	30%
South East	1,730,000	1,356,000	78%	374,000	22%
South West	1,202,000	1,043,000	87%	160,000	13%
Thames	5,325,000	4,092,000	77%	1,233,000	23%
Total	22,300,000	18,003,000	81%	4,265,000	19%

Notes ¹ Only English anglers included, fishing in the English part.
² Days in home RBD

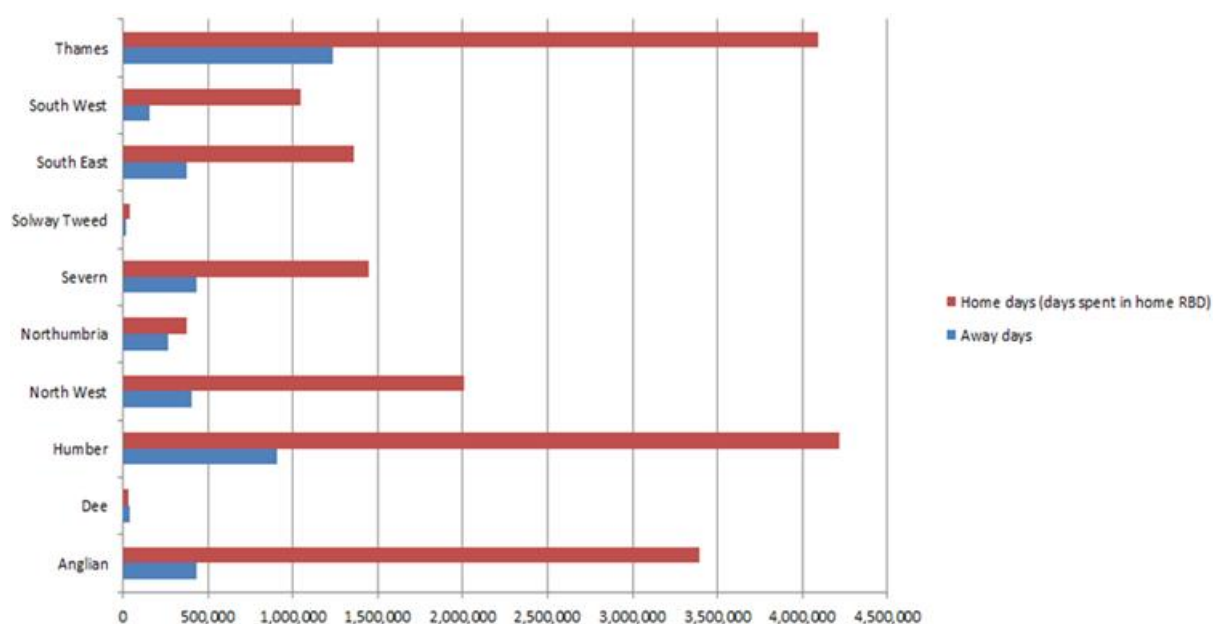


Figure 3.6 Total angler days by angler origin (all types of fishing)

Notes: Only English anglers fishing in the English part included in Dee, Severn and Solway Tweed RBDs.

Anglers from the Dee RBD appear to have spent a significant percentage of their days outside their RBD, but this may be because the Dee RBD falls mostly in Wales. As a result, the total number of angling days for the Dee RBD is low compared with other RBDs, reflecting both its smaller size but also the exclusion from this survey of Welsh anglers fishing in England and English anglers fishing in Wales. Similar border issues will affect 2 other RBDs – the Severn RBD (Welsh border) and the Solway Tweed RBD (Scottish border).

3.4.1 Distance travelled to fish

The distance travelled by type of fishing is set out in Table 3.7 and shown graphically in Figure 3.7.

Table 3.7 Number of trips by type of fishing and distance travelled from home

Type of fishing	Distance travelled (miles) ¹	Number of trips	% of total within each type of fishery
Coarse	≤5	325,000	22.8
	>5 and ≤25	668,000	46.9
	>25 and ≤50	203,000	14.2
	>50	230,000	16.1
Trout and grayling	≤5	29,000	9.2
	>5 and ≤25	120,000	38.0

	>25 and ≤50	75,000	23.7
	>50	93,000	29.4
	≤5	2,000	14.5
Salmon and sea trout	>5 and ≤25	4,000	28.9
	>25 and ≤50	2,000	14.5
	>50	7,000	50.6

Notes: ¹ This is distance from home, not the round trip distance.

Key findings are as follows.

- There was a significantly higher percentage of longer distances for salmon and sea trout angling due to the uneven geographical distribution of these fisheries.
- Most coarse angling trips took place within the 5–25 miles distance from home location, whereas for salmon fishing, over half of the trips involved travelling distances of more than 50 miles.
- Most of the trout fishing trips took place between 5 and 25 miles from home.

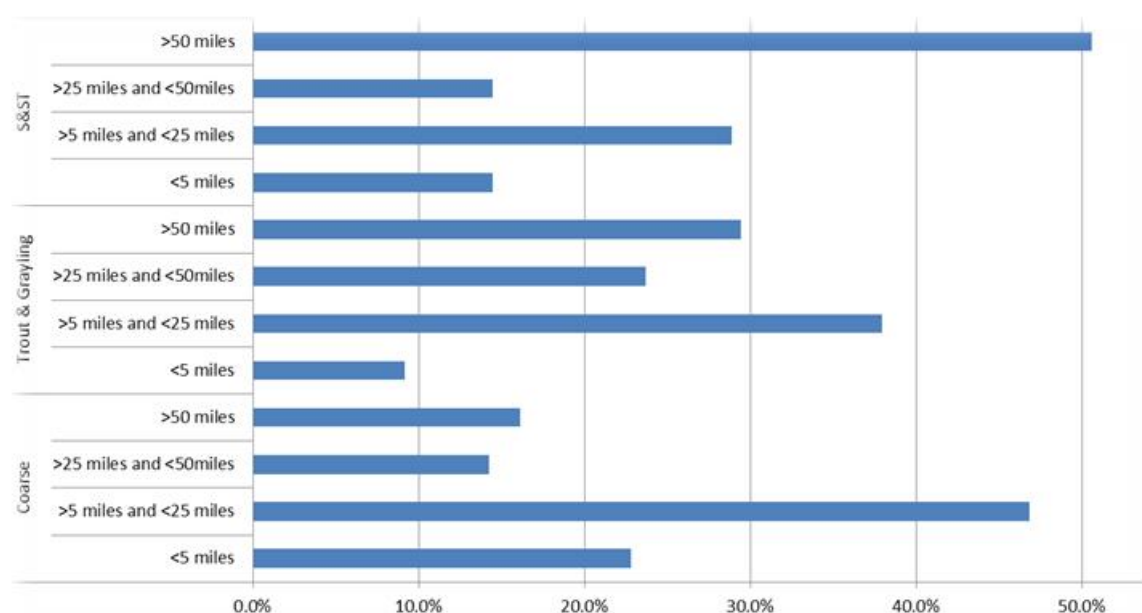


Figure 3.7 Trips by distance travelled from home

Anglers fishing for salmon and sea trout from the southern RBDs (that is, Anglian, Humber, Thames and the South East) travelled the greatest distances from home to pursue their recreational activity, with distances exceeding 100 miles (Table 3.8). This is because there are fewer opportunities to fish for salmon or sea trout in these RBDs compared with the north and west of England. Anglers from Northumbria, in contrast, travelled on average 23.6 miles to fish for salmon.

Coarse anglers in 2015 tended to travel shorter distances than other anglers, but there are some variations between RBDs (Table 3.8). For instance, coarse anglers from the Solway Tweed RBD needed to travel longer distances than salmon anglers from the same RBD. This is due to the salmonid character of the RBD, where coarse angling is less widely available. For trout, the average distance travelled varied between RBDs from 29 miles in the Dee RBD to 63 miles on average for anglers from the Thames RBD.

**Table 3.8 Average distance travelled by origin of angler and type of fishing
(miles)**

Home RBD	Type of fishing	Average distance travelled
Anglian	Coarse	24
	Trout and grayling	59
	Salmon and sea trout	171
Dee ¹	Coarse	47
	Trout and grayling	30
	Salmon and sea trout	62
Humber	Coarse	29
	Trout and grayling	38
	Salmon and sea trout	110
North West	Coarse	36
	Trout and grayling	35
	Salmon and sea trout	46
Northumbria	Coarse	67
	Trout and grayling	32
	Salmon and sea trout	24
Severn ¹	Coarse	31
	Trout and grayling	41
	Salmon and sea trout	90
Solway Tweed ¹	Coarse	76
	Trout and grayling	66
	Salmon and sea trout	22
South East	Coarse	34
	Trout and grayling	40
	Salmon and sea trout	294
South West	Coarse	30
	Trout and grayling	35
	Salmon and sea trout	31
Thames	Coarse	33
	Trout and grayling	63

Home RBD	Type of fishing	Average distance travelled
	Salmon and sea trout	178

Notes ¹ Only English anglers fishing in the English part included in Dee, Severn and Solway Tweed RBDs.

3.5 Angling effort by origin of anglers and trip destination

3.5.1 Overview

The total days spent fishing in 2015 across all types by anglers' origin and destination are shown in Table 3.9. As expected, most of the away visits are to neighbouring RBDs.

The Humber and Thames RBDs are the RBDs where the most angling effort was conducted in 2015 – both by destination and origin of trips. This is to be expected as they have the largest number of licensees (the 2 RBDs together have nearly 50% of total licences sold in 2015).

The Anglian RBD is the third most heavily fished. Most of the activity is from anglers based in the RBD though visitors from the Humber and Thames RBDs make a significant contribution (licences sold in the Anglian RBD represent 16% of total sales).

The Severn (the portion in England) and the North West RBDs are also heavily fished, but the number of days spent in 2015 is less than in the top 3 RBDs at around 2.2 million days in each. Most of the days in the North West RBD are accounted for by residents within the district. Visitors to the English part of the Severn RBD include anglers from the Humber and Thames RBDs.

In total, the greatest numbers of coarse angling trips in 2015 were in the Humber RBD, followed by the Thames and Anglian RBDs (Table 3.10). More trout and grayling fishing took place in the Humber RBD than in other RBDs (Table 3.11), but coarse fishing is more popular still.

Northumbria is the RBD where more anglers go salmon and sea trout fishing, with visitors mainly from the South East, but also the Humber and Thames RBDs. The South West is also important for salmon and sea trout fishing (Table 3.12).

3.5.2 Coarse fishing by type of water body

Table 3.10 showed the total angler days in 2015 by angler origin and location of coarse fisheries. A similar analysis for coarse fishing by type of water body is shown in Table 3.13 for rivers, in Table 3.24 for stillwaters and Table 3.15 for canals. The results are similar to those given in Table 3.10.

Most of the coarse fishing on rivers was in the Humber RBD, followed by the Thames and Anglian RBDs (Table 3.13). In particular:

- 958,000 days were spent in the Humber RBD, of which 89% were by district-based anglers and 4% by visitors from the Anglian RBD
- 943,000 days were spent by coarse anglers fishing on rivers in Thames RBD, with 98% of these days spent by district-based anglers
- 879,000 days were spent in the Anglian RBD with 9% of these days spent by visitors from Thames; 80% were spent by district-based anglers

The Humber and Thames RBDs had the most days fished on stillwaters, with over 3 million days spent in each RBD (Table 3.14). Around 88% of those days were by anglers based in the RBD. The Anglian RBD had the next highest figure with 2.8 million days spent. The percentage of anglers based in the Anglian RBD fishing on stillwaters is estimated at 79%, with 14% of total days in the RBD due to visitors from the Thames RBD.

The Humber, Thames and Anglian RBDs are the RBDs where coarse anglers spent the most days fishing on canals (Table 3.15). In particular:

- 87% of the 326,000 days spent fishing on canals in the Humber RBD were by district-based anglers
- in the Thames RBD, most angling days were conducted by district-based anglers (90% of the 320,000 estimated total days fishing on canals for coarse fishing)
- 299,000 days were spent in the Anglian RBD's canals, of which 80% were by district-based anglers

3.5.3 Trout and grayling fishing by type of water body

Table 3.11 showed the total angler days in 2015 by angler origin and location of trout and grayling fisheries. A similar analysis trout and grayling fishing by type of water body is shown in Table 3.16 for rivers and Table 3.17 for stillwaters. There is no trout and grayling fishing in England in canals.

The Humber RBD was the district where most days were spent trout fishing on both rivers and stillwaters. The total number of days spent on rivers is estimated at 190,000; 91% of these days were by district-based anglers but 5% were visits from the Northumbria RBD (Table 3.16). The total number of days spent on stillwaters in 2015 was estimated at over 300,000 days, of which 18% were spent by visitors (Table 3.17).

The second and third most visited RBDs for trout and grayling were the Thames and Anglian RBDs, with a similar number of days spent on stillwaters (around 200,000 days) (Table 3.17) and on rivers (over 125,000 days) (Table 3.16) in each RBD.

Again, district-based anglers represent the bulk of the angling activity within the RBD, as shown in the average distance travelled for trout fishing which is around 50 miles from the home residence.

3.5.4 Salmon and sea trout fishing in rivers in England

Total angler days by angler origin and regional location of rivers for salmon and sea trout fishing are given in Table 3.12. This shows that most of the salmon and sea trout fishing in England in 2015 took place in Northumbria. However, the origin of anglers fishing here is diverse, reflecting the earlier observation that salmon and sea trout fishing commands greater travelling distances.

Given that only the English part of the Solway Tweed RBD is included in Table 3.12, the number of trips to this district for salmon and sea trout fishing is significant.

The South West appears to be the second most visited location for salmon and sea trout fishing in England by English anglers, with a total of 30,000 days spent (Table 3.12). This correlates pretty well with the 22,000 days declared on rod licence catch returns for the old Environment Agency South West Region in 2015, bearing in mind that only about 60% of salmon licence holders tend to make returns. Over 5,000 of the days spent in the South West RBD were by visitors from the Thames and the Severn RBDs.

A total of 25,300 days were spent salmon and sea trout fishing in the North West RBD. Of these, 23,600 days were spent by district-based anglers and the rest by visitors.

Table 3.9 All fishing: total angler days by angler origin (rows) and destination (columns)

	Anglian	Dee ¹	Humber	North West	Northumbria	Severn ¹	Solway Tweed ¹	South East	South West	Thames	Total by origin
Anglian	3,395,000	1,000	143,000	6,000	2,000	63,000	2,000	19,000	29,000	169,000	3,828,000
Dee¹	0	33,000	0	14,000	0	21,000	0	4,000	0	0	70,000
Humber	269,000	3,000	4,220,000	113,000	39,000	335,000	9,000	16,000	56,000	65,000	5,127,000
North West	33,000	55,000	140,000	2,005,000	19,000	95,000	15,000	3,000	10,000	35,000	2,410,000
Northumbria	23,000	0	178,000	29,000	375,000	6,000	15,000	6,000	2,000	8,000	643,000
Severn¹	40,000	2,000	156,000	7,000	0	1,445,000	1,000	11,000	129,000	85,000	1,876,000
Solway Tweed¹	0	0	6,000	9,000	1,000	0	40,000	0	0	1,000	57,000
South East	36,000	0	10,000	8,000	7,000	26,000	2,000	1,356,000	130,000	154,000	1,730,000
South West	12,000	0	5,000	0	0	51,000	0	52,000	1,043,000	39,000	1,202,000
Thames	544,000	4,000	25,000	9,000	6,000	208,000	39,000	249,000	148,000	4,092,000	5,325,000
Total by destination	4,352,000	97,000	4,882,000	2,200,000	449,000	2,252,000	123,000	1,717,000	1,547,000	4,647,000	22,269,000

Notes: ¹ Only that part of the RBD in England.
 ² Rounded to nearest thousand or hundred.

Table 3.10 Coarse angling in all water body types: total angler days by angler origin (rows) and destination (columns)

	Anglian	Dee*	Humber	North West	Northumbria	Severn*	Solway Tweed*	South East	South West	Thames	Total by origin
Anglian	3,121,000	1,000	135,000	6,000	0	61,000	0	14,000	19,000	158,000	3,515,000
Dee*	0	25,000	0	13,000	0	17,000	0	4,000	0	0	58,000
Humber	254,000	0	3,800,000	74,000	31,000	282,000	4,000	14,000	54,000	41,000	4,555,000
North West	32,000	45,000	120,000	1,777,000	16,000	93,000	7,000	2,000	10,000	35,000	2,137,000
Northumbria	23,000	0	149,000	27,000	191,000	6,000	7,000	6,000	2,000	8,000	418,000
Severn*	39,000	1,000	145,000	6,000	0	1,258,000	0	1,000	119,000	77,000	1,645,000
Solway Tweed*	0	0	1,000	4,000	1,000	0	20,000	0	0	1,000	27,000
South East	35,000	0	9,000	6,000	0	24,000	0	1,186,000	112,000	145,000	1,517,000
South West	11,000	0	4,000	0	0	45,000	0	45,000	831,000	37,000	973,000
Thames	511,000	2,000	21,000	7,000	0	188,000	37,000	198,000	80,000	3,811,000	4,855,000
Total by destination	4,026,000	73,000	4,384,000	1,920,000	238,000	1,973,000	76,000	1,470,000	1,226,000	4,313,000	19,700,000

Notes: ¹ Only that part of the RBD in England.

² Rounded to nearest thousand or hundred.

Table 3.11 Trout and grayling fishing in all water body types: total angler days by angler origin (rows) and destination (columns)

	Anglian	Dee ¹	Humber	North West	Northumbria	Severn ¹	Solway Tweed ¹	South East	South West	Thames	Total by origin
Anglian	274,000	0	8,000	0	2,000	1,000	1,000	5,000	10,000	11,000	311,000
Dee¹	0	7,000	0	1,000	0	2,000	0	0	0	0	10,000
Humber	15,000	3,000	418,000	38,000	5,000	52,000	4,000	2,000	2,000	24,000	563,000
North West	1,000	9,000	20,000	204,000	2,000	2,000	6,000	1,000	0	0	244,000
Northumbria	0	0	28,000	2,000	160,000	0	7,000	0	0	0	199,000
Severn¹	1,000	1,000	11,000	1,000	0	179,000	0	10,000	9,000	8,000	220,000
Solway Tweed¹	0	0	5,000	5,000	0	0	12,000	0	0	0	22,000
South East	1,000	0	1,000	2,000	0	2,000	2,000	168,000	18,000	9,000	203,000
South West	1,000	0	1,000	0	0	6,000	0	7,000	188,000	2,000	205,000
Thames	33,000	2,000	4,000	2,000	3,000	17,000	2,000	50,000	64,000	281,000	458,000
Total by destination	326,000	22,000	496,000	255,000	172,000	262,000	33,000	244,000	291,000	334,000	2,436,000

Notes: ¹ Only that part of the RBD in England.
² Rounded to nearest thousand or hundred.

Table 3.12 Salmon and sea trout fishing: total angler days by angler origin (rows) and destination (columns)

	Anglian	Dee ¹	Humber	North West	Northumbria	Severn ¹	Solway Tweed ¹	South East	South West	Thames	Total by origin
Anglian	0	0	100	100	100	900	600	0	0	0	1,800
Dee¹	0	700	0	0	0	1,600	0	0	0	0	2,300
Humber	100	100	1,700	900	3,200	1,400	800	0	300	0	8,500
North West	0	1,300	0	23,600	1,300	400	2,400	0	100	0	29,100
Northumbria	0	0	600	0	23,900	300	1,300	0	0	0	26,100
Severn¹	0	100	0	200	0	8,300	800	0	1,200	0	10,600
Solway Tweed¹	0	0	0	300	100	0	8,000	0	0	0	8,400
South East	0	0	0	100	7,200	400	0	2,100	300	0	10,100
South West	0	0	0	0	300	0	0	300	23,700	0	24,300
Thames	0	0	0	100	2,800	3,400	100	1,100	4,400	200	12,100
Total by destination	100	2,200	2,400	25,300	38,900	16,700	14,000	3,500	30,000	200	133,300

Notes: ¹ Only that part of the RBD in England.

² Rounded to nearest thousand or hundred.

Table 3.13 Coarse angling in rivers: total angler days by angler origin (rows) and destination (columns)

	Anglian	Dee ¹	Humber	North West	Northumbria	Severn ¹	Solway Tweed ¹	South East	South West	Thames	Total by origin ^{2,3}
Anglian	700,000	1,000	40,000	3,000	0	11,000	0	0	2,000	13,000	770,000
Dee¹	0	11,000	0	0	0	2,000	0	0	0	0	13,000
Humber	38,000	0	853,000	20,000	12,000	44,000	0	0	29,000	0	996,000
North West	16,000	4,000	12,000	397,000	0	37,000	0	0	0	0	466,000
Northumbria	6,000	0	28,000	0	44,000	0	13,000	0	0	0	91,000
Severn¹	22,000	0	20,000	0	0	311,000	0	0	6,000	0	359,000
Solway Tweed¹	0	0	1,000	0	0	0	5,000	0	0	0	6,000
South East	10,000	0	0	0	0	3,000	0	288,000	26,000	5,000	332,000
South West	5,000	0	0	0	0	2,000	0	8,000	197,000	2,000	214,000
Thames	82,000	0	4,000	0	0	20,000	0	26,000	8,000	923,000	1,063,000
Total by destination^{2,3}	879,000	16,000	958,000	420,000	56,000	430,000	18,000	322,000	268,000	943,000	4,310,000

Notes: ¹ Only that part of the RBD in England.

² Rounded to nearest thousand or hundred.

³ Totals may not add up due to rounding and sampling error.

Table 3.14 Coarse angling in stillwaters: total angler days by angler origin (rows) and destination (columns)

	Anglian	Dee ¹	Humber	North West	Northumbria	Severn ¹	Solway Tweed ¹	South East	South West	Thames	Total by origin ^{2,3}
Anglian	2,250,000	0	76,000	3,000	0	38,000	0	6,000	8,000	108,000	2,489,000
Dee¹	0	18,000	0	8,000	0	13,000	0	2,000	0	0	41,000
Humber	172,000	0	2,731,000	40,000	14,000	204,000	9,000	7,000	25,000	23,000	3,225,000
North West	7,000	34,000	107,000	1,283,000	0	46,000	4,000	0	8,000	26,000	1,515,000
Northumbria	9,000	0	90,000	14,000	168,000	5,000	3,000	0	0	7,000	296,000
Severn¹	12,000	0	81,000	1,000	0	931,000	0	0	92,000	48,000	1,165,000
Solway Tweed¹	0	0	0	1,000	0	0	17,000	0	0	1,000	19,000
South East	4,000	0	2,000	3,000	0	5,000	0	884,000	45,000	130,000	1,073,000
South West	6,000	0	3,000	0	0	7,000	0	19,000	631,000	23,000	689,000
Thames	388,000	0	10,000	4,000	0	146,000	25,000	123,000	57,000	2,685,000	3,438,000
Total by destination^{2,3}	2,848,000	52,000	3,100,000	1,357,000	182,000	1,395,000	58,000	1,041,000	866,000	3,051,000	13,950,000

Notes: ¹ Only that part of the RBD in England.

² Rounded to nearest thousand or hundred.

³ Totals may not add up due to rounding and sampling error.

Table 3.15 Coarse fishing in canals: total angler days by angler origin (rows) and destination (columns)

	Anglian	Dee ¹	Humber	North West	Northumbria	Severn ¹	Solway Tweed ¹	South East	South West	Thames	Total by origin ^{2,3}
Anglian	238,000	0	4,000	0	0	0	0	0	0	15,000	257,000
Dee¹	0	0	0	4,000	0	0	0	0	0	0	4,000
Humber	22,000	0	276,000	1,000	0	23,000	0	0	0	12,000	334,000
North West	0	0	20,000	136,000	0	0	0	0	0	0	156,000
Northumbria	7,000	0	5,000	0	0	0	0	18,000	0	0	30,000
Severn¹	0	5,000	8,000	0	0	82,000	0	0	24,000	1,000	120,000
Solway Tweed¹	0	0	0	0	0	0	0	0	0	0	0
South East	0	0	12,000	1,000	0	5,000	0	86,000	0	7,000	111,000
South West	0	0	0	0	0	11,000	0	0	59,000	1,000	71,000
Thames	32,000	0	1,000	0	0	26,000	0	5,000	8,000	284,000	356,000
Total by destination^{2,3}	299,000	5,000	326,000	142,000	0	147,000	0	109,000	91,000	320,000	1,440,000

Notes: ¹ Only that part of the RBD in England.

² Rounded to nearest thousand or hundred.

³ Totals may not add up due to rounding and sampling error.

Table 3.16 Trout fishing and grayling in rivers: total angler days by angler origin (rows) and destination (columns)

	Anglian	Dee ¹	Humber	North West	Northumbria	Severn ¹	Solway Tweed ¹	South East	South West	Thames	Total by origin ^{2,3}
Anglian	101,000	0	2,000	0	0	1,000	0	3,000	3,000	10,000	120,000
Dee¹	0	2,000	0	0	0	1,000	0	0	0	0	0
Humber	19,000	3,000	173,000	5,000	1,000	11,000	3,000	1,000	1,000	0	220,000
North West	1,000	1,000	4,000	84,000	1,000	1,000	3,000	0	0	0	100,000
Northumbria	0	0	10,000	3,000	63,000	0	0	0	0	0	80,000
Severn¹	0	1,000	1,000	0	0	72,000	0	6,000	1,000	5,000	90,000
Solway Tweed¹	0	0	0	4,000	0	0	5,000	0	0	0	10,000
South East	0	0	0	2,000	0	2,000	1,000	60,000	9,000	4,000	80,000
South West	1,000	0	0	0	0	1,000	0	2,000	76,000	0	80,000
Thames	4,000	1,000	1,000	1,000	1,000	12,000	1,000	22,000	23,000	111,000	180,000
Total by destination^{2,3}	130,000	10,000	190,000	100,000	70,000	100,000	10,000	90,000	110,000	130,000	940,000

Notes: ¹ Only that part of the RBD in England.
² Rounded to nearest thousand or hundred.
³ Totals may not add up due to rounding and sampling error.

Table 3.17 Trout fishing and grayling in stillwaters: total angler days by angler origin (rows) and destination (columns)

	Anglian	Dee ¹	Humber	North West	Northumbria	Severn ¹	Solway Tweed ¹	South East	South West	Thames	Total by origin ^{2,3}
Anglian	170,000	0	5,000	0	2,000	0	0	1,000	10,000	3,000	190,000
Dee¹	0	5,000	0	2,000	0	0	0	0	0	0	10,000
Humber	5,000	0	254,000	28,000	5,000	37,000	0	1,000	1,000	15,000	350,000
North West	0	9,000	14,000	124,000	0	0	2,000	0	0	0	150,000
Northumbria	0	0	14,000	0	98,000	0	11,000	0	0	0	120,000
Severn¹	0	0	10,000	1,000	0	110,000	0	2,000	9,000	2,000	130,000
Solway Tweed¹	0	0	6,000	1,000	0	0	6,000	0	0	0	10,000
South East	0	0	0	0	0	1,000	0	119,000	1,000	4,000	130,000
South West	1,000	0	0	0	0	4,000	0	3,000	117,000	1,000	130,000
Thames	25,000	0	2,000	0	1,000	9,000	0	24,000	41,000	179,000	280,000
Total by destination^{2,3}	200,000	10,000	310,000	160,000	110,000	160,000	20,000	150,000	180,000	200,000	1,490,000

Notes: ¹ Only that part of the RBD in England.
² Rounded to nearest thousand or hundred.
³ Totals may not add up due to rounding and sampling error.

4 Economic activity supported by angling in England

4.1 Overview

This section looks at the activity supported by anglers' expenditure at national and regional level – otherwise known as economic impacts from angling. For the purposes of this study, the expenditure has been split into 2 types:

- **Non-trip related expenditure.** This is expenditure not related to specific fishing trips. It includes items such as clothing, tackle and equipment, club membership, season tickets and syndicate fees (grouped under the heading of angling permits), books and magazines.
- **Trip-related expenditure.** This is expenditure directly linked to the angling trip such as accommodation, subsistence, travel-related expenditure⁶ and day tickets.

It is difficult to assess the impacts of non-trip related expenditure at any smaller level than the national level as such expenditure may take place via retail outlets, or through online or mail order services. Because of this, the impacts from non-trip specific expenditure are assessed at the national level using national multipliers produced by the ONS for the different sectors.

In contrast, trip-related expenditure can largely be linked to the different geographical areas or RBDs in which angling takes place in order to assess the impact on the local or regional economy. Multipliers can assist in this analysis but, although multipliers are produced by the ONS at national level, Input-Output (I–O) multipliers are not produced at any other geographical level. This means that no 'off-the-shelf' regional I–O multipliers were available for use in this study.

The 2007 study developed its own I–O multipliers at the regional level – the so-called Dream® model. This used an approach based on a Detailed Regional Economic Accounting Model. Although access to this model was requested for this study, it was not possible to use it within the study's scope and budget. A similar approach to that of the 2007 study was therefore adopted for the purposes of this economic analysis.

This consisted of developing regional multipliers for trip-related expenditure based on LQs derived from the ONS (based on the SLQ approach; see Section 1.3). Trip-related expenditure was then linked to the different geographical units (NUTS2) for which statistical information on industry composition was available; this was because GVA statistics are available at the level of the NUTS2 regions. The NUTS2 regions were then linked to RBDs;

⁶ Although some expenditure may not be incurred at the destination (for example, on transport and bait), it was not possible to account for the specific location where such expenditure takes place. Thus, the study assumes that trip-related expenditure is incurred at the destination.

because they are not a perfect geographical match, any results should be read with caution. This required some adjustments to be made for the Humber and the Thames RBDs, as these districts include parts of the East Midlands and the South East regions respectively. Table 4.1, reproduced from Section 1, shows the correspondence.

Table 4.1 Correspondence between RBD and regional multipliers

RBD	Regional multipliers/NUTS2
Anglian	East of England
Thames ¹	London
Northumbria	North East
North West, Dee and Solway Tweed	North West
South East	South East
South West	South West
Severn	West Midlands
Humber ¹	Yorkshire and the Humber
	East Midlands ¹

Notes: The names of the regions in the right-hand column are those of the 9 official regions of England at the first level of NUTS for statistical purposes.
Adjustments were needed based on percentage of total expenditure in different regions (based on the regional analysis presented in Section 5).
¹ Thames RBD calculations include regional multipliers from the South East region and the Humber RBD calculations include regional multipliers from the East Midlands.

Table C.1 in Appendix C gives the Type I multipliers, based on the 2010 I–O tables, for the different industry groups believed to be the most appropriate to freshwater angling and its associated expenditure types. The following definitions apply.

- Output multipliers measure the effect on total economic output caused by a one unit change in the final demand of a specific product or expenditure. Multiplying the expenditure by the Type I output multiplier gives the **value of turnover (direct and indirect) as a result of angling expenditure**.
- The **GVA effect** is expressed as the direct and indirect GVA changes to the direct output change, reflected in household incomes, due to a unit increase in final demand. In other words, if there is a change in output (or turnover) for the industry, the GVA effect can be used to calculate the change in GVA for the economy as a whole.
- Multiplying the direct output change by the Type I employment costs effect gives an estimate of the direct plus the indirect employment changes resulting from this additional output. This provides the basis for estimating **FTE jobs** created directly and indirectly throughout England due to angling. In doing so, average labour costs per full-

time employee were taken for the applicable industry categories and based on Eurostat figures (indexed to UK prices in 2015).

Environment Agency regional expenditure on fisheries, much it derived from rod licences, is not included here. But as the 2007 report noted, rod licence expenditure by English anglers in 2005 represents only 1.1% of gross expenditure (Environment Agency 2007). Thus, any figures presented here are expected to be of the right order of magnitude.

4.2 Impacts of non-trip related expenditure

4.2.1 Non-trip related expenditure

The total expenditure in England in 2015 for items not derived from specific trips is estimated at around £680 million (Table 4.2). Over 50% of this expenditure was on tackle and equipment (Figure 4.1). On average, anglers each spent around £430 on tackle and equipment in 2015. This includes expenditure on rods, poles, reels, floats, lures, hooks, weights, lines, flies and fly-tying equipment (Table 4.2).

Table 4.2 Non-trip related expenditure in 2015

Type of expenditure	Total (£ thousands)	Mean expenditure per year per angler (£)
Specialist clothing	163,000	182
Tackle and equipment	382,000	430
Angling permits (including club membership, season tickets and syndicate fees)	110,000	120
Books, magazines, DVDs or other media related specifically to angling	25,000	28
Total	680,000¹	731

Notes: The non-trip related expenditure, excluding annual permits and syndicate fees, is estimated at £545 million. Figures from a recent survey for the Angling Trades Association (ATA) estimated this type of expenditure at around £337 million for the UK.

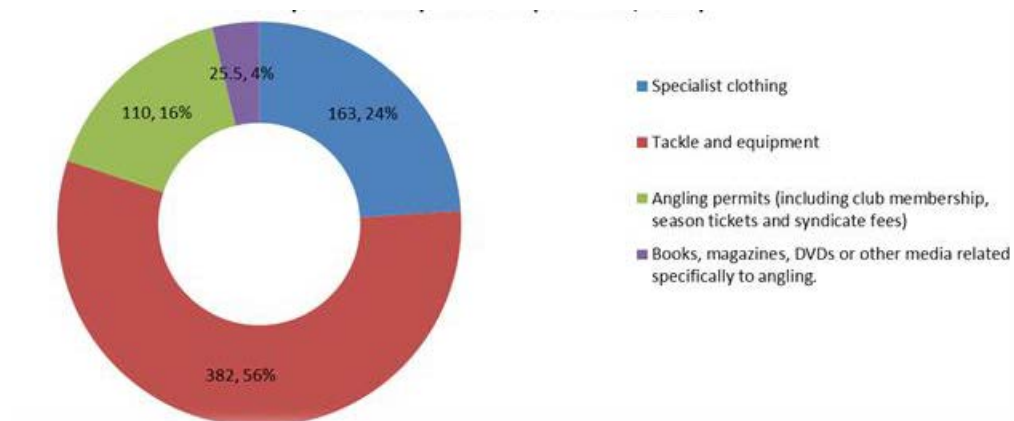


Figure 4.1 Non-trip related expenditure in 2015 by type of expenditure

A more detailed analysis by type of angling licence and expenditure type was also made (Table 4.3). It showed that salmon and sea trout anglers spent an average of around £400 on annual permits in 2015 including club membership, season tickets and syndicate fees.

Table 4.3 Expenditure on angling permits (including club membership, season tickets and syndicate fees) in 2015 by type of Environment Agency licence

Type of licence	Total (£ million)	Mean expenditure per year per angler (£)
Coarse fish and non-migratory trout	102	114
Salmon and sea trout	7.6	402
Total	110	£120

4.2.2 Economic activity supported by non-trip related expenditure

This expenditure is not specific to any RBD and includes expenditure made online or via a catalogue. As a result, the economic activity is calculated for England as a whole, using national multipliers to estimate its economic impact.

Non-trip related expenditure in 2015 supported over 10,700 FTE jobs and generated £583 million for the English economy (Table 4.4). However, this may be an underestimate as the calculation covers only direct and indirect effects (Type I multipliers) and not induced effects (see Section 1.3). The I–O tables produced by the ONS at national level were used to generate these estimates, but these include Type I multipliers only.

Table 4.4 Estimates from multiplier analysis of the economic impacts of non-trip related expenditure in 2015

GVA	£583 million
Total employment (FTEs)	10,730

4.3 Impacts of trip-related expenditure

The total trip-related expenditure in 2015 is estimated at around £1.06 billion. In aggregate and across all types of fishing, the greatest share is spent on bait (25% of total expenditure) and transport (20% of total expenditure) (Figure 4.2).

The highest proportion of trip-related expenditure is spent by coarse anglers, as might be expected, with nearly 90% of total trip-related expenditure (Figure 4.3).

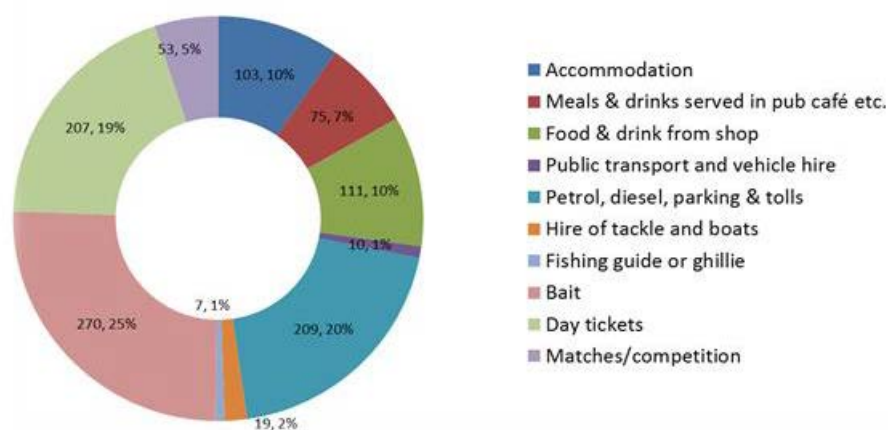


Figure 4.2 Trip-related expenditure in 2015 for all types of fishing by type of expenditure (£ million, %)

Notes: Total trip-related expenditure is estimated at £1.06 billion.



Figure 4.3 Trip-related expenditure in 2015 by type of fishing (£ million)

Notes: Total trip-related expenditure is estimated at £1.06 billion.

When looking at individual items of expenditure by type of fishing, salmon and sea trout anglers spent more on average than other anglers on accommodation (Table 4.5). This is probably as a result of the greater length of distance travelled (see Section 3.4.1).

Table 4.5 Total trip-related expenditure in 2015 by type of fishing and type of expenditure

	Total expenditure (£ thousands)	Average expenditure per angler per year (£)
Salmon and sea trout		
Accommodation	1,500	90
Meals and drinks served in pub, café and so on	1,100	70
Food and drink from shop	900	50

	Total expenditure (£ thousands)	Average expenditure per angler per year (£)
Public transport and vehicle hire	100	4
Petrol, diesel, parking and tolls	2,400	150
Hire of tackle and boats	100	4
Fishing guide or ghillie	800	40
Bait	300	10
Day tickets	1,100	80
Sub-total	8,200	
Coarse fish and eels		
Accommodation	94,000	70
Meals and drinks served in pub, café and so on	64,300	50
Food and drink from shop	103,000	80
Public transport and vehicle hire	9,000	10
Petrol, diesel, parking and tolls	175,000	150
Hire of tackle and boats	11,100	10
Fishing guide or ghillie	3,900	3
Bait	266,000	210
Day tickets	164,000	130
Match fees	52,800	270
Sub-total	943,200	
Trout or grayling		
	-	
Accommodation	7,700	30
Meals and drinks served in pub, café and so on	10,100	30
Food and drink from shop	7,100	20
Public transport and vehicle hire	800	2
Petrol, diesel, parking and tolls	31,400	110
Hire of tackle and boats	7,800	30
Fishing guide or ghillie	2,600	10
Bait	4,100	10

	Total expenditure (£ thousands)	Average expenditure per angler per year (£)
Day tickets	41,700	150
Competition fees	500	120
Sub-total	113,900	
Total	1,065,000	

The average spend for day tickets was the largest for trout and grayling fishing, but coarse anglers spent on average more on match fees than trout anglers spent on competition fees, nearly double the amount. Salmon and sea trout anglers spent, on average, a significantly smaller amount on day tickets than coarse and trout anglers. This is probably because a greater proportion of salmon and sea trout anglers obtain permission to fish on an annual rather than a daily basis. Annual expenditure on permission to fish is included in non-trip related expenditure. Although trout and coarse fishing tickets are generally cheaper, tickets can vary in price significantly.

4.3.1 Impacts in the Anglian RBD

Table 4.6 sets out the expenditure in 2015 by district-based anglers and visitors to the Anglian RBD by type of fishing. Total trip-related expenditure is estimated at around £178 million.

- Expenditure by coarse anglers in 2015 totalled £165 million. Of this, £117 million was from district-based anglers.
- Expenditure related to trout and grayling fishing in 2015 is estimated at £13 million, mostly from district-based anglers.
- Expenditure related to salmon and sea trout fishing is negligible in the Anglian RBD.

Table 4.6 Total trip-related expenditure in 2015 in the Anglian RBD (£ thousands)

Type of angler	Type of fishing		
	Coarse	Trout and grayling	Salmon and sea trout
District-based	117,000	10,000	—
Visitor	48,000	3,000	10
Total	165,000	13,000	10

In terms of the economic activity supported by the above expenditure, Table 4.7 sets out the economic value of angling in the Anglian RBD.

- In 2015, angling contributed £150 million to the economy within the RBD. Most of this contribution was from district-based anglers. Visitors' contribution was £40 million.
- Angling supported over 2,800 jobs (FTEs). Nearly 2,000 were generated as a result of spending by district-based anglers.

Table 4.7 Multiplier analysis: direct and indirect impacts from angling expenditure in 2015 for the Anglian RBD

Type of impact	Type of angler		Total
	District-based	Visitor	
Contribution to economy (GVA) (£ thousands)	110,000	40,000	150,000
Contribution to employment (FTE jobs)	1,998	815	2,814

Table 4.8 compares the impacts relating to the number of angling trips by district-based anglers and visitors.

- Expenditure per trip by district-based anglers is estimated at £46, with their contribution to GVA being £40 per trip.
- Visitors spent £149 per trip and generated £117 in GVA for each trip.

Table 4.8 Expenditure and GVA per trip by anglers' origin to the Anglian RBD

	District-based	Visitor
Expenditure (£ per trip)	46	149
GVA (£ per trip)	40	117

4.3.2 Impacts in Dee RBD (England only)

The Dee RBD spans the England and Wales border, but lies mainly within Wales. Table 4.9 sets out the expenditure in 2015 by English district-based anglers and English visitors to the Dee RBD by type of fishing. Total trip-related expenditure is estimated at around £9 million.

- Coarse anglers' expenditure in 2015 totalled £7 million. Of this, £4 million was spent by district-based anglers and £3 million by visitors.
- Expenditure related to trout and grayling fishing in 2015 is estimated at £1.6 million, more than half of which was generated by visitors.
- Salmon and sea trout anglers spent £0.2 million in the English part of the Dee RBD in 2015. Most of the expenditure (£0.19 million) was by visitors to the RBD.

Table 4.9 Total trip-related expenditure in 2015 in the English part of the Dee RBD (£ thousands)

Type of angler	Type of fishing		
	Coarse	Trout and grayling	Salmon and sea trout
District-based	4,000	700	20
Visitor	3,000	900	190
Total	7,000	1,600	200

In terms of the economic activity supported by the above expenditure, Table 4.10 sets out the economic impacts in the English part of the Dee RBD.

- In 2015, angling contributed £7.1 million to the economy within the English part of the Dee RBD. More than half of the GVA was generated as a result of expenditure by district-based anglers. Visitors contributed £3 million.
- Angling supported 127 jobs (FTEs), of which 74 were generated as a result of spending by district-based anglers.

Table 4.10 Multiplier analysis: direct and indirect impacts from angling expenditure in 2015 for the English part of the Dee RBD

Type of impact	Type of angler		Total
	District-based	Visitor	
Contribution to economy (GVA) (£ thousands)	4,100	3,000	7,100
Contribution to employment (FTE jobs)	74	53	127

Table 4.11 compares the impacts relating to the number of angling trips by district-based anglers and visitors.

- Expenditure per trip by district-based anglers is estimated at £61, with their contribution to GVA being £50 per trip.
- Visitors spent £65 per trip and generated £49 in GVA for each trip.

Table 4.11 Expenditure and GVA per trip by anglers' origin to the English part of the Dee RBD

	District-based	Visitor
Expenditure (£ per trip)	61	65
GVA (£ per trip)	50	49

4.3.3 Impacts in the Humber RBD

Table 4.12 sets out the expenditure in 2015 by district-based anglers and visitors to the Humber RBD by type of fishing. Total trip-related expenditure is estimated at around £257 million.

- Coarse anglers' expenditure in 2015 made up the majority of the total expenditure. Coarse anglers spent around £239 million, most of which was generated by district-based anglers.
- Expenditure related to trout and grayling fishing in 2015 is estimated at £17.9 million, mostly from district-based anglers.
- Salmon and sea trout anglers spent £0.19 million in the Humber RBD in 2015. Most of the expenditure (£0.12 million) was made by district-based anglers.

Table 4.12 Total trip-related expenditure in 2015 in the Humber RBD (£ thousands)

Type of angler	Type of fishing		
	Coarse	Trout and grayling	Salmon and sea trout
District-based	193,000	13,700	120

Type of angler	Type of fishing		
	Coarse	Trout and grayling	Salmon and sea trout
Visitor	47,000	4,200	80
Total	239,000	17,900	190

In terms of the economic activity supported by the above expenditure, Table 4.13 sets out the economic impacts in the Humber RBD.

- In 2015, angling contributed £215 million to the economy within the RBD. The majority of the GVA (£173 million) was generated as a result of expenditure by district-based anglers. Visitors contributed £42 million.
- Angling supported more than 3,900 jobs (FTEs), of which 3,161 were generated as a result of spending by district-based anglers.

Table 4.13 Multiplier analysis: direct and indirect impacts from angling expenditure in 2015 for the Humber RBD

Type of impact	Type of angler		Total
	District-based	Visitor	
Contribution to economy (GVA) (£ thousands)	172,800	42,200	215,000
Contribution to employment (FTE jobs)	3,161	782	3,944

Table 4.14 compares the impacts relating to the number of angling trips by district-based anglers and visitors.

- Expenditure per trip by district-based anglers is estimated at £70, with their contribution to GVA being £59 per trip.
- Visitors spent £105 per trip and generated £87 in GVA for each trip.

Table 4.14 Expenditure and GVA per trip by anglers' origin to the Humber RBD

	District-based	Visitor
Expenditure (£ per trip)	70	105
GVA (£ per trip)	59	87

4.3.4 Impacts in the North West RBD

Table 4.15 sets out the expenditure in 2015 by district-based anglers and visitors to the North West RBD by type of fishing. Total trip-related expenditure is estimated at around £98 million.

- Coarse angling appears to be the most popular form of angling in the RBD. Coarse anglers spent a total of £88 million in 2015, with the majority (£81 million) being spent by district-based anglers.
- Expenditure related to trout and grayling fishing in 2015 is estimated at £8.9 million and was mostly made by district-based anglers.
- Salmon and sea trout anglers spent £1.19 million in the North West RBD in 2015. Most of the expenditure (over £1 million) was made by district-based anglers.

Table 4.15 Total trip-related expenditure in 2015 in the North West RBD (£ thousands)

Type of angler	Type of fishing		
	Coarse	Trout and grayling	Salmon and sea trout
District-based	81,000	5,200	1,080
Visitor	7,000	3,700	110
Total	88,000	8,900	1,190

In terms of the economic activity supported by the above expenditure, Table 4.16 sets out the economic impacts in the North West RBD.

- In 2015, angling contributed with more than £80 million to the economy within the RBD. Most of the GVA (£72 million) was generated as a result of expenditure by district-based anglers. Visitors contributed around £8.9 million.
- Angling supported more than 1,500 jobs (FTEs), of which 1,344 were generated as a result of spending by district-based anglers.

Table 4.16 Multiplier analysis: direct and indirect impacts from angling expenditure in 2015 for the North West RBD

Type of impact	Type of angler		Total
	District-based	Visitor	
Contribution to economy (GVA) (£ thousands)	72,000	8,900	80,900
Contribution to employment (FTE jobs)	1,344	172	1,516

Table 4.17 compares the impacts relating to the number of angling trips by district-based anglers and visitors.

- Expenditure per trip by district-based anglers is estimated at £59, with their contribution to GVA being £49 per trip.
- Visitors spent £108 per trip and generated £87 in GVA for each trip.

Table 4.17 Expenditure and GVA per trip by anglers' origin to the North West RBD

	District-based	Visitor
Expenditure (£ per trip)	59	108
GVA (£ per trip)	49	87

4.3.5 Impacts in the Northumbria RBD

Table 4.18 sets out the expenditure in 2015 by district-based anglers and visitors to the Northumbria RBD by type of fishery. Total trip-related expenditure is estimated at around £19 million.

- Expenditure in 2015 related to coarse fishing is estimated at £8 million and was made mostly by district-based anglers.
- Trout and grayling fishing appears to be the most popular form of fishing in the RBD in 2015, with trout and grayling anglers spending a total of £8.6 million. Most of the expenditure was made by district-based anglers.
- Salmon and sea trout anglers spent around £2.8 million in the Northumbria RBD in 2015. Similar amounts were spent by district-based anglers and visitors (£1.02 million and £1.77 million respectively).

Table 4.18 Total trip-related expenditure in 2015 in the Northumbria RBD (£ thousands)

Type of angler	Type of fishing		
	Coarse	Trout and grayling	Salmon and sea trout
District-based	6,000	7,800	1,020
Visitor	2,000	900	1,770
Total	8,000	8,600	2,790

In terms of the economic activity supported by the above expenditure, Table 4.19 sets out the economic impacts in the Northumbria RBD.

- In 2015, angling contributed £15.4m to the economy within the RBD. The majority of the GVA (£1.7 million) was generated as a result of expenditure by district-based anglers. Visitors contributed £3.7 million.
- Angling supported more than 280 jobs (FTEs), of which 212 were generated as a result of spending by resident anglers.

Table 4.19 Multiplier analysis: direct and indirect impacts from angling expenditure in 2015 for the Northumbria RBD

Type of impact	Type of angler		Total
	District-based	Visitor	
Contribution to economy (GVA) (£ thousands)	11,700	3,700	15,400
Contribution to employment (FTE jobs)	212	70	283

Table 4.20 compares the impacts relating to the number of angling trips by district-based anglers and visitors.

- Expenditure per trip by district-based anglers is estimated at £48, with their contribution to GVA being £40 per trip.
- Visitors spent £228 per trip and generated £169 in GVA for each trip.

Table 4.20 Expenditure and GVA per trip by anglers' origin to the Northumbria RBD

	District-based	Visitors
Expenditure (£ per trip)	48	228
GVA (£ per trip)	40	169

4.3.6 Impacts in the Severn RBD (England only)

Table 4.21 sets out the expenditure in 2015 by district-based anglers in the English part of the Severn RBD and English visitors to it by type of fishing. Total trip expenditure is estimated at around £112 million.

- Expenditure by coarse anglers in the English part of the Severn RBD in 2015 made up the majority of the total expenditure. Coarse anglers spent around £99 million, with more than half of this being generated by district-based anglers.
- Expenditure in 2015 related to trout and grayling fishing is estimated at £11.8 million and was mostly made by district-based anglers.
- Salmon and sea trout anglers spent just over £1 million in the English part of the Severn RBD in 2015. The majority of this expenditure (£0.76 million) was made by visitors.

Table 4.21 Total trip-related expenditure in 2015 in the English part of the Severn RBD (£ thousands)

Type of angler	Type of fishing		
	Coarse	Trout and grayling	Salmon and sea trout
District-based	56,000	7,600	320
Visitor	43,000	4,200	760
Total	99,000	11,800	1,070

In terms of the economic activity supported by the above expenditure, Table 4.22 sets out the economic impacts in the Severn RBD.

- In 2015, angling contributed £93.1 million to the economy within the English part of the Severn RBD. More than a half of the GVA (£53.2 million) was generated as a result of expenditure by district-based anglers. English visitors contributed £39.9 million.
- Angling supported more than 1,700 jobs (FTEs). A similar number of jobs (967 and 760) were generated as a result of spending by district-based anglers and visitors.

Table 4.22 Multiplier analysis: direct and indirect impacts from angling expenditure in 2015 for the English part of the Severn RBD

Type of impact	Type of angler		Total
	District-based	Visitor	
Contribution to economy (GVA) (£ thousands)	53,200	39,900	93,100
Contribution to employment (FTEs)	967	760	1,727

Table 4.23 compares the impacts relating to the number of angling trips by district-based anglers and visitors.

- Expenditure per trip by district-based anglers is estimated at £51 per trip, with their contribution to GVA being £42 per trip.
- Visitors spent £171 per trip and generated £142 in GVA from each trip.

Table 4.23 Expenditure and GVA per trip by anglers' origin to the English part of the Severn RBD

	District-based	Visitor
Expenditure (£ per trip)	51	171
GVA (£ per trip)	42	142

4.3.7 Impacts in the Solway Tweed RBD (England only)

Table 4.24 sets out the expenditure in 2015 by English district-based anglers and visitors to the English part of the Solway Tweed RBD by type of fishing. Total trip-related expenditure is estimated at around £5.3 million.

- Coarse anglers' expenditure in 2015 is estimated at £1.7 million. Similar amounts were spent by district-based anglers and visitors (£0.8 million and £0.9 million respectively).
- Trout and grayling fishing was the most popular form of angling in the English part of the Solway Tweed RBD in 2015. Trout and grayling anglers spent around £2.5 million, with most of this being generated by visitors.
- Salmon and sea trout anglers spent £1.1 million in 2015. Most of the expenditure (£1 million) was made by visitors.

Table 4.24 Total trip-related expenditure in 2015 in the English part of the Solway Tweed RBD (£ thousands)

Type of angler	Type of fishing		
	Coarse	Trout and grayling	Salmon and sea trout
District-based	800	100	200
Visitor	900	2,400	1,000
Total	1,700	2,500	1,100

In terms of the economic activity supported by the above expenditure, Table 4.25 sets out the economic impacts in the English part of the Solway Tweed RBD.

- In 2015, angling contributed £5 million to the economy within the English part of the Solway Tweed RBD. The majority of the GVA (£4 million) was generated as a result of spending by visitors. District –based anglers contributed £1 million.
- Angling supported 78 jobs (FTEs), of which 15 were generated as a result of spending by district-based anglers and 63 were generated as a result of spending by visitors.

Table 4.25 Multiplier analysis: direct and indirect impacts from angling expenditure in 2015 for the English part of the Solway Tweed RBD

Type of impact	Type of angler		Total
	District-based	Visitor	
Contribution to economy (GVA) (£ thousands)	1,000	4,000	5,000
Contribution to employment (FTE jobs)	15	63	78

Table 4.26 compares the impacts relating to the number of angling trips by district-based anglers and visitors.

- Expenditure per trip by district-based anglers is estimated at £73, with their contribution to GVA being £66 per trip.
- Visitors spent £202 per trip and generated £172 in GVA per trip.

Table 4.26 Expenditure and GVA per trip by anglers' origin to the English part of the Solway Tweed RBD

	District-based	Visitor
Expenditure (£ per trip)	73	202

	District-based	Visitor
GVA (£ per trip)	66	172

4.3.8 Impacts in the South East RBD

Table 4.27 sets out the expenditure in 2015 by district-based anglers and visitors to the South East RBD by type of fishing. Total trip-related expenditure is estimated at around £80 million.

- Expenditure by coarse anglers in 2015 made up the majority of the total expenditure. Coarse anglers spent around £62 million, of which £44 million was spent by district-based anglers.
- Expenditure in 2015 related to trout and grayling fishing is estimated at £17.7 million and was mostly made by district-based anglers.
- Salmon and sea trout anglers spent just under £0.5 million in the South East RBD in 2015. Similar amounts were spent by district-based anglers and visitors (£0.21 million and £0.26 million respectively).

Table 4.27 Total trip-related expenditure in 2015 in the South East RBD (£ thousands)

Type of angler	Type of fishing		
	Coarse	Trout and grayling	Salmon and sea trout
District-based	44,000	11,100	210
Visitor	18,000	6,600	260
Total	62,000	17,700	470

In terms of the economic activity supported by the above expenditure, Table 4.28 sets out the economic impacts in the South East RBD.

- In 2015, angling contributed with almost £69 million to the economy within the RBD. The majority of the GVA (£47.6 million) was generated as a result of spending by district-based anglers. Visitors contributed £21.1 million.
- Angling supported more than 1,200 jobs (FTE), of which 854 were generated as a result of district-based anglers' spending and 394 were generated as a result of visitors' spending.

Table 4.28 Multiplier analysis: direct and indirect impacts from angling expenditure in 2015 for the South East RBD

Type of impact	Type of angler		Total
	District-based	Visitor	
Contribution to economy (GVA) (£ thousands)	47,600	21,100	68,700
Contribution to employment (FTE jobs)	854	394	1,247

Table 4.29 compares the impacts relating to the number of angling trips by district-based anglers and visitors.

- Expenditure per trip by district-based anglers is estimated at £55, with their contribution to GVA being £48 per trip.
- Visitors spent £133 per trip and generated £112 in GVA per trip.

Table 4.29 Expenditure and GVA per trip by anglers' origin to the South East RBD

	District-based	Visitor
Expenditure (£ per trip)	55	133
GVA (£ per trip)	48	112

4.3.9 Impacts in the South West RBD

Table 4.30 sets out the expenditure in 2015 by district-based anglers and visitors to the South West RBD by type of fishing. Total trip-related expenditure is estimated at around £72 million.

- Expenditure by coarse anglers in 2015 made up the majority of the total expenditure. Coarse anglers spent around £57 million; of this, similar amounts were spent by district-based anglers and visitors (£30 million and £27 million respectively).
- Expenditure in 2015 related to trout and grayling fishing is estimated at £13.8 million. Similar amounts were spent by district-based anglers and visitors (£7.1 million and £6.7 million respectively).
- Salmon and sea trout anglers spent around £1.3 million in the South West RBD in 2015. More than a half of this expenditure (£0.88 million) was made by district-based anglers.

Table 4.30 Total trip-related expenditure in 2015 in the South West RBD (£ thousands)

Type of angler	Type of fishing		
	Coarse	Trout and grayling	Salmon and sea trout
District-based	30,000	7,100	880
Visitor	27,000	6,700	450
Total	57,000	13,800	1,330

In terms of the economic activity supported by the above expenditure, Table 4.31 sets out the economic impacts in the South West RBD.

- In 2015, angling contributed more than £62 million to the economy within the RBD. Similar amounts of GVA were generated as a result of spending by district-based anglers and visitors (£32.8 million and £29.7 million respectively).
- Angling supported more than 1,160 jobs (FTEs), of which 594 were generated as a result of spending by district-based anglers and 571 were generated as a result of visitors' spending.

Table 4.31 Multiplier analysis: direct and indirect impacts from angling expenditure in 2015 for the South West RBD

Type of impact	Type of angler		Total
	District-based	Visitor	
Contribution to economy (GVA) (£ thousands)	32,800	29,700	62,500
Contribution to employment (FTE jobs)	594	571	1,165

Table 4.32 compares the impacts relating to the number of angling trips by district-based anglers and visitors.

- Expenditure per trip by district-based anglers is estimated at £50, with their contribution to GVA being £43 per trip.
- Visitors spent £152 per trip and generated £133 in GVA per trip.

Table 4.32 Expenditure and GVA per trip by anglers' origin to the South West RBD

	District-based	Visitor
Expenditure (£ per trip)	50	152
GVA (£ per trip)	43	133

4.3.10 Impacts in the Thames RBD

Table 4.33 sets out the expenditure in 2015 by district-based anglers and visitors to the Thames RBD by type of fishing. Total trip-related expenditure is estimated at around £223 million.

- Expenditure by coarse anglers in 2015 accounted for the majority of total expenditure. Coarse anglers spent around £215 million, of which £186 million was spent by district-based anglers.
- Expenditure related to trout and grayling fishing in 2015 is estimated at £18.6 million and was mostly made by district-based anglers.
- Expenditure related to salmon and sea trout fishing is negligible in the Thames RBD, with anglers spending around £0.04 million.

Table 4.33 Total trip-related expenditure in 2015 in the Thames RBD (£ thousands)

Type of angler	Type of fishing		
	Coarse	Trout and grayling	Salmon and sea trout
District-based	186,000	16,800	40
Visitor	29,000	1,800	0
Total	215,000	18,600	40

In terms of the economic activity supported by the above expenditure, Table 4.34 sets out the economic impacts in the Thames RBD.

- In 2015, angling contributed £197 million to the economy within the RBD. The majority of the GVA (£171 million) was generated as a result of spending by district-based anglers. Visitors contributed £26 million.
- Angling supported over 3,500 jobs (FTEs), of which 3,084 were generated as a result of spending by district-based anglers and 461 as a result of spending by visitors.

Table 4.34 Multiplier analysis: direct and indirect impacts from angling expenditure in 2015 for the Thames RBD

Type of impact	Type of angler		Total
	District-based	Visitor	
Contribution to economy (GVA) (£ thousands)	171,000	26,000	197,000
Contribution to employment (FTE jobs)	3,084	461	3,546

Table 4.35 compares the impacts relating to the number of angling trips by district-based and visitors.

- Expenditure per trip by district-based anglers is estimated at £100, with their contribution to GVA being £84 per trip.
- Visitors spent £62 per trip and generated £52 in GVA per trip.

Table 4.35 Expenditure and GVA per trip by anglers' origin to the Thames RBD

	District-based	Visitor
Expenditure (£ per trip)	100	92
GVA (£ per trip)	84	77

4.4 Total economic impacts

4.4.1 Trip-related expenditure by location (RBD)

Coarse angling generated the highest level of trip-related expenditure in most RBDs. The exceptions were the Solway Tweed and Northumbria RBDs, where the largest trip-related expenditure was made by anglers fishing for trout and grayling (Table 4.36).

Table 4.36 Total trip-related expenditure in 2015 by location of trip by type of fishing (£ thousands)

RBD	Type of fishing			Total by destination
	Coarse	Trout and grayling	Salmon and sea trout	
Anglian	165,000	13,000	10	178,000
Dee ¹	7,000	1,600	200	8,800
Humber	239,000	17,900	190	257,000
North West	88,000	8,900	1,190	98,100

RBD	Type of fishing			Total by destination
	Coarse	Trout and grayling	Salmon and sea trout	
Northumbria	8,000	8,600	2,790	19,390
Severn ¹	99,000	11,800	1,070	111,900
Solway Tweed ¹	1,700	2,500	1,100	5,300
South East	62,000	17,700	470	80,200
South West	57,000	13,800	1,330	72,100
Thames	215,000	18,600	40	234,000
Total by type of fishing	944,100	114,520	7,303	1,066,000

Notes: ¹ Only that part in England.

Figure 4.4 shows the trip-related expenditure by type of fishing in each RBD. The different magnitudes of expenditure across the RBDs in part reflect their varying sizes, with the Northumbria, Dee and Solway Tweed RBDs being considerably smaller than the others (particularly as the Dee and Solway Tweed, like the Severn, only include their English part).

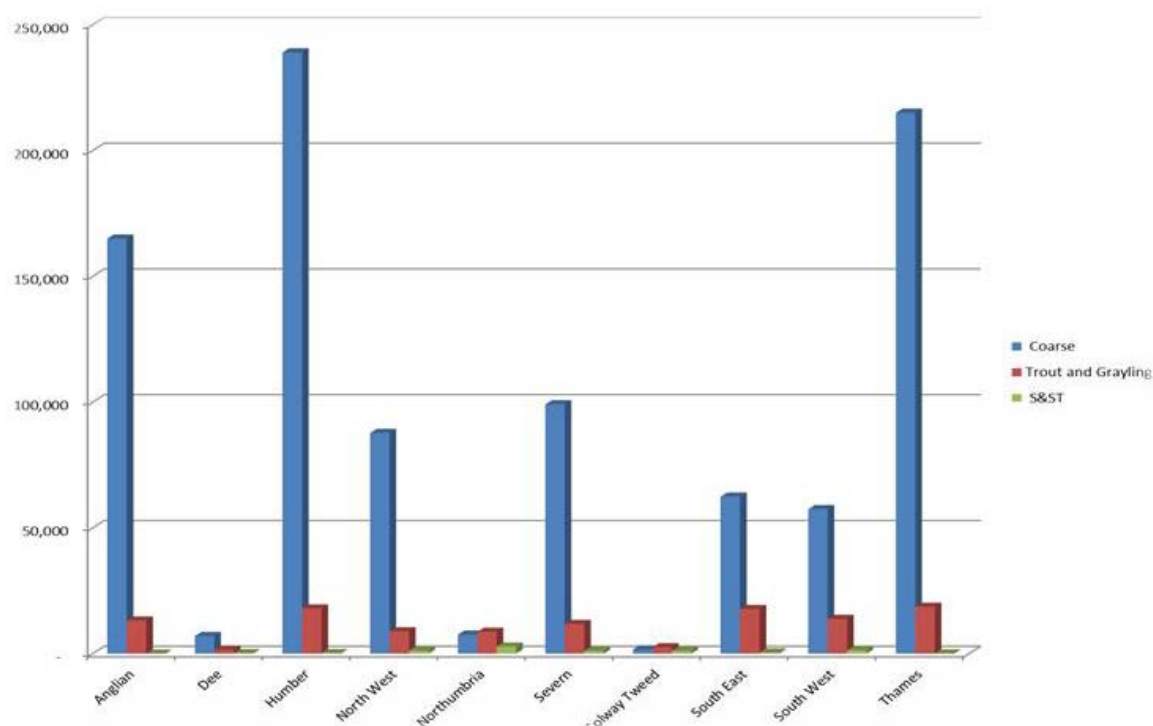


Figure 4.4 Trip-related expenditure (in £) in 2015 by type of fishing and RBD

District-based anglers represent the bulk of the expenditure. Expenditure by visitors from other parts of England varies significantly across the RBDs; it is

larger in the South West and Solway Tweed RBDs than that of district-based anglers (Table 4.37).

Table 4.37 **Total trip-related expenditure by type of angler in 2015 by destination of trip (£ thousands)**

RBD	Type of angler		Total
	District-based	Visitor	
Anglian	127,000	51,000	178,000
Dee ¹	5,000	4,000	8,800
Humber	207,000	51,000	257,000
North West	87,000	11,000	98,100
Northumbria	14,000	4,000	19,390
Severn ¹	64,000	48,000	111,900
Solway Tweed ¹	1,000	4,000	5,300
South East	55,000	25,000	80,200
South West	10,000	62,000	72,100
Thames	204,000	31,000	234,000
Total	774,000	291,000	1,066,000

Notes: ¹ Only that part in England

Figure 4.5 illustrates the variation across RBDs in the trip-related expenditure by district-based and visiting anglers in 2015.

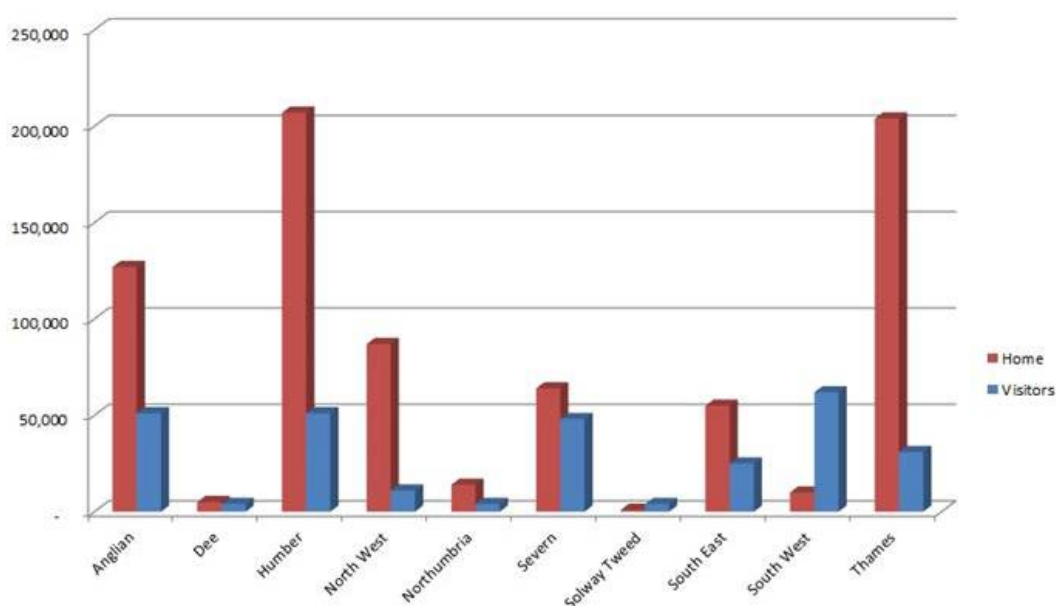


Figure 4.5 **Trip-related expenditure in 2015 by English district-based and visiting anglers to each RBD**

Table 4.38 presents data on the average expenditure of anglers by RBD distinguished between district-based and visiting anglers.

- Visitors to the Northumbria RBD had the highest expenditure per trip (£230), followed by visitors to the Solway Tweed RBD whose expenditure per trip is estimated at around £200.
- Visitors to the Thames RBD had the lowest expenditure per trip, estimated at around £60.

Table 4.38 Average expenditure (£) per trip by type of angler by location of trip

RBD	Type of angler		Total by destination
	District-based	Visitor	
Anglian	46	149	120
Dee ¹	61	65	69
Humber	70	105	85
North West	59	108	73
Northumbria	48	228	142
Severn ¹	41	171	135
Solway Tweed ¹	73	202	172
South East	55	133	112
South West	50	152	98
Thames	100	62	96

Notes: ¹ Only that part in England

4.4.2 Economic impacts

Table 4.39 presents a summary of the total estimated economic impacts from trip-related expenditure in 2015.

Based on the survey results, the economic activity supported by angling across England is estimated at:

- Contribution to economic activity (as GVA): £1.46 billion
- Jobs (FTE) supported by angling activity: 27,000

Trip-related expenditure is estimated to support about 16,000 FTE jobs. Non-trip related expenditure accounts for a further 10,700 FTE jobs.

Table 4.39 Summary of economic value: direct and indirect impacts from angling expenditure in 2015

	Trip-related	Non-trip related	Total
Expenditure (£ million)	1,070	681	1,750
GVA from anglers' expenditure (£ million)	882	583	1,460
Employment supported (FTE jobs)	16,100	10,700	26,900

The contribution to household incomes per £ of expenditure, in term of GVA, at RBD level is fairly similar across the RBDs (Table 4.40).

The sum of regional GVA and employment impacts in Table 4.40 may not add up to the national total in Table 4.39, not only due to rounding but also because of the method used to calculate the regional multipliers. The national multipliers were taken from the ONS database; unfortunately, multipliers were not available at RBD level to enable calculation of effects for individual RBDs. Instead, district-based multipliers were calculated by applying LQs to the ONS national multipliers. This approach to the derivation of regional multipliers is known to have a tendency to give overstated regional multipliers (see Section 1.3). To determine the potential magnitude of any such overestimation, the economic value of angling was also calculated by applying the national multipliers. Applying the ONS national multipliers to total expenditure (that is, the sum of district-based expenditures) provides an estimate that is only 1.3% lower than the estimate derived using the district-based multipliers. This is considered to reflect good coherence and be within reasonable levels of uncertainty. However, it is not possible to determine the magnitude by which each individual district-based figure is overestimated.

In addition, it should be noted that all estimates are based on Type I multipliers, which do not account for induced effects (see Section 1.3). Thus use of Type I multipliers is likely to give an underestimate of the total contribution of angling to the English economy and its regional economies.⁷ A comparison of Type I and Type II multipliers from the 2005 survey suggested that the ratio of induced effects plus direct and indirect effects (Type II) to direct plus indirect effects (Type I) was around 1.12 to 1.35 depending on the region. This suggests, overall, that the estimates produced here for the total value of angling are of the right order of magnitude.

⁷ An analysis of the relationship between Type II and Type I multipliers from the 2005 survey reveals that the former tend to be 11–35% bigger than Type I GVA multipliers, with variations according to region. For the West Midlands and the North East region, for instance, Type II multipliers are 11% larger and, for the South East region, the Type II GVA multiplier is 35% larger than the Type I multiplier.

Table 4.40 Multiplier analysis: direct and indirect impacts in 2015 from trip-related angling expenditure (£ thousands)

Type of impact	Location (RBD)									
	Anglian	Dee	Humber	North West	Northumbria	Severn	Solway Tweed	South East	South West	Thames
Expenditure	178,000	8,700	258,000	98,000	19,000	112,000	5,000	81,000	72,000	234,000
Impacts in GVA	150,000	7,130	215,000	80,900	15,200	93,100	4,300	68,600	62,300	197,000
Employment effects (FTE jobs)	2,800	100	3,900	1,500	300	1,700	100	1,200	1,200	3,500
GVA per £ spent	0.84	0.82	0.83	0.83	0.80	0.83	0.86	0.85	0.87	0.84
FTE jobs per £ spent	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.01

4.4.3 How do these results compare with other sources of information?

A recent survey for ATA assessed angling expenditure in the UK and its economic impacts. The expenditure excluded some expenditure types included here such as accommodation and travel expenditure. Total expenditure by freshwater anglers (broken down by angling type) on tackle, bait, specialist clothing was estimated at £450 million. The figures are comparable to those from this study considering that its estimate of £680.5 million includes items such as club membership, season tickets and syndicate fees, and excludes bait. The total number of people working in the tackle industry (manufacture, distribution, retail) was estimated in the ATA survey as 10,700 full-time and 8,185 part-time in the whole of the UK – comparable with the results of this study.

4.4.4 Potential remaining sources of bias

Although all the best efforts have been undertaken to avoid specific survey bias, such as setting quotas and weighting, there remains a few aspects affecting the interpretation of the results. These include the following:

In general, consumer surveys tend to overestimate expenditure. Most of the expenditure data were recorded as a range (for example, £0–10), yielding categorical data. Seven ranges were given in the survey questionnaire to ease completion and to restrict the bias or non-response to open questions. Variation between lower and upper bounds can vary from double to five-fold as the range increases. While this allows for extensive cross-tabulations to be performed, it is not ideal from the perspective of a quantitative analysis as it restricts the types of statistical inference methods that can be applied. The solution was to assign a midpoint of the expenditure bounds to all observations in that category. However, this method of imputation has knock-on effects for the estimates produced by reducing variation in expenditure.

Anglers demonstrate significant diversity in their behaviour. They range from anglers who make only the occasional trip to significant numbers who fish a hundred or more times per year. This is reflected in the difference between means and mode in the frequency of trips.

5 Comparison of the results by region with the 2005 survey

This section presents the findings of the 2015 survey by region in order to compare them with the results of the earlier survey conducted in 2005, which presented results by region. The comparison is made by type of water body, destination region and type of fishing.

5.1 Angling days by type of freshwater

The estimated number of days fished by licensed anglers appears to have decreased between 2005 and 2015 across all types of freshwater water body (Table 5.1). This is despite licence sales being similar in the 2 years surveyed.⁸ The total number of angling days in the previous survey was estimated at 28.5 million compared with the figure of 22.3 million estimated for this study.

Table 5.1 Total angling days by type of water body in 2005 and 2015 (millions)

	2005 survey (England only)	2015 survey (online responses)	Change between 2005 and 2015
Total number of angling days	28.5	22.27	↓ 22%
Angling days on stillwaters	16.62	15.49	↓ 7%
Angling days on rivers	9.43	5.40	↓ 43%
Angling days on canals	2.37	1.45	↓ 39%

By type of water body, the number of angling days on stillwaters remains well above the numbers for rivers and canals (Table 5.1). Angling on rivers has nearly halved since 2005. The reduction of angling activity in canals also appears to be significant.

Although the total numbers of angling days have declined, the results from the recent survey suggest that:

- there has been an increase in the number of days that anglers spent fishing for trout and grayling in rivers
- the decrease in the number of days spent coarse fishing on stillwaters was not very large, with the largest decline being on rivers (4 million fewer days spent)

⁸ They were about the same – 1.3 million across England and Wales. One reason why the number of days may be lower is the weather; it was wetter than average in summer 2015 while 2005 was drier.

- the decrease in the number of days angling in canals is estimated at around 800,000 days for 2015 (Table 5.2)

Table 5.2 Total angling days by type of fishing in 2005 and 2015 (millions)

Type of water body	Type of freshwater fishing					
	Coarse		Trout and grayling		Salmon and sea trout	
	2005 (England)	2015	2005 (England)	2015	2005 (England)	2015
Rivers	8.3	4.3	0.7	0.9	0.35	0.1
Stillwaters	14.6	14.0	2.0	1.5		
Canals	2.4	1.6				

5.2 Angling days by destination region

Table 5.3 presents a comparison of the number of trips by region of destination. The comparisons should be treated with caution as the methods for allocating trips to regions differed between the 2 surveys.

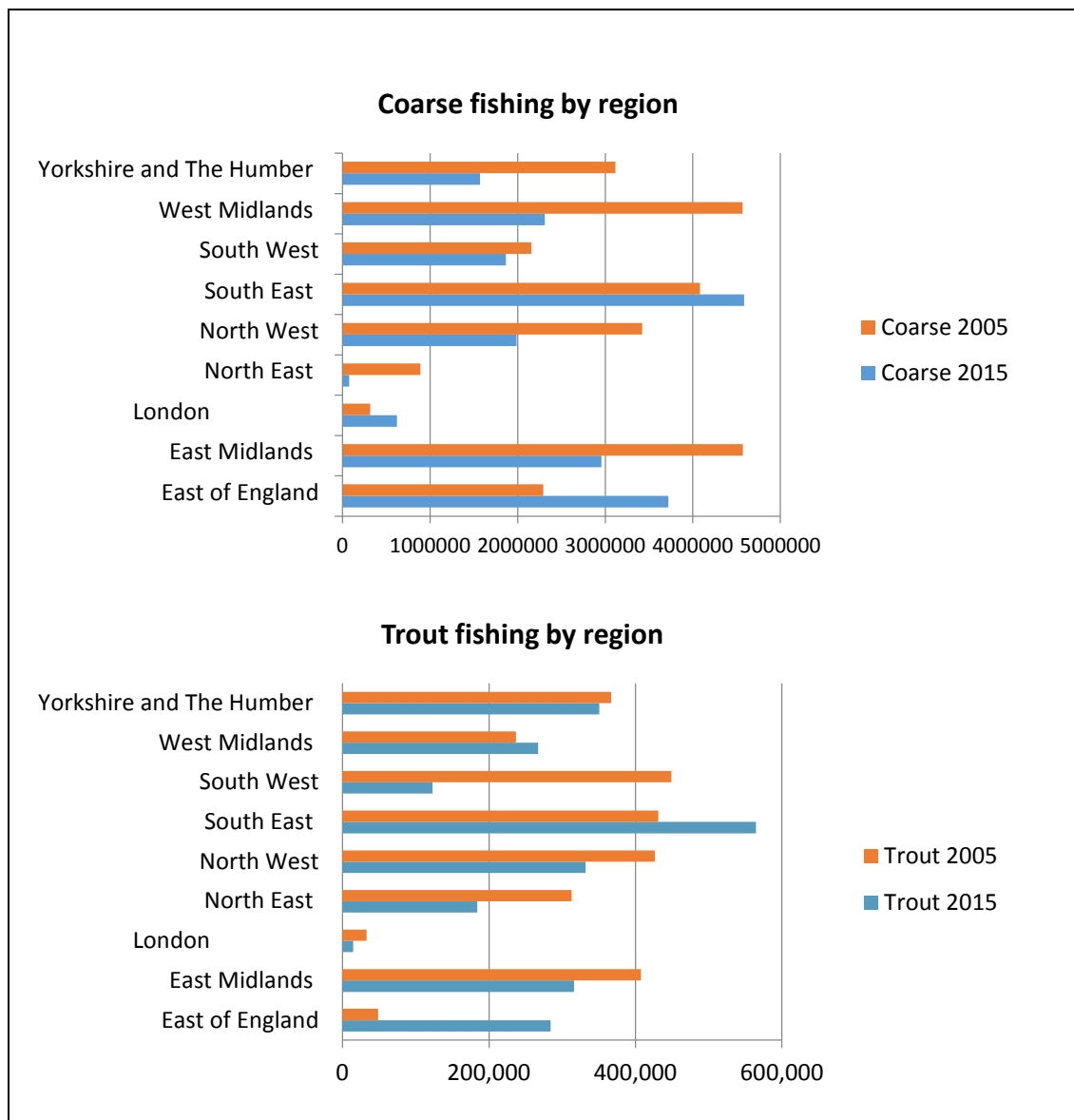
The only regions where estimates of angling activity were greater for the 2015 survey are London, the East of England and the South East. The greatest proportional reduction in trips found from the 2015 survey was in the North East; however, it is known that there were problems with the allocation of trips to this region in the 2005 survey. It is believed that some of the trips allocated to the North East region should have been allocated to Yorkshire and Humberside, but the extent of misallocation could not be quantified.

Table 5.3 Total angling days by destination in 2005 and 2015 (millions)

Region	Total 2005 survey (English residents only)	Total 2015 survey	Change between 2005 and 2015
East of England	2.3	4.0	71%
East Midlands	5.0	3.3	–34%
London	0.4	0.6	50%
North East	1.3	0.3	–76%
North West	4.0	2.4	–40%
South East	4.5	5.2	14%
South West	2.6	2.0	–24%
West Midlands	4.8	2.6	–46%

Yorkshire and the Humber	3.5	1.9	–45%
Total by destination	28.4	22.3	

Figure 5.1 and Table 5.4 present a comparison of the number of angling days in 2005 and 2015 for each region by type of fishing.



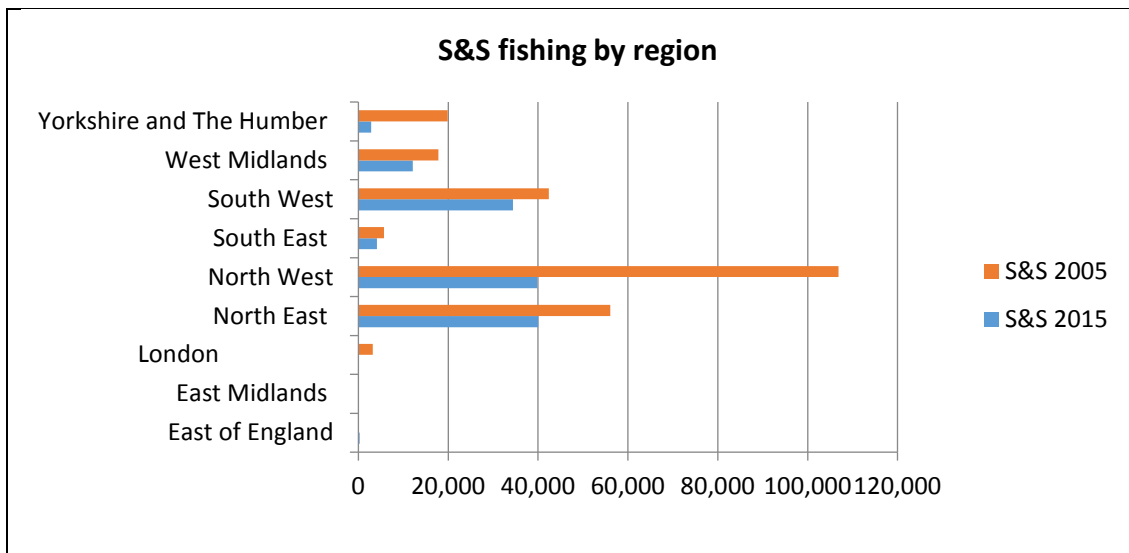


Figure 5.1 Comparison of number of angling days between 2005 and 2015 surveys by type of fishing and destination region

Compared with the 2005 results, the 2015 survey found:

- a significant reduction in the number of angling days fishing for salmon and sea trout in the North West region and Yorkshire and the Humber, with smaller reductions in the other regions for which comparative data are available
- increases in the number of days fishing for trout in the East of England and the South East regions and, to a lesser extent, the West Midlands
- increases in coarse angling activity in the East of England, London and the South East regions, with all of the other regions showing a decrease
- coarse angling to be still the most widely practised type of angling in all regions of England, apart from the North East region where most fishing was for trout and grayling in both 2005 and 2015

Table 5.4 Total angling days by destination region and type of fishing in 2005 and 2015

Region	Coarse		Trout		S&S	
	2005	2015	2005	2015	2005	2015
East of England	2,291,000	3,722,000	49,000	284,000		
East Midlands	4,571,000	2,958,000	407,000	316,000		
London	316,000	623,000	33,000	15,000	3,000	
North East	889,000	75,000	313,000	184,000	56,000	40,000
North West	3,422,000	1,987,000	427,000	332,000	107,000	40,000
South East	4,084,000	4,587,000	431,000	565,000	6,000	4,000

Region	Coarse		Trout		S&S	
	2005	2015	2005	2015	2005	2015
South West	2,157,000	1,867,000	449,000	123,000	42,000	34,000
West Midlands	4,569,000	2,312,000	237,000	267,000	18,000	12,000
Yorkshire and the Humber	3,115,000	1,571,000	367,000	350,000	20,000	3,000
Total	25,414,000	19,700,000	2,712,000	2,440,000	252,000	134,000

5.3 Expenditure by region of destination

To aid comparison, the expenditure results from the 2005 survey were updated to 2015 values using the Consumer Price Index.

Expenditure as estimated for 2015 fell compared with that estimated for 2005 across most regions apart from London, the East of England and the South East, where expenditure had increased (Table 5.5).

Table 5.5 Total trip-related expenditure by location of trip by type of angling (£ thousands)

Region	Type of fishing			Total	
	Coarse	Trout and grayling	Salmon and sea trout	2005 ¹	2015
East of England	152,000	11,000	50	83,000	163,000
East Midlands	133,000	11,000	10	166,000	144,000
London	21,000	1,000	0	9,000	21,000
North East	6,000	9,000	2,790	44,000	18,000
North West	95,000	11,000	2,290	139,000	108,000
South East	233,000	35,000	410	186,000	267,000
South West	82,000	17,000	1,440	103,000	101,000
West Midlands	152,000	8,000	700	196,000	161,000
Yorkshire and Humber	72,000	11,000	200	120,000	83,000
Total by type	945,000	113,000	7,900	1,046,000	1,066,000

Notes: ¹ Updated by inflation: £1 (2005) = £1.36 (2015)
(source: <http://inflation.stephenmorley.org>)

5.4 Non-trip related expenditure

For non-trip related expenditure, the 2015 figures represent an increase on the figures from the 2005 survey (Table 5.6). The most significant increase in expenditure is on tackle and equipment, with specialist clothing and spend on stationary products being of a comparable magnitude.⁹ Note that the 2005 survey did not include expenditure on annual membership fees

⁹ The 2005 survey reported £150 million spent on equipment, £30 million spent on magazines and books, and £160 million spent on clothing and footwear. Figures have been updated by inflation: £1 (2005) = £1.36 (2015).

Table 5.6 Comparison of total non-trip related expenditure between surveys (£ thousands)

Type of expenditure	2005	2015
Specialist clothing	217,800	163,000
Tackle and equipment	204,000	382,000
Angling permits (including club membership, season tickets and syndicate fees)	n/a	110,000
Books, magazines, DVDs or other media related specifically to angling	40,400	25,000
Total	462,200	680,000

5.5 Findings by region

Overall the results of the current and previous surveys are of comparable magnitude, although there are some different patterns according to the type of water body and fishing by regions. The main conclusions are as follows.

- For coarse fishing, there is a reduction in the number of angling days; this is the largest for rivers. The decrease is more significant for the West and the East Midlands regions, and is in contrast with an increase in the East of England and the South East regions.
- For trout, the reduction in the number of angling days is not as large as for coarse angling, with 3 regions seeing an increase.
- Salmon and sea trout estimates of days fished are lower for 2015, most notably in the North West region.

Although the total number of angling days has fallen (from 28.4 million in 2005 to 22.3 million in 2015), trip-related expenditure in aggregate increased slightly (by £200 million) in the same period. Despite reductions in aggregate expenditure by region (see Table 5.5), the expenditure per angling day has increased across all regions (Table 5.7). On average, anglers spent £12 more per trip in 2015 compared with the 2005 survey. However, how much this finding reflects methodological differences between the 2 surveys is unclear.

Table 5.7 Expenditure per angling day by location of trip in 2005 and 2015 (£)

Region	2005 ¹	2015
East of England	35.5	41
East Midlands	34	44
London	26	33
North East	35	59
North West	35	46

Region	2005¹	2015
South East	41	52
South West	38	50
West Midlands	40	62
Yorkshire and the Humber	36	43
£ per day across all regions	36	48

Notes: ¹ Updated by inflation. £1 (2005) = £1.36 (2015)
 (source: <http://inflation.stephenmorley.org>)

References

- ARMSTRONG, M., BROWN, A., HARGREAVES, J., HYDER, K., PILGIRM-MORRISON, S., MUNDAY, M., PROCTER, S., ROBERTS, A. AND WILLIAMSON, K., 2013. *Sea Angling 2012 – a survey of recreational sea angling activity and economic value in England*. London: Department for Environment, Food and Rural Affairs.
- BONFIGLIO, A. AND CHELLI, F., 2008. Assessing the behaviour of non-survey methods for constructing regional input–output tables through Monte Carlo simulation. *Economic Systems Research*, 20 (3), 243-258.
- BESS, R. AND AMBARGIS, Z.O., 2011. *Input-output models for impact analysis: suggestions for practitioners using RIMS II multipliers*. Presented at 50th Southern Regional Science Association Conference (New Orleans, 2011). BEA Working Papers 0081. Washington DC: US Bureau of Economic Analysis.
- BROWN, A., 2014. *Realising the Eden's angling potential. Stage two: angler survey*. Final report. Penrith: Eden Rivers Trust. Available from: <http://www.edenfishing.co.uk/documents.html> [Accessed 22 May 2018].
- CEFAS, ENVIRONMENT AGENCY AND NATURAL RESOURCES WALES, 2016. *Salmon stocks and fisheries in England and Wales in 2015. Preliminary assessment prepared for ICES, March 2016*. Lowestoft: Centre for Environment, Fisheries and Aquaculture Science.
- COMLEY, V. AND MACKINTOSH, C., 2014. *The economic impact of outdoor recreation in the UK: the evidence*. Reconomics project. London: Sport and Recreation Alliance, Available from: <http://www.sportandrecreation.org.uk/policy/research/reconomics> [Accessed 22 May 2018].
- D'HERNONCOURT, J., CORDIER, M. AND HADLEY, D., 2011. *Input–output multipliers specification sheets and supporting material*. Spicosa Project Report. Brussels: Université Libre de Bruxelles – CEESE; Norwich: University of East Anglia CSERGE.
- ENVIRONMENT AGENCY, 2001. Survey of rod licence holders. R&D Project W2-057. Bristol: Environment Agency.
- ENVIRONMENT AGENCY, 2005. *Public attitudes to angling 2005*. Bristol: Environment Agency.
- ENVIRONMENT AGENCY, 2007. *Economic evaluation of inland fisheries. The economic impact of freshwater angling in England & Wales*. Science Report Sc050026/SR2. Bristol: Environment Agency.
- ENVIRONMENT AGENCY, 2010. *Public attitudes to angling 2010*. Bristol: Environment Agency.
- ENVIRONMENT AGENCY, 2015. *River basin district map* [online]. Bristol: Environment Agency. Available from: <https://www.gov.uk/government/publications/river-basin-district-map> [Accessed 22 May 2018].

EUROSTAT, 2016. *NUTS background* [online]. Luxembourg: Eurostat. Available from: <http://ec.europa.eu/eurostat/web/nuts/background> [Accessed 22 May 2018].

FLEGG, A.T. AND TOHMO, T., 2013. *Estimating regional input coefficients and multipliers: the use of the FLQ is not a gamble*. Economics Working Paper Series 1302, Bristol: University of the West of England. Available from: <http://www2.uwe.ac.uk/faculties/BBS/BUS/Research/Economics13/1302.pdf> [Accessed 22 May 2018].

GLASGOW CALEDONIAN, GRID ECONOMICS AND COGENT INTERNATIONAL, 2009. *Technical report. Economic impact of recreational sea angling in Scotland*. Edinburgh: Scottish Government.

LEHTONEN, O. AND TYKKYLÄINEN, M., 2014. Estimating regional input coefficients and multipliers: is the choice of a non-survey technique a gamble? *Regional Studies*, 48 (2), 382-399.

NATIONAL PARKS ENGLAND, 2015. *So much more than the view. England's Areas of Outstanding Natural Beauty and National Parks*. Fairford, Gloucestershire: National Association for AONBs; London: National Parks England.

SOUTH WEST RESEARCH COMPANY, 2014. *South West Coast Path monitoring & evaluation framework. Year 2 (2012) key findings summary*. Ivybridge, Plymouth: South West Coast Path Association. Available from: <https://www.southwestcoastpath.org.uk/research/> [Accessed 22 May 2018].

SQW LTD, 2006. *Assessing the value and realising the potential of sustainable freshwater fisheries in Orkney*. Scottish Natural Heritage Commissioned Report No. 156 (Report No. F04LA09). Kirkwall, Orkney: Scottish Natural Heritage.

WRIGHT, J., 2007. *Understanding location quotient*. EMSI Resource Library. Moscow, ID: EMSI. Available from: http://www.economicmodeling.com/wp-content/uploads/2007/10/emsi_understandinglq.pdf [Accessed 22 May 2018].

List of abbreviations

ATA	Angling Trades Association
CATI	computer-assisted telephone interview
FTE	full-time equivalent
GVA	gross value added
LQ	location quotient
NUTS	Nomenclature of Territorial Units for Statistics
ONS	Office for National Statistics
RBD	river basin district
RIMS	Regional Input–Output Modeling System
SLQ	simple location quotient
WTP	willingness to pay

Glossary

Angling day	A day on which an angler went fishing. Part days are considered to represent an angling day.
Angling effort	A measure of the amount of angling. Frequently some surrogate is used relating to a given combination of inputs into the fishing activity, such as the number of hours or days spent fishing. In the context of this study, it is understood as angling days.
Angling trip	A journey in which a person goes somewhere for the purposes of angling and comes back again.
Angling	Term used for fishing. It is the sport of catching fish (freshwater or saltwater) typically with rod, line and hook. This study is concerned with freshwater fishing.
Bait	Anything used on the hook to entice and capture the fish.
Bivvy	A dome-shaped tent that has a large opening at the front so that you can fish from under it. Mainly used by carp or specimen anglers.
Coarse angler	A licence holder who had fished for coarse fish in 2015.
Coarse fish	For the purposes of this report, any freshwater fish other than salmon, trout and grayling.
Coarse fishing	Coarse fishing is angling for coarse fish. It encompasses many different techniques and methods. Major techniques classified under coarse fishing include legering, float fishing, pole fishing, whip fishing, lure fishing and feeder fishing.
Day ticket	Payment by anglers for permission to fish a fishery for a day.
Expenditure	<p>This refers to the moneys spent by anglers in conducting this recreational activity. For this study, it is divided into:</p> <ul style="list-style-type: none">• Non-trip related expenditure. This is expenditure not related to specific fishing trips. It includes items such as clothing, tackle and equipment, club membership, season tickets and syndicate fees (grouped under the heading of angling permits) and expenditure on media products.• Trip-related expenditure. This is expenditure directly linked to the angling trip such as accommodation, subsistence, travel-related costs and day tickets.
Fishing day	As 'angling day' above. A fishing day for a particular type of fish is one where the angler had fished for that type of fish, though not necessarily exclusively. So a 'carp fishing

	day' is one where the angler fished for carp though the angler may also have fished for other species.
Fly fishing	Fly fishing is an angling method in which an artificial 'fly' is used to catch fish. The fly is cast using a fly rod, reel and specialised weighted line.
Freshwater fish	A term used for fish living in waters such as rivers and lakes as opposed to saltwater fish that live in the sea.
Freshwater	Freshwater is a term used for waters such as rivers and lakes as opposed to saltwater (the sea).
Full-time equivalent (FTE)	Employee in full-time employment. This is normally defined based on the number of hours worked in a week. In the UK, a FTE job equates to 37.5 hours a week.
Gross value added (GVA)	The measure of the value of goods and services produced in an area, industry or sector of an economy. In national accounts, GVA is output minus intermediate consumption. In this study, it indicates the contribution made by angling-related expenditure to household incomes.
Licence	Anyone aged 12 years or over who fishes for salmon, trout, freshwater fish or eels in England must have an Environment Agency rod fishing licence as well as a permit from the fishery owner. Different categories of licence are available covering different types of fish and time periods, with concessionary rates on annual licences available for junior, senior or disabled anglers. Junior licences have been free since 2017.
Location quotient (LQ)	A way of quantifying how concentrated a particular industry, cluster, occupation or demographic group is in a region compared with the nation (Wright 2007).
Match fishing	A competitive form of fishing, which typically involves people drawing out a random peg (a place to fish), and then trying to catch as many fish as possible within the allotted time. Usually the winner will be the one with the greatest weight of fish caught.
Median	The median is the 'middle' value in the list of numbers. It is a measure of central tendency, showing that 50% of the population is above that value and 50% is below it.
Mode	The mode is the value that appears most often in a set of data. The mode of a discrete probability distribution is the value x at which its probability mass function takes its maximum value. In other words, it is the value that is most likely to be sampled.

Multiplier effects	<p>These include the direct and indirect effects on the economy dependent on anglers' expenditure. For instance, expenditure on accommodation has an impact on the revenues of hotels and their employees. These multiplier effects include the following types:</p> <ul style="list-style-type: none"> • Direct: This is the immediate effect caused directly by the change in final demand. 'The direct income effect of angler accommodation expenditure is the wages and profits paid by hotels to households in the region' (Environment Agency 2007, p. 3). • Indirect: This is the subsequent effect caused by the consequent changes in intermediate demand. 'For example, a hotel may purchase butcher supplies from within the region. This supports the wages of the local butcher's staff, the butcher's own income and perhaps the rent charged by the shop owner' (Environment Agency 2007, p. 3). • Induced: This is the effect attributable to the ensuing change in compensation of employees and other incomes, which may cause further spending and hence further changes in final demand. For example, the butcher in the example above may spend some of the extra income he receives from the hotel on local goods or services unrelated to his business.
NUTS	Statistical nomenclature for units of territory (NUT2 is equivalent to English regions) (Eurostat 2016).
RIMS II	This is an input–output model developed by the US Bureau of Economic Analysis in the mid-1970s. It incorporates linkages among industries in a regional economy and is best suited for analysing the impacts of small changes in a regional economy.
River basin district (RBD)	A RBD covers an entire river system including river, lake, groundwater, estuarine and coastal water bodies. RBDs are the main units for the management of river basins and have been delineated by EU Member States under Article 3 of the Water Framework Directive. There are 10 RBDs partly or wholly in England (Environment Agency 2015). Member States are also obliged to deliver plans to meet the objectives within the RBD. These are the so-called river basin management plans.
Stata	A general purpose statistical software package created in 1985 by StataCorp for statistical analysis. Most of its users work in research, especially in the fields of economics, sociology, political science, biomedicine and epidemiology.

Stillwaters

These are water bodies that usually retain water throughout the year. This includes both manmade and natural water bodies such as lakes, reservoirs, gravel pits, meres, broads and ponds.

Tackle

A term used to refer to any fishing equipment.

Appendix A: Survey



2972 Valuation of Freshwater Angling in England

SYSTEM INFORMATION:

DELETE IF ONLINE: Interviewer number

DELETE IF ONLINE: Interviewer name

Date:

Time interview started:

Introduction

Thank you for taking part in this survey of the economic impact of freshwater angling in England.

The survey is commissioned by the Environment Agency to provide a better understanding of angling's economic significance. The results will help ensure that our fisheries are appropriately managed and protected. We can only do this with help from licensed anglers, like you. We need to know about the types of freshwater fishing you did in 2015, where you fished and how much you spent on angling.

This survey is only about fishing in freshwater, that is, a pond, lake, reservoir, river, stream or canal.

This survey will take about 15 minutes if you complete it in one go. You can always return to it at any time of your convenience by re-clicking on the link
.....

The survey is divided into different parts as follows:

Part 1 asks you about your fishing in England in 2015.

Part 2 asks you about expenditure that is not related to any specific trip.

Part 3 asks some basic information about you (for use in the analysis only).

Part 4 asks you about specific fisheries that you visited in 2015.

Part 5 asks you about expenditure to those fisheries you visited in 2015.

Thank you for your help. If you have any queries about the survey please telephone the Environment Agency's National Customer Contact Centre on 03708 506 506 as shown on your rod licence.

PART 1: Your freshwater fishing in England in 2015

Q1. What type of rod licence did you hold in 2015? If you held more than one, please choose the most expensive type you held between April and December 2015 (please select one).

Licence type	Coarse fish and non-migratory trout	Salmon and sea trout
Full		
Senior (over 65) concession		
Disabled concession		
Junior (12 to 16) concession		
8-day licence		
1-day licence		

Q2. Did you fish for FRESHWATER species in England in 2015?

Yes

No **GO TO PART 2 (Q7)**

Don't know

Q3. IF Q2=2 (NO) GO TO PART 2 (Q7), OTHERS ASK: What did you fish for in England in 2015? Select all that apply

I fished for coarse fish or eels.

I fished for rainbow or brown trout or grayling.

I fished for salmon or sea trout.

Other, please specify **GO TO PART 2 (Q7)**

Q4. IF Q3=1 ASK, OTHERS GO TO Q5: How many days, or part days, did you fish for coarse fish or eels in 2015 on:

Rivers or streams: **DP ADD TEXT BOX**

Lakes/reservoirs/ponds: **DP ADD TEXT BOX**

Canals: **DP ADD TEXT BOX**

Q4.2 If you targeted particular species of coarse fish on some of your trips in 2015, on how many days were you trying to catch each species? You could target more than one species on the same day.

No, I was fishing for anything		
Yes, I targeted specific species		No. of days on which I was specifically fishing for each species
	Carp	
	Roach	
	Tench	
	Bream	
	Chub	
	Barbel	
	Perch	
	Pike	
	Crucian carp	
	Dace	
	Rudd	
	Catfish	
	Zander	
	Eel	
	Other (e.g. bleak, gudgeon)	

Q4.3 How many coarse fishing matches did you compete in?

None

Number of matches fished:

IF Q3≠2 or 3 GO TO PART 2 (Q7), OTHERS GO TO Q5

Q5. IF Q3=2 ASK, OTHERS GO TO Q6: How many days, or part days, did you fish for brown trout, rainbow trout or grayling in 2015 on:

Rivers: **DP ADD TEXT BOX**

Lakes/reservoirs/ponds: **DP ADD TEXT BOX**

Q5.2 If you targeted particular species on some of your trips in 2015, on how many days were you trying to catch each species? You could target more than one species on the same day.

No, I was fishing for anything		
Yes, I targeted specific species		No. of days on which I was specifically fishing for each species
	Stocked rainbow trout	
	Stocked brown trout	
	Other types of stocked trout	
	Wild trout	
	Grayling	

Q5.3 How many fishing competitions did you compete in?

None

Number of competitions: **DP ADD TEXT BOX**

IF Q3≠3 GO TO PART 2 (Q7), OTHERS GO TO Q6

Q6. IF Q3=3 ASK, OTHERS GO TO Q7: On how many days did you fish for salmon or sea trout in 2015?

Q6.2 If you targeted particular species on some of your trips in 2015, on how many days were you trying to catch each species? You could target more than one species on the same day.

No, I was fishing for anything		
Yes, I targeted specific species		No. of days on which I was specifically fishing for each species
	Salmon	
	Sea trout	

PART 2: Annual expenditure on tackle, clothing, books, magazines and club membership

Q7. ASK ALL: Please indicate your expenditure during 2015 on SPECIALIST CLOTHING FOR FRESHWATER ANGLING?

No spend

£1–£10

£11–£50

£51–£100

£101–£250

£251–£500

£501–1,000

£1,000–£5,000

Prefer not to say

Q8. Please indicate your expenditure during 2015 on TACKLE AND EQUIPMENT for each type of freshwater fishing (rods, poles, reels, floats, lures, hooks, weights, lines, flies, fly-tying equipment, nets and other fishing equipment, such as holdalls, boxes, umbrella, bivvy, seats, float tube, boats and engines). Please DO NOT INCLUDE non-equipment items such as bait, accommodation, meals, transport, boat hire, day permits or licences.

	No spend	£1–£10	£11–£50	£51–£100	£101–£250	£251–£500	£501–£1,000	£1,000 – £5,000	£5,000 – £10,000	More than £10,000 (please enter approximate amount)	Prefer not to say
Coarse fish, eels											
Brown trout, rainbow trout, grayling											
Salmon and sea trout											

Q9. Please indicate your expenditure during 2015 on permits to fish for all types of freshwater fishing in England, including club membership, season tickets and syndicate fees. Please DO NOT INCLUDE YOUR ENVIRONMENT AGENCY ROD LICENCE and/or DAY TICKETS in this.

	No spend	£1–£10	£11–£50	£51–£100	£101–£250	£251–£500	£501–£1,000	£1,000–£5,000	More than £5,000 (please enter)	Prefer not to say

									approximate amount) ADD TEXT BOX	
Club membership/ season tickets/ syndicate fees										

Q10. Please indicate your expenditure during 2015 on books, magazines, DVDs or other media related specifically to angling. Please remember to include any items you may have bought by mail order or online.

No spend

£1–£10

£11–£50

£51–£100

£101–£250

£251–£500

£501–£1,000

More than £1,000 (please enter approximate amount) **DP ADD TEXT BOX**

Prefer not to say

PART 3: About You

We need to ask a few questions about you to understand how different types of people choose to fish in different parts of the country.

Q11. Where you live. Please enter the first half of your postcode e.g. HP14 or click on the map to show your location

DP – ADD MAP

Q12. Your age (please select)

17–24

25–34

35–44

45–54

55–64

65–74

75 or over

Prefer not to say

DP - IF Q2=2 (NO) OR Q3=4 GO TO Q22

PART 4: Where you fished in England in 2015

Q13. IF Q3=1 ASK, OTHERS GO TO Q14: We need to know where you fished for coarse fish or eels. **There is one map and a couple of questions for each fishery you visited last year.** Please click [here](#) to go to the first map.

ON FIRST MAP: Place a marker on the map to mark the fishery.

DP – SUB-QUESTIONS FOR THIS FISHERY TO APPEAR ALONGSIDE THE MAP:

Q14.2 What type of water was this (please select)?

River/stream

Lake, pond or reservoir

Canal

Q14.3 What do you call this fishery? OPEN TEXT BOX

Q14.4 How many days, or part days, did you fish here for coarse fish or eels in 2015?

DP ADD TEXT BOX – UPPER LIMIT OF 99

Q14.5 Did you fish for coarse fish or eels at any other fishery in England in 2015?

Yes **GO TO NEW MAP AND REPEAT QUESTIONS 14.1-14.4**

No

Q14. IF Q3=2 ASK, OTHERS GO TO 0: Where did you fish for brown trout, rainbow trout or grayling in 2015? We need to know where you fished for trout or grayling and how far you travelled from home. **There is one map and a couple of questions for each fishery you visited last year.** Please click [here](#) to go to the map.

ON FIRST MAP: Place a marker on the map to mark the fishery.

DP – SUB-QUESTIONS FOR THIS FISHERY TO APPEAR ALONGSIDE THE MAP:

Q15.2 What type of water was this (please select)?

River/ stream

Lake, pond or reservoir

Q15.3 What do you call this fishery?

Q15.4 How many days, or part days, did you fish here for trout or grayling in 2015?

DP ADD TEXT BOX – UPPER LIMIT OF 99

Q15.5 Did you fish for trout or grayling at any other fishery in England in 2015?

Yes **GO TO NEW MAP AND REPEAT QUESTIONS 15.1-15.4**

No

Q15. IF Q3=3 ASK, OTHERS GO TO 0: Where did you fish for salmon or sea trout in 2015? We need to know where you fished for salmon or sea trout and how far you travelled from home. **There is one map and a couple of questions for each fishery you visited last year.** Please click [here](#) to go to the first map.

ON FIRST MAP: Place a marker on the map to mark the fishery.

DP – SUB-QUESTIONS FOR THIS FISHERY TO APPEAR ALONGSIDE THE MAP:

Q16.2 What do you call this fishery?

Q16.3 How many days, or part days, did you fish here for salmon or sea trout in 2015?

DP ADD TEXT BOX – MAX UPPER LIMIT OF 99

Q16.4 Did you fish for salmon or sea trout at any other fishery in England in 2015?

Yes **GO TO NEW MAP AND REPEAT QUESTIONS 16.1-16.3**

No

PART 5: Your expenditure on trips to particular fisheries

This part is about your personal spending on angling trips to individual fisheries that you visited in 2015.

Q16. IF Q3=3 ASK, OTHERS GO TO 0: You said that you fished for salmon or sea trout. (DP – INSERT THE NAME OF THE FISHERY THEY GAVE IN RESPONSE TO Q16.2 WHERE THEY FISHED THE MOST DAYS.) On a typical trip from home to this fishery, how many days or part days, did you fish?

One, it was usually a day trip

I usually stayed for ____days **DP ADD TEXT BOX**

Q17.2 Please indicate the amount you spent ON A TYPICAL TRIP on the following items (including the amount you spent on other people): (please select)

	No spend	<£ 1	£1– £2.50	£2.5 –£5	£5– £10	£10 – £25	£25 – £50	£50 – £75	£75 – £100	£100 – £250	More than £250	Prefer not to say
Accommodation including camping												
Meals and drinks served in pub, café etc.												
Food and drink from shop												
Public transport and vehicle hire												
Petrol and diesel												
Hire of tackle and boats												
Fishing guide or ghillie												

Bait												
Day tickets												

Q17. IF Q16.4=1 ASK, OTHERS GO TO 0: You also said that you fished for salmon or sea trout at **(DP-INSERT THE NAME OF THE FISHERY THEY GAVE IN RESPONSE TO Q16.2 THAT WAS FURTHEST AWAY FROM HOME. IF THIS IS THE SAME FISHERY AS FOR Q17, THEN SELECT THE SECOND FURTHEST.)** On a typical trip from home to this fishery, how many days or part days, did you fish?

One, it was usually a day trip

I usually stayed for ____days **DP ADD TEXT BOX**

Q18.2 Please indicate the amount you spent **ON A TYPICAL TRIP** on the following items (including the amount you spent on other people): (please select)

	No spend	<£ 1	£1– £2.50	£2.5 –£5	£5– £10	£10 – £25	£25 – £50	£50 – £75	£75 – £100	£100 – £250	More than £250	Prefe r not to say
Accommodation (including camping)												
Meals and drinks served in pub, café etc.												
Food and drink from shop												
Public transport and vehicle hire												
Petrol and diesel												
Hire of tackle and boats												
Fishing guide or ghillie												
Bait												
Day tickets												

Q18. IF Q3=1 ASK, OTHERS GO TO 0: You said that you fished for coarse fish or eels at **DP-INSERT THE NAME OF THE FISHERY THEY GAVE IN RESPONSE TO Q14.2 WHERE THEY FISHED THE MOST DAYS.**
On a typical trip from home to this fishery, how many days or part days, did you fish?

One, it was usually a day trip

I usually stayed for ____ days **DP ADD TEXT BOX**

Q19.2 Please indicate the amount you spent **ON A TYPICAL TRIP** on the following items (including the amount you spent on other people): (please select)

	No spend	<£ 1	£1– £2.50	£2. 5– £5	£5– £10	£10 – £25	£2 5– £5 0	£50 – £75	£75 – £10 0	£10 0– £25 0	More than £250	Prefer not to say
Accommodation including camping												
Meals and drinks served in pub, café etc.												
Food and drink from shop												
Public transport and vehicle hire												
Petrol and diesel												
Hire of tackle and boats												
Fishing guide												
Bait and groundbait												
Day tickets												
Match fees												

Q19. IF Q14.5=1 ASK, OTHERS GO TO 0: You also said that you fished for coarse fish or eels at **(DP-INSERT THE NAME OF THE FISHERY THEY GAVE IN RESPONSE TO Q14.2 THAT WAS FURTHEST AWAY FROM HOME. IF THIS IS THE SAME FISHERY AS FOR 0, THEN SELECT THE SECOND FURTHEST.)** On a typical trip from home to this fishery, how many days or part days, did you fish?

One, it was usually a day trip

I usually stayed for ____days **DP ADD TEXT BOX**

Q20.2 Please indicate the amount you spent **ON A TYPICAL TRIP** on the following items (including the amount you spent on other people): (please select)

	No spend	<£1	£1– £2.50	£2.5– £5	£5– £10	£10– £25	£25– £50	£50– £75	£75– £100	£100– £250	More than £250	Prefer not to say
Accommodation including camping												
Meals and drinks served in pub, café etc.												
Food and drink from shop												
Public transport and vehicle hire												
Petrol and diesel												
Hire of tackle and boats												
Fishing guide												
Bait and groundbait												
Day tickets												
Match fees												

Q20. IF Q3=2 ASK, OTHERS GO TO Q21: You said that you fished for trout or grayling at **(DP-INSERT THE NAME OF THE FISHERY THEY GAVE IN RESPONSE TO Q15.3 WHERE THEY FISHED THE MOST DAYS.)** On a typical trip from home to this fishery, how many days or part days, did you fish?

One, it was usually a day trip

I usually stayed for ____ days **DP ADD TEXT BOX**

Q21.2 Please indicate the amount you spent **ON A TYPICAL TRIP** on the following items (including the amount you spent on other people): (please select)

	No spend	<£ 1	£1– £2.50	£2.5 –£5	£5– £10	£10 – £25	£25– £50	£50– £75	£75– £100	£100– £250	More than £250	Prefe r not to say
Accommodation including camping												
Meals and drinks served in pub, café etc.												
Food and drink from shop												
Public transport and vehicle hire												
Petrol and diesel												
Hire of tackle and boats												
Fishing guide												
Bait												
Day tickets												
Competition fees												

Q21. IF Q15.5=1 ASK, OTHERS GO TO Q22: You also said that you fished for trout or grayling at (*insert the name of the fishery they gave in response to Q15.3 that was furthest away from home. If this is the same fishery as for 0, then select the second furthest.*) On a typical trip from home to this fishery, how many days or part days, did you fish?

One, it was usually a day trip

I usually stayed for ____ days **DP ADD TEXT BOX**

Q22.2 Please indicate the amount you spent **ON A TYPICAL TRIP** on the following items (including the amount you spent on other people): (please select)

	No spend	<£1	£1–£2.50	£2.5–£5	£5–£10	£10–£25	£25–£50	£50–£75	£75–£100	£100–£250	More than £250	Prefer not to say
Accommodation including camping												
Meals and drinks served in pub, café etc.												
Food and drink from shop												
Public transport and vehicle hire												
Petrol and diesel												
Hire of tackle and boats												
Fishing guide												
Bait												
Day tickets												
Competition fees												

Q22. We will be conducting another survey about how anglers value the fisheries and their environment. Would you be happy to be contacted again for this?

Yes, I can be contacted again for a follow-up. If yes, please enter your email address and telephone number **DP ADD TEXT BOX**

No

Thanks for your help.

The results of this survey will be reported by the Environment Agency in emails to licence holders and to the angling press.

This research was conducted under the terms of the MRS code of conduct and is completely confidential.

Appendix B: Annotated bibliography

B.1 Realising the Eden's Angling Potential. Stage 2: Angler survey (Brown 2014)

<http://www.edenfishing.co.uk/documents.html>

The Eden Angling Survey was carried out for the River Eden & District Fisheries Association (REDFA) by Substance in February and March 2014 to inform the socioeconomic aspects of the Eden Fisheries Plan. It sought to provide evidence about:

- the economic value of angling on the Eden catchment
- the profile of those that fish on the Eden and those in the region that do not
- the potential demand for increasing angling participation on the Eden
- what barriers exist for anglers and how they might be overcome

The report includes multipliers for each spend for the catchment, but based on another report (SQW Ltd 2006).

Table 13. Estimated Economic Output

Item	Average Spend per angler (2013)	Adjustment for leakage on permits (-5%)	Displacement adjustment (-10%)	Multiplier	Economic Output
Travel (not car)	£43.68		£39.31	1.2	£47.17
Accommodation	£136.47		£122.82	1.25	£153.53
Food and drink	£67.10		£60.39	1.21	£73.07
Fishing tackle	£195.49		£175.94	1.4	£246.32
Day or week tickets	£37.41	£35.54	£31.99	1.4	£44.78
Club membership and STs	£249.32	£236.85	£213.17	1.4	£298.44
Syndicate membership etc.	£56.99	£54.14	£48.73	1.4	£68.22
Go Wild tickets	£1.89		£1.70	1.4	£2.38
Guiding / tuition	£12.27	£11.66	£10.49	1.4	£14.69
Other	£2.91		£2.62	1.24	£3.25
Total	£803.53		£723.18		£951.84

Source: Brown (2014, p. 23)

Survey methodology and sample size

An online survey was set up by Substance and anglers were recruited:

- via an Environment Agency email to 40,000 rod licence holders in its North West and North East Regions
- by REDFA and Substance working with local angling clubs and riparian owners in the Eden catchment to distribute the survey

website address to their members, visiting ticket buyers and others in their contact lists

- the Eden Rivers Trust sending the survey website address to its contacts

A total of 2,830 people started the survey, of whom 2,434 (86%) completed all questions. The respondents included users (26.4%) and non-users (73.6%) of the Eden.

Values

The average spend per respondent in the Eden catchment in 2013 was £803. The average fell to £587 of all those surveyed (that is, across all years).

When displacement, leakage and multipliers are taken into account, the estimated economic output (the direct spending and indirect effect of that spending) is £951.84 per angler in 2013. This includes both visitor (likely to be higher) and district-based residents (likely to be lower).

Using the midpoint estimated population of 1,500 individual anglers who fished on the Eden in 2013, this produces a total economic output of £1,427,760 equating to £613,936.80 of GVA (using a GVA rate of 43% over the total economic output to discount for the costs of inputs). This expenditure equates to 35–36 FTE jobs in 2013 using an average of £40,000 of economic output per one FTE job (Armstrong 2013).

B.2 Economic Evaluation of Inland Fisheries: The economic impact of freshwater angling in England and Wales (Environment Agency 2007)

This study sought to estimate the economic activity supported by, and the economic impact of different types of, freshwater angling in each region of England and in Wales. The study also considered the economic consequences of potential increases and decreases in different types of freshwater angling.

Assessments were made for:

- the 9 Government Office Regions of England
- Wales
- England and Wales as a whole

For each of these regions, a separate evaluation was made for coarse fish, trout, salmon and sea trout. In effect, there were 33 separate evaluations each of which could be disaggregated to yield estimates by types of surface water (rivers, stillwaters and canals).

Survey methodology and sample size

A controlled sample of 3,000 anglers was drawn from these records and a telephone survey was conducted to establish the average number of angling days per angler across the region–fish species combinations.

An online questionnaire was then used to collect information on angler activity and expenditure. Using the known total number of anglers from licence sales, these observations were scaled to population totals (angler days per region per fish species).

Values

Table B.1 summarises the ‘economic activity supported by angling’ in England and Wales.

- Coarse angling was the most popular activity, while salmon and sea trout angling was relatively minor.
- Angler gross expenditure across the whole of England and Wales was £1.18 billion, with coarse angling responsible for £971 million of this.
- Household income of £980 million and 37,386 jobs were supported across England and Wales.

Table B.1 Economic activity supported by freshwater angling in England and Wales

Angler days ('000s)	Coarse	26,387
	Trout	3,434
	S & ST	429
	ALL	30,250
Gross angler expenditure (£'000s)	Coarse	£971,228
	Trout	£172,707
	S & ST	£36,958
	ALL	£1,180,893
Income (GVA) supported (£'000s)	Coarse	£804,203
	Trout	£147,603
	S & ST	£28,612
	ALL	£980,418
Employment supported (FTEs)	Coarse	30,580
	Trout	5,628
	S & ST	1,179
	ALL	37,386

Notes: Extract from summary table of the study's key findings (Environment Agency 2007, p. vi)

In the unlikely event of all forms of angling ceasing, expenditure would be diverted to other activities creating income and jobs elsewhere in England and Wales. So although income and jobs would be lost in angling services, there would be increases elsewhere. A substitution analysis was carried out for each species to estimate the ‘economic impact’ of net expenditure loss.

B.3 Public Attitudes to Angling 2005 (Environment Agency 2005)

http://resources.anglingresearch.org.uk/library/attitudes_2005

This is a study of public attitudes to angling in England and Wales. One of its objectives was to assess the levels of participation in freshwater and sea angling.

Survey methodology and sample size

The data were collected through Omnibus surveys using face-to-face interviews among representative samples. Two Omnibus studies were utilised:

- an adult Omnibus over 1 week
- a youth Omnibus over 4 weeks

A total of 2,258 people were interviewed, 419 of whom were aged 12–16 years. Both the youth and adult samples were designed to be representative of the population in England and Wales in terms of gender, age, social grade and region. Those aged 15+ were included within the adult sample; the youth data were collected from 12–16 year olds. The margin of error at the 95% confidence level for the overall sample data is approximately $\pm 2\%$.

Values

The survey data suggest that 8% of the population within England and Wales had been freshwater fishing in the past 2 years. Based on a population aged 12+ in England and Wales of 44,254,462, the number of people aged 12+ who have been freshwater fishing in the past 2 years was estimated at 3.5 million. This is a considerably higher participation rate than found by other studies and is 3 times the sales of around 1 million Environment Agency rod licences.

With respect to sea angling, 7% of the population of England and Wales aged 12+ had been sea fishing in the past 2 years. Based on the same population total (44,254,46), the number of people aged 12+ who had been sea angling was estimated at 3 million.

B.4 Public Attitudes to Angling 2010 (Environment Agency 2010)

http://resources.anglingresearch.org.uk/library/attitudes_2010

This is an update from the previous survey. The survey was designed to:

- assess the public's attitude to angling, including young people as determined by the reaction to a number of statements about angling
- assess the levels of participation in freshwater and sea angling

- explore the interest among non-anglers of participating in the sport at some future date
- determine the factors that would encourage potential anglers, especially youngsters to take up the sport
- determine awareness of events or schemes where the public can learn to fish

Survey methodology and sample size

The data were collected by means of face-to-face interviews among representative samples of adults within England and Wales aged 15+ and young people aged 12–16. A total of 2,304 people were interviewed, of whom 408 were aged 12–16 years.

The survey and data analysis were designed to provide results representative of the population in terms of gender, age, social grade and region.

Values

The 2010 survey indicated that 9% of the population within England and Wales (4.2 million) had been freshwater fishing in the past 2 years. It is possible that there had been an increase in the proportion of current anglers in the population since 2005 (8%, 3.6 million), but if so, the increase was not large enough to be detected given the sample size of the 2010 survey.

Some 7% (6%) of the population (3.3 million) were recent anglers (that is, they had been freshwater fishing within the previous year). Although there was no significant difference between the 2005 and 2010 data, this does not mean that the proportion had not increased, just that given the sample sizes, any differences were within the precision of the estimates.

Some 4% (5%) of the population over 12 said they had been sea fishing in the past year (1.9 million people). Of the 3.3 million people who had been freshwater fishing in the past year, 28% (940,000) had also been sea fishing in the past year. A total of 940,000 people had been sea fishing but not freshwater fishing in the past year.

B.5 Sea Angling 2012 – A survey of recreational sea angling activity and economic value in England (Armstrong et al. 2013)

<http://webarchive.nationalarchives.gov.uk/20140305101647/http://www.marine-management.org.uk/seaangling/finalreport.htm>

The study was undertaken to find out:

- how many people went sea angling in England
- how much they caught

- how much was released
- the economic and social value of sea angling

Survey methodology and sample size

Data were collected from over 11,000 sea anglers in England through:

- an ONS household survey
- face-to-face interviews with anglers by Inshore Fisheries and Conservation Authorities
- catch diaries
- online surveys

Values

The surveys estimated that there were 884,000 sea anglers in England, with 2% of all adults going sea angling. These anglers made a significant contribution to the economy, with sea anglers resident in England spending £1.23 billion on the sport in 2012, equivalent to £831 million direct spend once imports and taxes were excluded. This supported 10,400 FTE jobs and almost £360 million of GVA. Taking indirect and induced effects into account, sea angling supported £2.1 billion of total spending, a total of over 23,600 jobs and almost £980 million of GVA.

Almost 4 million days of sea angling were recorded over the year. Shore fishing was the most common type of sea angling – almost 3 million angler days compared with 1 million for private or rented boats and 0.1 million on charter boats. Anglers had most success on charter boats, catching 10 fish per day on average compared with around 5 from private boats and only 2 from the shore.

B.6 Economic Impact of Recreational Sea Angling in Scotland (Glasgow Caledonian et al. 2009)

<http://www.gov.scot/Publications/2009/07/31154700/0>

The aims of the study were to: estimate the economic impact of sea angling and to identify

- important local sea angling centres
- main competing areas within and outwith Scotland
- principal characteristics of the sea angling sector
- key trends
- future prospects for the sector

In addition, 5 case study areas were selected, reflecting not only the diversity of characteristics but also contemporary issues relating to sea angling in Scotland.

Extensive primary data needed to be collected from sea anglers and other stakeholders, with sea angling questions incorporated into a Scottish Omnibus telephone survey. The questions were designed to reveal the sea angling participation rate both across Scotland and in the 8 different regions of the study.

Survey methodology and sample size

Over 15,000 people took part in the Omnibus survey.

Values

The study estimated that 125,188 adults went sea angling in Scotland (plus some 23,445 juveniles).

Glasgow and the West had the greatest number of adult resident sea anglers (23,548). Edinburgh Fife and the South East region had the greatest total expenditure (£26,896 million). Total expenditure on sea angling across the whole of Scotland was £140,868 million.

Sea angling supported 3,148 FTE jobs and £69.67 million annually of Scottish household income in the form of wages, self-employment income, rents and profits. If sea angling ceased, a net loss of at least 1,675 FTE jobs and annual income loss of £37 million was predicted.

B.7 Assessing the Value and Realising the Potential of Sustainable Freshwater Fisheries in Orkney (SQW Ltd 2006)

http://www.snh.org.uk/pdfs/publications/commissioned_reports/F04LA09.pdf

In 2004, a group of organisations made up of Scottish Natural Heritage, the Orkney Islands Council, Orkney Trout Fishing Association and Orkney Enterprise – together with the LEADER+ programme –, commissioned a study to:

- gain information on the economic benefits of freshwater angling in Orkney and their distribution
- determine what management structures might best enhance sustainability of this resource to the benefit of the economy and the natural environment

The report proposed an action plan and subsequent implementation with the aim of increasing benefit from visiting anglers in a way that is sustainable in environmental, economic and social terms. It suggested that acceptable expansion of the freshwater fisheries could be achieved.

The report recommended that an Orkney Fisheries Forum be established, drawing together relevant stakeholders and assisted by the appointment of a Fisheries Development Officer to manage a sustainable future for Orkney's fisheries.

Survey methodology and sample size

Of the 257 survey questionnaires sent out to visiting anglers, 84 were completed giving an overall response rate of 33%.

In addition, permission was secured for SQW to have access to relevant material from the 2004 Orkney Visitor Survey being conducted by TNS-Global. TNS-Global had completed and processed 866 interviews carried out during the April–September period as the visitors left Orkney. From these, 13 returns were identified in which either the primary reason (5) or the subsidiary reason (8) for a visit to Orkney was given as 'loch fishing'. Expenditure and other data from these returns were analysed and compared with information from the SQW survey.

The total number of visiting anglers supplying data that could be used in the study was therefore 97.

Values

The survey found a high degree of satisfaction among visiting anglers about the quality of the fishing, the accommodation and Orkney's friendly people. Most anglers had been to Orkney before and intended to visit again.

It was calculated that the annual expenditure by anglers and accompanying non-anglers on fishing holidays in Orkney totalled some £1.9 million and sustained 60–75 FTE jobs. Visitors who came to specifically fish appeared to spend significantly more than the average for all visitors to Orkney.

Appendix C: I–O multipliers

Table C.1 Multiplier analysis: input–output analytical tables 2010

Standard Industrial Classification category	Expenditure category	Output multiplier	Employment cost multiplier	GVA multiplier	Employment cost effects	GVA effects
Accommodation services (55)	Accommodation	1.64754352	1.883800099	1.629590426	0.472004296	0.741242433
Food and beverage serving services (56)	Meals and drinks in pub, café etc.	1.610360439	2.407689456	1.566404394	0.490734559	0.755596835
Retail trade services, except of motor vehicles and motorcycles (47)	Food and drink from shop; petrol, diesel, parking and tolls; bait	1.622036098	1.482099034	1.508481814	0.524615974	0.867757233
Sports services and amusement and recreation services (93)	Hire of tackle and boats; day tickets; fishing guide or ghillie	1.803680335	2.239023681	2.222058647	0.447815126	0.79753915
Land transport services and transport services via pipelines, excluding rail transport (49.3-5)	Public transport and vehicle hire	1.639797038	1.605238299	1.65328384	0.538576086	0.79197399
Rail transport services	Public transport and vehicle hire	1.978653316	1.821003247	2.201835523	0.677997098	0.855347479
Non-trip related expenditure multipliers		Output multiplier	Employment cost multiplier	GVA multiplier	Employment cost effects	GVA effects
Retail trade services, except of motor	All except permits, retail	1.622036098	1.482099034	1.508481814	0.524615974	0.867757233

Standard Industrial Classification category	Expenditure category	Output multiplier	Employment cost multiplier	GVA multiplier	Employment cost effects	GVA effects
vehicles and motorcycles (47)/	covers 'retail sale of sporting equipment in specialised stores' as well as retail trade not in stores (e.g. internet, postal)					
Sports services and amusement and recreation services (93)	Permits	1.803680335	2.239023681	2.222058647	0.447815126	0.79753915

Table C.2 Location coefficients: regional multipliers by industry category

Region	Accommodation and food services	Wholesale and retail trade; repair of motor vehicles and motorcycles	Arts, entertainment and recreation	Transport and storage
East of England	0.958550587	1.06802426	0.956321211	0.989526117
East Midlands	0.840516637	1.138330346	0.841380478	1.134838208
London	0.995285812	0.778123192	1.255101672	1.079959754
North East	0.94434824	1.134003921	0.764657868	0.904420045
North West	1.07498396	1.013377666	0.924546556	0.97566145
South East	0.945346283	1.058849958	1.015714505	0.98685972
South West	1.212573312	0.991392551	1.045933014	0.686663292
West Midlands	0.894698416	1.098811599	0.902683961	1.117986506
Yorkshire and the Humber	1.083519054	1.036428921	0.869560185	1.029724189

Appendix D: Detailed statistics

According to Table D.1, in 2015:

- a quarter of anglers had spent up to 4 days fishing for any type of fish
- half of all anglers had spent less than 14 days fishing for any type fish

The majority of anglers (95%) had spent up to 87 days fishing and only 1% of anglers had spent more than 175 days fishing in 2015.

Table D.1 Total days spent fishing in 2015 for any kind of fish (per angler)

Percentile (share of anglers)	Angling days
1%	1
5%	1
10%	2
25%	4
50% (median)	14
75%	31
90%	60
95%	87
99%	175

Table D.2 Total days spent fishing in 2015 by type of fishing and species

Coarse fishing	Total days	Average days per angler per year	Median (50th percentile)	Mode	95th percentile
Carp	7,440,000	17	8	10	65
Bream	2,980,000	11	3	1	50
Roach	2,470,000	10	2	1	50
Perch	1,810,000	7	2	1	30
Pike	1,720,000	7	1	1	30
Tench	1,630,000	6	2	5	30
Barbel	1,550,000	6	1	1	30
Chub	1,230,000	5	1	1	25
Rudd	1,168,000	6	0	1	26
Crucian carp	1,013,000	5	0	5	25
Catfish	453,000	3	0	1	13
Eel	425,000	3	0	1	10
Dace	347,000	2	0	1	10
Zander	262,000	2	0	1	5
Other (bleak, gudgeon and so on)	580,000	4	0	1	20
Trout and grayling					
Stocked rainbow trout	1,608,000	10	4	1	40
Stocked brown trout	1,059,000	8	2	1	35
Other types of stocked trout	323,000	4	0	1	20
Wild trout	839,000	6	2	1	27
Grayling	383,000	4	0	1	20
Salmon and sea trout					
Salmon	109,000	11	7	2	33
Sea trout	71,000	8	5	7	30

Table D.3 Summary statistics for angling effort (days spent fishing) by fishery type

Coarse fish or eels	Total days	Average no days per angler (all anglers)	Median (50th percentile)	Mode	95th percentile
Rivers or streams	4,310,000	13.08	6	2	48
Lakes/reservoirs/ponds	14,000,000	20.27	10	10	70
Canals	1,440,000	8.64	4	1	30
Brown trout, rainbow trout or grayling					
Rivers	938,000	9.21	4	1	30
Lakes/reservoirs/ponds ¹	1,490,000	10.48	4	1	40
Salmon or sea trout					
Rivers or streams	133,000	12.25	7	2	40
Total	22,300,000				

Notes: ¹ There is no grayling fishing in lakes or reservoirs in England and so these days relate to trout fishing.

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