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Economic evaluation of inland fisheries:

The economic impact of freshwater angling in England & Wales

Science Report – SC050026/SR2

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Steve Killeen

Head of Science

Executive Summary

This report covers Module B of the study, *Economic evaluation of inland fisheries*. Module B was carried out by economists Alan Radford and Geoff Riddington from Glasgow Caledonian University and by Hervey Gibson of CogentSI Ltd, in collaboration with Jacobs UK Ltd and ADAS Ltd.

This report is accompanied by a sister report, *Module A: Welfare benefits of inland fisheries*, covering a survey of the general public using contingent valuation and choice modelling analyses.

Module B had the following aims, namely to:

> i) estimate annual expenditure on different types of freshwater angling in each region of England and in Wales;
>
> ii) estimate the impact on regional economies of potential increases and decreases in different types of freshwater angling, identifying the contribution made by tourism.

Thirty-three separate assessments were produced of the dependency of regions on the spending of anglers fishing for coarse fish, trout, salmon and sea trout. Estimates were also categorised by types of surface water, that is, rivers, stillwaters and canals. Assessments were made for the nine Government Office Regions of England; Wales; and for England and Wales as a whole.

For each of the 33 region/fish species combinations, the study estimated the economic activity supported by each species as well as the potential economic impact of their loss. Among the parameters estimated were:

- total annual income in the form of wages, profits and income from self-employment accruing to households − this is called gross value added (GVA);
- total employment (measured in full-time job equivalents (FTEs);
- GVA generated per pound of angler expenditure;
- angler expenditure necessary to generate one FTE;
- GVA generated per angler day;
- FTEs per thousand angler days.

An online internet questionnaire was used to collect information across the combinations of regions and fish species. Given that in England and Wales a licence is required to fish in freshwater, the Environment Agency holds the names and addresses of licensed anglers. A controlled sample of 3,000 anglers was drawn from these records. ADAS Ltd then managed a telephone survey of the anglers and collected observations on the average number of angling days per angler across the region/fish species combinations. Using the known total number of anglers from licence sales, these observations were scaled to population totals (angler days per region per fish species).

Having established population totals, the survey generated data on average angler expenditure per day across the 33 combinations. These expenditure estimates were then processed in DREAM® models tailored to each regional economy by CogentSI Ltd.

Key results of all 33 region/species combinations are given in the summary table below.

Using the South East as an example, the summary table shows that in 2005, anglers spent £171 million on coarse angling in the South East. This generated household income of £88

million and 3,657 FTEs in the South East. If coarse angling in the South East were to cease, some angler expenditure would be diverted outside the region. From asking anglers how they would respond to the loss of coarse angling here, we estimated that £66 million of the £171 million would be lost. This would result in a net fall in household income of £34 million and a net loss of 1,386 jobs in the South East.

The summary table does not report the economic impact of a loss of all species in any of the regions. It does, however, report the economic activity supported by all species. The South East shows a total of 4.5 million angler days for all species (4.1 million coarse, 0.4 million trout and only six thousand salmon and sea trout). Angler gross expenditure on fishing for all freshwater species in the South East in 2005 was £199 million, and this supported £103 million of household income and 4,241 FTEs in the South East.

For England and Wales as a whole, the summary table shows that total effort on freshwater angling by licensed anglers in England and Wales in 2005 was 30 million angler days. Coarse angling was the most popular activity, while salmon and sea trout angling was a relatively minor activity.

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 generated across England and Wales. 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. Thus, although income and jobs would be lost in angling services, there would be increases elsewhere.

This study could not estimate the economic impact of the loss of all species; however, a substitution analysis was carried out for each species, to estimate the net expenditure loss and associated income and job effects. Taking coarse fish as an example, the gross expenditure of coarse anglers in England and Wales supported household incomes of £804 million and 30,580 FTEs. If coarse angling were to cease across England and Wales, from interviews with anglers we estimate that £161 million would be lost, resulting in a net loss of £133 million in household income and 5,060 jobs. The same interpretation can be applied to trout and salmon and sea trout.

In the public domain, the total expenditure of anglers and the employment generated is often used for advocacy purposes. In some instances, the findings of an impact study are used inappropriately. This inappropriate use may be deliberate but may also simply be misguided. Both culpable and innocent misuse is best tackled by ensuring that all sides are familiar with the scope and limitations of impact studies and we therefore recommend that users of this study consult the main scientific report.

Summary table: Key findings of the study

		North East	North West	Yorks & Humber	West Midlands	East Midlands	East of England	London	South East	South West	Wales	England & Wales[1]
Angler days ('000s)	**Coarse**	889	3,474	3,117	4,592	4,580	2,296	317	**4,093**	2,182	847	26,387
	Trout	314	431	368	249	409	49	33	**434**	455	692	3,434
	S & ST	57	108	20	18	0	0	3	**6**	43	175	429
	ALL	1,260	4,013	3,505	4,859	4,989	2,344	353	**4,533**	2,680	1,714	30,250
Gross angler expenditure (£'000s)	**Coarse**	£26,208	£117,128	£115,447	£175,685	£140,400	£101,648	£21,141	**£170,669**	£78,171	£24,731	£971,228
	Trout	£12,131	£16,336	£16,478	£16,473	£16,761	£8,280	£2,486	**£26,951**	£19,145	£37,666	£172,707
	S & ST	£7,228	£7,655	£1,694	£1,142	£0	£0	£138	**£1,233**	£6,261	£11,607	£36,958
	ALL	£45,567	£141,119	£133,618	£193,300	£157,161	£109,929	£23,765	**£198,853**	£103,577	£74,004	£1,180,893
Income (GVA) supported (£'000s)	**Coarse**	£12,938	£67,042	£65,303	£90,772	£71,415	£47,881	£12,336	**£87,907**	£40,200	£11,204	£804,203
	Trout	£4,858	£7,985	£8,642	£8,604	£6,757	£3,744	£1,487	**£14,380**	£8,373	£15,307	£147,603
	S & ST	£3,224	£4,216	£1,026	£598	£0	£0	£84	**£613**	£2,922	£5,294	£28,612
	ALL	£21,020	£79,243	£74,970	£99,974	£78,173	£51,625	£13,907	**£102,900**	£51,495	£31,805	£980,418
Employment supported (FTEs)	**Coarse**	573	2,736	2,730	3,829	3,039	1,986	397	**3,657**	1,760	501	30,580
	Trout	216	331	363	362	297	160	48	**560**	366	689	5,628
	S & ST	146	180	46	27	0	0	3	**24**	130	263	1,179
	ALL	935	3,247	3,139	4,218	3,336	2,146	448	**4,241**	2,255	1,454	37,386
Net expenditure (£'000s)	**Coarse**	£10,650	£46,331	£42,972	£71,732	£59,838	£35,744	£5,503	**£66,309**	£32,055	£10,480	£160,996
	Trout	£4,921	£6,516	£6,145	£6,145	£6,539	£1,928	£414	**£10,402**	£7,892	£16,855	£49,363
	S & ST	£2,778	£2,650	£360	£360	£0	£0	£38	**£269**	£2,484	£4,029	£14,501
Impact on income (GVA) (£'000s)	**Coarse**	£5,342	£26,116	£25,057	£36,163	£31,689	£16,410	£6,739	**£33,504**	£16,053	£4,714	£133,082
	Trout	£2,194	£3,690	£3,357	£3,349	£3,126	£802	£227	**£6,466**	£3,621	£8,109	£41,643
	S & ST	£1,857	£1,966	£460	£306	£0	£0	£48	**£277**	£1,715	£2,729	£10,720
Impact on employment (FTEs)	**Coarse**	231	1,052	1,016	1,499	1,334	671	99	**1,386**	692	205	5,060
	Trout	96	150	135	135	135	32	7	**244**	152	358	1,588
	S & ST	82	84	20	13	0	0	2	**11**	75	137	445

[1] Because of different multiplier effects, estimates of GVA and FTE are not summations of individual regions. Similarly estimates of economic impacts of individual species cannot be summed across regions but they also cannot be summed across species because different substitution patterns apply. Only angler days and gross expenditures can be summed across regions and species.

Acknowledgements

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The project steering group provided data and guidance on all aspects of report. We would particularly like to thank Guy Mawle, the main contact at the Environment Agency, for his input. Finally, appreciation is due to the many anglers who participated in the telephone and postal surveys and to Diane Simpson from ADAS Ltd, who managed the postal survey of 3,000 anglers.

Glossary of terms and abbreviations

Angler gross expenditure: Anglers' current total expenditure.

Angler non-specific expenditure: Angler's expenditure which is not specific to a particular fishing trip.

Angler substitution possibilities: What anglers would do if angling for species Y ceased in region X.

Direct effect: The economic activity (income and employment) in region X directly dependent on angler expenditure. For example, income and employment in fisheries, hotels, retail units providing angler services and so on.

DREAM®: Detailed Regional Accounting Model developed by CogentSI Ltd.

Economic activity supported: Economic activity such as household income (measured by GVA) and employment (measured in FTEs) resulting from the combined effects of all the direct, indirect and induced effects associated with angler gross expenditure.

Economic impact: Economic activity such as household income (measured by GVA) and employment (measured in FTEs) resulting from the combined effects of all the direct, indirect and induced effects associated with the net expenditure lost as a result of angling for species Y ceasing in region X.

FTE: Full-time job equivalent.

Gross value added (GVA): Measurement of annual household income in the form of wages, profits, rents and income from self-employment.

Indirect effects: The first round indirect effect is the regional economic activity (income and employment) which is dependent on the direct effect. The second round indirect effect is dependent on the first round effects. The third round is dependent on the second round and so on. The effect of each round becomes successively smaller.

Induced effects: A proportion of the increase in regional household income created by the direct and indirect effects is spent within the region, giving rise to further increases in economic activity. This is the induced effect.

Net expenditure loss: Angler expenditure that would be lost if angling for species Y ceased in region X.

NUTS: EU statistical nomenclature for units of territory (NUTS).

OD matrix: Origin-destination matrix.

Contents

List of tables

1 Objectives and scope

This study, *Economic evaluation of inland fisheries. Module B: The economic impact of freshwater angling*, has the following objectives, namely to:

- estimate annual expenditure on different types of freshwater angling in each region of England and Wales.

- estimate the impact on regional economies of potential increases and decreases in different types of freshwater angling, identifying the contribution made by tourism.

1.1 Regions and fish species

The above objectives were further refined with respect to regions and type of angling The regions were Wales plus each of the nine regions of England (which correspond to the regional development agencies of England), plus England and Wales as a whole. The fish species were coarse, trout and salmon & sea trout.

The full list of study regions was the North East, North West, Yorkshire and Humberside, West Midlands, East Midlands, East of England, London, South East, South West, Wales, England and Wales.

The combination of three fish species and eleven regions generated a requirement to produce 33 separate economic impact assessments. This meant that the survey instruments had to be capable of delivering sufficient observations on, among other things, angler characteristics, angler effort and expenditure for each of the 33 cells in the implied matrix of region/fish species combinations.

1.2 Types of surface water

In addition to regions and fish species, the study was required to provide estimates categorised by type of surface water where appropriate. These further categories were:

- rivers (coarse, trout and salmon & sea trout);
- stillwaters (coarse and trout);
- canals (coarse only).

In recognition of this requirement, survey work generated observations on angler effort (the number of angler days) on each of the six species/surface water-type combinations. It was, however, not practicable to obtain individual observations on angler expenditure relating to specific surface water types. Thus, estimates of the economic impact of, say, coarse angling on rivers in the West Midlands could not be based on the aggregation of expenditure data from individual anglers fishing these particular rivers.

Despite this, the regional economic impact attributable to surface water type could be estimated by using the survey data on the distribution of angler days across surface water types, to disaggregate the estimated total economic impact attributable to a fish species. Thus, estimates of the economic impact of, say, coarse angling in the West Midlands could be disaggregated to coarse angling on rivers, stillwaters and canals.

The legitimacy of this procedure would depend on the validity of the assumption that, for a given species, expenditure per angler day does not vary significantly between types of water.

Thus, five further potential economic impact assessments could be extrapolated for each of the eleven regions. These are:

- **Coarse**
- **Trout**
- **Salmon & Sea Trout**

- coarse/river
- coarse/stillwater
- coarse/canal
- trout/river
- trout/stillwater.

1.3 Economic impacts: some theoretical underpinnings.

In assessing the economic impact of angler expenditure, one is effectively seeking to answer the question: "What would happen (to income and employment) in region 'X' if angling for fish species 'Y' ceased to exist?" Two key issues arise here.

Firstly, what would anglers do if angling for fish species 'Y' ceased in region 'X' and how much of their expenditure would be diverted outside the region? We use the term angler substitution possibilities to describe this issue.

Secondly, what is the impact on income and employment within region 'X' of the decrease in angler expenditure? This is estimated by first modelling the regional economy and then using the model to trace the effects of the expenditure change.

1.3.1 Angler substitution possibilities

Anglers will respond in different ways to the loss of fishing for a particular species in a region. Some anglers might spend as much on alternative activities within the region. If all anglers responded in this way, the cessation of angling for a given fish species would have little impact on regional income and employment. On the other hand, if anglers diverted their expenditure outside the region, angling's contribution to regional income and employment could be much more significant.

Practitioners often assume that visitors have better substitutes outside the region, whereas local residents have better substitutes within it (see Fisheries Resources Management, 2000). This implies that a region would lose almost all visitor angler spending and retain almost all local angler spending. Researchers employing this assumption thus only need to quantify visitor spending.

This assumption is somewhat crude, where actual substitution possibilities are not always evident and may only be properly revealed by interrogation of anglers. Moreover, substitution possibilities will vary with size of region. The smaller the region, the fewer substitutes within it. Since this study encompassed ten regions of varying size, plus England and Wales as a whole, the legitimacy of the above assumption would vary across the regions. We therefore eschewed the above approach and sought to obtain data on angler substitution possibilities from individual anglers. Note that other things being equal, a small region can be expected to lose more of its angler expenditure than a larger one.

Estimates of gross expenditure (pre-substitution levels of expenditure) provide a snapshot of current levels of angler expenditure in each region. Gross expenditure supports regional household income and employment. In this study, gross expenditure is the basis for estimating the economic activity supported by angler expenditure.

The net change in angler expenditure depends on substitution effects. For example, if anglers in a given region substitute the loss of, say, coarse angling by switching to trout angling, the net loss in regional expenditure, income and jobs could be relatively minor. Although the region will lose income and jobs previously supported by coarse angling, it will gain from increased expenditure on trout angling. In this report, the balance of these effects is termed the economic impact of the loss of angling within the region.

For each of the regions, this study sought to estimate both the economic activity supported by each fish species and the economic impact of losing.each species.

1.3.2 Regional expenditure and its direct, indirect and induced effects

The full effect on regional income and employment of each (gross or net) pound of angler expenditure depends, among other things, on what the angler purchases and the strength of the direct, indirect and induced effects. These effects are explained below.

The direct effect on a region is simply the increase in local income and employment arising from initial angler expenditure. Through a combination of taxation and the purchase of supplies from outside, a proportion of this initial expenditure will be immediately lost to the region, and can be ignored. However, a proportion of angler expenditure will remain within the area. It is this proportion which creates the direct effect. For example, the direct employment effect of angler expenditure on, say, accommodation is simply the proportion of employment in hotels that is dependent on angler expenditure. The direct income effect of angler accommodation expenditure is the wages and profits paid by hotels to households in the region.

Some categories of expenditure have a minimal direct impact. For example, only about five per cent of spending on petrol has a direct effect locally; 95 per cent 'bounces off' through tax, duty and the purchasing of inputs from outside. In contrast, angler accommodation expenditure has a strong direct effect. The composition of angler expenditure is thus important in determining the magnitude of the direct effect on regional incomes and employment.

Indirect effects can arise from the direct effect. 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 from self-employment and perhaps the rent charged by the shop owner. It also contributes to employment in the butcher's shop. These effects are known as first round indirect effects.

Further indirect rounds can be considered. The butcher may purchase some of his supplies from a local abattoir, thereby supporting the wages of abattoir staff and the abattoir's profits. This also contributes to employment in the abattoir. There will be further rounds of, albeit successively smaller, indirect effects. For example, the abattoir may purchase livestock from local farmers, who in turn may purchase building services from local companies. The combined impact of direct and indirect effects is modelled by "Type I" multiplier analysis. Among other things, this analysis calculates the total Type I household income in the region (measured by gross value added or GVA) and regional employment (measured by full-time equivalents orFTEs) dependent on the fishery.

Both the direct effect and every round of indirect effects increases household incomes in the region in the form of wages, profits, rents and income from self-employment. Thus, the

income of a diverse range of households in the region will be increased as a result of angler spending (such as hotel workers, hotel owners, butcher's staff, the butcher, butcher's landlord, abattoir staff, owners of the abattoir, farm workers, the farmer, building workers and so on). In each spending round, a proportion of these regional income streams are spent on goods produced within the region, creating further increases in regional income and employment. This is the induced effect. "Type II" multiplier analysis incorporates these induced effects, enabling estimation of the corresponding Type II total income effect (Type II GVA) and Type II total employment (Type II FTEs). In this report, we only record the outcome of the Type II analysis.

The strength of the direct, indirect and induced effects depend on such things as inter-firm links within the regional economy, taxation policy, and the proportion of local income normally spent within the region. These parameters themselves will depend on the size of the region. The smaller the area, the less likely local businesses and retailers will purchase locally produced supplies (weak indirect effects). The smaller the area, the less likely local households will purchase locally produced goods (weak induced effects). In modelling the regional economy, this study used the Detailed Regional Economic Accounting Model (DREAM®) developed by CogentSI.

1.3.3 Regional impact of changes in angling activity

One of the aims of Module B was to estimate the impact on regional economies of potential increases and decreases in different types of freshwater angling, identifying the contribution made by tourism.

Estimating current activity levels and regional income and employment enables a number of ratios to be produced. In this study, six ratios were calculated for each region/fish species combination.

- GVA (Type II) generated in the region per pound of local angler expenditure;
- GVA (Type II) generated in the region per pound of visitor angler expenditure;
- GVA (Type II) per angler day;
- local angler expenditure necessary to generate one FTE (Type II);
- visitor angler expenditure necessary to generate one FTE (Type II);
- FTEs (Type II) per thousand angler days.

Provided some caution is exercised, these ratios can be used to draw inferences about the impact of more or less angling activity. For example, GVA per angler day can be used to draw conclusions about the impact on household incomes of additional angler days. In would, however, be necessary to assume that, for a given species, the expenditure characteristics of additional and existing angler days would be similar. In other words, underlying relationships are assumed to be linear and calculated averages adequately describe the consequences of marginal changes. Similarly, if the magnitude of additional visitor (or local) spending is known, the calculated ratio of GVA per pound of visitor (or local) angler spending can be used to estimate how regional GVA will change.

Greater caution is needed when drawing inferences about employment, because the causal chain linking additional anglers to employment is longer and there is a greater probability that some relationships will not be linear. If there was significant excess capacity, additional angler expenditure is likely to result in existing labour being used more intensively, rather than new labour being hired. It is difficult to generalise about the use of these ratios. The context in which these ratios are used will determine how much caution should be exercised.

1.4 Estimating the impact of the loss of all species in a region

There was no expectation that the study would estimate the economic impact of the simultaneous loss of all fish species in any of the ten regions. This would have required the survey instruments specifically to interrogate anglers about how they would react to the loss of all species in any of the regions, but would have made the questionnaire too long and complicated to be practical. Some users of this report may be tempted to produce 'all species' estimates by aggregating the impacts of the loss of each fish type. Unfortunately, this would produce an underestimate, since the loss of all types of angling precludes anglers switching expenditure to other types of angling within the region.

It was, however, possible for the study to produce crude 'all species' estimates for each region, by making assumptions about how particular categories of anglers might react. A further ten 'all species' assessments were thus produced, but given the lower level of confidence attached to them, the procedures used and estimates themselves are presented in Appendix C. These issues are discussed again in Section 10.

1.5 Unlicensed anglers and overseas anglers

This study relied on names and addresses and other information in Environment Agency records of licences to fish in freshwater. The study was thus an assessment of economic dependency on licensed anglers. In addition, the telephone survey could not contact visitors from outside the UK. Given the low levels of fishing by unlicensed anglers and the small numbers of individuals who travel to the UK to fish, the economic impact of these elements is probably minor. We have attempted to provide some insight into illegal angling, but this is highly speculative and is relegated to Appendix B.

1.6 Structure of the report

- Section 2 summarises the research design.
- Section 3 outlines the survey design, method and instruments.
- Section 4 presents estimates of the amount of angling in England and Wales, split by region, species and type of surface water.
- Section 5 explains how angler expenditure was estimated.
- Section 6 presents estimates of expenditure flows between regions.
- Section 7 outlines the substitution analysis used in this study.
- Section 8 presents expenditure flows after allowing for angler substitution possibilities.
- Section 9 explains the DREAM® model.
- Section 10 provided estimates of the economic activity supported by and the economic impact of each fish species on each region.
- Section 11 provides estimates of the national economic activity supported by and the economic impact of each fish species.

1.7 Summary

Sections 10 and 11 present 33 highly detailed assessments of the dependency of income and employment on angler expenditure. Assessments for each of the English regions and Wales are in Section 10, with the three assessments for England and Wales as a whole in Section 11. These form the basis upon which ratios are calculated, enabling inferences to be drawn about the regional impact of potential increases and decreases in spending on each of the three fish species. Given some reasonable assumptions, the 33 assessments can be disaggregated by surface water types to yield a further 55 impact assessments. A further ten regional 'all species' assessments are relegated to Appendix C.

2 Overview of research design

2.1 Key steps

Economic impacts were estimated via the following stages described below:

a) Identification of total angler effort (measured in angler days) distributed across regions, fish species and surface water types.

b) Estimation of total regional angler expenditure by fish type.

c) Assessment of the extent to which regional angler expenditure by fish type will change (substitution analysis).

d) Modelling of the regional economies.

e) Assessment of the regional output, income and employment supported by total angler expenditure.

f) Assessment of the regional output, income and employment lost as a consequence of the change in angler expenditure.

g) Production of ratios for future assessments of increases and decreases in different types of freshwater angling.

Stages a), b) and c) required extensive primary data from individual anglers. An overview of the survey design is presented below and a more detailed discussion provided in Section 3.

2.2 Primary data collection

Survey design was shaped by a number of elements and requirements.

- In England and Wales, a licence is required to fish in freshwater. Subject to high levels of compliance with the requirement, there is a known population of anglers. Moreover, since the Environment Agency holds their names and addresses, a sample could be drawn and anglers contacted.

- There were ten regional origin and ten regional destination regions and six fish species/water-type combinations. A large number of observations were required to populate the potential six hundred cells. Given this, the unit used to measure variables such as angling effort and expenditure was the ‘angler day’. This had more variability and the capacity to generate more observations than the alternative of using individual anglers as the basic unit.

- Online questionnaires can generate large numbers of responses at a fraction of the cost of postal, telephone, self-completion or face-to-face surveys. Unfortunately, because of an expectation that anglers who fish more frequently are more inclined to complete an online questionnaire, there is the potential for self-selection bias.

- Fortunately, any controlled sample drawn from the Environment Agency database would be free from self-selection bias. Consequently, it was possible correct for the

bias endemic in the internet survey. A telephone survey of around 3,000 anglers generated observations on the average number of angler days per angler. Using the known total number of anglers from licence sales, these observations were scaled. In this way, population totals (angler days per region per species) were expected to be largely free from self-selection bias.

- The principal function of the internet survey was to increase the number of observations on average angler expenditure per day for each of the region/fish species combinations.

3 Survey method and instruments

3.1 Environment Agency licence and database

Anybody over 12 years of age fishing for salmon, trout, freshwater fish or eels in England, Wales or the Border Esk in Scotland requires a current fishing licence. No licence is required for sea angling. A salmon licence also covers the angler for trout and coarse fishing. Table 3.1 shows the major categories and 2006/7 fees.

Table 3.1: Licence categories and fees

Category	Full season	Concession season	Junior	Eight day	One day
Trout	£24.00	£12.00	£5.00	£8.50	£3.25
Salmon	£65.00	£32.50	£32.50	£20.50	£6.75

Licences are available via the internet, over the phone or from any post office. Concessionary licences are available to disabled anglers holding a 'Blue Badge' and senior anglers, aged 65 or over. Junior licences are available for those aged 16 or under. Bailiffs patrol angling sites; failure to produce a valid licence could result in prosecution (maximum fine £2,500).

The Environment Agency database has the name and address of each holder, plus information on gender and age and the licence applied for. As a result of internet sales, the database also holds some email addresses. The Environment Agency normally compiles information by its own regions. However for this project, addresses were sorted by government office regions (GOR) and duplicate names and addresses of anglers who may have purchased multiple licences were removed so that the totals reflected the number of individuals. The outcome was an accurate record of the number of licensed anglers by region (of residence) by licence category, as given in Table 3.2.

Table 3.2: The number of licence holders by licence category and region

	Salmon Full, 1&8d	Trout Full, 1&8d	Salmon conc	Trout conc	Salmon junior	Trout junior	Total
East Midlands	486	80,650	113	15,986	0	11,276	108,511
East Of England	406	87,465	86	13,975	2	13,758	115,692
London	649	33,427	61	4,194	4	3,250	41,585
North East	2,324	27,478	751	3,591	68	3,739	37,951
North West	4,493	82,072	1,631	16,223	96	12,311	116,826
South East	1,532	121,630	395	16,947	20	19,283	159,807
South West	2,535	64,585	796	10,046	41	9,798	87,801
Wales	4,231	30,007	1,776	5,485	143	5,544	47,186
West Midlands	1,402	97,018	634	19,669	23	13,150	131,896
Yorkshire & Humberside	1,312	84,414	325	17,719	12	12,703	116,485
Scotland	244	2,535	25	83	1	142	3,030
N. Ireland	19	253	0	8	0	13	293
Channel Isles	6	40	1	2	0	1	50
TOTAL	**19,639**	**711,574**	**6,594**	**123,928**	**410**	**104,968**	**967,113**

From the database, the Environment Agency supplied names and addresses. During its regular licence renewal reminder to internet purchasers, it also promoted the website for the internet survey plus a request for completion.

There is some unlicensed angling, as discussed in Appendix B. However, the database was an excellent basis for constructing a sampling framework and the 967,113 anglers recorded was undoubtedly the most accurate estimate of licensed freshwater angling in England and Wales.

3.2 Telephone survey

Designed simultaneously, the telephone and internet surveys ask the same sets of questions. The basic design of the questionnaire is shown in Appendix A. Anglers were initially asked questions relating to the individual (gender, age, home location) plus details of angling effort in England and Wales, by fish species (coarse, trout, salmon and sea trout) and by type of water (canals, rivers and stillwaters). They were then asked to provide details of daily expenditure on the species/region combination to which they devoted the largest number of angler days in 2005. This was followed by a request to indicate their behavioral responses if they were unable to fish for that species/region combination in 2005. Questions relating to their most popular species/region combination were then repeated for their second most popular combination. These species / region combinations were the survey cases. Thus, some anglers were asked to provide data on only one case, whilst others who fished in different regions and/or for different species were asked to provide multiple cases. Few anglers provided information on more than two cases for the telephone survey.

The telephone survey was undertaken with the aid of CATI (Computer Assisted Telephone Interview) software, designed for optimum reliability with checks and counterchecks of responses and to help generate the next number to be called by the investigator. The survey was conducted largely in the early evening. Failure to reach a

listed individual was marked as a call back. Repeated failure led to deletion. Refusal by a respondent also led to deletion.

The telephone survey was managed by a team from ADAS Ltd. From the names and addresses supplied by the Environment Agency, a random sample of 250 was taken from each of the nine regions of England and Wales, and a further sample of 250 from all other licence holders. To ensure appropriate coverage of young people and salmon anglers, quotas were set corresponding to the proportion of each category amongst the licence holders. For example for the East Midlands, 10 per cent of the sample were juniors, so a quota level of 25 was set. Similarly, 0.5 per cent of licence holders held salmon licences, so at least three salmon anglers were contacted. Inevitably, there was some resistance in the populace to unsolicited telephone calling. However, refusal rates were relatively low at 15 per cent.

For aggregation purposes, the weighting was the relative number of anglers in each region. Further stratification, for example by sex or age, was possible but the numbers sampled became very small, given stratification also for region and species

3.3 Internet survey

The internet survey was developed using SNAP software and was modified twice after going live. The basic design is shown in Appendix A. Questions on health and welfare, which related to elements of Module A of this study, were stripped out after two months when that section of the study had been completed.

Efforts were made to make the survey more user-friendly. A zoomable (PDF) map was added to provide more information on regional boundaries and exit at any stage made easier. Despite these amendments, some respondents complained about the repetitive nature of some of the questions. Unfortunately, repetition was unavoidable.

Invitations to complete the internet survey were issued via Environment Agency mailing; through e-mails to angling associations and to anglers who bought a licence over the internet; and through fishing magazines. In all, over 4,000 anglers responded to the invitation by the time of closure in early July 2006. The questionnaire design copied the telephone survey, with preliminary questioning about the individual and the distribution of their angling effort during 2005. Respondents were then invited to provide detailed information on their daily expenses for the region/fish species combinations they fished during 2005.

The maximum number of combinations anglers were allowed to provide was six. The average number of combinations obtained was 2.5, producing detailed information on 10,000 region/fish species combinations. The data on individuals and combinations were exported to Statistical Package for the Social Sciences (SPSS) and for some analyses, merged with data from the telephone survey.

3.4 Possible bias arising from age/gender response

The possibility of reducing bias by stratifying by age and/or gender was investigated. Tables 3.3 and 3.4 compare the age and gender distributions from the telephone and internet surveys with those from licence details.

Table 3.3: Distribution of respondents by gender (%)

	Internet	Telephone	Licences
Male	97.8	96.5	95.4
Female	2.2	3.5	4.6
Total	100	100	100

At any level of disaggregation, the sample size should be sufficiently large to provide a reasonable sample mean. It would be possible to disaggregate by gender, but the number of observations for females in our 90 off-diagonal elements of the matrices would be minimal and the resultant errors could well outweigh any possible gains from reducing bias. As a consequence, disaggregation by gender was not pursued.

Anglers in the 12-16 (junior) age group were covered by a quota and consequently were selected at the appropriate level. However, from Table 3.4 it appears that in the telephone survey, younger age groups (17-44) did not respond proportionately. Females are also under-represented. Such imbalances are only a cause for concern if the numbers in the groups are a significant part of the total population, and there are significant differences in key variables such as the average number of angler days, average expenditure per day or where they fish.

Table 3.4: Distribution of respondents by age (%)

Age	Internet	Telephone	Licences
12-16	3.1	9.6	10.8
17-24	4.9	4.1	10.5
25-34	15.8	6.7	14.6
35-44	28.2	15.4	20.4
45-54	26.9	22.4	17.9
55-64	17.2	27.6	15.1
Over 65	3.8	14.2	10.7
Total	100	100	100

Although there were not enough observations to justify disaggregating into the seven age groups, each with its own ten*ten*six matrix, disaggregating between anglers over and under 45 could be justified if there were significant differences in either mean angler days or mean expenditures.

Table 3.5, however, is reassuring, since there are no significant differences in angler days between the groups. The number of days is remarkably similar, except for the over 65 group. Although this group is slightly over-represented, the potential level of any bias is small.

Table 3.5: Angler days by age group

Age	Mean	N	Std. Deviation
12-16	26.9	289	50.7
17-24	27.1	124	39.5
25-34	25.3	204	31.0
35-44	25.7	465	36.3
45-54	28.5	678	40.4
55-64	29.9	833	38.8
Over 65	34.7	430	46.1
Total	28.9	3,023	40.8

Table 3.6 gives the level of expenditure by age group from the telephone survey. There were clearly significant differences in mean expenditure, though as explained above, disaggregation using the seven age categories was simply not feasible.

Table 3.6: Mean expenditure per day by age group

Age	Mean	Number	Std. Deviation
12-16	£2.0	289	22.6
17-24	£9.7	124	70.7
25-34	£44.2	204	306.7
35-44	£37.1	465	252.8
45-54	£36.8	678	223.1
55-64	£14.7	833	76.3
Over 65	£27.0	430	252.3
Total	£25.4	3,023	195.8

Table 3.7 gives the mean expenditure under the more feasible two-part disaggregation. This table shows that the difference is not significant enough to warrant a two-part split.

Table 3.7: Mean expenditure above and below age 45

	17-44	Over 45	Total
Mean	25.91	25.17	25.43

The above analysis suggests that the internet survey under-sampled the young, the old and females. The overall conclusion, however, was that given the sample size and the significant disaggregation already required, further disaggregation by age and/or gender was not likely to increase the accuracy of any estimates and might lead to errors resulting from inferences being drawn from small sample sizes.

3.5 Comparison of telephone and internet samples

Whilst on theoretical grounds there is an expectation that anglers who fish more often would be more likely to complete the online questionnaire, there are less compelling reasons to suggest significantly different levels of daily expenditure or destinations for this group. This section examines these issues.

3.5.1 Comparison of income distributions

Table 3.8 shows that internet respondents have higher incomes than phone respondents, implying a higher total expenditure if not a higher daily expenditure.

Table 3.8: Income distribution: Internet and telephone respondents (%)

Household income	Internet	Telephone	Total
Less than £5,000	1.3	2.0	1.5
£5,001-£10,000	4.1	7.7	5.3
£10,001-£20,000	13.6	23.4	16.9
£20,001-£30,000	22.2	27.3	23.9
£30,001-£40,000	22.1	18.3	20.8
£40,001-£50,000	14.7	9.2	12.9
£50,001-£70,000	13.1	7.6	11.3
£70,001-£90,000	4.2	2.6	3.7
Over £90,000	4.6	2.0	3.7

3.5.2 Comparison of regional distribution of responses

The telephone survey had equal numbers from each region. Table 3.9 compares the percentage of respondents from each region for the two surveys. This shows over-representation of London, the South East and visitors to the UK in the internet survey.

Table 3.9: Distribution of internet responses by region (%)

	Internet	Telephone
North East	3.08	3.92
North West	10.85	12.08
Yorks & Humber	7.81	12.05
West Midlands	9.37	13.64
East Midlands	9.16	11.22
East of England	11.24	11.96
London	8.17	4.3
South East	23.61	16.52
South West	10.89	9.08
Wales	5.20	4.88
Outside	0.64	0.34
Total	100	100

3.5.3 Comparison of mean angler days

There is an expectation of higher levels of angler effort from internet respondents both fishing within their home region and in other regions. Table 3.10 gives mean angler days split between home and away regions for the two survey instruments.

Table 3.10: Balance between home and away angling by respondents

	Source	Mean home	Mean away	Total	% Away
North East	Internet	50	11	61	18.4
	Telephone	20	6	26	23.0
North West	Internet	56	8	65	13.0
	Telephone	31	5	36	13.4
Yorks & Humber	Internet	68	14	82	16.7
	Telephone	27	9	36	24.5
West Midlands	Internet	57	11	68	15.9
	Telephone	32	7	39	17.7
East Midlands	Internet	60	15	75	20.3
	Telephone	32	4	36	11.2
East of England	Internet	47	14	61	23.5
	Telephone	20	13	33	39.5
London	Internet	19	27	46	58.5
	Telephone	2	20	22	91.9
South East	Internet	44	7	50	13.7
	Telephone	22	4	25	14.7
South West	Internet	44	4	48	9.0
	Telephone	23	3	26	11.3
Wales	Internet	56	9	66	14.1
	Telephone	27	3	30	9.8

In every case the internet reports higher figures, ranging between double and treble the number found in the telephone survey. This disparity has implications for procedures used to estimate population statistics relating to total angler effort.

There is, however, no clear pattern in terms of the percentage of time spent outside the area. The dedication of internet respondents to their angling might simply result in more days both at home and away. This is discussed further in Section 3.5.6.

3.5.4 Fishing for species in locations

The surveys generated data on six combinations of fish species and surface water types. As seen in Table 3.11, in every case the internet respondent was more likely to have fished that type. Internet respondents fished more often and appeared to fish a greater range of species and surface water types.

Table 3.11: Distribution of fishing type by respondents (%)

	Internet	Telephone	All Respondents
Coarse angling on rivers			
No	29.1	73.5	63.5
Yes	70.9	26.5	36.5
	100.0	100.0	100.0
Coarse angling on canals			
No	64.8	90.9	85.1
Yes	35.2	9.1	14.9
	100.0	100.0	100.0
Coarse angling on stillwaters			
No	19.8	50.0	43.2
Yes	80.2	50.0	56.8
	100.0	100.0	100.0
Trout angling on stillwaters			
No	75.0	82.5	80.8
Yes	25.0	17.5	19.2
	100.0	100.0	100.0
Trout angling on rivers			
No	82.4	92.9	90.6
Yes	17.6	7.1	9.4
	100.0	100.0	100.0
Salmon angling			
No	89.8	96.2	94.8
Yes	10.2	3.8	5.2
	100.0	100.0	100.0

3.5.5 Comparison of differences in daily expenditure

Table 3.12: Expenditure patterns by sampling method (%)

	Internet	Telephone	Total
Nothing	1.9	7.8	3.8
Less than £1	1.1	0.3	0.9
£1 to £5	9.4	9.5	9.4
£5 to £10	24.1	21.1	23.1
£11 to £25	34.1	30.4	32.9
£26 to £50	19.0	18.0	18.7
£51 to £100	5.7	7.1	6.2
£101 to £200	2.6	2.3	2.5
Above £200	2.1	3.5	2.5
Total	100.0	100.0	100.0
Observations	5,759	2,688	8,447

The most important feature in Table 3.12 is the number of telephone respondents who apparently spent nothing on their fishing trips. However, more of those interviewed on the telephone claimed daily expenditure in excess of £50 (12.4 versus 10.4 per cent), which resulted in a slightly higher mean spend of £33.4 compared to £29.9[2]. An F-test confirmed that differences between the distributions were more likely to be a result of chance than systematic. Thus, they could be treated as a single sample. A similar result was observed in a survey of anglers in Scotland by Radford *et al*. (2004) that used an internet questionnaire and other survey instruments.

3.5.6 Comparison of destination patterns

One problem that emerged was that the internet survey picked up observations on the distribution of angler effort that were not identified by the phone survey. For example, the internet survey might reveal anglers, say, in the North East who had fished for trout in London, whilst the phone survey had no observations for that origin/destination/fish combination. Given the six hundred feasible cells (ten origins * ten destinations * six fish types) this was not surprising, particularly since the telephone survey generated less than 100 anglers travelling to other regions to fish.

Exclusive reliance on the telephone survey to estimate totals would result in zero angler days in some cells for which we had internet observations. Understandably, some respondents would be confused if this report were, on the basis of the telephone survey, to declare zero observations for angler activity for which they had supplied information.

We resolved the problem of incorrect zero cells through selective use of the internet survey for those situations where we had incorrect zeros. A key hypothesis was that, whilst the total number of days spent angling at home and away estimated from the internet survey was biased (and should not be used in isolation), the pattern of visits would not be. By pattern of visits we mean the percentage of angler days from region A which are fished in locations B rather than C, D, E and so on). It should therefore be possible to combine some elements of the internet and telephone surveys.

The normal parametric test for the similarity of distributions is the F-test. However, there was a major problem in the lack of data from the telephone survey. In effect, we had fewer than 100 observations to complete the off-diagonals in three 10*10 matrices (270 cells). The chance of obtaining a statistically significant match between the distribution generated by the telephone survey and the distribution generated by the internet survey would appear *a priori* to be extremely small. One approach therefore was to simply reduce the significance criterion. Anything above 0.5 would suggest that similarity was more likely than not. If the F-test did not even generate that level of probability, then there would appear to be a good case for suggesting that even selective use of data form the internet survey might bias the results.

An alternative test was to examine the ranking of choices made by anglers from a specific area. A test of the commonality of these choices is Spearman's Rank Correlation. Table 3.13 gives the rank correlation and F-test results for the ten regions and the distribution of regions visited by anglers travelling from these regions.

[2] These means were estimated from raw data. Estimated means were obtained using age group means and group frequencies. This would appear to have suppressed the variance within each age group and biased the total mean downwards.

Table 3.13: Relationship between visiting patterns

	Rank (R)	F-test
North East	0.72	0.87
North West	0.64	0.95
Yorks & Humber	0.70	0.84
West Midlands	0.85	0.99
East Midlands	0.44	0.96
East of England	0.55	0.78
London	0.60	0.64
South East	0.81	1.00
South West	0.68	0.94
Wales	0.82	0.97
External	0.64	0.38

The 95 per cent significance level for Rs was 0.5515. At this level, we would expect one in 20 tests to give an R of less than 0.5515 just by chance. Only the East Midlands failed to reach this level. Conversely, East Midlands was one of only three regions to reach the 95 per cent level for the F-test. There was believed to be enough evidence from the rank correlations and F-test to suggest similar underlying patterns for the internet and phone surveys. In conclusion, since the control variable (percentage away) remained with the phone sample, it appeared that increases in accuracy were possible with only minimal possibility of bias by incorporating the destination distribution from the internet survey.

3.5.7 Conclusion on approach

The analysis above confirmed that simply incorporating the results from the internet survey would bias the number of angler days significantly upward and potentially exaggerate the expenditure and economic impact of freshwater fishing. However, it also confirmed that a greater degree of accuracy was possible if the distribution pattern and daily expenditure (particularly for some of the least popular combinations) were incorporated into the results.

4 Estimated angler effort

The procedures used to estimate the distribution of angler days is described in Section 4.1 below. Section 4.2, 4.3, 4.4 and 4.5 provide estimates of total angler effort, coarse effort, trout effort and salmon & sea trout effort, respectively.

4.1 Estimation procedures

As discussed in Section 3, licence sales and the telephone survey provided largely unbiased estimates of the total number of days and proportion of total days devoted to angling locally and outside each region.

Visiting angler days were estimated by recording the regions and days visited by anglers from each region. For example, the telephone survey recorded accurately the number of angler days an angler from the North East spends outside the North East, but there were not enough data to accurately estimate the number of days or average expenditure of anglers from the North East who fish in, say, the North West. In other words, the phone survey did not permit accurate estimation of the total number of visiting angler days to a specific region. On its own, the survey could not reliably estimate the number of visiting angler days (or average expenditure per visiting angler day) in the North West.

When developing the origin-destination matrices of angler days, to achieve the appropriate number of data points it was necessary to selectively integrate the results of the internet survey. As can be seen from the following tables (Tables 4.1, 4.2 and 4.3), even after combining, the number of data points available in some cells was quite low. On the other hand, whilst the variance was high, we were dealing with cells that had small numbers and correspondingly small impacts on estimates of total angler days and expenditures of a region's visiting anglers. In Table 4.1 angler origins are given by the columns, with rows representing the destinations. Thus, there were 786 coarse anglers normally resident in London and 385 anglers who fished in London for coarse fish (252 of them from London). The same format is used in Tables 4.2 and 4.3.

Table 4.1: Number of telephone and internet observations on coarse angling

	Origins										
Coarse	**North East**	**North West**	**Yorks & Humb**	**West Midlands**	**East Midlands**	**East of England**	**London**	**South East**	**South West**	**Wales**	**Total**
North East	257	19	7	10	5	0	6	14	11	0	329
North West	21	682	26	18	25	11	11	18	9	11	832
Yorkshire and Humberside	45	31	548	23	23	20	13	18	25	3	749
West Midlands	8	53	22	666	32	26	17	77	39	29	969
East Midlands	11	26	78	51	665	136	13	45	11	16	1,052
East of England	8	14	20	26	35	761	53	81	29	6	1,033
London	1	3	6	6	11	28	252	62	13	3	385
South East	14	28	19	31	32	65	347	1,283	62	12	1,893
South West	12	38	11	39	28	58	59	155	674	23	1,097
Wales	6	26	3	30	17	7	15	26	8	278	416
Total	383	920	740	900	873	1,112	786	1,779	881	381	8,755

Table 4.2: Number of telephone and internet observations on trout angling

	Origins										
Trout	**North East**	**North West**	**Yorks & Humb**	**West Midlands**	**East Midlands**	**East of England**	**London**	**South East**	**South West**	**Wales**	**Total**
North East	150	9	1	2	4	5	1	6	1	1	180
North West	10	141	7	6	0	4	4	14	8	0	194
Yorkshire and Humberside	14	10	71	4	3	1	2	5	2	0	112
West Midlands	1	4	0	61	4	2	1	5	1	11	90
East Midlands	2	3	5	11	108	22	0	5	5	8	169
East of England	0	2	4	2	7	47	11	9	5	4	91
London	2	0	1	2	1	1	23	3	1	0	34
South East	3	2	2	7	5	8	52	187	18	4	288
South West	0	1	10	11	7	8	19	28	185	15	284
Wales	2	20	2	9	12	11	13	6	14	259	348
Total	184	192	103	115	151	109	126	268	240	302	1,790

Table 4.3: Number of telephone and internet observations on salmon angling

	Origins										
Salmon	**North East**	**North West**	**Yorks & Humb**	**West Midlands**	**East Midlands**	**East of England**	**London**	**South East**	**South West**	**Wales**	**Total**
North East	35	4	2	5	0	2	1	3	1	3	56
North West	3	54	7	3	0	0	2	8	2	5	84
Yorkshire and Humberside	2	2	14	4	0	0	2	4	1	1	30
West Midlands	1		0	6	4	2	0	0	0	0	13
East Midlands	0	0	0	1	0	1	0	0	0	0	2
East of England	0	0	0	0	0	0	0	0	0	0	0
London	2	0	1	1	0	1	0	1	1	1	8
South East	1	1	0	2	0	2	3	18	0	0	27
South West	2	6	0	1	0	2	0	6	17	5	39
Wales	1	11	0	8	5	2	7	17	13	76	140
Total	47	80	24	33	14	15	15	58	36	91	413

The procedure for estimating angler days had the following stages:

1. Telephone survey data were downloaded into the software package Statistical Package for the Social Sciences (SPSS). Output was then generated on the mean number of angler days each angler licence type spends on each of the six fish species/surface water types in each region[3].

2. Total angler days for each regional fish species/surface water type were calculated by scaling mean angler days by the total number of anglers of each licence type in each region.

3. For each region, the number of days spent outside the region was estimated, such as number of days North East salmon anglers spent outside the North East.

4. For each region, SPSS output was generated on the distribution of destination regions that the resident anglers visit. For example, this stage would estimate the percentage of visitor angler days North East salmon anglers fished in the North West, West Midlands and so on. As explained in Section 3.6, it was necessary, to use primary data from the phone and internet surveys to calculate percentages.

5. This distribution was then applied to angler days in each region to obtain full origin-destination (OD) matrices of angler days. A typical cell of the salmon matrix would give the total number of days the North East salmon angler spends in the North West, West Midlands and so on.

6. The results were inspected to identify unusual patterns of angler activity. For example, some individuals claimed to have fished salmon in the East of England whilst there was little salmon fishing recorded for West Midlands (and the Severn)

7. The coarse river, coarse stillwater and coarse canal angler days were combined to form a regional OD matrix of coarse angler days. The same procedure was applied to trout river and trout stillwater angler days. In this way, OD matrices were estimated for the three species types (coarse, trout, salmon and sea trout)

[3] The fish species/surface water types were: coarse river, coarse stillwater, coarse canal, trout river, trout stillwater, salmon and sea trout.

4.2 Total angler effort in England and Wales in 2005

Total angler effort expended on coarse, trout and salmon & sea trout fishing in England and Wales was estimated to be 30 million angler days. The tables in Section 4.2 subdivide the total for England and Wales by the following criteria:

- fish species;
- type of water;
- regional origin of anglers;
- regional origin; and
- regional location of fisheries.

4.2.1 Total angler effort by fish species

By a considerable margin, coarse angling is the most popular form of angling in England and Wales. Salmon and sea trout angling is a relatively minor activity.

Table 4.4: Total angler days by fish species

Fish species	Angler days (millions)
Coarse	**26.4**
Trout	**3.4**
Salmon & sea trout	**0.4**
Total	**30.2**

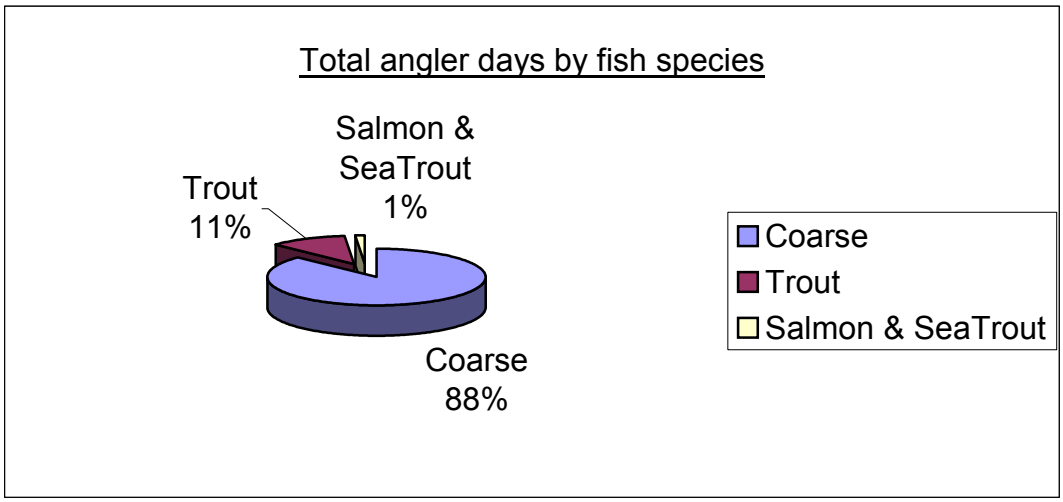


Figure 4.1: Breakdown of angler days by fish species

4.2.2 Total angler effort by type of water

In the angler surveys, stillwaters were defined as lakes, ponds or reservoirs. The relative importance of stillwaters is evident from the table below.

Table 4.5: Total angler days by type of water

Type of water	Angler days (millions)
Stillwaters	**17.7**
Rivers	**10.1**
Canals	**2.4**
Total	**30.2**

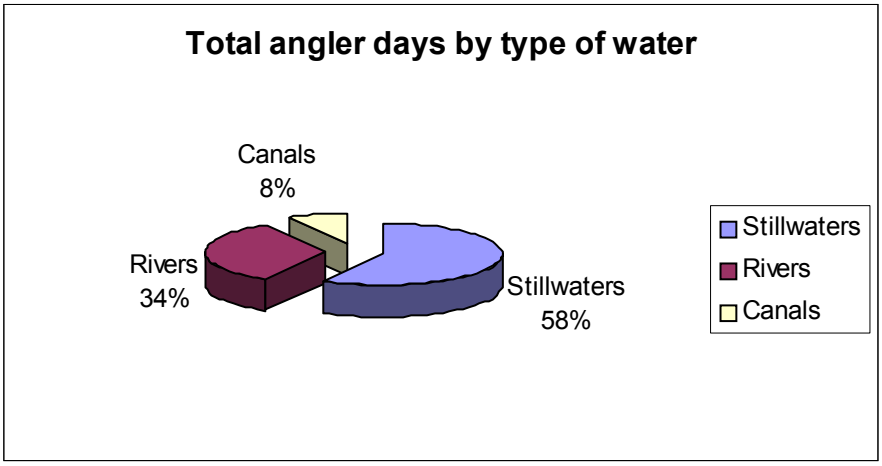


Figure 4.2: Breakdown of angler days by type of water

4.2.3 Total angler effort by regional origin of anglers

The regional data in the table below are based on angler effort in England and Wales originating from that region. Of the 30 million angler days during 2005, 24 million (79 per cent) were undertaken by anglers fishing in their home region. Not unexpectedly, most of the angler effort by Londoners (92 per cent) was directed outside London.

Table 4.6: Total angler days by angler origin

Angler origin	Total days	Home days	Away days
North East	968,160	745,257	222,903
		77.0%	23.0%
North West	4,205,126	3,642,920	562,206
		86.6%	13.4%
Yorks and Humber	4,159,643	3,156,269	1,003,375
		75.9%	24.1%
West Midlands	5,236,849	4,346,284	890,565
		83.0%	17.0%
East Midlands	3,781,410	3,382,184	399,226
		89.4%	10.6%
East of England	3,236,240	1,904,323	1,331,917
		58.8%	41.2%
London	911,621	74,925	836,697
		8.2%	91.8%
South East	4,052,126	3,464,679	587,447
		85.5%	14.5%
South West	2,286,714	2,024,640	262,075
		88.5%	11.5%
Wales	1,388,153	1,249,753	138,400
		90.0%	10.0%
Scotland	21,375	-	21,375
		0.0%	100.0%
Other	1,728	-	1,728
		0.0%	100.0%
Total	30,249,151	23,991,232	6,257,919
		79.3%	20.7%

4.2.4 Total angler days by regional origin and by regional location of fisheries

In Table 4.7, the regional origin of anglers is given by the columns, with destinations recorded in the rows. Thus from the table, the total angler effort by Londoners is 911,621 whereas total angler effort expended in London is 352,741. The totals at the bottom of the table relate to the destinations. Of the 352,741 days fished in London, 74,925 (21 per cent) were undertaken by Londoners.

Table 4.7: Total angler days by angler origin and by fishing location

	Regional origins of anglers														
	North East	North West	Yorks & Humber	West Midlands	East Midlands	East of England	London	South East	South West	Wales	Scotland	Other	Total days	Home days	Home%
North East	745,257	127,424	167,734	94,539	17,556	79,896	12,055	4,629	8,537	2,211	282	36	1,260,158	745,257	59.1%
North West	38,926	3,642,920	97,689	52,931	41,974	69,783	3,008	7,558	453	50,399	7,812	136	4,013,588	3,642,920	90.8%
Yorks & Humber	125,069	63,352	3,156,269	59,592	15,022	71,665	5,115	2,759	2,485	1,172	1,339	639	3,504,479	3,156,269	90.1%
West Midlands	954	131,022	50,980	4,346,284	131,773	99,053	3,280	30,652	29,636	35,505	352	83	4,859,575	4,346,284	89.4%
East Midlands	7,360	44,622	580,888	237,146	3,382,184	680,503	13,171	30,443	2,223	8,154	1,682	500	4,988,876	3,382,184	67.8%
East Of England	4,120	13,283	36,602	60,519	145,617	1,904,323	84,167	90,666	660	1,070	3,305	56	2,344,387	1,904,323	81.2%
London	2,907	10,405	459	2,461	2,186	100,284	74,925	149,081	9,087	917	0	28	352,741	74,925	21.2%
South East	3,680	40,537	11,801	35,423	12,473	164,807	607,945	3,464,679	179,522	8,766	2,448	83	4,532,163	3,464,679	76.4%
South West	7,651	33,507	8,220	189,454	20,571	29,831	98,571	236,043	2,024,640	30,205	714	167	2,679,574	2,024,640	75.6%
Wales	32,236	98,056	49,001	158,500	12,055	36,095	9,385	35,615	29,472	1,249,753	3,440	0	1,713,609	1,249,753	72.9%
Total	968,160	4,205,126	4,159,643	5,236,849	3,781,410	3,236,240	911,621	4,052,126	2,286,714	1,388,153	21,375	1,728	30,249,151	23,991,232	79.3%

4.3 Coarse angler effort

From Table 4.1, there was an estimated total of 26.4 million coarse angler days during 2005. Tables in this section subdivide total coarse angler effort by the following criteria:

- type of water;
- regional origin of anglers;
- regional origin and regional location of fisheries;
- coarse days on rivers by regional origin of anglers;
- coarse days on rivers by angler origin and by river location;
- coarse days on canals by angler origin;
- coarse days on canals by angler origin and by canal location;
- coarse days on stillwater by angler origin;
- coarse days in stillwater by angler origin and by stillwater location.

4.3.1 Total coarse angler days by type of water

Table 4.8: Total coarse angler days by type of water

Type of water	Angler days (millions)
Stillwaters	**15.4**
Rivers	**8.6**
Canals	**2.4**
Total	**26.4**

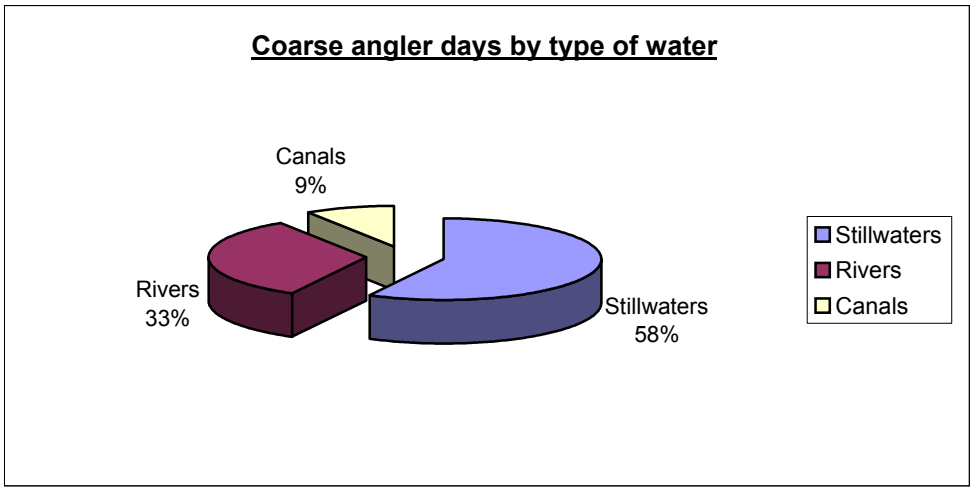


Figure 4.3: Breakdown of coarse angler days by type of water

4.3.2 Total coarse angler days by regional origin of anglers

Table 4.9: Total coarse angler days by angler origin

Angler origin	Total days	Home days	Away days
North East	666,830	469,609	197,221
		70.4%	29.6%
North West	3,606,878	3,164,743	442,135
		87.7%	12.3%
Yorks and Humber	3,695,782	2,819,300	876,482
		76.3%	23.7%
West Midlands	4,819,689	4,106,317	713,373
		85.2%	14.8%
East Midlands	3,416,047	3,041,214	374,833
		89.0%	11.0%
East of England	3,110,506	1,869,997	1,240,510
		60.1%	39.9%
London	809,196	58,390	750,806
		7.2%	92.8%
South East	3,625,512	3,097,674	527,838
		85.4%	14.6%
South West	1,871,874	1,656,731	215,143
		88.5%	11.5%
Wales	752,005	638,557	113,449
		84.9%	15.1%
Scotland	10,828	0	10,828
		0.0%	100.0%
Other	1,584	0	1,584
		0.0%	100.0%
Total	26,386,733	20,922,531	5,464,202
		79.3%	20.7%

4.3.3 Total coarse angler days by angler origin and regional location of coarse fisheries

In Table 4.10, the regional origin of anglers is given by the columns, with destinations recorded in the rows. Thus from the table, the total coarse angler effort by anglers from the West Midlands is 4,819,689. The coarse angler effort directed at coarse fisheries located in the West Midlands is 4,592,190. Totals at the right of the table relate to the destinations. Thus, of the 4,592,190 coarse days fished in the West Midlands, 4,106,317 (89 per cent) were undertaken by anglers resident in the West Midlands.

Table 4.10: Total coarse angler days by angler origin and by fishing location

	Regional origins of anglers														
	North East	North West	Yorks & Humber	West Midlands	East Midlands	East of England	London	South East	South West	Wales	Scotland	Other	Total days	Home days	Home%
North East	469,609	100,557	150,825	89,558	9,289	66,420	620	1,795	220	0	164	0	889,057	469,609	52.8%
North West	35,301	3,164,743	63,380	47,249	38,795	62,730	1,704	7,481	440	48,315	4,087	28	3,474,253	3,164,743	91.1%
Yorks & Humber	110,400	38,651	2,819,300	59,293	13,114	65,078	4,958	2,095	1,980	153	916	639	3,116,577	2,819,300	90.5%
West Midlands	954	130,095	50,980	4,106,317	131,137	89,902	2,479	29,324	27,938	22,629	352	83	4,592,190	4,106,317	89.4%
East Midlands	7,360	44,622	551,591	207,835	3,041,214	673,257	13,014	30,222	1,980	7,645	775	500	4,580,015	3,041,214	66.4%
East Of England	2,862	4,714	35,364	60,220	145,617	1,869,997	81,340	90,666	660	1,070	3,124	56	2,295,689	1,869,997	81.5%
London	0	3,457	459	2,162	2,186	92,585	58,390	148,417	8,359	917	0	28	316,960	58,390	18.4%
South East	3,680	40,537	10,563	18,529	11,201	157,328	576,506	3,097,674	167,847	8,256	634	83	4,092,840	3,097,674	75.7%
South West	5,316	25,139	7,808	165,527	16,119	16,437	66,002	197,790	1,656,731	24,463	493	167	2,181,991	1,656,731	75.9%
Wales	31,348	54,363	5,511	62,999	7,376	16,773	4,183	20,048	5,720	638,557	282	0	847,161	638,557	75.4%
Total	666,830	3,606,878	3,695,782	4,819,689	3,416,047	3,110,506	809,196	3,625,512	1,871,874	752,005	10,828	1,584	26,386,733	20,923,532	79.3%

4.3.4 Coarse angler days on rivers by regional origin of anglers

Table 4.11: Coarse angler days on rivers

Angler origin	Total days	Home days	Away days
North East	198,949	146,035	52,914
		73.4%	26.6%
North West	1,195,708	1,004,588	191,120
		84.0%	16.0%
Yorks and Humber	1,274,139	973,841	300,298
		76.4%	23.6%
West Midlands	1,395,485	1,221,309	174,176
		87.5%	12.5%
East Midlands	980,366	844,774	135,593
		86.2%	13.8%
East of England	1,171,272	757,288	413,984
		64.7%	35.3%
London	221,548	40,121	181,427
		18.1%	81.9%
South East	1,396,565	1,104,117	292,448
		79.1%	20.9%
South West	544,792	479,012	65,780
		87.9%	12.1%
Wales	219,546	190,224	29,322
		86.6%	13.4%
Scotland	4,088	0	4,088
		0.0%	100.0%
Other	120	0	120
		0.0%	100.0%
Total	8,602,579	6,761,309	1,841,270
		78.6%	21.4%

4.3.5 Coarse angler days on rivers by angler origin and regional location of rivers

In Table 4.12, the regional origin of anglers is given by the columns, with destinations recorded in the rows. Thus from the table, the total coarse angler effort on rivers by anglers from the North East is 198,949 days. Coarse angler effort directed at coarse river fisheries located in the North East is 261,401. The totals at the right of the table relate to the destinations. Thus, of the 261,401 coarse days on rivers in the North East, 56 per cent were undertaken by anglers resident in the North East.

Table 4.12: Coarse angler days on rivers by angler origin and by river location

	Regional origins of anglers													
	North East	North West	Yorks & Humber	West Midlands	East Midlands	East of England	London	South East	South West	Wales	Scotland	Other	Total	HOME%
North East	146,035	18,810	60,438	14,824	274	18,922	186	1,613	179	0	119	0	261,401	55.9%
North West	8,765	1,004,588	28,396	12,484	2,192	0	536	4,287	347	7,520	1,668	0	1,070,782	93.8%
Yorks & Humber	38,860	19,912	973,841	3,277	7,684	20,207	309	833	880	0	39	0	1,065,841	91.4%
West Midlands	175	60,594	12,523	1,221,309	56,860	19,259	1,867	15,384	11,279	10,441	264	64	1,410,019	86.6%
East Midlands	305	30,365	172,301	63,476	844,774	221,708	4,217	17,255	761	1,564	460	40	1,357,226	62.2%
East Of England	986	3,165	12,800	5,684	53,323	757,288	16,635	46,024	340	763	810	0	897,818	84.3%
London	0	1,996	281	0	1,082	26,328	40,121	82,199	1,968	0	0	16	153,991	26.1%
South East	2,048	10,721	6,057	9,834	5,236	85,809	140,709	1,104,117	45,614	745	348	0	1,411,240	78.2%
South West	1,352	14,023	4,080	33,826	6,638	10,220	15,216	114,381	479,012	8,288	245	0	687,282	69.7%
Wales	424	31,534	3,423	30,770	2,305	11,532	1,751	10,471	4,411	190,224	135	0	286,980	66.3%
Total	198,949	1,195,708	1,274,139	1,395,485	980,366	1,171,272	221,548	1,396,565	544,792	219,546	4,088	120	8,602,579	

4.3.6 Coarse angler days on canals by regional origin of anglers

Table 4.13: Coarse angler days on canals by angler origin

Angler origin	Total days	Home days	Away days
North East	6,028	4,410	1,617
		73.2%	26.8%
North West	247,566	232,829	14,737
		94.0%	6.0%
Yorks and Humber	417,726	330,528	87,198
		79.1%	20.9%
West Midlands	647,811	564,756	83,055
		87.2%	12.8%
East Midlands	323,923	307,504	16,419
		94.9%	5.1%
East of England	196,548	83,298	113,250
		42.4%	57.6%
London	42,509	11,487	31,022
		27.0%	73.0%
South East	378,335	344,938	33,397
		91.2%	8.8%
South West	123,370	97,879	25,491
		79.3%	20.7%
Wales	37,356	28,413	8,943
		76.1%	23.9%
Scotland	41	0	41
		0.0%	100.0%
Other	15	0	15
		0.0%	100.0%
Total	2,421,227	2,006,043	415,184
		82.9%	17.1%

4.3.7 Coarse angler days on canals by angler origin and regional location of canals

In Table 4.14, the regional origin of anglers is given by the columns, with destinations recorded in the rows. Thus from the table, the total coarse angler effort on canals by anglers from the South East is 378,355 days. Coarse angler effort directed at coarse canal fisheries located in the South East is 407,715. The totals at the right of the table relate to the destinations. Thus, of the 407,715 coarse days on canals in the South East, 85 per cent were undertaken by anglers resident in the South East.

Table 4.14: Coarse angler days on canals by angler origin and by canal location

	Regional origins of anglers													
	North East	**North West**	**Yorks & Humber**	**West Midlands**	**East Midlands**	**East of England**	**London**	**South East**	**South West**	**Wales**	**Scotland**	**Other**	**Total**	**HOME%**
North East	4,410	5,749	14,928	14,567	0	8,746	90	0	0	0	0	**0**	48,490	9.1%
North West	102	232,829	4,981	820	3,165	11,771	425	1,035	18	2,218	0	**0**	257,365	90.5%
Yorks & Humber	1,203	998	330,528	1,825	798	8,248	75	813	195	0	0	**3**	344,687	95.9%
West Midlands	0	1,699	16,227	564,756	9,427	17,886	162	1,904	1,713	4,337	7	**0**	618,119	91.4%
East Midlands	86	791	44,133	24,786	307,504	36,737	613	1,793	524	1,216	12	**9**	418,206	73.5%
East Of England	0	415	5,739	16,927	1,583	83,298	2,307	7,295	226	0	0	**0**	117,790	70.7%
London	0	167	0	0	406	11,357	11,487	13,780	1,140	0	0	**2**	38,340	30.0%
South East	199	1,390	107	735	354	12,753	25,565	344,938	21,675	0	0	**0**	407,715	84.6%
South West	27	788	990	14,360	243	3,277	1,693	6,779	97,879	1,172	0	**0**	127,207	76.9%
Wales	0	2,740	93	9,034	443	2,473	91	0	0	28,413	21	**0**	43,308	65.6%
Total	6,028	247,566	417,726	647,811	323,923	196,548	42,509	378,335	123,370	37,356	41	15	2,421,227	

4.3.8 Coarse angler days on stillwaters by regional origin of anglers

Table 4.15: Coarse angler days on stillwaters by angler origin

Angler origin	Total days	Home days	Away days
North East	461,853	319,164	142,689
		69.1%	30.9%
North West	2,163,604	1,927,326	236,278
		89.1%	10.9%
Yorks and Humber	2,003,917	1,514,931	488,986
		75.6%	24.4%
West Midlands	2,776,393	2,320,252	456,141
		83.6%	16.4%
East Midlands	2,111,757	1,888,935	222,822
		89.4%	10.6%
East of England	1,742,686	1,029,411	713,276
		59.1%	40.9%
London	545,139	6,782	538,357
		1.2%	98.8%
South East	1,850,612	1,648,619	201,994
		89.1%	10.9%
South West	1,203,712	1,079,840	123,872
		89.7%	10.3%
Wales	495,103	419,920	75,183
		84.8%	15.2%
Scotland	6,700	0	6,700
		0.0%	100.0%
Other	1,449	0	1,449
		0.0%	100.0%
Total	15,362,927	12,155,179	3,207,748
	461,853	319,164	142,689

4.3.9 Coarse angler days on stillwaters by angler origin and regional location of stillwaters

In Table 4.16, the regional origin of anglers is given by the columns, with destinations recorded in the rows. Thus from the table, the total coarse angler effort on stillwaters by anglers from Wales is 495,103 days. Coarse angler effort directed at coarse stillwater fisheries located in Wales is 516,873. The totals at the right of the table relate to the destinations. Thus, of the 516,873 coarse days on stillwaters in Wales, 79 per cent were undertaken by anglers resident in Wales.

Table 4.16: Coarse angler days on stillwater by angler origin and by stillwater location

	Regional origins of anglers													
	North East	**North West**	**Yorks & Humber**	**West Midlands**	**East Midlands**	**East of England**	**London**	**South East**	**South West**	**Wales**	**Scotland**	**Other**	**Total**	**HOME%**
North East	319,164	75,998	75,460	60,166	9,015	38,752	344	182	41	0	46	**0**	579,166	55.1%
North West	26,434	1,927,326	30,003	33,945	33,439	50,959	743	2,159	75	38,576	2,419	**28**	2,146,106	89.8%
Yorks & Humber	70,338	17,742	1,514,931	54,191	4,632	36,623	4,574	449	904	153	877	**636**	1,706,049	88.8%
West Midlands	779	67,802	22,229	2,320,252	64,850	52,757	450	12,037	14,946	7,850	81	**20**	2,564,052	90.5%
East Midlands	6,969	13,466	335,157	119,574	1,888,935	414,811	8,184	11,174	695	4,865	303	**451**	2,804,583	67.4%
East Of England	1,877	1,134	16,826	37,608	90,711	1,029,411	62,397	37,348	93	307	2,314	**56**	1,280,080	80.4%
London	0	1,293	178	2,162	698	54,900	6,782	52,438	5,252	917	0	**10**	124,629	5.4%
South East	1,433	28,426	4,400	7,960	5,611	58,766	410,232	1,648,619	100,558	7,511	286	**83**	2,273,885	72.5%
South West	3,937	10,328	2,738	117,341	9,238	2,940	49,093	76,630	1,079,840	15,003	248	**167**	1,367,503	79.0%
Wales	30,924	20,089	1,996	23,195	4,629	2,768	2,341	9,577	1,309	419,920	125	**0**	516,873	81.2%
Total	461,853	2,163,604	2,003,917	2,776,393	2,111,757	1,742,686	545,139	1,850,612	1,203,712	495,103	6,700	1,449	15,362,927	

4.4 Trout angler effort

From Table 4.1 there was an estimated total of 3.4 million trout angler days during 2005. The tables in this section subdivide total trout angler effort by the following criteria:

- type of water;
- regional origin of anglers;
- regional origin and regional location of fisheries;
- trout days on rivers by regional origin of anglers;
- trout days on rivers by angler origin and by river location;
- trout days on stillwater by regional origin of anglers;
- trout days on stillwater by angler origin and by river location.

4.4.1 Total trout angler days by type of water

Table 4.17: Total trout angler days by type of water

Type of water	Angler days (millions)
Stillwaters	**2.3**
Rivers	**1.1**
Total	**3.4**

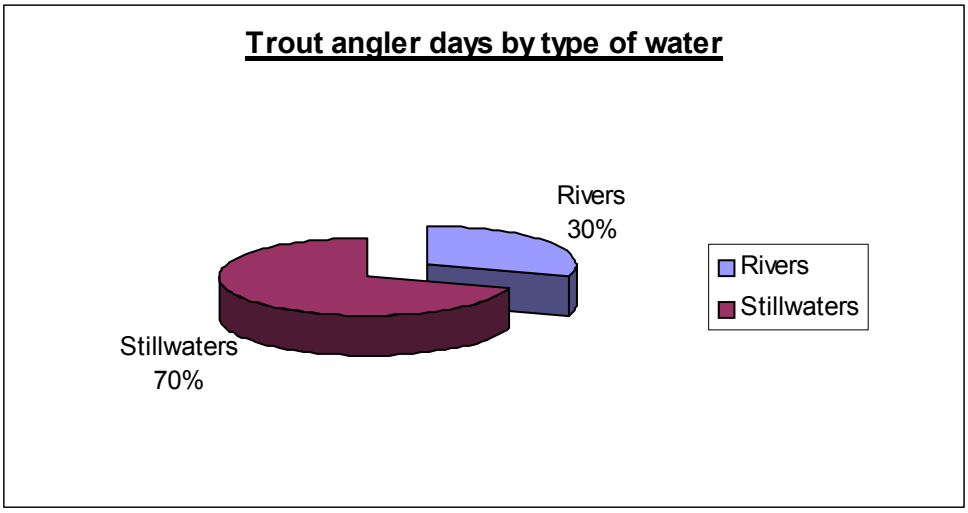


Figure 4.4: Breakdown of trout angler days by type of water

4.4.2 Total trout angler days by regional origin of anglers

Table 4.18: Total trout angler days by angler origin

Angler origin	Total days	Home days	Away days
North East	258,662	237,282	19,604
		92.42%	7.58%
North West	488,336	399,170	70,593
		85.54%	14.46%
Yorks and Humber	425,881	324,785	101,096
		76.26%	23.74%
West Midlands	349,769	224,750	125,019
		64.26%	35.74%
East Midlands	363,864	340,970	22,894
		93.71%	6.29%
East of England	120,839	34,326	86,513
		28.41%	71.59%
London	100,183	16,484	83,699
		16.45%	83.55%
South East	414,560	366,975	47,585
		88.52%	11.48%
South West	377,716	331,126	46,590
		87.67%	12.33%
Wales	524,838	500,886	23,952
		95.44%	4.56%
Scotland	8,644	0	8,644
		0.00%	100.00%
Other	0	0	0
		0.00%	0.00%
Total	3,433,293	2,776,753	656,540
		80.88%	19.12%

4.4.3 Total trout angler days by angler origin and regional location of trout fisheries

In Table 4.19, the regional origin of anglers is given by the columns, with destinations recorded in the rows. Thus from the table, the total trout angler effort by anglers from the South West is 377,716. The trout angler effort directed at trout fisheries located in the South West is 455,014. Totals at the right of the table relate to the destinations. Thus, of the 455,014 trout days fished in the South West, 73 per cent were undertaken by anglers resident in the South West.

Table 4.19: Trout angler days by angler origin and by fishery location

	Regional origins of anglers														
	North East	**North West**	**Yorks & Humber**	**West Midlands**	**East Midlands**	**East of England**	**London**	**South East**	**South West**	**Wales**	**Scotland**	**Other**	**Total days**	**Home days**	**Home%**
North East	237,281	16,675	16,093	1,495	8,267	12,077	10,521	1,992	8,250	1,529	0	0	**314,181**	**237,281**	75.50%
North West	2,695	399,170	9,491	4,187	3,180	6,587	1,256	0	0	2,039	2,478	0	**431,083**	**399,170**	92.60%
Yorks & Humber	14,553	17,138	324,786	299	1,908	6,587	157	664	485	1,019	423	0	**368,020**	**324,786**	88.30%
West Midlands	0	926	0	224,750	636	6,587	785	1,328	1,699	12,741	0	0	**249,452**	**224,750**	90.10%
East Midlands	0	0	29,297	29,311	340,970	7,246	157	221	243	510	907	0	**408,861**	**340,970**	83.40%
East Of England	1,258	8,569	1,238	299	0	34,326	2,827	0	0	0	181	0	**48,698**	**34,326**	70.50%
London	0	6,948	0	299	0	7,466	16,484	664	728	0	0	0	**32,588**	**16,484**	50.60%
South East	0	0	1,238	11,664	1,272	7,246	31,250	366,975	11,648	510	1,813	0	**433,615**	**366,975**	84.60%
South West	2,336	7,874	413	23,927	4,452	13,394	32,506	33,199	331,126	5,606	181	0	**455,014**	**331,126**	72.80%
Wales	539	31,034	43,327	53,537	3,180	19,323	4,240	9,517	23,538	500,886	2,660	0	**691,780**	**500,886**	72.40%
Total	258,662	488,336	425,881	349,769	363,864	120,839	100,183	414,560	377,716	524,838	8,644	0	**3,433,293**	**2,776,754**	80.87%

4.4.4 Trout angler days on rivers by regional origin of anglers

Table 4.20: Trout angler days on rivers by angler origin

Angler origin	Total days	Home days	Away days
North East	63,646	50,669	11,202
		81.90%	18.10%
North West	172,583	118,612	35,397
		77.00%	23.00%
Yorks and Humber	223,540	181,640	41,900
		81.26%	18.74%
West Midlands	101,310	24,939	76,371
		24.62%	75.38%
East Midlands	65,713	56,571	9,142
		86.09%	13.91%
East of England	46,348	0	46,348
		0.00%	100.00%
London	56,866	3,753	53,113
		6.60%	93.40%
South East	91,396	61,355	30,041
		67.13%	32.87%
South West	103,458	70,481	32,977
		68.13%	31.87%
Wales	210,113	206,652	3,461
		98.35%	1.65%
Scotland	2,893	0	2,893
		0.00%	100.00%
Other	0	0	0
		0.00%	0.00%
Total	1,137,865	774,672	363,193
		68.08%	31.92%

4.4.5 Trout angler days on rivers by angler origin and regional location of rivers

In Table 4.21, the regional origin of anglers is given by the columns, with destinations recorded in the rows. Thus from the table, the total trout angler effort on rivers by anglers from Yorkshire and Humberside is 223,540 days. Trout angler effort directed at trout river fisheries located in Yorkshire and Humberside is 214,105. The totals at the right of the table relate to the destinations. Thus, of the 214,105 trout days on rivers in the Yorkshire and Humberside, 84.8 per cent were undertaken by anglers resident in the Yorkshire and Humberside.

Table 4.21: Trout angler days on rivers by angler origin and by river location

	Regional origins of anglers													
	North East	**North West**	**Yorks & Humber**	**West Midlands**	**East Midlands**	**East of England**	**London**	**South East**	**South West**	**Wales**	**Scotland**	**Other**	**Total**	**HOME%**
North East	50,669	9,931	3,866	1,495	3,071	5,314	3,527	1,620	5,551	329	0	**0**	85,373	59.3%
North West	1,317	118,612	2,712	228	434	4,338	1,074	0	0	84	743	**0**	129,543	91.6%
Yorks & Humber	7,957	15,317	181,640	299	480	6,587	157	244	323	1,019	81	**0**	214,105	84.8%
West Midlands	0	59	0	24,939	43	3,706	558	653	1,585	1,904	0	**0**	33,447	74.6%
East Midlands	0	0	11,636	15,960	56,571	126	94	31	24	8	59	**0**	84,508	66.9%
East Of England	1,118	6,639	1,238	20	0	0	650	0	0	0	9	**0**	9,674	0.0%
London	0	6,948	0	89	0	4,428	3,753	50	546	0	0	**0**	15,813	23.7%
South East	0	0	885	10,123	373	2,322	12,714	61,355	6,241	4	899	**0**	94,916	64.6%
South West	2,336	6,255	59	17,449	2,246	7,589	31,081	20,059	70,481	113	9	**0**	157,677	44.7%
Wales	249	8,822	21,503	30,709	2,494	11,938	3,258	7,385	18,707	206,652	1,092	**0**	312,810	66.1%
Total	63,646	172,583	223,540	101,310	65,713	46,348	56,866	91,396	103,458	210,113	2,893	**0**	1,137,865	

4.4.6 Trout angler days on stillwater by regional origin of anglers

Table 4.22: Trout angler days on stillwater by angler origin

Angler origin	Total days	Home days	Away days
North East	195,015	186,613	8,402
		95.69%	4.31%
North West	315,754	280,558	35,196
		88.85%	11.15%
Yorks and Humber	202,341	143,145	59,196
		70.74%	29.26%
West Midlands	248,460	199,811	48,649
		80.42%	19.58%
East Midlands	298,151	284,399	13,752
		95.39%	4.61%
East of England	74,490	34,326	40,164
		46.08%	53.92%
London	43,317	12,731	30,586
		29.39%	70.61%
South East	323,164	305,620	17,544
		94.57%	5.43%
South West	274,259	260,645	13,614
		95.04%	4.96%
Wales	314,726	294,234	20,492
		93.49%	6.51%
Scotland	5,751	0	5,751
		0.00%	100.00%
Other	0	0	0
		0.00%	
Total	2,295,428	2,002,081	293,347
		87.22%	12.78%

4.4.7 Trout angler days on stillwaters by angler origin and regional location of stillwaters

In Table 4.23, the regional origin of anglers is given by the rows, with destinations recorded in the columns. Thus from the table, the total trout angler effort on stillwaters by anglers from the East of England is 74,490 days. Trout angler effort directed at trout stillwater fisheries located in the East of England is 39,025. Totals at the right of the table relate to the destinations. Thus, of the 39,025 trout days on stillwaters in the East of England, 88 per cent were undertaken by anglers resident in the East of England.

Table 4.23: Trout angler days on stillwater by angler origin and by stillwater location

	Regional origins of anglers													
	North East	**North West**	**Yorks & Humber**	**West Midlands**	**East Midlands**	**East of England**	**London**	**South East**	**South West**	**Wales**	**Scotland**	**Other**	**Total**	**HOME%**
North East	186,613	6,744	12,226	0	5,196	6,762	6,994	372	2,699	1,200	0	**0**	228,808	81.6%
North West	1,378	280,558	6,778	3,960	2,746	2,249	182	0	0	1,954	1,736	**0**	301,540	93.0%
Yorks & Humber	6,596	1,822	143,145	0	1,428	0	0	420	162	0	342	**0**	153,915	93.0%
West Midlands	0	867	0	199,811	593	2,882	227	675	113	10,837	0	**0**	216,005	92.5%
East Midlands	0	0	17,661	13,351	284,399	7,120	63	191	218	502	848	**0**	324,353	87.7%
East Of England	139	1,930	0	279	0	34,326	2,177	0	0	0	172	**0**	39,025	88.0%
London	0	0	0	211	0	3,038	12,731	614	182	0	0	**0**	16,776	75.9%
South East	0	0	353	1,542	898	4,924	18,536	305,620	5,407	506	914	**0**	338,700	90.2%
South West	0	1,619	354	6,478	2,205	5,805	1,425	13,140	260,645	5,493	172	**0**	297,337	87.7%
Wales	290	22,213	21,824	22,828	686	7,384	982	2,132	4,831	294,234	1,567	**0**	378,970	77.6%
Total	195,015	315,754	202,341	248,460	298,151	74,490	43,317	323,164	274,259	314,726	5,751	**0**	2,295,428	

4.5 Salmon and sea trout (S & ST) angler effort

From Table 4.1 there was an estimated total of 0.4 million salmon and sea trout (S & ST) angler days during 2005. S & ST angling in England and Wales is largely restricted to rivers and therefore in this section, tables subdivide total S & ST by the following criteria:

- by regional origin of anglers;
- by regional origin and by regional location of fisheries.

4.5.1 Total S & ST angler days by regional origin of anglers

Table 4.24: S & ST angler days by angler origin

Angler Origin	Total days	Home Region Days	Days Away
North East	42,669	38,367	4,302
		89.92%	10.08%
North West	109,911	79,006	30,905
		71.90%	28.12%
Yorks and Humber	37,981	12,183	25,798
		32.10%	67.92%
West Midlands	66,238	9,463	56,775
		14.29%	85.71%
East Midlands	1,499	0	1,499
		0.00%	100.00%
East of England	4,895	0	4,895
		0.00%	100.00%
London	2,243	51	2,192
		2.30%	97.73%
South East	13,201	30	13,171
		0.23%	99.77%
South West	37,124	36,783	341
		99.10%	0.92%
Wales	111,310	110,310	1,000
		99.10%	0.90%
Scotland	1,903	0	1,903
		0.00%	100.00%
Other	144	0	144
		0.00%	100.00%
Total	429,119	286,193	142,926
		66.69%	33.31%

4.5.2 Total S & ST angler days by angler origin and regional location of S & ST fisheries

In Table 4.25 below, the regional origin of anglers is given by the columns, with destinations recorded in the rows. Thus from the table, the total S & ST angler effort by anglers from Wales is 111,310. The S & ST angler effort directed at S & ST fisheries located in Wales is 174,668. The totals at the right of the table relate to the destinations. Thus, of the 174,668 S & ST days fished in Wales, 63 per cent were undertaken by anglers resident in Wales.

Table 4.25: Salmon angler days by angler origin and by fishing location

	Regional origins of anglers														
	North East	North West	Yorks & Humber	West Midlands	East Midlands	East of England	London	South East	South West	Wales	Scotland	Other	Total days	Home days	HOME%
North East	38,367	10,192	816	3,486	0	1,399	914	842	67	682	118	36	56,920	38,367	67.80%
North West	930	79,006	24,818	1,494	0	466	47	77	13	45	1,247	108	108,252	79,006	73.10%
Yorks & Humber	116	7,562	12,183	0	0	0	0	0	20	0	0	0	19,882	12,183	61.30%
West Midlands	0	0	0	15,217	0	2,564	16	0	0	136	0	0	17,933	15,217	85.00%
East Midlands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
East Of England	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00%
London	2,907	0	0	0	0	233	51	0	0	0	0	0	3,192	51	1.60%
South East	0	0	0	5,229	0	233	189	30	27	0	0	0	5,708	30	0.60%
South West	0	493	0	0	0	0	63	5,054	36,783	136	39	0	42,569	36,783	86.40%
Wales	349	12,658	163	41,964	1,499	0	962	6,050	214	110,310	499	0	174,668	110,310	63.20%
Total	42,669	109,911	37,981	66,238	1,499	4,895	2,243	13,201	37,124	111,310	1,903	144	429,119	286,193	66.69%

4.6 Summary of key angler day estimates by destination

Table 4.26: Summary of key angler day estimates by destination region

Region	Fish species	Angler days
North East	Coarse	889,057
	Trout	314,181
	S & ST	56,920
	Total	1,260,158
North West	Coarse	3,474,253
	Trout	431,083
	S & ST	108,252
	Total	4,013,588
Yorkshire and Humberside	Coarse	3,116,577
	Trout	368,020
	S & ST	19,882
	Total	3,504,479
West Midlands	Coarse	4,592,190
	Trout	249,452
	S & ST	17,933
	Total	4,859,575
East Midlands	Coarse	4,580,015
	Trout	408,861
	S & ST	0
	Total	4,988,876
East Of England	Coarse	2,295,689
	Trout	48,698
	S & ST	0
	Total	2,344,387
London	Coarse	316,960
	Trout	32,588
	S & ST	3,192
	Total	352,740
South East	Coarse	4,092,840
	Trout	433,615
	S & ST	5,706
	Total	4,532,163
South West	Coarse	2,181,991
	Trout	455,014
	S & ST	42,569
	Total	2,679,574
Wales	Coarse	847,161
	Trout	691,780
	S & ST	174,668
	Total	1,713,609
England and Wales	Coarse	26,386,734
	Trout	3,433,293
	S & ST	429,119
	Total	30,249,146

5 Procedures for estimating expenditures

Section 4 outlined the estimation of the OD matrix of angler days per fish species (by regional origins and regional destinations). This matrix was estimated for each fish species (coarse, trout, salmon and sea trout). This section explains the next stage: the estimation of the OD matrices of expenditure.

5.1 Primary data on expenditure

There were three categories of expenditure: angler trip expenditure, angler non-specific expenditure and Environment Agency expenditure. These are discussed below.

5.1.1 Angler trip expenditure

When anglers undertake angling trips, they incur trip-related expenditures on such items as accommodation, meals, drinks, transport, boat hire, permits, bait, gifts and souvenirs.

Provided one can obtain a sufficient number of observations, it is relatively straight forward to estimate expenditure per angler day for specific cells in the OD matrix (see Question 6 in Part 2 of the questionnaire in Appendix A). The main purpose of the internet survey was to generate large numbers of observations on average expenditure per day necessary to populate the OD matrix of expenditure per angler day per species.

5.1.2 Angler non-specific expenditure

During any given year, anglers also undertake expenditures which are not specific to particular fishing trips. Examples include specialised angling clothing, magazines, books, rods, poles and so on. These items may be used over the whole year and in a range of regions. We were primarily interested in the region where this non-specific expenditure was undertaken, including mail order (see Question 13 in Part 1 of the questionnaire in Appendix A).

Anglers were asked to provide an estimate of the total of such expenditure in each region, including their home one. From sample data, mean expenditure per angler in their home region and in each of the other regions was calculated. This average mean expenditure data was then grossed up by the number of anglers in each region, as revealed by Environment Agency licence sales. These totals were allocated to species on the basis of the proportion of angler days devoted to each species.

Non-specific expenditures were relatively more significant than anticipated, averaging just over £350 per angler and around £350 million in total. As discussed in Section 1, the economic impact depends on the composition of expenditure. It is therefore necessary to input categorised expenditure data into the DREAM® model.

Anglers were asked to provide only their total non-specific expenditure in each region, and these data needed to be categorised. Categorisation was based on a variety of published information. For example, spending on magazines is known from trade association literature. A previous report for the Environment Agency (Sturgeon *et al*., 2001) provided a breakdown of total angler expenditure. In addition, a limited telephone survey of anglers provided further insights. Table 5.1 provides the breakdown of non-specific expenditure.

Table 5.1: Categories of equipment and non-specific expenditure

	Estimated	Percent
Magazines and Books	£30	8.5
Equipment	£150	42.6
Clothing	£120	34.1
Footwear	£40	11.4
Other	£12	3.4
Total	£352	100

5.1.3 Environment Agency expenditure

Although a licence may be used anywhere, it was assumed that it would normally be purchased at home. One feature of expenditure on such licences is that it is effectively a tax which leaks out of the region. Consequently, the negative impact would fall entirely on the home region. However, the Environment Agency also spends considerable sums, much of which is funded from licence receipts. In estimating gross expenditure, one should deduct the amount that anglers from that region spent on rod licence fees and then add back in the amount the Environment Agency spends on that region. Thus, gross expenditure in some regions would go up if Environment Agency spending on that region exceeded the amount anglers from the region paid in licence fees.

From the Environment Agency, we obtained data on regional angling expenditure plus expenditure on projects for salmon/sea trout and other fish species. GOR regions were mapped to Environment Agency regions and the expenditure in each GOR region calculated. The licence expenditure and Environment Agency expenditure were split between coarse and trout, based on the distribution of angler days.

5.2 Estimation of regional gross expenditure

Given the above, for each region for each species the following gross expenditure was based on the aggregation of:

- trip expenditure by local anglers;
- trip expenditure by visiting anglers;
- non-specific expenditure by local anglers;
- non-specific expenditure by visiting anglers;
- licence expenditure;
- Environment Agency expenditure.

Finally, for the purposes of inputting into DREAM®, expenditure was disaggregated into ten 10 expenditure categories (such as accommodation, rents, transport) for home and visitor anglers.

6 Estimates of (gross) angler expenditure flows between regions

This section reports the distribution of total (gross) angler expenditure estimated on the basis of the principles and procedures outlined in the previous section.

- Section 6.1 presents gross expenditure for England and Wales as a whole broken down in a variety of ways.
- Section 6.2 presents an OD matrix for non-specific expenditure.
- Section 6.3 presents an OD matrix for total coarse angling trip expenditure.
- Section 6.3 presents an OD matrix for total trout angling trip expenditure.
- Section 6.3 presents an OD matrix for total salmon and sea trout angling trip expenditure.

6.1 Gross expenditure in England and Wales in 2005

Table 6.1: Gross expenditure by category for England and Wales (£'000s)

Category	**Species**		
Trip expenditure	Coarse	£689,446	
	Trout	£119,559	
	S & ST	£23,477	
	Total		£832,483
Non-specific expenditure			
	Coarse	£271,559	
	Trout	£51,403	
	S & ST	£7,395	
	Total		£329,917
Environment Agency expenditure			
	Coarse	£10,223	
	Trout	£1,745	
	S & ST	£6,526	
	Total		£18,494
Total expenditure			£1,180,893
Licence fees	Coarse	£14,295	
	Trout	£1,915	
	S & ST	£1,174	
	Total		£17,384
Gross expenditure (excluding license fees)			
	Total		**£1,163,510**

From Table 6.1, total angler trip expenditure was £832 million. Non-specific angler expenditure was £330 million. With respect to Environment Agency activities, licence revenues were £17 million and estimated Environment Agency angling specific expenditure was £18 million. The sum of all these expenditures is £1,180 million. By including licence revenues there is an element of double counting and once this is removed, gross expenditure on angling is estimated to be £1,163 million.

6.1.1 Total angler trip expenditure by fish species

The greatest proportion of total expenditure was spent on coarse angling (83 per cent). Salmon and sea trout angling was relatively unimportant, accounting for only three per cent of total freshwater angler expenditure.

Table 6.2: Total angler trip expenditure on species (£'000s)

Fish species	Angler expenditure
Coarse	£689,446
Trout	£119,559
Salmon & sea trout	£23,477
Total	£832,483

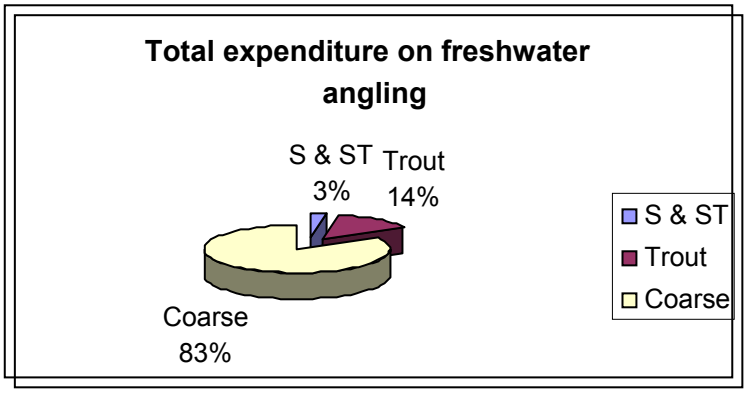


Figure 6.1: Total expenditure on freshwater angling

Table 6.3 below presents the OD matrix of total trip related expenditure.

6.1.2 Total angler trip expenditure by angler origin and regional location of fisheries

In the table below, the regional origin of anglers is given by the columns, with destinations recorded in the rows. Thus from the table, the total trip expenditure by anglers from London is £32.2 million, whereas the trip expenditure on London fisheries is £6.8 million.

Table 6.3: Origin and destination of trip expenditure on all angling (£'000s)

	Origin of anglers													
	North East	North West	Yorks and Humber	West Midlands	East Midlands	East of England	London	South East	South West	Wales	Scotland	Other	Total	%Visitors
North East	£19,418	£4,556	£1,773	£1,718	£254	£2,881	£1,622	£210	£165	£38	£11	£0	£32,646	40.5%
North West	£1,139	£91,910	£3,111	£1,210	£2,061	£2,342	£210	£282	£20	£1,452	£454	£27	£104,218	11.8%
Yorks and Humber	£4,538	£1,901	£78,612	£559	£318	£2,278	£134	£52	£50	£28	£44	£26	£88,539	11.2%
West Midlands	£19	£2,946	£3,172	£128,685	£2,865	£3,223	£108	£827	£2,345	£548	£8	£4	£144,751	11.1%
East Midlands	£186	£837	£16,842	£5,368	£81,665	£15,936	£462	£605	£43	£138	£87	£49	£122,218	33.2%
East of England	£186	£444	£2,429	£1,601	£2,688	£48,269	£2,204	£3,193	£31	£75	£330	£0	£61,452	21.5%
London	£52	£277	£52	£40	£30	£1,980	£1,965	£1,970	£333	£141	£0	£0	£6,841	71.3%
South East	£188	£1,113	£216	£1,678	£452	£5,078	£22,044	£102,035	£3,793	£403	£131	£5	£137,135	25.6%
South West	£552	£1,388	£553	£8,043	£460	£1,188	£3,119	£8,050	£52,419	£1,323	£32	£9	£77,137	32.0%
Wales	£566	£3,696	£13,390	£8,249	£389	£660	£377	£1,473	£1,240	£27,136	£392	£0	£57,567	52.9%
Total	£26,845	£109,067	£120,150	£157,153	£91,182	£83,835	£32,244	£118,699	£60,439	£31,283	£1,490	£119	£832,505	
Home	£19,418	£91,910	£78,612	£128,685	£81,665	£48,269	£1,965	£102,035	£52,419	£27,136	£0	£0	£632,115	
Away	£7,426	£17,157	£41,538	£28,467	£9,517	£35,566	£30,279	£16,663	£8,020	£4,146	£1,490	£119	£200,390	
%Home	72.3%	84.3%	65.4%	81.9%	89.6%	57.6%	6.1%	86.0%	86.7%	86.7%	0.0%	0.0%	75.9%	
Balance	£5,801	-£4,847	-£31,610	-£12,401	£31,037	-£22,383	-£25,403	£18,438	£16,699	£26,287	-£1,490	-£119		

6.2 Non-specific expenditure by angler origin and regional location of fisheries

The procedure for allocating non-specific expenditure to origins and destinations was explained in Section 5.

Table 6.4: Origin and destination of non-specific (capital) expenditure (£'000s)

		Origin of anglers													
		North East	North West	Yorks and Humber	West Midlands	East Midlands	East of England	London	South East	South West	Wales	Scotland	Other	Total	%From outside
DESTINATION	North East	£9,559	£904	£155	£35	£174	£1,157	£0	£0	£24	£0	£46	£3	£12,056	20.7%
	North West	£80	£31,649	£91	£0	£76	£156	£38	£0	£56	£513	£11	£0	£32,667	3.1%
	Yorks and Humber	£42	£0	£42,245	£0	£7	£1,307	£26	£44	£0	£0	£0	£0	£43,672	3.3%
	West Midlands	£0	£0	£80	£52,431	£1,629	£31	£0	£102	£242	£71	£0	£5	£54,590	4.0%
	East Midlands	£0	£0	£0	£523	£32,970	£108	£113	£0	£119	£0	£74	£0	£33,907	2.8%
	East of England	£1,248	£0	£0	£0	£154	£45,693	£124	£0	£6	£13	£1	£0	£47,239	3.3%
	London	£2	£0	£0	£177	£36	£1,472	£14,906	£219	£954	£0	£2	£0	£17,769	16.1%
	South East	£103	£0	£310	£1,413	£69	£2,660	£528	£54,101	£214	£0	£4	£0	£59,402	8.9%
	South West	£0	£0	£80	£34	£18	£0	£49	£109	£25,237	£30	£4	£1	£25,562	1.3%
	Wales	£103	£194	£145	£0	£69	£7	£58	£22	£318	£12,200	£52	£20	£13,187	7.5%
	Total	£11,138	£32,746	£43,105	£54,613	£35,201	£52,591	£15,842	£54,597	£27,170	£12,827	£194	£29	£329,917	
	Home	£9,559	£31,649	£42,245	£52,431	£32,970	£45,693	£14,906	£54,101	£25,237	£12,200	£0	£0	£310,992	
	External	£1,579	£1,097	£859	£2,182	£2,231	£6,898	£936	£496	£1,933	£626	£194	£29	£18,995	
	%Home	85.8%	96.6%	98.0%	96.0%	93.7%	86.9%	94.1%	99.1%	92.9%	95.1%	0.0%	0.0%	94.4%	

6.3 Trip expenditure on coarse angling by angler origin and regional location of fisheries

In the table below, the regional origin of anglers is given by the columns, with destinations recorded in the rows. Thus from the table, the total trip expenditure by anglers from the East of England on coarse angling is £78 million, whereas the trip expenditure on East of England coarse fisheries is £60 million.

Table 6.5: Origin and destination of trip expenditure on coarse angling (£'000s)

		Origin of anglers													
		North East	**North West**	**Yorks and Humber**	**West Midlands**	**East Midlands**	**East of England**	**London**	**South East**	**South West**	**Wales**	**Scotland**	**Other**	**Total**	**%Visitors**
DESTINATION	**North East**	£11,125	£3,121	£1,087	£1,224	£149	£1,993	£9	£84	£7	£0	£5	£0	**£18,803**	**40.8%**
	North West	£1,018	£78,998	£675	£776	£1,966	£1,649	£105	£277	£19	£1,401	£249	£0	**£87,133**	**9.3%**
	Yorks and Humber	£4,060	£1,182	£68,356	£553	£281	£2,027	£131	£45	£44	£2	£23	£26	**£76,731**	**10.9%**
	West Midlands	£19	£2,933	£3,172	£121,237	£2,854	£2,771	£107	£688	£2,333	£462	£8	£3	**£136,588**	**11.2%**
	East Midlands	£186	£837	£16,214	£4,572	£71,097	£15,777	£454	£601	£28	£107	£37	£33	**£109,943**	**35.3%**
	East of England	£153	£112	£2,429	£1,596	£2,688	£46,947	£2,078	£3,193	£31	£75	£324	£0	**£59,626**	**21.3%**
	London	£0	£97	£52	£17	£30	£1,667	£1,366	£1,955	£309	£141	£0	£0	**£5,635**	**75.7%**
	South East	£188	£1,113	£207	£842	£428	£4,563	£20,053	£86,796	£3,038	£388	£13	£3	**£117,630**	**26.2%**
	South West	£490	£1,172	£539	£6,682	£346	£450	£1,979	£5,885	£39,309	£1,148	£17	£5	**£58,020**	**32.3%**
	Wales	£521	£2,501	£105	£3,040	£260	£180	£77	£499	£267	£11,856	£33	£0	**£19,337**	**38.7%**
	Total	**£17,759**	**£92,065**	**£92,835**	**£140,539**	**£80,098**	**£78,023**	**£26,359**	**£100,023**	**£45,385**	**£15,580**	**£709**	**£70**	**£689,446**	
	Home	£11,125	£78,998	£68,356	£121,237	£71,097	£46,947	£1,366	£86,796	£39,309	£11,856	£0	£0	£537,088	
	Away	£6,634	£13,067	£24,479	£19,302	£9,000	£31,076	£24,993	£13,227	£6,076	£3,724	£709	£70	£152,358	
	%Home	62.6%	85.8%	73.6%	86.3%	88.8%	60.2%	5.2%	86.8%	86.6%	76.1%	0.0%	0.0%	0.0%	

6.4 Trip expenditure on trout angling by angler origin and regional location of fisheries

In the table below, the regional origin of anglers is given by the columns, with destinations recorded in the rows. Thus from the table, the total trip expenditure by anglers from the North West on trout angling is £12 million, whereas the trip expenditure on the North West trout fisheries is £12 million.

Table 6.6: Origin and destination of trip expenditure on trout angling (£'000s)

	North East	North West	Yorks and Humber	West Midlands	East Midlands	East of England	London	South East	South West	Wales	Scotland	Other	Total	%Visitors
North East	£5,519	£288	£625	£58	£106	£469	£1,612	£47	£152	£38	£0	£0	**£8,913**	**38.1%**
North West	£68	£10,651	£228	£421	£94	£633	£98	£0	£0	£51	£171	£0	**£12,415**	**14.2%**
Yorks and Humber	£477	£432	£9,939	£6	£37	£250	£3	£6	£3	£26	£21	£0	**£11,201**	**11.3%**
West Midlands	£0	£13	£0	£7,278	£12	£121	£0	£36	£12	£86	£0	£0	**£7,557**	**3.7%**
East Midlands	£0	£0	£628	£796	£10,567	£159	£8	£4	£16	£31	£50	£0	**£12,260**	**13.8%**
East Anglia	£34	£333	£0	£5	£0	£1,322	£127	£0	£0	£0	£6	£0	**£1,826**	**27.6%**
London	£0	£180	£0	£23	£0	£284	£597	£15	£23	£0	£0	£0	**£1,122**	**46.8%**
South East	£0	£0	£9	£444	£24	£446	£1,988	£15,238	£753	£15	£118	£0	**£19,033**	**19.9%**
South West	£63	£204	£14	£1,362	£115	£739	£1,137	£1,170	£9,556	£175	£9	£0	**£14,543**	**34.3%**
Wales	£21	£783	£13,277	£1,996	£98	£479	£273	£326	£951	£12,152	£334	£0	**£30,689**	**60.4%**
Total	**£6,181**	**£12,884**	**£24,720**	**£12,388**	**£11,053**	**£4,901**	**£5,843**	**£16,841**	**£11,466**	**£12,574**	**£708**	**£0**	**£119,559**	
Home	£5,519	£10,651	£9,939	£7,278	£10,567	£1,322	£597	£15,238	£9,556	£12,152	£0	£0	**£82,818**	
Away	£662	£2,232	£14,781	£5,111	£485	£3,579	£5,245	£1,604	£1,910	£422	£708	£0	**£36,741**	
%Home	89.3%	82.7%	40.2%	58.7%	95.6%	27.0%	10.2%	90.5%	83.3%	96.6%	0.0%	0.0%	100.0%	

6.5 Trip expenditure on salmon & sea trout by angler origin and regional location of fisheries

In the table below, the regional origin of anglers is given by the columns with destinations recorded in the rows. Thus from the table, the total trip expenditure by anglers from Wales on salmon and sea trout angling is £3 million, whereas the trip expenditure on Welsh salmon and sea trout fisheries is £7.5 million.

Table 6.7: Origin and destination of trip expenditure on salmon and sea trout angling (£'000s)

	Origins of anglers													
	North East	**North West**	**Yorks and Humber**	**West Midlands**	**East Midlands**	**East of England**	**London**	**South East**	**South West**	**Wales**	**Scotland**	**Other**	**Total**	**%Visitors**
North East	£2,774	£1,147	£61	£436	£0	£420	£0	£79	£6	£0	£7	£0	**£4,930**	**43.7%**
North West	£53	£2,260	£2,209	£13	£0	£60	£7	£5	£1	£0	£35	£26	**£4,669**	**51.6%**
Yorks and Humber	£1	£287	£317	£0	£0	£0	£0	£0	£2	£0	£0	£0	**£607**	**47.8%**
West Midlands	£0	£0	£0	£170	£0	£331	£1	£104	£0	£0	£0	£0	**£606**	**71.9%**
East Midlands	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	**£0**	**0.0%**
East Anglia	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	£0	**£0**	**100.0%**
London	£52	£0	£0	£0	£0	£30	£2	£0	£0	£0	£0	£0	**£84**	**97.8%**
South East	£0	£0	£0	£392	£0	£70	£3	£2	£3	£0	£0	£0	**£470**	**99.6%**
South West	£0	£11	£0	£0	£0	£0	£2	£996	£3,555	£0	£6	£0	**£4,570**	**22.2%**
Wales	£24	£412	£8	£3,213	£31	£0	£27	£649	£22	£3,129	£25	£0	**£7,541**	**58.5%**
Total	**£2,904**	**£4,118**	**£2,595**	**£4,225**	**£31**	**£911**	**£43**	**£1,834**	**£3,588**	**£3,129**	**£72**	**£26**	**£23,477**	
Home	£2,774	£2,260	£317	£170	£0	£0	£2	£2	£3,555	£3,129	£0	£0	£12,209	
Away	£130	£1,858	£2,278	£4,054	£31	£911	£41	£1,832	£34	£0	£72	£26	£11,268	
%Home	95.5%	54.9%	12.2%	4.0%	0.0%	0.0%	4.3%	0.1%	99.1%	100.0%	0.0%	0.0%	0.0%	

7 Substitution possibilities

As explained in Section 1, economic impact (as distinct from economic activity) depends on the extent that expenditure stays within a region or leaks outside. This, in turn, depends on the types of expenditure we are dealing with. In Section 5, we explained that regional gross expenditure comprised:

- angler trip-related expenditure (by home and visiting angler);
- angler non-specific expenditure (by home and visiting angler);
- the balance of Environment Agency licence income and expenditure.

7.1 Angler trip-related expenditure

If, for example, the closure of salmon fishing in Wales led to a 100 per cent transfer of trip-related expenditure to Scotland or other parts of the world, the economic impact of salmon fishing in both Wales and the whole England and Wales area would be the entire expenditure on salmon fishing in Wales. This, however, would be unlikely. Many anglers would be more likely to transfer a large part of their expenditure to other forms of fishing, or to other activities within Wales.

The economic impact therefore depends on what anglers would do. As previously explained, these were captured in questions in the survey as described in Figure 7.1.

Q33. If you had been unable to fish for [fish] in [region] which of the following would you most likely have done?

a) Same species in different region
b) Different species in same region
c) Outside England and Wales
d) Would not fish

Q34. If you had been unable to fish for [fish] anywhere in England or Wales, which of the following would you most likely have done?

a) Different species in England and Wales
b) Outside England and Wales
c) Would not fish

Figure 7.1: Survey questions on substitution

The assumed impacts on regional and national (England and Wales) angler trip expenditure are shown in the tables below.

Table 7.1: Impact on trip expenditure of anglers' substitution responses

	Response	Local impact	National impact
Species not available in region	Same species in different region	Yes	No
	Different species in same region	No	No
	Outside E&W	Yes	Yes
	Would not fish	No	No
Species not available in England and Wales	Different species in England and Wales	No	No
	Outside England and Wales	Yes	Yes
	Would not fish	No	No

Thus in the case of a species ceasing to be available in an area, if an angler chooses to fish for another species in the same area we assume an equivalent expenditure in the local area. If the individual gives up angling we also assume they will spend an equivalent amount on different activities in the same area. In both cases therefore 'No' economic impact is identified. In the latter case this assumption may be too strong with some of the expenditure being diverted. There may, as a result, be a slight under-estimation of the impact. In the other cases if the anglers divert their expenditure outside the area, either inside or outside England and Wales, then there will be an economic impact in the local area. In which case, 'Yes' there will be an impact. The same logic applies in the case of the complete elimination of a species such as salmon, in England and Wales. If the angler turns to trout fishing in the local area there will be 'No' economic impact locally or in England and Wales. If the angler turned to Trout fishing elsewhere in England and Wales there will be 'No' impact in England and Wales, but there will be an impact locally.

In both elimination scenarios, it is only when the angler fishes outside England and Wales e.g. in Scotland, that the answer to the question "is there an impact in England and Wales?" will be 'Yes'. Consequently the expected impact is likely to be relatively small.

The impact, if angling for all species ceased, would be greater than the sum of impacts from individual species, because of substitution between species. However, as explained in Section 1, the study did not formally embrace this dimension[4].

7.2 Angler non-specific expenditure

This element was a greater proportion of gross expenditure than anticipated. The direct questioning of angler substitution possibilities related to their trip-related expenditure. The impact on non-specific expenditure was therefore more difficult to identify. The important assumptions were that:

a) Spending in the home region on goods such as magazines and clothing would continue if anglers continued to fish in England and Wales for whatever species. There would therefore be no loss of expenditure to either the home region or to

[4] See Appendix C

England and Wales. In reality, some of this home expenditure would be lost, and this assumption probably leads to an underestimation of economic impacts.

b) If they ceased to go fishing altogether, the assumption was made that expenditure would be transferred wholly to other activities within the anglers' home region. There would therefore be no loss to the region or to England and Wales as a whole. In reality, some of home expenditure might be lost, and this assumption probably leads to an underestimation of economic impacts.

c) If anglers went to fish overseas, it was assumed that all their expenditure would be lost to the region and to England and Wales as a whole. In reality, only some of expenditure might be lost, and this assumption probably leads to an overestimation of economic impacts.

The balance of a), b) and c) probably means that economic impacts would be underestimated, but that the error would be small. The consequences of anglers' substitution responses for non-specific expenditure are summarised in Table 7.2.

Table 7.2: Impact on non-specific expenditure of anglers' substitution responses

	Response	**Local impact**	**National impact**
Species not available in region	Same species in different region	No	No
	Different species in same region	No	No
	Outside E&W	Yes	Yes
	Would not fish	No	No
Species not available in England and Wales	Different species in England and Wales	No	No
	Outside England and Wales	Yes	Yes
	Would not fish	No	No

7.3 Environment Agency licence expenditure and income

It was necessary to make assumptions about Environment Agency expenditure in the context of angling ceasing for one species in a region. One possibility was to assume that the Environment Agency would continue their work on rivers at the same rate, to try to recover the situation and to provide facilities for other users. The actual response would very much depend on circumstance, and it is conceivable that expenditure would be diverted elsewhere. On balance, by itself this assumption would probably underestimate the economic impacts of species loss.

Typically, licence revenues flow directly out of the region. With the loss of a single species, some anglers would give up fishing and might divert this expenditure to other activities in the region. Paradoxically, the demise of angling could have a positive effect on income and employment operating through licence sales. On the other hand, anglers might continue to purchase licences to enable them to fish for other species. Indeed, if they switched to angling for salmon, they might spend more on licences. Moreover, if they fished for salmon in another region, the species loss could lead to an outflow of expenditure. On balance, conceptually it would be appropriate to treat licence sales as a tax remitted to central

government. Procedurally, however, we did not ask anglers what they spent individually on licences and were therefore unsure as to which category of expenditure should be adjusted before feeding the categorised expenditure data into the models of regional economies. Since licence spending is less than 1.5 per cent of gross expenditure, and given the underestimation implicit in the treatment of Environment Agency spending, no adjustment was made for angler expenditure on licences. This would lead to a relatively small overestimation of economic impacts.

8 Post-substitution changes in expenditures

Section 5 explained how the major categories of expenditure were calculated. These were:

- trip expenditure by local anglers;
- trip expenditure by visiting anglers;
- Environment Agency licence receipts;
- Environment Agency expenditure;
- non-specific expenditure.

Section 7 explained the consequences of the substitution analysis for each of these categories. This section (Section 8) reports the estimates of gross and net (post-substitution) expenditures for the above categories.

For each region, we report the gross expenditure for each species, broken down by the above categories. The substitution analysis seeks to predict the proportion of expenditure that would be lost if angling for each fish species ceased in the region.

The proportion of expenditure lost is calculated for both the regional economy and England and Wales as a whole. These percentages enable the estimation of expenditure lost to the regional and national economies. This expenditure loss is termed net expenditure (the net change in expenditure due to species loss). In Sections 10 and 11, estimation of the economic activity supported by angling is based on estimates of gross expenditure, whereas net expenditure determines the economic impact of angling.

Gross and net expenditures are reported in the sections below in the following order.

Section 8.1	North East
Section 8.2	North West
Section 8.3	Yorkshire and Humberside
Section 8.4	West Midlands
Section 8.5	East Midlands
Section 8.6	East of England
Section 8.7	London
Section 8.8	South East
Section 8.9	South West
Section 8.10	Wales
Section 8.11	England and Wales as a whole
Section 8.12	Summary of the gross and net expenditure estimates by region

8.1 North East

Table 8.1: Gross and net change in expenditure due to loss of species in North East (£'000s)

			Regional impact of species loss in region		National impact of species loss in region	
		Gross	Percent lost	Net	Percent lost	Net
COARSE						
	Home	£11,125	47.03	£5,232	10.27	£1,143
	Visitors	£7,678	55.79	£4,284	3.16	£242
	Total	£18,803	50.61	£9,515	7.37	£1,385
	EA Spend	£411	0.00	£0	0.00	£0
	Allocated NS Spend	£6,993	16.22	£1,134	16.22	£1,134
	TOTAL	£26,208		£10,650		£2,519
TROUT						
	Home	£5,403	47.03	£2,541	10.27	£555
	Visitors	£3,323	55.79	£1,854	3.16	£105
	Total	£8,726	50.36	£4,395	7.56	£660
	EA Spend	£160	0.00	£0	0.00	£0
	Allocated NS Spend	£3,245	16.22	£526	16.22	£526
	TOTAL	£12,131		£4,921		£1,186
SALMON						
	Home	£2,774	47.03	£1,305	10.27	£285
	Visitors	£2,112	55.79	£1,179	3.16	£67
	Total	£4,887	50.81	£2,483	7.20	£352
	EA Spend	£524	0.00	£0	0.00	£0
	Allocated NS Spend	£1,817	16.22	£295	16.22	£295
	TOTAL	£7,228		£2,778		£646
TOTAL						
	Home	£19,302	78.60	£15,171	10.27	£1,982
	Visitors	£13,113	86.22	£11,306	3.16	£414
	Total	£32,416	81.68	£26,477	7.39	£2,397
	EA Spend	£1,095	89.80	£983	0.00	£0
	Non-specific	£12,056	21.28	£2,566	16.22	£1,955
	TOTAL	£45,567	65.89	£30,026	9.55	£4,352

8.2 North West

Table 8.2: Gross and net change in expenditure due to loss of species in North West (£'000s)

			Regional impact of species loss in region		National impact of species loss in region	
		Gross	Percent lost	Net	Percent lost	Net
COARSE						
	Home	£78,998	47.03	£37,150	10.27	£8,113
	Visitors	£8,136	55.79	£4,539	3.16	£257
	Total	£87,133	47.85	£41,689	9.61	£8,370
	EA Spend	£1,373	0.00	£0	0.00	£0
	Allocated NS Spend	£28,622	16.22	£4,641	16.22	£4,641
	TOTAL	£117,128		£46,331		£13,012
TROUT						
	Home	£10,427	47.03	£4,904	10.27	£1,071
	Visitors	£1,729	55.79	£965	3.16	£55
	Total	£12,157	48.27	£5,868	9.26	£1,126
	EA Spend	£186	0.00	£0	0.00	£0
	Allocated NS Spend	£3,993	16.22	£648	16.22	£648
	TOTAL	£16,336		£6,516		£1,773
SALMON						
	Home	£2,260	47.03	£1,063	10.27	£232
	Visitors	£2,399	55.79	£1,339	3.16	£76
	Total	£4,660	51.54	£2,402	6.61	£308
	EA Spend	£1,465	0.00	£0	0.00	£0
	Allocated NS Spend	£1,531	16.22	£248	16.22	£248
	TOTAL	£7,655		£2,650		£556
ALL						
	Home	£91,686	78.04	£71,548	10.27	£9,416
	Visitors	£12,264	84.07	£10,310	3.16	£387
	Total	£103,950	78.75	£81,859	9.43	£9,804
	EA Spend	£3,024	32.52	£983	0.00	£0
	Non-specific	£34,146	21.75	£7,427	16.22	£5,537
	TOTAL	£141,119	63.97	£90,269	10.87	£15,341

8.3 Yorkshire and Humberside

Table 8.3: Gross and net change in expenditure due to loss of species in Yorkshire and Humberside (£'000s)

			Regional impact of species loss in region		National impact of species loss in region	
		Gross	Percent lost	Net	Percent lost	Net
COARSE						
	Home	£68,356	47.03	£32,146	10.27	£7,020
	Visitors	£8,374	55.79	£4,672	3.16	£264
	Total	£76,731	47.98	£36,818	9.49	£7,285
	EA Spend	£768	0.00	£0	0.00	£0
	Allocated NS Spend	£37,949	16.22	£6,154	16.22	£6,154
	TOTAL	£115,447		£42,972		£13,439
TROUT						
	Home	£9,730	47.03	£4,576	10.27	£999
	Visitors	£1,236	55.79	£690	3.16	£39
	Total	£10,966	48.01	£5,265	9.47	£1,038
	EA Spend	£88	0.00	£0	0.00	£0
	Allocated NS Spend	£5,423	16.22	£879	16.22	£879
	TOTAL	£16,478		£6,145		£1,918
SALMON						
	Home	£317	47.03	£149	10.27	£33
	Visitors	£290	55.79	£162	3.16	£9
	Total	£607	51.22	£311	6.87	£42
	EA Spend	£786	0.00	£0	0.00	£0
	Allocated NS Spend	£300	16.22	£49	16.22	£49
	TOTAL	£1,694		£360		£90
ALL						
	Home	£78,403	80.15	£62,838	10.27	£8,052
	Visitors	£9,901	78.92	£7,814	3.16	£313
	Total	£88,304	80.01	£70,651	9.47	£8,365
	EA Spend	£1,642	59.87	£983	0.00	£0
	Non-specific	£43,672	19.86	£8,672	16.22	£7,082
	TOTAL	£133,618	60.10	£80,306	11.56	£15,447

8.4 West Midlands

Table 8.4: Gross and net change in expenditure due to loss of species in West Midlands (£'000s)

			Regional impact of species loss in region		National impact of species loss in region	
		Gross	Percent lost	Net	Percent lost	Net
COARSE						
	Home	£121,237	47.03	£57,014	10.27	£12,451
	Visitors	£15,350	55.79	£8,564	3.16	£485
	Total	£136,588	48.01	£65,578	9.47	£12,936
	EA Spend	£1,149	0.00	£0	0.00	£0
	Allocated NS Spend	£37,949	16.22	£6,154	16.22	£6,154
	TOTAL	£175,685		£71,732		£19,090
TROUT						
	Home	£9,730	47.03	£4,576	10.27	£999
	Visitors	£1,236	55.79	£690	3.16	£39
	Total	£10,966	48.01	£5,265	9.47	£1,038
	EA Spend	£83	0.00	£0	0.00	£0
	Allocated NS Spend	£5,423	16.22	£879	16.22	£879
	TOTAL	£16,473		£6,145		£1,918
SALMON						
	Home	£317	47.03	£149	10.27	£33
	Visitors	£290	55.79	£162	3.16	£9
	Total	£607	51.22	£311	6.87	£42
	EA Spend	£234	0.00	£0	0.00	£0
	Allocated NS Spend	£300	16.22	£49	16.22	£49
	TOTAL	£1,142		£360		£90
ALL						
	Home	£131,284	78.22	£102,691	10.27	£13,483
	Visitors	£16,877	83.32	£14,061	3.16	£533
	Total	£148,161	78.77	£116,752	9.46	£14,016
	EA Spend	£1,467	67.02	£983	0.00	£0
	Non-specific	£43,672	21.83	£9,532	16.22	£7,082
	TOTAL	£193,300	65.84	£127,267	10.91	£21,098

8.5 East Midlands

Table 8.5: Gross and net change in expenditure due to loss of species in East Midlands (£'000s)

			Regional impact of species loss in region		National impact of species loss in region	
		Gross	Percent lost	Net	Percent lost	Net
COARSE						
	Home	£71,097	47.03	£33,435	10.27	£7,302
	Visitors	£38,846	55.79	£21,672	3.16	£1,227
	Total	£109,943	50.12	£55,107	7.76	£8,529
	EA Spend	£1,279	0.00	£0	0.00	£0
	Allocated NS Spend	£29,178	16.22	£4,732	16.22	£4,732
	TOTAL	£140,400		£59,838		£13,260
TROUT						
	Home	£10,345	47.03	£4,865	10.27	£1,062
	Visitors	£1,657	55.79	£925	3.16	£52
	Total	£12,003	48.24	£5,790	9.29	£1,115
	EA Spend	£136	0.00	£0	0.00	£0
	Allocated NS Spend	£4,622	16.22	£750	16.22	£750
	TOTAL	£16,761		£6,539		£1,864
ALL						
	Home	£81,443	76.62	£62,402	10.15	£8,265
	Visitors	£40,503	79.41	£32,164	9.11	£3,690
	Total	£121,946	77.55	£94,566	9.80	£11,955
	EA Spend	£1,415	61.23	£866	0.00	£0
	Non-specific	£33,800	23.56	£7,962	22.33	£7,549
	TOTAL	£157,161	65.79	£103,394	12.41	£19,504

8.6 East of England

Table 8.6: Gross and net change in expenditure due to loss of species in the East of England (£'000s)

			Regional impact of species loss in region		National impact of species loss in region	
		Gross	Percent lost	Net	Percent lost	Net
COARSE						
	Home	£46,947	47.03	£22,078	10.27	£4,822
	Visitors	£12,679	55.79	£7,074	3.16	£400
	Total	£59,626	48.89	£29,152	8.76	£5,222
	EA Spend	£1,371	0.00	£0	0.00	£0
	Allocated NS Spend	£40,651	16.22	£6,592	16.22	£6,592
	TOTAL	£101,648		£35,744		£11,814
TROUT						
	Home	£1,294	47.03	£608	10.27	£133
	Visitors	£494	55.79	£275	3.16	£16
	Total	£1,787	49.45	£884	8.31	£148
	EA Spend	£53	0.00	£0	0.00	£0
	Allocated NS Spend	£6,440	16.22	£1,044	16.22	£1,044
	TOTAL	£8,280		£1,928		£1,193
ALL						
	Home	£48,241	76.17	£36,747	6.74	£3,250
	Visitors	£13,172	81.36	£10,717	6.99	£921
	Total	£61,414	77.29	£47,464	6.79	£4,172
	EA Spend	£1,424	64.33	£916	0.00	£0
	Non-specific	£47,090	23.79	£11,204	23.04	£10,851
	TOTAL	£109,929	54.20	£59,584	13.67	£15,023

8.7 London

Table 8.7: Gross and net change in expenditure due to loss of species in London (£'000s)

			Regional impact of species loss in region		National impact of species loss in region	
		Gross	Percent lost	Net	Percent lost	Net
COARSE						
	Home	£1,366	47.03	£643	10.27	£140
	Visitors	£4,268	55.79	£2,381	3.16	£135
	Total	£5,635	53.66	£3,024	4.88	£275
	EA Spend	£215	0.00	£0	0.00	£0
	Allocated NS Spend	£15,291	16.22	£2,480	16.22	£2,480
	TOTAL	£21,141		£5,503		£2,755
TROUT						
	Home	£0	47.03	£0	10.27	£0
	Visitors	£37	55.79	£21	3.16	£1
	Total	£37	55.79	£21	3.16	£1
	Licences	£80	26.49	£21	26.49	£6
	EA Spend	£27	0.00	£0	0.00	£0
	Allocated NS Spend	£2,422	16.22	£393	16.22	£393
	TOTAL	£2,486		£414		£394
SALMON						
	Home	£0	47.03	£0	10.27	£0
	Visitors	£52	55.79	£29	3.16	£2
	Total	£52	55.79	£29	3.16	£2
	EA Spend	£30	0.00	£0	0.00	£0
	Allocated NS Spend	£56	16.22	£9	16.22	£9
	TOTAL	£138		£38		£11
ALL						
	Home	£1,366	83.02	£1,134	18.03	£246
	Visitors	£4,358	80.84	£3,523	10.63	£463
	Total	£5,724	81.36	£4,657	12.40	£710
	EA Spend	£272	0.00	£0	0.00	£0
	Non-specific	£17,769	16.01	£2,845	12.79	£2,272
	TOTAL	£23,765	31.57	£7,502	12.55	£2,982

8.8 South East

Table 8.8: Gross and net change in expenditure due to loss of species in the South East (£'000s)

			Regional impact of species loss in region		National impact of species loss in region	
		Gross	Percent lost	Net	Percent lost	Net
COARSE						
	Home	£86,796	47.03	£40,818	10.27	£8,914
	Visitors	£30,834	55.79	£17,202	3.16	£974
	Total	£117,630	49.32	£58,020	8.41	£9,888
	EA Spend	£1,922	0.00	£0	0.00	£0
	Allocated NS Spend	£51,117	16.22	£8,289	16.22	£8,289
	TOTAL	£170,669		£66,309		£18,177
TROUT						
	Home	£14,917	47.03	£7,015	10.27	£1,532
	Visitors	£3,717	55.79	£2,074	3.16	£117
	Total	£18,634	48.77	£9,089	8.85	£1,649
	EA Spend	£220	0.00	£0	0.00	£0
	Allocated NS Spend	£8,097	16.22	£1,313	16.22	£1,313
	TOTAL	£26,951		£10,402		£2,963
SALMON						
	Home	£2	47.03	£1	10.27	£0
	Visitors	£427	55.79	£238	3.16	£13
	Total	£429	55.75	£239	3.19	£14
	EA Spend	£617	0.00	£0	0.00	£0
	Allocated NS Spend	£187	16.22	£30	16.22	£30
	TOTAL	£1,233		£269		£44
ALL						
	Home	£101,715	82.31	£83,724	12.34	£12,548
	Visitors	£34,978	78.72	£27,535	12.37	£4,326
	Total	£136,693	81.39	£111,259	15.17	£16,874
	EA Spend	£2,758	35.64	£983	0.00	£0
	Non-specific	£59,402	17.89	£10,627	17.51	£9,633
	TOTAL	£198,853	61.79	£122,869	13.33	£26,507

8.9 South West

Table 8.9: Gross and net change in expenditure due to loss of species in the South West (£'000s)

			Regional impact of species loss in region		National impact of species loss in region	
		Gross	Percent lost	Net	Percent lost	Net
COARSE						
	Home	£39,309	47.03	£18,486	10.27	£4,037
	Visitors	£18,712	55.79	£10,439	3.16	£591
	Total	£58,020	49.85	£28,925	7.98	£4,628
	EA Spend	£846	0.00	£0	0.00	£0
	Allocated NS Spend	£19,305	16.22	£3,130	16.22	£3,130
	TOTAL	£78,171		£32,055		£7,758
TROUT						
	Home	£9,355	47.03	£4,399	10.27	£961
	Visitors	£4,883	55.79	£2,724	3.16	£154
	Total	£14,238	50.03	£7,123	7.83	£1,115
	EA Spend	£171	0.00	£0	0.00	£0
	Allocated NS Spend	£4,737	16.22	£768	16.22	£768
	TOTAL	£19,145		£7,892		£1,883
SALMON						
	Home	£3,555	47.03	£1,672	10.27	£365
	Visitors	£1,015	55.79	£566	3.16	£32
	Total	£4,570	48.97	£2,238	8.69	£397
	EA Spend	£171	0.00	£0	0.00	£0
	Allocated NS Spend	£1,520	16.22	£247	16.22	£247
	TOTAL	£6,261		£2,484		£644
ALL						
	Home	£52,218	78.92	£41,212	13.05	£6,813
	Visitors	£24,610	87.05	£21,422	17.88	£4,400
	Total	£76,828	81.53	£62,634	14.60	£11,214
	EA Spend	£1,187	82.81	£983	0.00	£0
	Non-specific	£25,562	21.15	£5,405	20.76	£5,306
	TOTAL	£103,577	66.64	£69,022	15.95	£16,520

8.10 Wales

Table 8.10: Gross and net change in expenditure due to loss of species in Wales (£'000s)

		Regional impact of species loss in region		National impact of species loss in region	
	Gross	Percent lost	Net	Percent lost	Net
COARSE					
Home	£11,856	47.03	£5,575	10.27	£1,218
Visitors	£7,481	55.79	£4,174	3.16	£236
Total	£19,337	50.42	£9,749	7.52	£1,454
EA Spend	£889	0.00	£0	0.00	£0
Allocated NS Spend	£4,505	16.22	£730	16.22	£730
TOTAL	£24,731		£10,480		£2,184
TROUT					
Home	£11,896	47.03	£5,594	10.27	£1,222
Visitors	£18,150	55.79	£10,126	3.16	£573
Total	£30,046	52.32	£15,720	5.97	£1,795
EA Spend	£621	0.00	£0	0.00	£0
Allocated NS Spend	£6,999	16.22	£1,135	16.22	£1,135
TOTAL	£37,666		£16,855		£2,930
SALMON					
Home	£3,129	47.03	£1,471	10.27	£321
Visitors	£4,095	55.79	£2,285	3.16	£129
Total	£7,224	51.99	£3,756	6.24	£451
EA Spend	£2,700	0.00	£0	0.00	£0
Allocated NS Spend	£1,683	16.22	£273	16.22	£273
TOTAL	£11,607		£4,029		£724
ALL					
Home	£26,880	80.36	£21,602	29.90	£8,038
Visitors	£29,726	83.39	£24,789	39.79	£11,827
Total	£56,607	81.95	£46,391	35.09	£19,866
EA Spend	£4,210	23.36	£983	0.00	£0
Non-specific	£13,187	20.39	£2,689	11.07	£1,460
TOTAL	£74,004	67.65	£50,063	28.82	£21,326

8.11 England and Wales as a whole

Table 8.11: Gross and net change in expenditure due to loss of species throughout England and Wales (£'000s)

			National impact of species loss	
		Gross expenditure	Percent lost	Net impact
COARSE				
	Home	£537,088	16.3%	£87,545
	Visitors	£152,358	18.8%	£28,643
	Total	£689,446	16.9%	£116,189
	EA Spend	£10,223	0.0%	£0
	Allocated NS Spend	£271,559	16.5%	£44,807
	TOTAL	£971,228	16.6%	£160,996
TROUT				
	Home	£83,097	26.2%	£21,771
	Visitors	£36,463	39.3%	£14,334
	Total	£119,559	30.2%	£36,101
	EA Spend	£1,745	0.0%	£0
	Allocated NS Spend	£51,403	25.8%	£13,262
	TOTAL	£172,707	28.6%	£49,363
SALMON				
	Home	£12,595	38.3%	£4,824
	Visitors	£10,882	64.9%	£7,062
	Total	£23,477	50.6%	£11,886
	EA Spend	£6,526	0.0%	£0
	Allocated NS Spend	£6,955	37.6%	£2,615
	TOTAL	£36,958	39.2%	£14,501
ALL				
	Home	£632,780		
	Visitors	£199,703		
	Total	£832,483		
	EA Spend	£18,494		
	Non-specific	£329,917		
	TOTAL	£1,180,893		

8.12 Summary of key gross and net expenditure estimates by region

Table 8.12: Summary of regional gross and net expenditure estimates (£'000s)

Region	Fish Species	Gross Exp	Net Exp
North East	Coarse	£26,208	£10,650
	Trout	£12,131	£4,921
	S & ST	£7,228	£2,778
	ALL	£45,567	
North West	Coarse	£117,128	£46,331
	Trout	£16,336	£6,516
	S & ST	£7,655	£2,650
	ALL	£141,119	
Yorkshire and Humberside	Coarse	£115,447	£42,972
	Trout	£16,478	£6,145
	S & ST	£1,694	£360
	ALL	£133,618	
West Midlands	Coarse	£175,685	£71,732
	Trout	£16,473	£6,145
	S & ST	£1,142	£360
	ALL	£193,300	
East Midlands	Coarse	£140,400	£59,838
	Trout	£16,761	£6,539
	S & ST	£0	£0
	ALL	£157,161	
East Of England	Coarse	£101,648	£35,744
	Trout	£8,280	£1,928
	S & ST	£0	£0
	ALL	£109,929	
London	Coarse	£21,141	£5,503
	Trout	£2,486	£414
	S & ST	£138	£38
	ALL	£23,765	
South East	Coarse	£170,669	£66,309
	Trout	£26,951	£10,402
	S & ST	£1,233	£269
	ALL	£198,853	
South West	Coarse	£78,171	£32,055
	Trout	£19,145	£7,892
	S & ST	£6,261	£2,484
	Total	£103,577	
Wales	Coarse	£24,731	£10,480
	Trout	£37,666	£16,855
	S & ST	£11,607	£4,029
	Total	£74,004	
England and Wales	Coarse	£971,228	£160,996
	Trout	£172,707	£49,363
	S & ST	£36,958	£14,501
	Total	£1,180,893	

9 Modelling economic impacts: The Dream® model

9.1 Introduction

The aim of economic impact analysis (EIA) is to identify changes in incomes and employment as a result of an economic activity. It is normally considered in terms of the actual or hypothetical introduction of new activity or the ending of existing activity. These changes are peculiar to a particular region and its economic structure, and to the pattern of expenditure associated with the activity. Consequently, to examine the impact of coarse fishing in the East of England requires a completely different analysis from salmon fishing in the North East or indeed from trout fishing in the East of England.

The DREAM® model uses an approach based on a Detailed Regional Economic Accounting Model which considers any activity in detail and is specific to each locality, but consistent across the whole of the UK and Ireland. In the following sections, we discuss the broad principles of the model and its construction and use, including the data transformations and inputs required. Readers interested in details of construction are referred to Riddington, Gibson and Anderson (2006).

9.2 Structure of DREAM®

The aim of the DREAM® family of models is to provide economic information usually analysed at national level for regional and local economies. DREAM® snapshot is the nucleus of the system and for most users provides the most detailed picture ever seen of the local economy, fully consistent with all valid summary views that are available.

DREAM® follows national and international standards. It uses 123 industry categories, although for any particular problem the effect on most of these will be miniscule. By adhering strictly to established standards, the models are fully consistent with UK national accounts and official regional data, and each DREAM® model is consistent and comparable with the model for every other region and locality.

DREAM® differs from other models of the economy, most of which are designed to provide forecasts. DREAM® describes in detail the characteristics of the local economy, and forecasting then focuses on estimating impact or developing scenarios.

The structure of DREAM® snapshot is based on the layout of the supply and use tables in UK national accounts (see Figure 9.1).

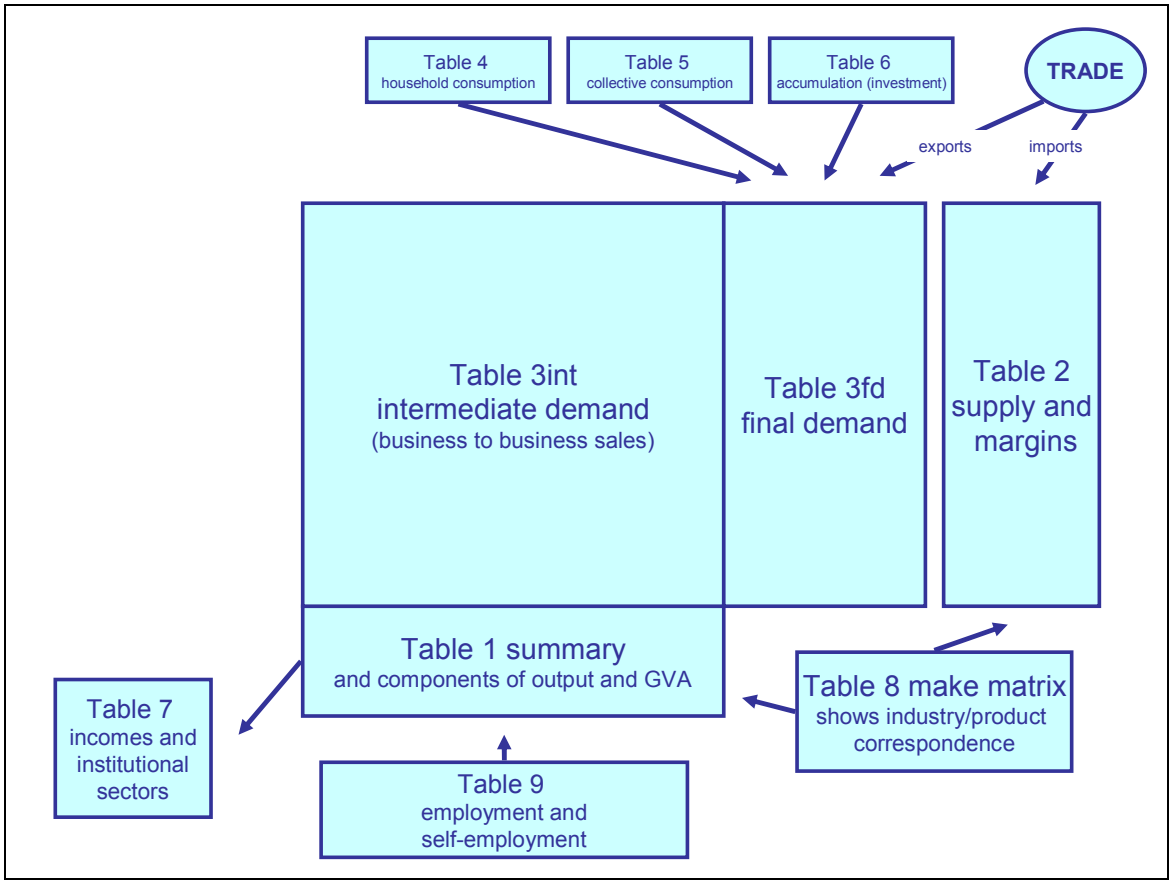


Figure 9.1: Layout of supply and use tables

9.3 Classifications and the level of detail

As noted earlier, the full DREAM® model is based on 123 standard industries (SIC) and products as set out in Appendix D. In addition, there are eight institutional sectors:

- households;
- NPISH, non-profit institutions serving households;
- central and regional government;
- local government;
- financial corporations;
- non-financial corporations;
- rest of the EU 26;
- rest of the world.

These sectors absorb output and produce inputs for the 123 industries. However, consumption is defined in terms of products (not industries) and follows a different international classification. The relationship between industry and product is defined by industry/product models and submodels.

Household demand can also be defined by socioeconomic characteristics; for example, it is quite possible to distinguish differential impacts of age (such as the impact of a new university), sex or occupation.

The standard model has 155 geographic units, based on the NUTS classification of the European Union. The Office of National Statistics (ONS) prepares regional accounts for

areas defined under that statistical nomenclature for units of territory (NUTS). In the UK, the twelve NUTS1 regions are the nine government office regions of England plus Scotland, Northern Ireland and Wales. The NUTS2 areas are subdivisions of NUTS1 regions. NUTS3 and NUTS4 are subdivisions of NUTS2 and NUTS3 respectively In England, Wales and Northern Ireland, the NUTS3 level is used and is equivalent to local authority areas. Geographic submodels can be produced to ward or postcode level.

9.4 Estimating the DREAM® model

The DREAM® model is based on the incorporation and reconciliation of ALL current statistics on production, consumption and trade at the lowest regional level in the UK. Appendix D outlines the procedures used. These models are updated whenever there is a new release of data.

The unique feature of the DREAM® model is the estimation of trade. The original Scottish model estimated trade matrices between the 41 geographical units used, but as the number of areas has grown to 155, the all-inclusive strategy has been modified. In the current version of DREAM®, a 'geography' is defined for each area appropriate to the main trade flows between seven areas. The result is 123 7*7 trade tables. The seven areas are typically the home region, three key trading regions, the rest of the UK (RUK), the rest of the EU (REU) and the rest of the world (ROW). For example for the North East, trade flows for the 123 products were estimated between the North East, the North West, Yorkshire and Humberside, rest of England and Wales, RUK, REU and ROW. In total, 10*123 7*7 trade matrices were estimated here.

Initial estimates of trade are prepared using the production/absorption estimates as origin-destination values in a 'gravity' model. In such a model, the trade between two areas is proportional to total flows from the origin and total flows to the destination, and inversely related to the distance between them. The importance of distance is summarised in a friction coefficient describing the inverse relationship. These are then reconciled with all known data by a process of iteration, as detailed in Appendix D. It is important to note that within any trade submodel, all trade flows will necessarily be balanced. However, it is possible for a model based on the geography of the North West, which has a different set of trading partners but includes the North East, to generate slightly different trade flow values from a model based in the North East that includes the North West. Research has shown that these differences are very small.

Any disadvantages from the 'specific geography' approach are significantly outweighed by advantages in terms of flexibility. Subdivisions to NUTS4 level in England and Wales can be easily incorporated and analyses for specific problems constructed. For example, the ripple effect from a city to the suburban and semi-rural areas can be identified, as can feedback effects from the suburbs to the city. The identification of feedback is unique to DREAM®.

The first stage, building the Dream® snapshot regional model, is complex and data intensive; the procedure is discussed below.

9.5 Estimating direct impacts

The estimation of direct impact is not straightforward. For each category, the following procedure is used:

1. Categories are mapped to SIC industries. For example, 'accommodation' and 'food and drink purchased' are mapped to 'hospitality'. Most purchases, however, are via retail. In this case, the retail margin is allocated to the retail sector and the balance

allocated to other industries. In the case of 'food and drink purchased', this involves a split between retail, various food processing sectors, soft drink, alcoholic drink and various agricultural sectors. The defaults for these splits are statistically based.
2. VAT and duty are then removed. In the case of fuel and alcohol, these are very significant.
3. The final step is the allocation of expenditure between home production and imports. Where the purchase is direct, such as accommodation, this will normally be 100 per cent home production. Where the purchase is via retail, the splits identified by the trade model are normally used.

These steps provide estimates of the change in output in each industry in each of the trading partners. In some cases, such as fuel purchases in a region without refining or distribution facilities, each pound of expenditure may generate only five pence direct impact. If the main expenditure on an activity is travel by car, then it is quite possible for the expenditure to output multiplier to be less than one.

9.6 Estimating indirect impacts

The indirect impact tracks industry-to-industry purchases in the local region. The direct impact is spent on (raw material) purchases from other industries (including services) and on wages, or is retained by the owners for either distribution or investment. To simplify the analysis, profit is added to wage to make income (or rather GVA) and treated as if it were household income. Similarly, investment expenditure is assumed to be exhausted in a year and is treated simply as raw material in the production process.

The input-output table identifies the split between industrial sectors and the percentage of that which is expected to be local. This is the indirect impact within the region.

Uniquely, the DREAM® model also identifies feedback effects from the trading partners. For example, quarrying will typically be outside an urban region. An increase in building demand in the urban region will lead to a flow of expenditure outside, but that industry will in turn use services inside the urban area Thus, there will be an expansion of the service output indirectly via the trading partner region.

Aggregation of these industry-to-industry flows immediately following expenditure is known as the first round indirect impact. This change will have a further impact as the industries purchase (or reduce) goods and services to meet the impact. This second round impact, in turn, generates third and fourth round impacts and so on. Although the model can identify 10 rounds, in practice 99 per cent of the impact is identified in the first four rounds. The ratio of the total to direct impact is known as Type 1 output multiplier.

9.7 Estimation of induced impacts

The expansion of activity generates increases in local incomes and consequently increases in local expenditure. In practice, these effects are less than generally expected for two reasons. Firstly income tax, national insurance and pension payments reduce disposable income to spend in the region. If the region does not have a financial sector, expenditures on mortgages and insurance also leak from the region.

The second problem is the propensity of consumers to import directly or via retailers. For example, expenditure in the hospitality sector will include holidays that are inevitably taken outside the region and increasingly outside the UK.

The procedure for estimating the induced impact is as follows:

1. Taxes and national insurance are removed to give disposable income.
2. The direct spend to industries, as opposed to retail, is identified and the proportion of direct spend to local industry estimated.
3. For retail, the percentage of retail spent within the region is calculated. For small regions where the local retail park is outside the region, this can be significant.
4. The retail margin is calculated and forms the retail industry's part of the induced effect.
5. The locally sourced proportion in each industry supplying retail is estimated and provides the third part of the induced effect.
6. The sum of these effects is the first round induced impact and is added to the first round indirect effect to provide a total first round impact.
7. The proportion allocated to incomes of the total first round impact is identified and goes on to generate the second round impact.
8. The ratio of sum of the indirect and induced effects to the direct impact is known as the Type 2 multiplier.

9.8 Estimation of changes in incomes and employment

In each round, the additional income (GVA) is identified. The sum of these over all the rounds provides a measure of the additional (reduction in) income from the change. Each industry in each region has a unique productivity (reflecting the speciality of the region) and a unique pattern of employment to produce the output. It is relatively simple, therefore, to take changes in output and identify from that the employment by gender and employment category (part-time/full-time).

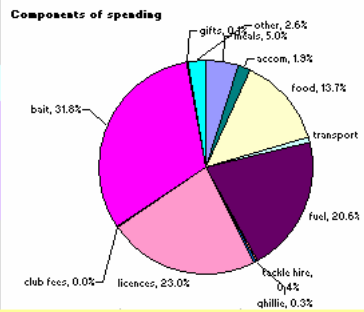
9.9 Presentation of results

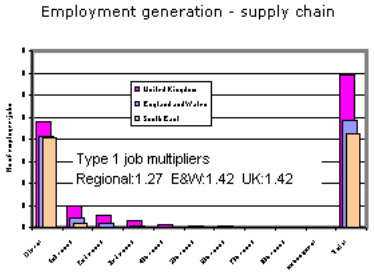
The model requires large amounts of data and is capable of generating the most detailed of outputs. Figure 9.2 below gives an example of the output. In this case, the output relates to the trip expenditure of local anglers fishing for coarse fish in the South East. Both Type I and Type II impacts on output, income and jobs are reported. In this report, these results are simplified to give gross and net effects (post-substitution) of Type II analysis of incomes and employment. For the purpose of this project, we present the full DREAM® output in an accompanying CD.

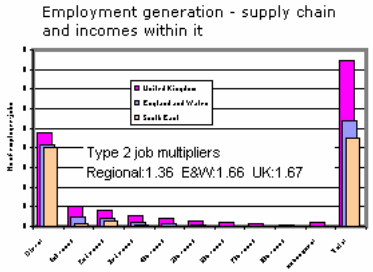
Region:	South East	Neighbouring regions:	London	South West
Species:	Coarse			
Angler origin:	Local			

Fig 9.1

DREAM Output







Survey results

Angler days	Spend per day	Total spend
3097592	£28.02	£86,795,980

Components of spending

meals	accom	food	transport	fuel	tackle hire	ghillie	licences	club fees	bait	gifts	other	Total
£4,311,621	£1,672,008	£11,923,120	£588,634	£17,877,040	£340,334	£238,249	£19,920,626	£0	£27,612,718	£54,850	£2,256,781	£86,795,980
5.0%	1.9%	13.7%	0.7%	20.6%	0.4%	0.3%	23.0%	0.0%	31.8%	0.1%	2.6%	100.0%

Total effective spend	Retail margins	Wholesale margins	VAT and other product taxes	Spend net of product taxes	Falling on all South East producers	Falling on all London producers	Falling on all South West producers	Falling on other E&W producers	Falling on other UK producers	Falling on all UK producers	Imports EU	Imports RoW
	£10,758,955	£4,545,557	£12,264,509	£1,820	£51,310,824	£9,708,742	£1,043,325	£7,031,106	£565,207	£69,661,024	£1,536,879	£1,519,304
0.0%	0.0%	12.4%	14.1%	0.0%	59.1%	11.2%	1.2%	8.1%	0.7%	80.3%	1.8%	1.8%

Type 1 multiplier analysis (business-to-business supply chain) (£000)

	Direct expenditure	First round indirect	Subsequent indirect	Total output effect	Output multiplier	Direct jobs	Total jobs	Employment multiplier	Jobs per £ mn effective spend	Jobs per 1000 angler-days	Total GVA generated	GVA/job generated
South East	£51,311	£22,938	£7,391	£81,640	1.591	1,369	1,734	1.266	20.0	0.56	£40,594	£23,412
Rest of England and Wales	£17,783	£7,739	£15,799	£41,322		271	586				£20,288	£34,629
England and Wales	£69,094	£30,677	£23,191	£122,962	1.780	1,640	2,320	1.415	26.7	0.75	£60,882	£26,245
Rest of UK	£565	£312	£1,032	£1,909		6	20				£865	£42,351
UK	£69,659	£30,989	£24,222	£124,871	1.793	1,646	2,340	1.422	27.0	0.76	£61,747	£26,385

Type 2 multiplier analysis (supply chain plus spending of all who work in it and consequent supply chains)

	Direct expenditure	First round indirect	Subsequent indirect	Total output effect	Output multiplier	Direct jobs	Total jobs	Employment multiplier	Jobs per £ effective spend	Jobs per 1000 angler-days	Total GVA generated	GVA/job generated
South East	£51,311	£37,990	£26,219	£115,520	2.251	1,369	1,866	1.363	21.5	0.60	£45,493	£24,380
Rest of England and Wales	£17,783	£12,542	£50,892	£81,217		270	851				£30,149	£35,411
England and Wales	£69,094	£50,532	£77,111	£196,737	2.847	1,639	2,717	1.658	31.3	0.88	£75,642	£27,836
Rest of UK	£565	£444	£2,323	£3,332		6	29				£1,253	£42,596
UK	£69,659	£50,976	£79,434	£200,068	2.872	1,645	2,747	1.670	31.6	0.89	£76,894	£27,994

10 Regional economic activity supported by and economic impact of inland fisheries

As previously discussed, the net change in angler expenditure depends on substitution effects. For example, if anglers in the North East substituted for the loss of, say, coarse angling by switching to trout angling, the net loss in angler expenditure in the North East could be relatively minor, with correspondingly small impacts on regional income and employment. Though the North East would lose the income and employment supported by coarse angling expenditure, it would gain from increased expenditure on trout angling. The balance of these effects describes the economic impact of the loss of angling within the region. In this study, for each region we estimate both the economic activity supported by and the economic impact of the loss of each fish species.

Sections 10.2 to 10.11 provide tables with indicators of the consequences for the regional and national economy of individual fish species loss in each region.

The list of principal indicators for each region is given in Section 10.1.4; some readers may wish to skip the intervening sections which explain the rationale for each indicator.

10.1 Presentation of results

Estimates of gross expenditure (pre-substitution expenditure) provide a snapshot of current levels of angler expenditure in each region, which supports regional household income and employment. In this study, gross expenditure is the basis for estimating the economic activity supported by angler expenditure.

Whilst estimates of the economic impact for each region/fish species combination are given below, estimates of the economic impact of 'all species' in each region are given in Appendix C. This study was not required to produce regional 'all species' economic impact assessments. Some users might seek to produce 'all species' estimates by simply summing the economic impacts of the losses of individual fish species. Such an aggregation would not be legitimate. The economic impact assessment relating to individual species is based on a substitution analysis that allows anglers to switch to other species within a region. Simultaneous loss of all species would preclude anglers switching to other fish species in the region. Given this, the 'all species' economic impact would be greater than the sum of the impacts associated with each fish species.

Unfortunately, a regional 'all species' substitution analysis would have placed a severe burden on the survey instruments. None the less, we were able to produce somewhat crude 'all species' estimates for each of the ten regions. These estimates are based on assumptions about how particular categories of anglers would react, rather than details provided by individual anglers. Because of their reduced reliability, these estimates are relegated to the appendices.

Using the DREAM® model, we generated detailed assessments of the regional economic activity supported by 'all species' and by each fish species, and the regional economic impact of each, but not all, fish species[5].

[5] This 'all species' regional economic impact assessment is given in Appendix C.

As explained, the DREAM® output is detailed and for this section, it was necessary to select only the key economic indicators. These are explained below in Section 10.1.1.

10.1.1 Key indicators

- **Direct employment supported**. This is the regional employment, measured in full-time equivalents (FTEs), which is employed to satisfy the demands of anglers as reflected in the anglers' expenditure.
- **Total GVA.** This is the extent to which household incomes in the region (wages, rents, profits and income from self-employment) are supported by angling, as a result of all the direct, indirect and induced effects on the regional economy.
- **Total employment.** This is the regional employment, measured in full-time job equivalents (FTEs), which is employed as a result of all the direct, indirect and induced effects working through the regional economy.

Total GVA and employment more completely describe the employment effects. Direct employment is included largely to compare structural differences between regions[6].

In addition to the regional effects of losing a fish species, there would be consequences for national (England and Wales) economic activity. As well as reporting the regional consequences (in the form of activity supported by and economic impact of), we report the national consequences of regional species loss. This is different from the national consequences of a national loss of a fish species, which is the focus of Section 11.

10.1.2 Economic activity supported by all fish species

As discussed above, 'all species' economic impact assessments are relegated to Appendix C. In this section, we report the economic activity supported by all fish species in each region, In doing so, we report the following (regional and national): direct employment (FTEs); total GVA; total employment (FTEs).

Analysts may also wish to know the relative contribution of various categories of expenditure. We have therefore selected (regional and national) total employment and have partitioned this into the following five categories:

- local and visitor angler activity expenditure (two categories);
- local and visitor angler non-specific expenditure (two categories);
- Environment Agency expenditure.

10.1.3 Economic activity supported by and economic impact of individual fish species

For each fish species in each region, we report both the activity supported and the economic impact using the following: direct employment (FTEs); total GVA; total employment (FTEs).

As discussed in Section 1, users of this report can further disaggregate these regional tables by the number of angler days on each type of water. Thus, users could use the data tables in Section 4 to disaggregate further the tables in this section. For example, with respect to, say, coarse angling in the South East, it would be possible to use data on angler days

[6] We do not report total output, since it is subject to double counting.

extracted from Tables 4.11, 4.13 and 4.15 to disaggregate Table 10.3. This would generate estimates for both the economic activity supported by and economic impact of:

- coarse angler days on rivers in South East;
- coarse angler days on stillwaters in the South East;
- coarse angler days on canals in the South East.

Analysts, policy makers and those with more specialised interests may need to know the potential relationship between angler expenditure and key indicators of economic dependency. We therefore report two key ratios. The first is the total regional income (total GVA) generated per pound of angler expenditure. The second is the amount of angler expenditure necessary to generate one full-time job. The DREAM® output enables these ratios to be calculated separately for local and visitor angler expenditure. For each fish species in each region, we report these results using the following:

	Activity supported		**Economic impact**	
	Regional	**England & Wales**	**Regional**	**England & Wales**
GVA per £ local angler expenditure	0.47	0.76	0.21	0.05
Local angler expenditure (£'000s) per FTE	49.83	34.91	115.15	497.45
GVA per £ visitor angler expenditure	0.51	0.78	0.31	0.05
Visitor angler expenditure (£'000s) per FTE	46.38	32.85	76.77	525.67

The specimen ratios given in the table above relate to coarse angling in the North East (see Section 10.2.3). The table above informs us that with respect to the North East:

- Each pound of local angler expenditure on coarse angling in the North East supports £0.47 of regional household income. This ratio is relevant if a policy initiative were to result in increased (decreased) expenditure by locals on coarse angling, and there was no expectation of a consequential decrease (increase) in local expenditure elsewhere in the region.

- Each pound of local angler expenditure on coarse angling in the North East has a net economic impact of £0.21 on regional household income. This ratio is relevant if a policy initiative were to result in increased (decreased) expenditure by locals on coarse angling, and there was an expectation of a consequential decrease (increase) in local expenditure elsewhere in the region.**

- Each pound of visitor angler expenditure on coarse angling in the North East supports £0.51 of regional household income. This ratio is relevant if a policy initiative were to result in increased (decreased) expenditure by visitors on coarse angling, and there was no expectation of a consequential decrease (increase) in visitor angler expenditure elsewhere in the region.

- Each pound of visitor angler expenditure on coarse angling in the North East has a net economic impact of £0.31 on regional household income. This ratio is relevant if a policy initiative were to result in increased (decreased) expenditure by visitors on

coarse angling, and there was an expectation of a consequential decrease (increase) in local expenditure elsewhere in the region.**

- Each £49,830 of local angler expenditure on coarse angling in the North East supports one full-time job equivalent. In other words, there would be a net gain (loss) of one FTE in the North East for every increase (decrease) in £49,830 spent by local anglers on coarse angling in the North East. This ratio is relevant if a policy initiative were to result in increased (decreased) expenditure by locals on coarse angling, and there was no expectation of a consequential decrease (increase) in local expenditure elsewhere in the region.

- There would be a net gain (loss) of one full-time job equivalent in the North East for every increase (decrease) of £115,150 of local spending on coarse angling, in circumstances where there was an expectation of a consequential decrease (increase) in local expenditure elsewhere in the North East.**

- Each £46,380 of visiting angler expenditure on coarse angling in the North East supports one full-time job equivalent. In other words, there would be a net gain (loss) of one full-time job in the North East for an increase (decrease) of £46,380 spent by visiting anglers on coarse angling in the North East. This ratio is relevant if a policy initiative were to result in increased (decreased) expenditure by visitors on coarse angling, and there was no expectation of a consequential decrease (increase) in visitor expenditure elsewhere in the North East.

- There would be a net gain (loss) of one full-time job in the North East for every additional (decrease of) £76,770 of visitor spending on coarse angling, in circumstances where there was an expectation of a consequential decrease (increase) in visitor expenditure elsewhere in the North East.**
- On average, each angler day on coarse angling in the North East supports £14.55 of regional household income. This ratio is relevant if a policy initiative were to result in increases (decreases) in coarse angler days in the North East and there was no expectation of a consequential decrease (increase) in angler days elsewhere in the region.
- On average, each angler day on coarse angling in the North East has a net economic impact of £6.01 on regional household income. This ratio is relevant if a policy initiative were to result in increases (decreases) in coarse angler days in the North East and there was an expectation of a consequential decrease (increase) in angler days elsewhere in the region.**

- On average, each thousand coarse angler days in the North East supports 0.64 full-time job equivalents. In other words, there would be a net gain (loss) of 0.64 full-time job equivalents in the North East for an increase (decrease) of 1,000 coarse angler days in the North East. This ratio is relevant if a policy initiative were to result in increases (decreases) in coarse angler days in the North East and there was no expectation of a consequential decrease (increase) in angler days elsewhere in the region.
- On average, there would be a net gain (loss) of 0.26 full-time jobs in the North East for every additional (decrease of) 1,000 coarse angler days in the North East, in circumstances where there was an expectation of a consequential decrease (increase) in visitor expenditure elsewhere in the North East.**

***The magnitude of consequential decrease (increase) in expenditure should be commensurate with the substitution patterns to be expected if coarse angling were no longer available anywhere in the North East*.

The above ratios are also produced for the impact on the rest of England and Wales of the loss of each fish species in the North East.

Finally, we also report the relative contribution of the five categories of expenditure to total employment. This is reported for both the economic activity supported and economic impact of each species.

10.1.4 Summary

Sections 10.2 through to 10.11 present detailed impact assessments for each of the ten regions. Ignoring direct employment, the tables for each region list the following:

1. Regional gross expenditure broken down by species.
2. Household income (total GVA) supported by **all species** expenditure.
3. Employment (total FTEs) supported by **all species** expenditure.
4. Percentage of employment supported by categories of **all species** expenditure (local trip expenditure, visitor trip expenditure, local non-specific expenditure, visitor non-specific expenditure, Environment Agency expenditure).
5. Household income (total GVA) supported by **coarse** angling expenditure.
6. Household income (total GVA) supported by one **coarse** angler day.
7. Employment (total FTEs) supported by **coarse** angler expenditure.
8. Employment (total FTEs) supported by one thousand **coarse** angler days.
9. Percentage of employment supported by categories of **coarse** angler expenditure (local trip expenditure, visitor trip expenditure, local non-specific expenditure, visitor non-specific expenditure, Environment Agency expenditure).
10. Regional household income (total GVA) supported per pound of local **coarse** angler expenditure.
11. Regional household income (total GVA) supported per pound of visiting **coarse** angler expenditure.
12. Local **coarse** angler expenditure necessary to support one FTE in the region.
13. Visiting **coarse** angler expenditure necessary to support one FTE in the region.
14. The impact (post-substitution) on household income (total GVA) of **coarse** angler expenditure.
15. The impact (post-substitution) on employment (total FTEs) of **coarse** angler expenditure.
16. The impact (post-substitution) on household income (total GVA) of one **coarse** angler day.
17. The impact (post-substitution) on employment (total FTEs) of one thousand **coarse** angler days.

18. Percentage of the impact (post-substitution) on employment attributable to categories of **coarse** angler expenditure (local trip expenditure, visitor trip expenditure, local non-specific expenditure, visitor non-specific expenditure, Environment Agency expenditure).

19. Economic impact (post-substitution) on regional household income (total GVA) per pound of local **coarse** angler expenditure.

20. Economic impact (post-substitution) on regional household income (total GVA) per pound of visiting **coarse** angler expenditure.

21. Local **coarse** angler expenditure necessary to generate (post-substitution) one FTE in the region.

22. Visiting **coarse** angler expenditure necessary to generate (post-substitution) one FTE in the region.

23. Household income (total GVA) supported by **trout** angler expenditure.

24. Household income (total GVA) supported by one **trout** angler day.

25. Employment (total FTEs) supported by **trout** angler expenditure.

26. Employment (total FTEs) supported by one thousand **trout** angler days.

27. Percentage of employment supported by categories of **trout** angler expenditure (local trip expenditure, visitor trip expenditure, local non-specific expenditure, visitor non-specific expenditure, Environment Agency expenditure).

28. Regional household income (total GVA) supported per pound of local **trout** angler expenditure.

29. Regional household income (total GVA) supported per pound of visiting **trout** angler expenditure.

30. Local **trout** angler expenditure necessary to support one FTE in the region.

31. Visiting **trout** angler expenditure necessary to support one FTE in the region.

32. The impact (post-substitution) on household income (total GVA) of **trout** angler expenditure.

33. The impact (post-substitution) on employment (total FTEs) of **trout** angler expenditure.

34. The impact (post-substitution) on household income (total GVA) of one **trout** angler day.

35. The impact (post-substitution) on employment (total FTEs) of one thousand **trout** angler days.

36. Percentage of the impact (post-substitution) on employment attributable to categories of **trout** angler expenditure (local trip expenditure, visitor trip expenditure, local non-specific expenditure, visitor non-specific expenditure, Environment Agency expenditure).

37. Economic impact (post-substitution) on regional household income (total GVA) per pound of local **trout** angler expenditure.

38. Economic impact (post-substitution) on regional household income (total GVA) per pound of visiting **trout** angler expenditure.

39. Local **trout** angler expenditure necessary to generate (post-substitution) one FTE in the region.

40. Visiting **trout** angler expenditure necessary to generate (post-substitution) one FTE in the region.

41. Household income (total GVA) supported by **salmon and sea trout** angler expenditure.

42. Household income (total GVA) supported by a **salmon and sea trout** angler day.

43. Employment (total FTEs) supported by **salmon and sea trout** angler expenditure.

44. Employment (total FTEs) supported by one thousand **salmon and sea trout** angler days.

45. Percentage of employment supported by categories of **salmon & sea trout** angler expenditure (local trip expenditure, visitor trip expenditure, local non-specific expenditure, visitor non-specific expenditure, Environment Agency expenditure).

46. Regional household income (total GVA) supported per pound of local **salmon and sea trout** angler expenditure.

47. Regional household income (total GVA) supported per pound of visiting **salmon and sea trout** angler expenditure.

48. Local **salmon and sea trout** angler expenditure necessary to support one FTE in the region.

49. Visiting **salmon and sea trout** angler expenditure necessary to support one FTE in the region.

50. The impact (post-substitution) on household income (total GVA) of **salmon and sea trout** angler expenditure.

51. The impact (post-substitution) on employment (total FTEs) of **salmon and sea trout** angler expenditure.

52. The impact (post-substitution) on household income (total GVA) of one **salmon and sea trout** angler day.

53. The impact (post-substitution) on employment (total FTEs) of one thousand **salmon and sea trout** angler days.

54. Percentage of the impact (post-substitution) on employment attributable to categories of **salmon and sea trout** angler expenditure (local trip expenditure, visitor trip expenditure, local non-specific expenditure, visitor non-specific expenditure, Environment Agency expenditure).

55. Economic impact (post-substitution) on regional household income (total GVA) per pound of local **salmon and sea trout** angler expenditure.

56. Economic impact (post-substitution) on regional household income (total GVA) per pound of visiting **salmon and sea trout** angler expenditure.

57. Local **salmon and sea trout** angler expenditure necessary to generate (post-substitution) one FTE in the region.

58. Visiting **salmon and sea trout** angler expenditure necessary to generate (post-substitution) one FTE in the region.

The above 58 elements of each impact assessment are also available for the national economic impact of species loss in the region, making a total of 116 pieces of information that describe the consequences of a species loss in each of the ten regions. Our understanding is that the elements relating to the regional consequences of a species loss will be of greater interest than the national consequences.

10.2 North East

10.2.1 Gross expenditure in the North East by all fish species

Table 10.1: Gross expenditure in the North East by fish species (£'000s)

Fish Species	Expenditure	
Coarse	£26,208	57.52%
Trout	£12,131	26.62%
Salmon & Sea Trout	£7,228	15.86%
Total	£45,567	100%

10.2.2 Economic activity supported by all fish species in the North East

Table 10.2: Economic activity supported by all species in the North East

Gross Expenditure = £45.567 million	**Activity Supported**	
	Regional	**England and Wales**
	Key Measures	
Direct Employment (FTEs)	657	784
Total GVA (£'000s)	£21,020	£33,659
Total Employment (FTEs)	935	1,345
	Relative Contribution of Expenditure Categories	
Local Activity	37.4%	40.5%
Visitor Activity	27.3%	28.9%
Local Non-Specific	25.0%	21.7%
Visitor Non-Specific	6.5%	5.7%
Environment Agency	3.7%	3.3%
Total	100.0%	100.0%

10.2.3 North East coarse angling

Table 10.3: Economic activity supported by and economic impact of coarse angling in the North East

Angler Days 889,057	Activity Supported		Economic Impact	
Expenditure £26.208million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	404	461	161	48
Total GVA (£'000s)	£12,938	£19,615	£5,342	£1,944
Total Employment (FTEs)	573	782	231	80
	Relative Contribution of Expenditure Categories			
Local Activity	39.00%	40.80%	41.80%	28.00%
Visitor Activity	28.90%	29.90%	43.30%	18.30%
Local Non-Specific	23.70%	21.60%	11.00%	39.60%
Visitor Non-Specific	6.20%	5.70%	2.90%	10.40%
Environment Agency	2.30%	2.10%	1.10%	3.80%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.47	0.76	0.21	0.05
Local angler expenditure (£'000s) per FTE	49.83	34.91	115.15	497.45
GVA per £ visitor angler expenditure	0.51	0.78	0.31	0.05
Visitor angler expenditure (£'000s) per FTE	46.38	32.85	76.77	525.67
GVA per Angler Day	£14.55	£22.06	£6.01	£2.19
FTE per Thousand Angler Day	0.64	0.88	0.26	0.09

10.2.4 North East trout angling

Table 10.4: Economic activity supported by and economic impact of trout angling in the North East

Angler Days 314,181	Activity Supported		Economic Impact	
Expenditure £12.131million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	152	201	66	74
Total GVA (£'000s)	£4,858	£8,842	£2,194	£3,292
Total Employment (FTEs)	216	352	96	130
	Relative Contribution of Expenditure Categories			
Local Activity	37.70%	43.70%	41.70%	49.70%
Visitor Activity	23.10%	26.30%	32.70%	26.70%
Local Non-Specific	29.10%	22.30%	19.10%	17.50%
Visitor Non-Specific	7.60%	5.80%	5.00%	4.60%
Environment Agency	2.50%	1.90%	1.60%	1.50%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.36	0.75	0.18	0.31
Local angler expenditure (£'000s) per FTE	66.3	35.18	135.31	83.76
GVA per £ visitor angler expenditure	0.36	0.72	0.22	0.27
Visitor angler expenditure (£'000s) per FTE	66.32	35.92	106.11	95.77
GVA per Angler Day	£15.46	£28.14	£6.98	£10.48
FTE per Thousand Angler Day	0.69	1.12	0.31	0.41

10.2.5 North East salmon and sea trout angling

Table 10.5: Economic activity supported by and economic impact of salmon and sea trout angling in the North East

Angler Days 56,920	Activity Supported		Economic Impact	
Expenditure £7.228million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	101	122	56	54
Total GVA (£'000s)	£3,224	£5,202	£1,857	£2,404
Total Employment (FTEs)	146	211	82	96
	Relative Contribution of Expenditure Categories			
Local Activity	30.70%	34.30%	35.30%	42.70%
Visitor Activity	27.40%	29.60%	48.40%	39.80%
Local Non-Specific	24.20%	20.80%	9.40%	10.10%
Visitor Non-Specific	6.30%	5.50%	2.50%	2.60%
Environment Agency	11.40%	9.80%	4.40%	4.80%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.39	0.69	0.25	0.39
Local angler expenditure (£'000s) per FTE	62.15	38.29	95.3	67.75
GVA per £ visitor angler expenditure	0.41	0.72	0.41	0.44
Visitor angler expenditure (£'000s) per FTE	53.02	33.87	53.02	55.43
GVA per Angler Day	£56.64	£91.39	£32.62	£42.23
FTE per Thousand Angler Day	2.57	3.71	1.44	1.69

10.3 North West

10.3.1 Gross expenditure in the North West by all fish species

Table 10.6: Gross expenditure in the North West by fish species (£'000s)

Fish Species	Expenditure	
Coarse	£117,128	83.12%
Trout	£16,336	11.49%
Salmon & Sea Trout	£7,655	5.39%
Total	£141,119	100.00%

10.3.2 Economic activity supported by all fish species in the North West

Table 10.7: Economic activity supported by all species in the North West

Gross Expenditure = £141,119 million	**Activity Supported**	
	Regional	**England and Wales**
	Key Measures	
Direct Employment (FTEs)	2,174	2,548
Total GVA (£'000s)	£79,243	£116,132
Total Employment (FTEs)	3,247	4,563
	Relative Contribution of Expenditure Categories	
Local Activity	61.9%	64.9%
Visitor Activity	8.4%	8.9%
Local Non-Specific	24.9%	21.9%
Visitor Non-Specific	2.0%	1.7%
Environment Agency	2.9%	2.6%
Total	100.0%	100.0%

10.3.3 North West coarse angling

Table 10.8: Economic activity supported by and economic impact of coarse angling in the North West

Angler Days 3,474,253	Activity Supported		Economic Impact	
Expenditure £117.128million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	1833	2116	697	240
Total GVA (£'000s)	£67,042	£96,585	£26,116	£10,301
Total Employment (FTEs)	2,736	3,783	1,052	412
	Relative Contribution of Expenditure Categories			
Local Activity	65.00%	67.70%	73.30%	41.10%
Visitor Activity	6.80%	7.00%	9.70%	5.30%
Local Non-Specific	24.80%	22.10%	14.90%	46.90%
Visitor Non-Specific	2.00%	1.70%	1.20%	3.70%
Environment Agency	1.50%	1.40%	0.90%	3.00%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.57	0.84	0.25	0.06
Local angler expenditure (£'000s) per FTE	44.44	30.86	102.41	466.95
GVA per £ visitor angler expenditure	0.57	0.84	0.31	0.07
Visitor angler expenditure (£'000s) per FTE	43.98	30.55	79.55	375.75
GVA per Angler Day	£19.30	£27.80	£7.52	£2.96
FTE per Thousand Angler Day	0.79	1.09	0.30	0.12

10.3.4 North West trout angling

Table 10.9: Economic activity supported by and economic impact of trout angling in the North West

Angler Days 431,083	Activity Supported		Economic Impact	
Expenditure £16.336million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	221	289	97	109
Total GVA (£'000s)	£7,985	£13,223	£3,690	£5,195
Total Employment (FTEs)	331	525	150	204
	Relative Contribution of Expenditure Categories			
Local Activity	57.90%	64.00%	74.90%	76.90%
Visitor Activity	9.60%	10.60%	14.40%	13.40%
Local Non-Specific	28.50%	22.20%	9.40%	8.50%
Visitor Non-Specific	2.30%	1.80%	0.70%	0.70%
Environment Agency	1.70%	1.40%	0.60%	0.50%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.46	0.82	0.27	0.39
Local angler expenditure (£'000s) per FTE	54.36	31.03	92.91	66.3
GVA per £ visitor angler expenditure	0.46	0.82	0.31	0.4
Visitor angler expenditure (£'000s) per FTE	54.36	31.03	80.03	63.26
GVA per Angler Day	£18.52	£30.67	£8.56	£12.05
FTE per Thousand Angler Day	0.77	1.22	0.35	0.47

10.3.5 North West salmon and sea trout angling

Table 10.10: Economic activity supported by and economic impact of salmon and sea trout angling in the North West

Angler Days 108,252	Activity Supported		Economic Impact	
Expenditure £7.655million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	120	143	56	44
Total GVA (£'000s)	£4,216	£6,324	£1,966	£1,955
Total Employment (FTEs)	180	255	84	79
	Relative Contribution of Expenditure Categories			
Local Activity	22.30%	26.00%	29.30%	32.70%
Visitor Activity	30.90%	32.40%	56.80%	48.60%
Local Non-Specific	20.20%	17.50%	6.00%	7.90%
Visitor Non-Specific	1.60%	1.40%	0.50%	0.60%
Environment Agency	25.10%	22.70%	7.50%	10.20%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.46	0.77	0.28	0.3
Local angler expenditure (£'000s) per FTE	56.39	34.08	92.27	87.64
GVA per £ visitor angler expenditure	0.52	0.82	0.44	0.38
Visitor angler expenditure (£'000s) per FTE	43.27	29.08	50.49	62.64
GVA per Angler Day	£38.95	£58.42	£18.16	£18.06
FTE per Thousand Angler Day	1.66	2.36	0.78	0.73

10.4 Yorkshire and Humberside

10.4.1 Gross expenditure in Yorkshire and Humberside by all fish species

Table 10.11: Gross expenditure in Yorks and Humberside by fish species (£'000s)

Fish Species	Expenditure	
Coarse	£115,447	86.40%
Trout	£16,478	12.33%
Salmon & Sea Trout	£1,694	1.27%
Total	£133,618	100.00%

10.4.2 Economic activity supported by all fish species in Yorkshire and Humberside

Table 10.12: Economic activity supported by all species in Yorkshire and Humberside

Gross Expenditure = £133.618 million	**Activity Supported**	
	Regional	**England and Wales**
	Key Measures	
Direct Employment (FTEs)	2,166	2,541
Total GVA (£'000s)	£74,970	£112,557
Total Employment (FTEs)	3,139	4,363
	Relative Contribution of Expenditure Categories	
Local Activity	54.5%	57.8%
Visitor Activity	6.9%	7.3%
Local Non-Specific	35.8%	32.2%
Visitor Non-Specific	1.2%	1.1%
Environment Agency	1.7%	1.6%
Total	100.0%	100.0%

10.4.3 Yorkshire and Humberside coarse angling

Table 10.13: Economic activity supported by and economic impact of coarse angling in Yorkshire and Humberside

Angler Days 3,116,577	Activity Supported		Economic Impact	
Expenditure £115.447million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	1884	2187	687	238
Total GVA (£'000s)	£65,303	£96,913	£25,057	£9,575
Total Employment (FTEs)	2730	3751	1016	389
	Relative Contribution of Expenditure Categories			
Local Activity	55.40%	58.30%	69.70%	27.70%
Visitor Activity	6.80%	7.20%	9.40%	4.00%
Local Non-Specific	35.70%	32.60%	19.70%	64.40%
Visitor Non-Specific	1.20%	1.10%	0.70%	2.20%
Environment Agency	0.90%	0.90%	0.50%	1.70%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.57	0.87	0.27	0.04
Local angler expenditure (£'000s) per FTE	45.19	31.26	96.47	633.92
GVA per £ visitor angler expenditure	0.55	0.86	0.29	0.05
Visitor angler expenditure (£'000s) per FTE	45.37	31.07	87.6	539.8
GVA per Angler Day	£20.95	£31.10	£8.04	£3.07
FTE per Thousand Angler Day	0.88	1.20	0.33	0.12

10.4.4 Yorkshire and Humberside trout angling

Table 10.14: Economic activity supported by and economic impact of trout angling in Yorkshire and Humberside

Angler Days 368,020	Activity Supported		Economic Impact	
Expenditure £16.478million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	250	318	90	100
Total GVA (£'000s)	£8,642	£14,149	£3,357	£4,694
Total Employment (FTEs)	363	551	135	179
	Relative Contribution of Expenditure Categories			
Local Activity	52.50%	58.80%	72.10%	73.30%
Visitor Activity	6.70%	7.50%	11.60%	11.20%
Local Non-Specific	38.40%	31.70%	15.40%	14.60%
Visitor Non-Specific	1.30%	1.10%	0.50%	0.50%
Environment Agency	1.10%	1.00%	0.40%	0.50%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.5	0.89	0.26	0.36
Local angler expenditure (£'000s) per FTE	51	30.03	99.88	74.29
GVA per £ visitor angler expenditure	0.5	0.89	0.32	0.43
Visitor angler expenditure (£'000s) per FTE	51	30.03	79.06	62.06
GVA per Angler Day	£23.48	£38.45	£9.12	£12.75
FTE per Thousand Angler Day	0.99	1.50	0.37	0.49

10.4.5 Yorkshire and Humberside salmon and sea trout angling

Table 10.15: Economic activity supported by and economic impact of salmon and sea trout angling in Yorkshire and Humberside

Angler Days 19,882	Activity Supported		Economic Impact	
Expenditure £1.694million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	31	35	14	14
Total GVA (£'000s)	£1,026	£1,496	£460	£579
Total Employment (FTEs)	46	61	20	24
	Relative Contribution of Expenditure Categories			
Local Activity	14.40%	15.40%	18.10%	22.10%
Visitor Activity	13.80%	14.00%	26.70%	15.50%
Local Non-Specific	16.80%	15.80%	12.90%	13.90%
Visitor Non-Specific	0.60%	0.50%	0.40%	0.50%
Environment Agency	54.50%	54.30%	41.90%	47.90%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.46	0.73	0.26	0.41
Local angler expenditure (£'000s) per FTE	47.85	33.73	86.13	60.71
GVA per £ visitor angler expenditure	0.53	0.77	0.45	0.33
Visitor angler expenditure (£'000s) per FTE	45.77	33.98	53.4	79.29
GVA per Angler Day	£51.60	£75.24	£23.14	£29.12
FTE per Thousand Angler Day	2.31	3.07	1.01	1.21

10.5 West Midlands

10.5.1 Gross expenditure in the West Midlands by all fish species

Table 10.16: Gross expenditure in the West Midlands by fish species (£'000s)

Fish Species	Expenditure	
Coarse	£175,685	86.80%
Trout	£16,473	12.34%
Salmon & Sea Trout	£1,142	0.86%
Total	£193,300	100.00%

10.5.2 Economic activity supported by all fish species in the West Midlands

Table 10.17: Economic activity supported by all species in the West Midlands

Gross Expenditure = £193.300 million	**Activity Supported**	
	Regional	**England and Wales**
	Key Measures	
Direct Employment (FTEs)	2,158	2,533
Total GVA (£'000s)	£99,974	£112,264
Total Employment (FTEs)	4,217	4,349
	Relative Contribution of Expenditure Categories	
Local Activity	54.7%	57.9%
Visitor Activity	6.9%	7.3%
Local Non-Specific	35.9%	32.3%
Visitor Non-Specific	1.2%	1.1%
Environment Agency	1.3%	1.3%
Total	100.0%	100.0%

10.5.3 West Midlands coarse angling

Table 10.18: Economic activity supported by and economic impact of coarse angling in the West Midlands

Angler Days 4,592,190	Activity Supported		Economic Impact	
Expenditure £175,685million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	1890	2194	688	240
Total GVA (£'000s)	£90,772	£97,289	£36,163	£9,674
Total Employment (FTEs)	3,829	3764	1,499	393
	Relative Contribution of Expenditure Categories			
Local Activity	55.20%	58.10%	69.50%	27.40%
Visitor Activity	6.70%	7.20%	9.40%	3.90%
Local Non-Specific	35.60%	32.40%	19.70%	63.80%
Visitor Non-Specific	1.20%	1.10%	0.70%	2.20%
Environment Agency	1.20%	1.20%	0.70%	2.60%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.57	0.87	0.27	0.04
Local angler expenditure (£'000s) per FTE	45.19	31.26	96.47	633.92
GVA per £ visitor angler expenditure	0.55	0.86	0.29	0.05
Visitor angler expenditure (£'000s) per FTE	45.37	31.07	87.6	539.8
GVA per Angler Day	£19.77	£21.19	£7.87	£2.11
FTE per Thousand Angler Day	0.83	0.82	0.33	0.09

10.5.4 West Midlands trout angling

Table 10.19: Economic activity supported by and economic impact of trout angling in the West Midlands

Angler Days 249,452	Activity Supported		Economic Impact	
Expenditure £16.474million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	249	317	90	100
Total GVA (£'000s)	£8,604	£14,093	£3,349	£4,681
Total Employment (FTEs)	362	549	135	178
	Relative Contribution of Expenditure Categories			
Local Activity	52.80%	59.00%	72.30%	73.50%
Visitor Activity	6.70%	7.50%	11.60%	11.20%
Local Non-Specific	38.60%	31.80%	15.40%	14.60%
Visitor Non-Specific	1.30%	1.10%	0.50%	0.50%
Environment Agency	0.70%	0.60%	0.20%	0.20%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.5	0.89	0.26	0.36
Local angler expenditure (£'000s) per FTE	51	30.03	99.88	74.29
GVA per £ visitor angler expenditure	0.5	0.89	0.32	0.43
Visitor angler expenditure (£'000s) per FTE	51	30.03	79.06	62.06
GVA per Angler Day	£34.49	£56.50	£13.43	£18.77
FTE per Thousand Angler Day	1.45	2.20	0.54	0.71

10.5.5 West Midlands salmon and sea trout angling

Table 10.20: Economic activity supported by and economic impact of salmon and sea trout angling in the West Midlands

Angler Days 17,933	Activity Supported		Economic Impact	
Expenditure £1.142million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	19	22	10	9
Total GVA (£'000s)	£598	£788	£306	£481
Total Employment (FTEs)	27	38	13	18
	Relative Contribution of Expenditure Categories			
Local Activity	24.90%	26.30%	27.50%	36.20%
Visitor Activity	23.80%	24.00%	40.60%	25.40%
Local Non-Specific	29.00%	27.10%	19.60%	22.80%
Visitor Non-Specific	1.00%	0.90%	0.70%	0.80%
Environment Agency	21.40%	21.70%	11.70%	14.80%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.46	0.73	0.26	0.41
Local angler expenditure (£'000s) per FTE	47.85	33.73	86.13	60.71
GVA per £ visitor angler expenditure	0.53	0.77	0.45	0.33
Visitor angler expenditure (£'000s) per FTE	45.77	33.98	53.4	79.29
GVA per Angler Day	£33.35	£43.94	£17.06	£26.82
FTE per Thousand Angler Day	1.51	2.12	0.72	1.00

10.6 East Midlands

10.6.1 Gross expenditure in the East Midlands by all fish species

Table 10.21: Gross expenditure in the East Midlands by fish species (£'000s)

Fish Species	Expenditure	
Coarse	£140,400	89.34%
Trout	£16,761	10.66%
Salmon & Sea Trout	0	0%
Total	£157,161	100.00%

10.6.2 Economic activity supported by all fish species in the East Midlands

Table 10.22: Economic activity supported by all species in the East Midlands

Gross Expenditure = £157.161 million	**Activity Supported**	
	Regional	**England and Wales**
	Key Measures	
Direct Employment (FTEs)	2,384	3,030
Total GVA (£'000s)	£78,173	£130,684
Total Employment (FTEs)	3,336	5,081
	Relative Contribution of Expenditure Categories	
Local Activity	47.4%	51.1%
Visitor Activity	25.4%	25.9%
Local Non-Specific	25.3%	21.2%
Visitor Non-Specific	0.7%	0.6%
Environment Agency	1.3%	1.1%
Total	100.0%	100.0%

10.6.3 East Midlands coarse angling

Table 10.23: Economic activity supported by and economic impact of coarse angling in the East Midlands

Angler Days 4,580,015	Activity Supported		Economic Impact	
Expenditure £140.400million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	2166	2711	941	248
Total GVA (£'000s)	£71,415	£117,294	£31,689	£9,906
Total Employment (FTEs)	3039	4560	1334	399
	Relative Contribution of Expenditure Categories			
Local Activity	47.10%	50.10%	53.00%	16.80%
Visitor Activity	27.10%	27.80%	32.80%	22.20%
Local Non-Specific	24.00%	20.40%	13.20%	56.30%
Visitor Non-Specific	0.70%	0.60%	0.40%	1.60%
Environment Agency	1.30%	1.10%	0.70%	3.10%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.49	0.85	0.24	0.02
Local angler expenditure (£'000s) per FTE	49.71	31.12	100.56	1060.51
GVA per £ visitor angler expenditure	0.5	0.84	0.27	0.06
Visitor angler expenditure (£'000s) per FTE	47.24	30.66	88.91	437.29
GVA per Angler Day	£15.59	£25.61	£6.92	£2.16
FTE per Thousand Angler Day	0.66	1.00	0.29	0.09

10.6.4 East Midlands trout angling

Table 10.24: Economic activity supported by and economic impact of trout angling in the East Midlands

Angler Days 408,861	Activity Supported		Economic Impact	
Expenditure £16.76million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	218	319	97	144
Total GVA (£'000s)	£6,757	£13,390	£3,126	£6,253
Total Employment (FTEs)	297	521	135	239
	Relative Contribution of Expenditure Categories			
Local Activity	50.40%	60.10%	72.60%	78.40%
Visitor Activity	8.10%	9.60%	14.30%	12.20%
Local Non-Specific	38.80%	28.30%	12.20%	8.80%
Visitor Non-Specific	1.10%	0.80%	0.30%	0.30%
Environment Agency	1.60%	1.20%	0.50%	0.40%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.34	0.8	0.22	0.48
Local angler expenditure (£'000s) per FTE	69.08	33.05	105.83	55.34
GVA per £ visitor angler expenditure	0.34	0.8	0.27	0.46
Visitor angler expenditure (£'000s) per FTE	69.08	33.05	86.07	57.09
GVA per Angler Day	£16.53	£32.75	£7.65	£15.29
FTE per Thousand Angler Day	0.73	1.27	0.33	0.58

10.7 East of England

10.7.1 Gross expenditure in the East of England by all fish species

Table 10.25: Gross expenditure in the East of England by fish species (£'000s)

Fish Species	Expenditure	
Coarse	£101,648	92.47%
Trout	£8,280	7.53%
Salmon & Sea Trout	0	0%
Total	£109,929	100.00%

10.7.2 Economic activity supported by all fish species in the East of England

Table 10.26: Economic activity supported by all species in East of England

Gross Expenditure = £109.929 million	**Activity Supported**	
	Regional	**England and Wales**
	Key Measures	
Direct Employment (FTEs)	1,489	1,809
Total GVA (£'000s)	£51,625	£93,453
Total Employment (FTEs)	2,147	3,314
	Relative Contribution of Expenditure Categories	
Local Activity	39.1%	42.1%
Visitor Activity	13.0%	12.7%
Local Non-Specific	44.8%	42.2%
Visitor Non-Specific	1.5%	1.4%
Environment Agency	1.6%	1.6%
Total	100.0%	100.0%

10.7.3 East of England coarse angling

Table 10.27: Economic activity supported by and economic impact of coarse angling in the East of England

Angler Days 2,295,689	Activity Supported		Economic Impact	
Expenditure £101.648million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	1374	1667	458	232
Total GVA (£'000s)	£47,881	£86,616	£16,410	£10,889
Total Employment (FTEs)	1986	3065	671	404
	Relative Contribution of Expenditure Categories			
Local Activity	41.50%	44.40%	48.80%	18.50%
Visitor Activity	13.70%	13.30%	19.70%	5.10%
Local Non-Specific	41.80%	39.40%	29.40%	71.10%
Visitor Non-Specific	1.40%	1.30%	1.00%	2.40%
Environment Agency	1.60%	1.60%	1.10%	2.80%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.45	0.88	0.18	0.05
Local angler expenditure (£'000s) per FTE	56.96	34.52	143.52	627.51
GVA per £ visitor angler expenditure	0.52	0.92	0.25	0.05
Visitor angler expenditure (£'000s) per FTE	46.52	31.01	95.95	613.95
GVA per Angler Day	£20.86	£37.73	£7.15	£4.74
FTE per Thousand Angler Day	0.87	1.34	0.29	0.18

10.7.4 East of England trout angling

Table 10.28: Economic activity supported by and economic impact of trout angling in the East of England

Angler Days 48,698	Activity Supported		Economic Impact	
Expenditure £8.280million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	115	142	22	28
Total GVA (£'000s)	£3,744	£6,837	£802	£1,597
Total Employment (FTEs)	160	249	32	54
	Relative Contribution of Expenditure Categories			
Local Activity	10.00%	13.90%	25.70%	32.80%
Visitor Activity	3.80%	5.30%	12.70%	14.20%
Local Non-Specific	81.90%	76.60%	58.50%	50.30%
Visitor Non-Specific	2.80%	2.60%	2.00%	1.70%
Environment Agency	1.60%	1.60%	1.10%	1.10%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.36	0.89	0.19	0.46
Local angler expenditure (£'000s) per FTE	81	37.41	156.93	72.49
GVA per £ visitor angler expenditure	0.36	0.89	0.24	0.52
Visitor angler expenditure (£'000s) per FTE	81	37.41	121.49	64.13
GVA per Angler Day	£46.88	£84.40	£16.47	£32.79
FTE per Thousand Angler Day	2.29	4.11	0.66	1.11

10.8 London

10.8.1 Gross expenditure in London by all fish species

Table 10.29: Gross expenditure in London by fish species (£'000s)

Fish Species	Expenditure	
Coarse	£21,141	88.96%
Trout	£2,486	10.46%
Salmon & Sea Trout	£138	0.58%
Total	£23,765	100.00%

10.8.2 Economic activity supported by all fish species in London

Table 10.30: Economic activity supported by all species in London

Gross Expenditure = £23.765 million	**Activity Supported**	
	Regional	**England and Wales**
	Key Measures	
Direct Employment (FTEs)	264	297
Total GVA (£'000s)	£13,907	£19,369
Total Employment (FTEs)	447	615
	Relative Contribution of Expenditure Categories	
Local Activity	5.3%	5.1%
Visitor Activity	17.3%	16.7%
Local Non-Specific	63.8%	64.4%
Visitor Non-Specific	12.2%	12.4%
Environment Agency	1.4%	1.4%
Total	100.0%	100.0%

10.8.3 London coarse angling

Table 10.31: Economic activity supported by and economic impact of coarse angling in London

Angler Days 316,960	Activity Supported		Economic Impact	
Expenditure £21.141million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	234	263	57	32
Total GVA (£'000s)	£12,336	£14,793	£3,066	£2,079
Total Employment (FTEs)	397	545	99	66
	Relative Contribution of Expenditure Categories			
Local Activity	10.00%	13.90%	25.70%	32.80%
Visitor Activity	3.80%	5.30%	12.70%	14.20%
Local Non-Specific	81.90%	76.60%	58.50%	50.30%
Visitor Non-Specific	2.80%	2.60%	2.00%	1.70%
Environment Agency	1.60%	1.60%	1.10%	1.10%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.36	0.89	0.19	0.46
Local angler expenditure (£'000s) per FTE	81	37.41	156.93	72.49
GVA per £ visitor angler expenditure	0.36	0.89	0.24	0.52
Visitor angler expenditure (£'000s) per FTE	81	37.41	121.49	64.13
GVA per Angler Day	£38.92	£46.67	£9.67	£6.56
FTE per Thousand Angler Day	1.25	1.72	0.31	0.21

10.8.4 London trout angling

Table 10.32: Economic activity supported by and economic impact of trout angling in London

Angler Days 32,588	Activity Supported		Economic Impact	
Expenditure £2.486million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	28	32	4	5
Total GVA (£'000s)	£1,487	£2,084	£227	£317
Total Employment (FTEs)	48	66	7	10
	Relative Contribution of Expenditure Categories			
Local Activity	0.00%	0.00%	0.00%	0.00%
Visitor Activity	1.40%	1.30%	7.10%	6.70%
Local Non-Specific	81.60%	81.70%	76.90%	77.30%
Visitor Non-Specific	15.70%	15.70%	14.80%	14.80%
Environment Agency	1.30%	1.30%	1.20%	1.20%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	N.A.	N.A.	N.A.	N.A.
Local angler expenditure (£'000s) per FTE	N.A.	N.A.	N.A.	N.A.
GVA per £ visitor angler expenditure	0.66	0.84	0.5	0.63
Visitor angler expenditure (£'000s) per FTE	55.03	42.06	73.37	56.08
GVA per Angler Day	£45.63	£63.95	£6.97	£9.73
FTE per Thousand Angler Day	1.47	2.03	0.21	0.31

10.8.5 London salmon and sea trout angling

Table 10.33: Economic activity supported by and economic impact of salmon and sea trout angling in London

Angler Days 3,192	Activity Supported		Economic Impact	
Expenditure £0.138million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	2	2	1	1
Total GVA (£'000s)	£84	£116	£48	£67
Total Employment (FTEs)	3	4	2	2
	Relative Contribution of Expenditure Categories			
Local Activity	0.00%	0.00%	0.00%	0.00%
Visitor Activity	33.80%	33.80%	58.30%	58.30%
Local Non-Specific	33.60%	34.20%	21.20%	21.60%
Visitor Non-Specific	6.50%	6.60%	4.10%	4.10%
Environment Agency	26.10%	25.40%	16.50%	16.00%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	N.A.	N.A.	N.A.	N.A.
Local angler expenditure (£'000s) per FTE	N.A.	N.A.	N.A.	N.A.
GVA per £ visitor angler expenditure	0.52	0.73	0.52	0.73
Visitor angler expenditure (£'000s) per FTE	57.94	42.49	57.94	42.49
GVA per Angler Day	£26.32	£36.34	£15.04	£20.99
FTE per Thousand Angler Day	0.94	1.25	0.63	0.63

10.9 South East

10.9.1 Gross expenditure in the South East all fish species

Table 10.34: Gross expenditure in the South East by fish species (£'000s)

Fish Species	Expenditure	
Coarse	£170,669	85.83%
Trout	£26,951	13.55%
Salmon & Sea Trout	£1,233	0.62%
Total	£198,853	100.00%

10.9.2 Economic activity supported by all fish species in the South East

Table 10.35: Economic activity supported by all species in the South East

Gross Expenditure = £198.853 million	**Activity Supported**	
	Regional	**England and Wales**
	Key Measures	
Direct Employment (FTEs)	3,058	3,769
Total GVA (£'000s)	£102,901	£177,692
Total Employment (FTEs)	4,241	6,386
	Relative Contribution of Expenditure Categories	
Local Activity	51.8%	54.5%
Visitor Activity	15.9%	15.7%
Local Non-Specific	28.0%	25.7%
Visitor Non-Specific	2.7%	2.5%
Environment Agency	1.6%	1.5%
Total	100.0%	100.0%

10.9.3 South East coarse angling

Table 10.36: Economic activity supported by and economic impact of coarse angling in the South East

Angler Days 4,092,840	Activity Supported		Economic Impact	
Expenditure £170.669million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	2649	3119	1008	360
Total GVA (£'000s)	£87,907	£144,000	£33,504	£16,558
Total Employment (FTEs)	3657	5247	1386	614
	Relative Contribution of Expenditure Categories			
Local Activity	51.00%	51.80%	56.10%	28.40%
Visitor Activity	17.00%	17.40%	23.90%	8.90%
Local Non-Specific	27.90%	26.90%	17.50%	54.70%
Visitor Non-Specific	2.70%	2.60%	1.70%	5.40%
Environment Agency	1.30%	1.30%	0.80%	2.70%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.52	0.87	0.22	0.06
Local angler expenditure (£'000s) per FTE	46.51	31.94	111.66	497.69
GVA per £ visitor angler expenditure	0.49	0.83	0.26	0.05
Visitor angler expenditure (£'000s) per FTE	49.5	33.83	93.21	565.69
GVA per Angler Day	£21.48	£35.18	£8.19	£4.05
FTE per Thousand Angler Day	0.89	1.28	0.34	0.15

10.9.4 South East trout angling

Table 10.37: Economic activity supported by and economic impact of trout angling in the South East

Angler Days 433,615	Activity Supported		Economic Impact	
Expenditure £26.951million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	394	632	171	253
Total GVA (£'000s)	£14,380	£32,668	£6,466	£13,404
Total Employment (FTEs)	560	1103	244	443
	Relative Contribution of Expenditure Categories			
Local Activity	59.10%	69.40%	76.50%	80.80%
Visitor Activity	8.20%	7.70%	12.80%	11.10%
Local Non-Specific	28.90%	20.30%	9.50%	7.20%
Visitor Non-Specific	2.80%	2.00%	0.90%	0.70%
Environment Agency	0.90%	0.70%	0.30%	0.20%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.6	1.57	0.34	0.73
Local angler expenditure (£'000s) per FTE	45.09	19.48	79.88	41.65
GVA per £ visitor angler expenditure	0.33	0.7	0.23	0.4
Visitor angler expenditure (£'000s) per FTE	80.73	43.92	119.48	75.59
GVA per Angler Day	£33.16	£75.34	£14.91	£30.91
FTE per Thousand Angler Day	1.29	2.54	0.56	1.02

10.9.5 South East salmon and sea trout angling

Table 10.38: Economic activity supported by and economic impact of salmon and sea trout angling in the South East

Angler Days 5,706	Activity Supported		Economic Impact	
Expenditure £1.233million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	16	19	7	9
Total GVA (£'000s)	£613	£1,025	£277	£469
Total Employment (FTEs)	24	36	11	16
	Relative Contribution of Expenditure Categories			
Local Activity	0.10%	0.10%	0.10%	0.10%
Visitor Activity	22.00%	23.10%	36.70%	38.20%
Local Non-Specific	15.40%	14.40%	12.50%	11.50%
Visitor Non-Specific	1.50%	1.40%	1.20%	1.10%
Environment Agency	61.00%	61.00%	49.50%	49.10%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.29	0.57	0.1	0.14
Local angler expenditure (£'000s) per FTE	91.53	52.95	274.6	211.79
GVA per £ visitor angler expenditure	0.32	0.58	0.24	0.43
Visitor angler expenditure (£'000s) per FTE	79.47	51.23	105.96	68.3
GVA per Angler Day	£107.43	£179.64	£48.55	£82.19
FTE per Thousand Angler Day	4.21	6.31	1.93	2.80

10.10 South West

10.10.1 Gross expenditure in the South West by all fish species

Table 10.39: Gross expenditure in the South West by fish species (£'000s)

Fish Species	Expenditure	
Coarse	£78,171	75.47%
Trout	£19,145	18.48%
Salmon & Sea Trout	£6,261	6.04%
Total	£103,577	100.00%

10.10.2 Economic activity supported by all fish species in the South West

Table 10.40: Economic activity supported by all species in the South West

Gross Expenditure = £103.577 million	**Activity Supported**	
	Regional	**England and Wales**
	Key Measures	
Direct Employment (FTEs)	1,988	1,665
Total GVA (£'000s)	£51,495	£80,916
Total Employment (FTEs)	2,255	3,261
	Relative Contribution of Expenditure Categories	
Local Activity	44.4%	48.4%
Visitor Activity	23.5%	24.2%
Local Non-Specific	30.2%	25.7%
Visitor Non-Specific	0.4%	0.3%
Environment Agency	1.5%	1.4%
Total	100.0%	100.0%

10.10.3 South West coarse angling

Table 10.41: Economic activity supported by and economic impact of coarse angling in the South West

Angler Days 2,181,991	Activity Supported		Economic Impact	
Expenditure £78.171million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	1501	1293	602	144
Total GVA (£'000s)	£40,200	£61,366	£16,053	£5,741
Total Employment (FTEs)	1760	2473	692	243
	Relative Contribution of Expenditure Categories			
Local Activity	44.80%	48.30%	49.40%	22.90%
Visitor Activity	24.20%	24.50%	31.90%	11.20%
Local Non-Specific	29.20%	25.60%	17.70%	61.80%
Visitor Non-Specific	0.40%	0.30%	0.20%	0.80%
Environment Agency	1.40%	1.30%	0.80%	3.20%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.49	0.79	0.21	0.04
Local angler expenditure (£'000s) per FTE	49.85	32.92	115.04	705.51
GVA per £ visitor angler expenditure	0.53	0.81	0.27	0.04
Visitor angler expenditure (£'000s) per FTE	43.9	30.88	84.86	684.05
GVA per Angler Day	£18.42	£28.12	£7.36	£2.63
FTE per Thousand Angler Day	0.81	1.13	0.32	0.11

10.10.4 South West trout angling

Table 10.42: Economic activity supported by and economic impact of trout angling in the South West

Angler Days 455,014	Activity Supported		Economic Impact	
Expenditure £19.145million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	370	273	169	96
Total GVA (£'000s)	£8,373	£14,924	£3,621	£5,940
Total Employment (FTEs)	366	600	152	233
	Relative Contribution of Expenditure Categories			
Local Activity	41.90%	47.70%	49.40%	52.60%
Visitor Activity	21.80%	24.90%	38.10%	37.40%
Local Non-Specific	34.50%	25.90%	11.80%	9.50%
Visitor Non-Specific	0.40%	0.30%	0.20%	0.10%
Environment Agency	1.40%	1.10%	0.50%	0.40%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.4	0.79	0.19	0.34
Local angler expenditure (£'000s) per FTE	61.09	32.68	124.15	76.26
GVA per £ visitor angler expenditure	0.4	0.79	0.29	0.46
Visitor angler expenditure (£'000s) per FTE	61.09	32.68	84	55.92
GVA per Angler Day	£18.40	£32.80	£7.96	£13.05
FTE per Thousand Angler Day	0.80	1.32	0.33	0.51

10.10.5 South West salmon and sea trout angling

Table 10.43: Economic activity supported by and economic impact of salmon and sea trout angling in the South West

Angler Days 42,569	Activity Supported		Economic Impact	
Expenditure £6.261million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	117	99	70	38
Total GVA (£'000s)	£2,922	£4,626	£1,715	£1,733
Total Employment (FTEs)	130	188	75	71
	Relative Contribution of Expenditure Categories			
Local Activity	46.20%	51.40%	50.70%	37.10%
Visitor Activity	18.50%	18.30%	27.00%	33.50%
Local Non-Specific	31.10%	26.50%	19.60%	25.60%
Visitor Non-Specific	0.40%	0.30%	0.30%	0.30%
Environment Agency	3.80%	3.50%	2.40%	3.40%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.4	0.7	0.26	0.19
Local angler expenditure (£'000s) per FTE	59.17	36.79	92.98	134.89
GVA per £ visitor angler expenditure	0.54	0.83	0.45	0.57
Visitor angler expenditure (£'000s) per FTE	42.18	29.51	49.85	42.63
GVA per Angler Day	£68.64	£108.67	£40.29	£40.71
FTE per Thousand Angler Day	3.05	4.42	1.76	1.67

10.11 Wales

10.11.1 Gross expenditure in Wales by all fish species

Table 10.44: Gross expenditure in Wales by fish species (£'000s)

Fish Species	Expenditure	
Coarse	£24,731	33.42%
Trout	£37,666	50.90%
Salmon & Sea Trout	£11,607	15.68%
Total	£74,004	100.00%

10.11.2 Economic activity supported by all fish species in Wales.

Table 10.45: Economic activity supported by all species in Wales

Gross Expenditure = £74.004 million	**Activity Supported**	
	Regional	**England and Wales**
	Key Measures	
Direct Employment (FTEs)	1,074	1,360
Total GVA (£'000s)	£31,805	£53,629
Total Employment (FTEs)	1,454	2,197
	Relative Contribution of Expenditure Categories	
Local Activity	31.1%	33.3%
Visitor Activity	36.9%	40.2%
Local Non-Specific	22.0%	17.7%
Visitor Non-Specific	1.8%	1.4%
Environment Agency	8.2%	7.3%
Total	100.0%	100.0%

10.11.3 Welsh coarse angling

Table 10.46: Economic activity supported by and economic impact of coarse angling in Wales

Angler Days 847,161	Activity Supported		Economic Impact	
Expenditure £24.731million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	373	440	151	43
Total GVA (£'000s)	£11,204	£17,295	£4,714	£1,643
Total Employment (FTEs)	501	697	205	68
	Relative Contribution of Expenditure Categories			
Local Activity	42.00%	45.40%	48.40%	48.00%
Visitor Activity	29.40%	29.10%	40.30%	9.40%
Local Non-Specific	21.80%	19.10%	8.70%	31.80%
Visitor Non-Specific	1.80%	1.50%	0.70%	2.60%
Environment Agency	5.00%	4.90%	2.00%	8.10%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.44	0.71	0.21	0.07
Local angler expenditure (£'000s) per FTE	77.59	61.22	165	596.07
GVA per £ visitor angler expenditure	0.44	0.68	0.25	0.02
Visitor angler expenditure (£'000s) per FTE	56.33	37.42	119.77	364.36
GVA per Angler Day	£13.23	£20.42	£5.56	£1.94
FTE per Thousand Angler Day	0.59	0.82	0.24	0.08

10.11.4 Welsh trout angling

Table 10.47: Economic activity supported by and economic impact of trout angling in Wales

Angler Days 691,780	Activity Supported		Economic Impact	
Expenditure £37.666million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	503	672	260	287
Total GVA (£'000s)	£15,307	£27,392	£8,109	£12,005
Total Employment (FTEs)	689	1111	358	481
	Relative Contribution of Expenditure Categories			
Local Activity	27.70%	29.20%	26.00%	29.80%
Visitor Activity	43.20%	48.60%	59.60%	57.10%
Local Non-Specific	24.60%	18.60%	12.10%	11.00%
Visitor Non-Specific	2.00%	1.50%	1.00%	0.90%
Environment Agency	2.50%	2.10%	1.30%	1.30%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.41	0.73	0.2	0.32
Local angler expenditure (£'000s) per FTE	62.36	36.72	127.69	83.09
GVA per £ visitor angler expenditure	0.37	0.74	0.26	0.38
Visitor angler expenditure (£'000s) per FTE	60.99	33.59	85.14	66.19
GVA per Angler Day	£22.13	£39.60	£11.72	£17.35
FTE per Thousand Angler Day	1.00	1.61	0.52	0.70

10.11.5 Welsh salmon and sea trout angling

Table 10.48: Economic activity supported by and economic impact of salmon and sea trout angling in Wales

Angler Days 174,668	Activity Supported		Economic Impact	
Expenditure £11.607million	Regional	England & Wales	Regional	England & Wales
	The Key Measures			
Direct Employment (FTEs)	198	249	104	108
Total GVA (£'000s)	£5,294	£8,942	£2,729	£3,850
Total Employment (FTEs)	263	389	137	167
	Relative Contribution of Expenditure Categories			
Local Activity	19.30%	23.60%	24.50%	27.40%
Visitor Activity	34.90%	36.00%	53.00%	48.60%
Local Non-Specific	15.50%	12.80%	7.60%	7.60%
Visitor Non-Specific	1.30%	1.00%	0.60%	0.60%
Environment Agency	29.00%	26.60%	14.30%	15.80%
Total	100%	100%	100%	100%
	Key Ratios			
GVA per £ local angler expenditure	0.44	0.71	0.21	0.07
Local angler expenditure (£'000s) per FTE	61.64	34.14	93.39	68.27
GVA per £ visitor angler expenditure	0.44	0.68	0.25	0.02
Visitor angler expenditure (£'000s) per FTE	50.69	36.9	90.87	1168.64
GVA per Angler Day	£30.31	£51.19	£15.62	£22.04
FTE per Thousand Angler Day	1.51	2.23	0.78	0.96

11 National economic activity supported by and economic impact of inland fisheries

11.1 Introduction

In this section, we report on the national consequences of a national loss of a species. The survey instruments specifically addressed this issue, thereby enabling a substitution analysis. It is thus possible to present estimates of both the national economic activity supported by and national economic impact of national angler expenditure on each fish species. In doing so, we follow the reporting structure outlined in Section 10.1. The national analyses of individual fish species are presented in Sections 11.3 to 11.6 below.

With respect to the analysis of 'all species', as explained in Section 10, summation of the national economic activity supported by individual fish species is legitimate. This is because substitution effects are explicitly ignored.

A properly conducted 'all species' national economic impact assessment requires a specific substitution analysis which asks anglers what they would do in the unlikely event of cessation of all forms of freshwater angling everywhere in England and Wales. Unfortunately, the survey instruments could not sustain the burden of this type of questioning. In Section 11.2, we therefore report only the national economic activity supported by all fish species.

11.2 All fish species.

Table 11.1: National economic activity supported by all fish species in England and Wales

Gross Expenditure = £1,180.893 million	**Activity Supported in England and Wales**
	Key Measures
Direct Employment (FTEs)	20,335
Total GVA (£'000s)	£980,418
Total Employment (FTEs)	37,386
	Relative Contribution of Expenditure Categories
Local Activity	51.8%
Visitor Activity	16.8%
Local Non-Specific	27.7%
Visitor Non-Specific	1.7%
Environment Agency	2.0%
Total	100.0%
	Key Ratios
GVA per £ local angler expenditure	0.86
Local angler expenditure (£'000s) per FTE	31.55
GVA per £ visitor angler expenditure	0.81
Visitor angler expenditure (£'000s) per FTE	32.31

11.3 Coarse angling in England and Wales

Table 11.2: National economic activity supported by and economic impact of coarse angling across England and Wales

Gross Expenditure £971.228 million	**Activity Supported**	**Economic Impact**
Angler Days 26,386,734	**The Key Measures**	
Direct Employment (FTEs)	16,449	2,724
Total GVA (£'000s)	£804,203	£133,082
Total Employment (FTEs)	30,580	5,060
	Relative Contribution of Expenditure Categories	
Local Activity	52.90%	52.10%
Visitor Activity	15.80%	18.00%
Local Non-Specific	28.30%	28.20%
Visitor Non-Specific	1.70%	1.70%
Environment Agency	1.40%	0.00%
Total	100.00%	100.00%
	Key Ratios	
GVA per £ local angler expenditure	0.85	0.14
Local angler expenditure (£'000s) per FTE	31.88	195.91
GVA per £ visitor angler expenditure	0.83	0.16
Visitor angler expenditure (£'000s) per FTE	32.01	170.49
GVA per Angler Day	£30.48	£5.04
FTE per Thousand Angler Day	1.16	0.19

11.4 Trout angling in England and Wales

Table 11.3: National economic activity supported by and economic impact of trout angling across England and Wales

Gross Expenditure £172.707 million	**Activity Supported**	**Economic Impact**
Angler Days 3,433,293	**The Key Measures**	
Direct Employment (FTEs)	3,196	900
Total GVA (£'000s)	£147,603	£41,643
Total Employment (FTEs)	5,628	1,588
	Relative Contribution of Expenditure Categories	
Local Activity	52.90%	52.10%
Visitor Activity	15.80%	18.00%
Local Non-Specific	28.30%	28.20%
Visitor Non-Specific	1.70%	1.70%
Environment Agency	1.40%	0.00%
Total	100.00%	100.00%
	Key Ratios	
GVA per £ local angler expenditure	0.95	0.25
Local angler expenditure (£'000s) per FTE	29.04	111.01
GVA per £ visitor angler expenditure	0.76	0.3
Visitor angler expenditure (£'000s) per FTE	34.1	86.75
GVA per Angler Day	£42.99	£12.13
FTE per Thousand Angler Day	1.64	0.46

11.5 Salmon and sea trout angling in England and Wales

Table 11.4: National economic activity supported by and economic impact of salmon and sea trout angling across England and Wales

Gross Expenditure £36.957 million	**Activity Supported**	**Economic Impact**
Angler Days 429,119	**The Key Measures**	
Direct Employment (FTEs)	690	264
Total GVA (£'000s)	£28,612	£10,720
Total Employment (FTEs)	1179	445
	Relative Contribution of Expenditure Categories	
Local Activity	29.30%	29.70%
Visitor Activity	29.30%	50.40%
Local Non-Specific	18.10%	18.10%
Visitor Non-Specific	1.80%	1.80%
Environment Agency	21.40%	0.00%
Total	100.00%	100.00%
	Key Ratios	
GVA per £ local angler expenditure	0.71	0.27
Local angler expenditure (£'000s) per FTE	35.72	93.3
GVA per £ visitor angler expenditure	0.77	0.5
Visitor angler expenditure (£'000s) per FTE	30.89	47.59
GVA per Angler Day	£66.68	£24.98
FTE per Thousand Angler Day	2.75	1.04

12 Appendices

12.1 Appendix A: Internet questionnaire

Survey of Anglers in England and Wales

The Environment Agency and the Department for Environment Food and Rural Affairs wish to assess the economic impact of freshwater angling across England and Wales and have commissioned a study from economists at Glasgow Caledonian University and Jacobs Babtie. Once completed, the study will provide a better understanding of angling's economic significance and will help to ensure that our freshwater resources and fisheries are appropriately managed and developed.

The survey covers FRESHWATER angling (salmon or sea trout, grayling, eels, coarse fish, brown or rainbow trout) in the ten regions of ENGLAND AND WALES. If you have fished in freshwater in England and Wales anytime during 2005, then we would like your help. By freshwater, we mean fishing in a pond, lake, reservoir, river, stream or canal but not the sea.

Part 1 asks you about your angling activity.
Part 2 asks about your expenditure in a specific region, for a species that you fish for most often.
If you wish, you may continue with the survey, providing information about additional regions/species. This will be extremely useful for us, but it is not essential and you may drop out at any point after Part 2.

Thank you for your help. If you have any queries about the survey please telephone the Environment Agency's Customer Care Contact Centre on 08708-506506

About You

Q1 Area of your home

- ☐ North East
- ☐ North West
- ☐ Yorks and Humberside
- ☐ West Midlands
- ☐ East Midlands
- ☐ East Anglia
- ☐ London
- ☐ South East
- ☐ South West
- ☐ Wales
- ☐ Scotland or Ireland
- ☐ Mainland Europe
- ☐ North America
- ☐ Other

A map of the regions used in this study can be found by clicking here www.gcal.ac.uk/econsurv/regionalmap.pdf

Q2 Your Age

- ☐ 12-16
- ☐ 17-24
- ☐ 25-34
- ☐ 35-44
- ☐ 45-54
- ☐ 55-64
- ☐ Over 65

Q3 Your Gender

- ☐ Male
- ☐ Female

Q4 Your annual household income in 2005.

- ☐ less than £5,000
- ☐ £5,001 - £10,000
- ☐ £10,001 - £20,000
- ☐ £20,001 - £30,000
- ☐ £30,001 - £40,000
- ☐ £40,001 - £50,000
- ☐ £50,001 - £70,000
- ☐ £70,001 - £90,000
- ☐ Over £90,000
- ☐ Do Not Know

Your Fishing

Q5 Did you fish for FRESHWATER species in England and Wales in 2005

- ☐ Yes
- ☐ No

Q6 We are interested in the species of fish you **wanted to catch in England and Wales** and the type of water you fished . Which of the following applied to you in 2005. Tick all that apply.

- ☐ I fished for Coarse Fish, Grayling or Eels on Rivers
- ☐ I fished for Coarse Fish, Grayling or Eels on Canals
- ☐ I fished for Coarse Fish, Grayling or Eels on a Lake, Pond or Reservoir
- ☐ I fished for Rainbow or Brown Trout on a Lake, Pond or Reservoir
- ☐ I fished for Rainbow or Brown Trout on Rivers
- ☐ I fished for Salmon or Sea Trout

Q7

You have indicated that you fished for

Coarse Fish, Grayling or Eels in **Rivers.**

For each region below, please indicate the total **number of days in 2005** that you fished this particular combination. If you did not fish this combination in a given region then please leave that row blank. Please regard any part of a day as one full day (e.g. if you fished for only a morning this should be counted as one full day)

	1 or 2	3 or 4	5-9	10-19	Once every 2 weeks 20-39	Once a week 40-64	Twice a week 65-109	More than twice a week > 110
North East	○	○	○	○	○	○	○	○
North West	○	○	○	○	○	○	○	○
Yorks and Humber	○	○	○	○	○	○	○	○
West Midlands	○	○	○	○	○	○	○	○
East Midlands	○	○	○	○	○	○	○	○
East Anglia	○	○	○	○	○	○	○	○
London	○	○	○	○	○	○	○	○
South East	○	○	○	○	○	○	○	○
South West	○	○	○	○	○	○	○	○
Wales	○	○	○	○	○	○	○	○

A map of the regions used in this study can be found by clicking here www.gcal.ac.uk/econsurv/regionalmap.pdf

Q8

You have indicated that you fished for

Coarse Fish, Grayling or Eels on **Canals**.

For each region below, please indicate the total **number of days in 2005** that you fished this particular combination. If you did not fish this combination in a given region then please leave that row blank. Please regard any part of a day as one full day (e.g. if you fished for only a morning this should be counted as one full day)

	1 or 2	3 or 4	5-9	10-19	Once every 2 weeks 20-39	Once a week 40-64	Twice a week 65-109	More than twice a week > 110
North East	○	○	○	○	○	○	○	○
North West	○	○	○	○	○	○	○	○
Yorks and Humber	○	○	○	○	○	○	○	○
West Midlands	○	○	○	○	○	○	○	○
East Midlands	○	○	○	○	○	○	○	○
East Anglia	○	○	○	○	○	○	○	○
London	○	○	○	○	○	○	○	○
South East	○	○	○	○	○	○	○	○
South West	○	○	○	○	○	○	○	○
Wales	○	○	○	○	○	○	○	○

A map of the regions used in this study can be found by clicking here www.gcal.ac.uk/econsurv/regionalmap.pdf

Q9

You have indicated that you fished for

Coarse Fish, Grayling or Eels on **Lake, Pond or Reservoir.**

For each region below, please indicate the total **number of days in 2005** that you fished this particular combination. If you did not fish this combination in a given region then please leave that row blank. Please regard any part of a day as one full day (e.g. if you fished for only a morning this should be counted as one full day)

	1 or 2	3 or 4	5-9	10-19	Once every 2 weeks 20-39	Once a week 40-64	Twice a week 65-109	More than twice a week > 110
North East	○	○	○	○	○	○	○	○
North West	○	○	○	○	○	○	○	○
Yorks and Humber	○	○	○	○	○	○	○	○
West Midlands	○	○	○	○	○	○	○	○
East Midlands	○	○	○	○	○	○	○	○
East Anglia	○	○	○	○	○	○	○	○
London	○	○	○	○	○	○	○	○
South East	○	○	○	○	○	○	○	○
South West	○	○	○	○	○	○	○	○
Wales	○	○	○	○	○	○	○	○

A map of the regions used in this study can be found by clicking here www.gcal.ac.uk/econsurv/regionalmap.pdf

Q10

You have indicated that you fished for

Rainbow or Brown Trout on **Lake, Pond or Reservoir.**

For each region below, please indicate the total **number of days in 2005** that you fished this particular combination. If you did not fish this combination in a given region then please leave that row blank. Please regard any part of a day as one full day (e.g. if you fished for only a morning this should be counted as one full day)

	1 or 2	3 or 4	5-9	10-19	Once every 2 weeks 20-39	Once a week 40-64	Twice a week 65-109	More than twice a week > 110
North East	○	○	○	○	○	○	○	○
North West	○	○	○	○	○	○	○	○
Yorks and Humber	○	○	○	○	○	○	○	○
West Midlands	○	○	○	○	○	○	○	○
East Midlands	○	○	○	○	○	○	○	○
East Anglia	○	○	○	○	○	○	○	○
London	○	○	○	○	○	○	○	○
South East	○	○	○	○	○	○	○	○
South West	○	○	○	○	○	○	○	○
Wales	○	○	○	○	○	○	○	○

A map of the regions used in this study can be found by clicking here www.gcal.ac.uk/econsurv/regionalmap.pdf

Q11

You have indicated that you fished for

Rainbow or Brown Trout on **Rivers.**

For each region below, please indicate the total **number of days in 2005** that you fished this particular combination. If you did not fish this combination in a given region then please leave that row blank. Please regard any part of a day as one full day (e.g. if you fished for only a morning this should be counted as one full day)

	1 or 2	3 or 4	5-9	10-19	Once every 2 weeks 20-39	Once a week 40-64	Twice a week 65-109	More than twice a week > 110
North East	○	○	○	○	○	○	○	○
North West	○	○	○	○	○	○	○	○
Yorks and Humber	○	○	○	○	○	○	○	○
West Midlands	○	○	○	○	○	○	○	○
East Midlands	○	○	○	○	○	○	○	○
East Anglia	○	○	○	○	○	○	○	○
London	○	○	○	○	○	○	○	○
South East	○	○	○	○	○	○	○	○
South West	○	○	○	○	○	○	○	○
Wales	○	○	○	○	○	○	○	○

A map of the regions used in this study can be found by clicking here www.gcal.ac.uk/econsurv/regionalmap.pdf

Q12

You have indicated that you fished for

Salmon or Sea Trout.

For each region below, please indicate the total **number of days in 2005** that you fished for this species. If you did not fish this combination in a given region then please leave that row blank. Please regard any part of a day as one full day (e.g. if you fished for only a morning this should be counted as one full day)

	1 or 2	3 or 4	5-9	10-19	Once every 2 weeks 20-39	Once a week 40-64	Twice a week 65-109	More than twice a week > 110
North East	○	○	○	○	○	○	○	○
North West	○	○	○	○	○	○	○	○
Yorks and Humber	○	○	○	○	○	○	○	○
West Midlands	○	○	○	○	○	○	○	○
East Midlands	○	○	○	○	○	○	○	○
East Anglia	○	○	○	○	○	○	○	○
London	○	○	○	○	○	○	○	○
South East	○	○	○	○	○	○	○	○
South West	○	○	○	○	○	○	○	○
Wales	○	○	○	○	○	○	○	○

A map of the regions used in this study can be found by clicking here www.gcal.ac.uk/econsurv/regionalmap.pdf

Expenditure on Tackle, Clothing, Books and Magazines

Q13 Please indicate your TOTAL expenditure **in each region** during 2005 on FRESHWATER fishing tackle, specialised angling clothing, books and magazines.
INCLUDE purchases of all tackle for example rods, poles, reels, floats, lures, hooks, weights, line flies, fly -tying equipment, nets, waders, waistcoats, waterproofs, bags, holdalls, boxes, umbrella, bivvy, seats, bite alarm, float tube, boats and engines.
Please remember to include any items you may have bought by mail order from these regions
DO NOT INCLUDE non-equipment items such as bait, accommodation, meals, transport, boat hire, rents or licences

	£0	less than £5	£5-£10	£10-25	£25-£50	£50-£100	£100-£250	£250-500	£500-1000	£1K-£5K	More than £5K
North East	○	○	○	○	○	○	○	○	○	○	○
North West	○	○	○	○	○	○	○	○	○	○	○
Yorks and Humberside	○	○	○	○	○	○	○	○	○	○	○
West Midlands	○	○	○	○	○	○	○	○	○	○	○
East Midlands	○	○	○	○	○	○	○	○	○	○	○
East Anglia	○	○	○	○	○	○	○	○	○	○	○
London	○	○	○	○	○	○	○	○	○	○	○
South East	○	○	○	○	○	○	○	○	○	○	○
South West	○	○	○	○	○	○	○	○	○	○	○
Wales	○	○	○	○	○	○	○	○	○	○	○
Not Known	○	○	○	○	○	○	○	○	○	○	○

The next Parts ask about your spending on angling trips for the species and regions that you fished in 2005.

Each Part will ask you the same questions, but about a different combination of species and region. It will be extremely useful for us if you **complete a Part for each combination of species and region that you fish, up to a maximum of 7 combinations**.

Once you have entered information on all of the combinations that you fish, you should finish the survey by clicking on the Exit link at the start of the subsequent Part.

For example, if you live in the South East and usually fish locally for Rainbow Trout, but in summer 2005 you took a week's Salmon angling in Wales, then you should:

-complete Part 2 on your fishing for "Rainbow or Brown Trout" in the "South East"
-complete Part 3 on "Salmon and Sea Trout" in "Wales"
-exit the survey by clicking on the button at the start of Part 4

Some of the questions may seem a little repetitive, but we do need all of this information for our study - and we greatly appreciate your help.

Q14 Before continuing **please enter a personal code** that you can remember, such as your dog's name, forename or post code.

You will be asked to repeat this code at the start of each section. The code should be repeated identically (e.g. in capitals where used) each time.

Before submitting this part, you may wish to make a note of the personal code you just typed in.

Before submitting this part, you may wish to make a pencil note of the personal code you just typed in.

This ends the first part of the survey. Thank you for your help.

Survey of Anglers in England and Wales Part 2

This part seeks information on the species and region combination to which you devoted the largest number of angler days in 2005 .

Q1 Please enter the personal code EXACTLY as entered at the end of Part 1

You may end this survey at any time by simply closing this window but we would greatly appreciate further details about species/region combinations you fish.

To which freshwater species and region combination did you devote the largest number of angler days in 2005 ?

Q2 Please indicate the region

- ☐ North East
- ☐ North West
- ☐ Yorks and Humberside
- ☐ West Midlands
- ☐ East Midlands
- ☐ East Anglia
- ☐ London
- ☐ South East
- ☐ South West
- ☐ Wales

As before a map of the regions used in this study can be found by clicking on this link

Q3 Please indicate the species

- ☐ Salmon or Sea Trout
- ☐ Brown or Rainbow Trout
- ☐ Coarse Fish, Grayling or Eels

Q4 Please indicate the number of days fishing for this species in this region in 2005

- [ ] 1 or 2
- [ ] 3 or 4
- [ ] 5 - 9
- [ ] 6-10
- [ ] 10-19
- [ ] 20-39 (Once every two weeks)
- [ ] 40-64 (Once a week)
- [ ] 65-109 (Twice a week)
- [ ] 110-179 (Three times a week)
- [ ] 180- 249 (Four time a week)
- [ ] More than 250

Q6 Again please indicate the **average** amount you spent for **each day** that you fished for this species in this region in 2005 - this time split betweeen the following items

	£0	Less than £1	£1-£2.50	£2.50 -£5	£5-£10	£10-£25	£25-£50	£50-£75	£75-£100	£100-£250	More than £250
Accommodation (per day)	○	○	○	○	○	○	○	○	○	○	○
Meals & drinks Served (per day)	○	○	○	○	○	○	○	○	○	○	○
Food & Drink from shop (per day)	○	○	○	○	○	○	○	○	○	○	○
Public Transport & Vehicle Hire per day	○	○	○	○	○	○	○	○	○	○	○
Petrol & Diesel bought locally per day	○	○	○	○	○	○	○	○	○	○	○
Hire of tackle and boats per day	○	○	○	○	○	○	○	○	○	○	○
Ghillie or guide hire per day	○	○	○	○	○	○	○	○	○	○	○
Licences and Permits and club fees per day	○	○	○	○	○	○	○	○	○	○	○
Bait per day	○	○	○	○	○	○	○	○	○	○	○
Gifts and souvenirs per day	○	○	○	○	○	○	○	○	○	○	○
Anything else spent (per day)	○	○	○	○	○	○	○	○	○	○	○

Alternatives

Q7 If there were no fish of this species in this region what is your most likely response?

- ☐ Fish for the same species in a different region of England or Wales
- ☐ Fish for a different species in the same region of England orWales
- ☐ Fish outside England and Wales
- ☐ Would not fish

Q8 If there were no fish of this species **anywhere** in England and Wales what is your most likely response?

- ☐ Fish for a different species in England and Wales
- ☐ Fish outside England and Wales
- ☐ Would not fish

Again thank you for your assistance. We would now like to ask you about another combination of fish species and region. If you can, please think about when you fished in a region other than where you live.

If you wish to exit the survey please submit this part and then close the new page that appears

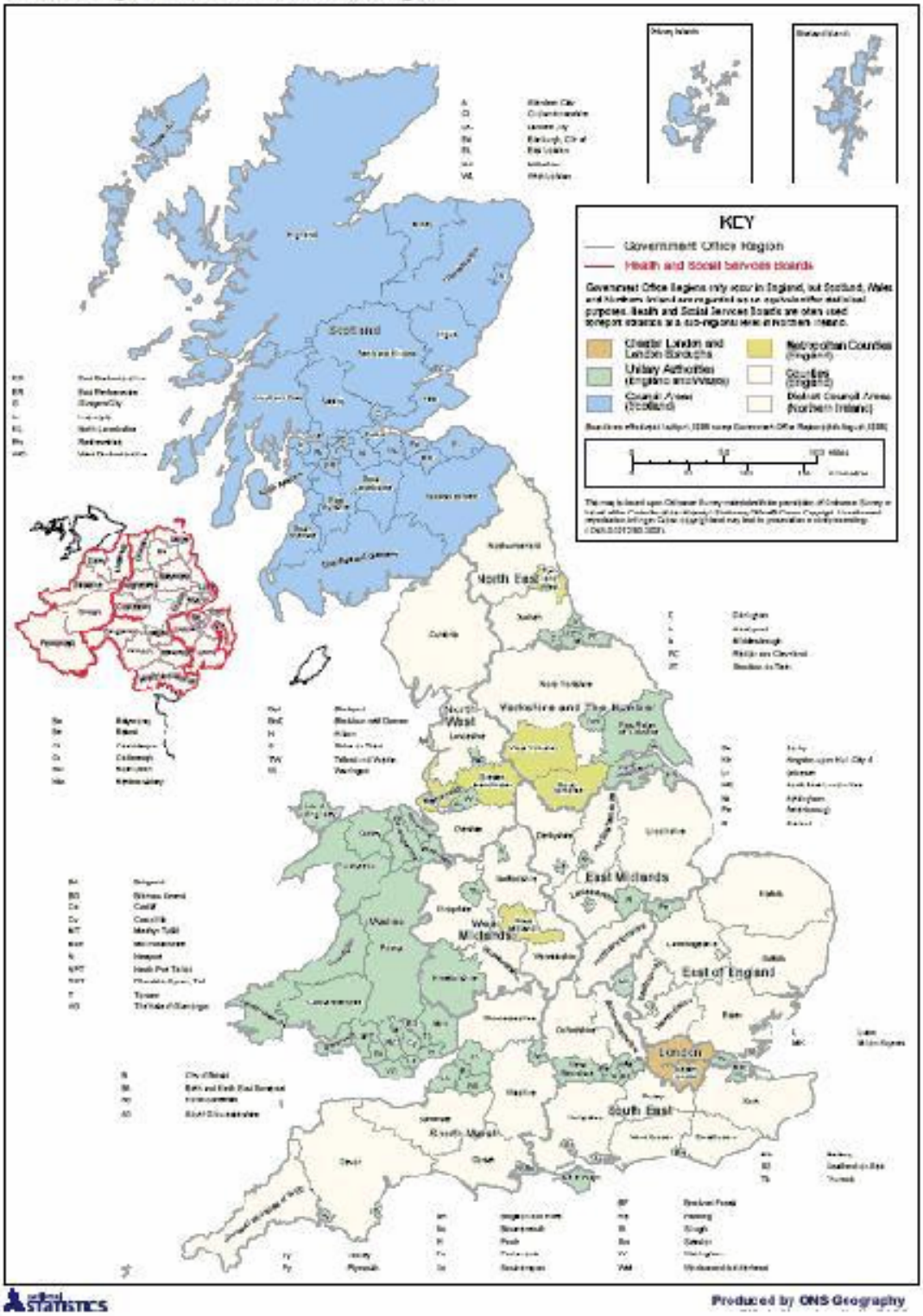
Survey of Anglers in England and Wales Part 3

We are now asking you about another combination of fish species and region. If you can please think about when you fished in a region other than where you live.
If you did not make fishing trips to a region other than where you live, please give details of the species and region to which you devoted the second largest number of angler days in 2005.

Q1 Please enter the personal code EXACTLY as entered at the end of Part 1

You may end this survey at any time by simply closing this window but we would greatly appreciate further details about species/region combinations you fish.

United Kingdom: Government Office Regions



12.2 Appendix B: Non-licensed freshwater angling

B.1 Number of unlicensed anglers

Clearly since unlicensed angling is illegal, estimation is extremely difficult. There are two approaches. Firstly, surveys of activity should include unlicensed anglers. Thus, the Angler Attitude Survey estimate of 2,891,000 freshwater anglers would include unlicensed anglers. Although this figure is comparable to a number of other earlier studies, it is not compatible with the recent Active People Survey nor the Time Use and Health surveys. It also has a large female representation (23 per cent) which is significantly out of line with all other surveys, which are generally five per cent or less. The hypothesis is that the Angler Attitude Survey may include a number of females and children that accompany a licensed angler and may/may not actually fish.

The alternative is to examine the records of bailiffs on the number of unlicensed anglers. The Environment Agency's data (Mawle,pers. Comm..) indicates that about five per cent of those fishing in 2006 were found not to have licences. Given that some unlicensed anglers will successfully evade a bailiff (and not be recorded), the number of unlicensed angler days will be in excess of five per cent of total angler days (30,240,000), that is, 1.6 million days. The difference between the Angler Attitude Survey and licensed anglers is 1.8 million Anglers, which would put the mean days per unlicensed angler at less than one.

Given the uncertainty, our best guess is that there are two million unlicensed angler days (seven per cent) and probably of the order of one million unlicensed anglers, many of whom will be accompanying licensed anglers.

B.2 Expenditure of unlicensed anglers

Our archetypal unlicensed angler is a local young male with very little income. Rents will not be paid and it is unlikely that our archetype will have travelled far. The major items of expenditure will be on equipment and bait, but even this will tend towards the lower end of the range. The likely species will be coarse.

Expenditure per day on bait is surprisingly large, ranging from £6 to £7 depending upon area. Given the lower range plus incidentals, an average daily spend of £7.50 for non-licensed anglers seems realistic; this might account for a total spend of £15 million.

Equipment spend is estimated at £5.50 per activity day. Although the cost will be at the lower end, this is compensated by the lower number of angler days. Our archetype is not expected to spend heavily on clothing, footwear or specialist magazines. We estimate therefore a total expenditure of £12 million in this category.

The total expenditure of unlicensed anglers is put at £27 million (£27 per head).

B.3 Economic activity supported by and economic impact of unlicensed angling

Table B.1 gives the ratio of spend and final jobs and GVA after allowance for multiplier effects to the resulting jobs and GVA from our estimated spend of £27 million.

Table B.1: Calculation of jobs and GVA supported by unlicensed angling

	Jobs/Spend	GVA/Spend	Jobs	GVA
Local	0.00001385	0.474174197	374	£12,802,703
E&W	0.00001651	0.788092172	446	£21,278,489

We have no information on the likely actions of our non-licensed angler if angling for a particular or all species ceased. However, given our archetype, it seems likely that the vast majority of the spend would be retained in the local area and there would be minimal impact on the local economy from this group.

B.4 Conclusions

There is a considerable number of unlicensed anglers in England and Wales, possibly over one million. Inevitably, they have an effect and it is estimated that upwards of 374 jobs and £12.8 million income may be supported by this illegal activity. However, should all this activity cease (for example, by rigorous law enforcement), the economic impact is likely to be minimal as spend is diverted to other activities.

12.3 Appendix C: Economic impact of loss of all species in each region

As explained in Section 9, the survey instruments could not bear the burden of questions which addressed the issue of what anglers would do if there were no fishing for any species in each of the regions. Moreover, it was not legitimate to sum the economic impacts associated with the loss of individual species.

The problem is that individual species economic impacts are grounded in a substitution analysis which allows anglers to switch to other species within England and Wales. This switching would not be possible with the simultaneous loss of all species in England and Wales. Thus, the 'all species' national economic impact would be greater than the sum of the national impacts associated with each fish species.

In the absence of anglers stated preferences on their response to the loss of all species in a region, it is necessary to make somewhat crude assumptions. The question posed to anglers is reproduced below and we have assumed that if a region lost all its fishing, then those who would fish for another species would now go outside the region. Only the expenditure from those who would no longer fish is retained in the area.

Q34. If you had been unable to fish for [fish] in [region], which of the following would you most likely have done?

Same Species in Different Region
Different Species in Same Region
Fish outside England and Wales
Would not fish

Table C.1: Economic impact of all fish species in the North East

Gross Expenditure = £45.567 million	Regional Economic Impact
	Key Measures
Direct Output (£'000s)	£15,992
Direct Employment (FTEs)	433
Total GVA (£'000s)	£14,258
Total Employment (FTEs)	622
	Relative Contribution of Expenditure Categories
Local Activity	44.0%
Visitor Activity	37.4%
Local Non-Specific	8.7%
Visitor Non-Specific	9.8%
Environment Agency	0.0%
Total	100.0%
	Key Ratios
GVA per £ local angler expenditure	0.34
Local angler expenditure (£'000s) per FTE	70.56
GVA per £ visitor angler expenditure	1.00
Visitor angler expenditure (£'000s) per FTE	23.38

Table C.2: Economic impact of all fish species in the North West

Gross Expenditure = £141.119 million	Regional Economic Impact
	Key Measures
Direct Output (£'000s)	£57,603
Direct Employment (FTEs)	1384
Total GVA (£'000s)	£52,414
Total Employment (FTEs)	2103
	Relative Contribution of Expenditure Categories
Local Activity	79.0%
Visitor Activity	11.3%
Local Non-Specific	6.6%
Visitor Non-Specific	3.0%
Environment Agency	0.0%
Total	100.0%
	Key Ratios
GVA per £ local angler expenditure	0.46
Local angler expenditure (£'000s) per FTE	55.17
GVA per £ visitor angler expenditure	0.47
Visitor angler expenditure (£'000s) per FTE	51.58

Table C.3: Economic impact of all fish species in Yorkshire and Humberside

Gross Expenditure = £133.618 million	Regional Economic Impact
	Key Measures
Direct Output (£'000s)	£48,687
Direct Employment (FTEs)	1242
Total GVA (£'000s)	£45,932
Total Employment (FTEs)	1849
	Relative Contribution of Expenditure Categories
Local Activity	74.7%
Visitor Activity	9.2%
Local Non-Specific	14.1%
Visitor Non-Specific	2.1%
Environment Agency	0.0%
Total	100.0%
	Key Ratios
GVA per £ local angler expenditure	0.45
Local angler expenditure (£'000s) per FTE	56.76
GVA per £ visitor angler expenditure	0.43
Visitor angler expenditure (£'000s) per FTE	58.37

Table C.4: Economic impact of all fish species in the West Midlands

Gross Expenditure = £133.443 million	Regional Economic Impact
	Key Measures
Direct Output (£'000s)	£52,965
Direct Employment (FTEs)	1345
Total GVA (£'000s)	£49,939
Total Employment (FTEs)	2006
	Relative Contribution of Expenditure Categories
Local Activity	76.0%
Visitor Activity	9.1%
Local Non-Specific	13.0%
Visitor Non-Specific	1.9%
Environment Agency	0.0%
Total	100.0%
	Key Ratios
GVA per £ local angler expenditure	0.50
Local angler expenditure (£'000s) per FTE	51.42
GVA per £ visitor angler expenditure	0.46
Visitor angler expenditure (£'000s) per FTE	54.16

Table C.5: Economic impact of all fish species in the East Midlands

Gross Expenditure = £157.161 million	Regional Economic Impact
	Key Measures
Direct Output (£'000s)	£55,501
Direct Employment (FTEs)	1496
Total GVA (£'000s)	£50,619
Total Employment (FTEs)	2125
	Relative Contribution of Expenditure Categories
Local Activity	55.6%
Visitor Activity	35.6%
Local Non-Specific	7.6%
Visitor Non-Specific	1.1%
Environment Agency	0.0%
Total	100.0%
	Key Ratios
GVA per £ local angler expenditure	0.35
Local angler expenditure (£'000s) per FTE	68.90
GVA per £ visitor angler expenditure	0.44
Visitor angler expenditure (£'000s) per FTE	53.49

Table C.6: Economic impact of all fish species in the East of England

Gross Expenditure = £109.929 million	Regional Economic Impact
	Key Measures
Direct Output (£'000s)	£34,603
Direct Employment (FTEs)	785
Total GVA (£'000s)	£29,050
Total Employment (FTEs)	1166
	Relative Contribution of Expenditure Categories
Local Activity	60.2%
Visitor Activity	21.4%
Local Non-Specific	15.7%
Visitor Non-Specific	2.8%
Environment Agency	0.0%
Total	100.0%
	Key Ratios
GVA per £ local angler expenditure	0.38
Local angler expenditure (£'000s) per FTE	68.78
GVA per £ visitor angler expenditure	0.46
Visitor angler expenditure (£'000s) per FTE	52.93

Table C.7: Economic impact of all fish species in London

Gross Expenditure = £23.765 million	Regional Economic Impact
	Key Measures
Direct Output (£'000s)	£6,738
Direct Employment (FTEs)	122
Total GVA (£'000s)	£6,521
Total Employment (FTEs)	210
	Relative Contribution of Expenditure Categories
Local Activity	9.8%
Visitor Activity	34.1%
Local Non-Specific	30.0%
Visitor Non-Specific	26.1%
Environment Agency	0.0%
Total	100.0%
	Key Ratios
GVA per £ local angler expenditure	0.47
Local angler expenditure (£'000s) per FTE	65.97
GVA per £ visitor angler expenditure	0.51
Visitor angler expenditure (£'000s) per FTE	60.74

Table C.8: Economic impact of all fish species in the South East

Gross Expenditure = £198.853 million	Regional Economic Impact
	Key Measures
Direct Output (£'000s)	£68,510
Direct Employment (FTEs)	1816
Total GVA (£'000s)	£61,277
Total Employment (FTEs)	2504
	Relative Contribution of Expenditure Categories
Local Activity	61.9%
Visitor Activity	21.7%
Local Non-Specific	11.8%
Visitor Non-Specific	4.6%
Environment Agency	0.0%
Total	100.0%
	Key Ratios
GVA per £ local angler expenditure	0.38
Local angler expenditure (£'000s) per FTE	65.65
GVA per £ visitor angler expenditure	0.38
Visitor angler expenditure (£'000s) per FTE	64.39

Table C.9: Economic impact of all fish species in the South West

Gross Expenditure = £103.577 million	Regional Economic Impact
	Key Measures
Direct Output (£'000s)	£38,122
Direct Employment (FTEs)	1380
Total GVA (£'000s)	£35,189
Total Employment (FTEs)	1499
	Relative Contribution of Expenditure Categories
Local Activity	56.3%
Visitor Activity	31.8%
Local Non-Specific	11.3%
Visitor Non-Specific	0.6%
Environment Agency	0.0%
Total	100.0%
	Key Ratios
GVA per £ local angler expenditure	0.39
Local angler expenditure (£'000s) per FTE	61.85
GVA per £ visitor angler expenditure	0.45
Visitor angler expenditure (£'000s) per FTE	51.59

Table C.10: Economic impact of all fish species in Wales

Gross Expenditure = £74.004 million	Regional Economic Impact
	Key Measures
Direct Output (£'000s)	£23,875
Direct Employment (FTEs)	683
Total GVA (£'000s)	£21,051
Total Employment (FTEs)	932
	Relative Contribution of Expenditure Categories
Local Activity	40.1%
Visitor Activity	49.4%
Local Non-Specific	7.7%
Visitor Non-Specific	2.8%
Environment Agency	0.0%
Total	100.0%
	Key Ratios
GVA per £ local angler expenditure	0.34
Local angler expenditure (£'000s) per FTE	71.88
GVA per £ visitor angler expenditure	0.34
Visitor angler expenditure (£'000s) per FTE	64.52

12.4 Appendix D: Estimating the DREAM® model

Introduction

The DREAM® model is based on the incorporation and reconciliation of ALL current statistics on production and consumption in the UK. The following sections outline the procedures used.

Production

Gross value added (GVA) to NUTS3 level is estimated for 123 industries by an iterative process constraining initial estimates to ONS regional accounts as published for NUTS1, NUTS2 and NUTS3 levels, to the annual business inquiry (employment) at the four-digit SIC level, to the annual business inquiry (financial) at region by division level and the national accounts (supply and use tables, SUTS). Additional data is brought to bear in Scotland, Northern Ireland and the Republic of Ireland[7].

A similar procedure is followed for compensation of employees, also making use of local data from the Annual Survey of Earnings and Hours.

Gross output (sales turnover) and detailed purchases are estimated using the GVA estimates together with the annual business inquiry (financial) and the national accounts SUTS. Various extensions to and disaggregations of the national accounts are modelled to assist in this, for example distribution margins by product are split by distribution industry and by origin, and a complete 123-industry matrix is estimated based on the limited non-disclosive information which ONS can make available. This is used to convert industry outputs to product outputs.

The final estimates are constrained to the national accounts, SUTS, even though the regional accounts may not exactly match due to data timing issues, and ABI is frequently significantly different. The differences between ABI and national and regional accounts arise because the ABI is only one early source for national accounting data, does not have complete coverage, and the later balancing and adjustment stages take into consideration many other sources. This is especially important in the hospitality industries, where national accounts estimates of GVA are about £7 billion higher than ABI estimates. Type 2 multipliers (see below) are particularly affected because much of the additional GVA is allocated to compensation of the employed and self-employed.

About a dozen industrial submodels are also used, in certain industries, normally to identify physical products and disaggregate activities. The industries covered include

- agriculture by farm type and constituent country;
- forestry by country, activity, maturity and timber type;
- fishing between caught (by species) and farmed;
- energy: multi-industry multi-fuel submodel includes generating mix, disaggregation of oil and gas extraction, refining products and so on;

[7] For Northern Ireland, the Census of Employment replaces ABI1, interpolated between census years by the Northern Ireland Labour Force Survey. The Northern Ireland Annual Business Inquiry, the Manufacturing Sales and Exports Survey and the Business Insurance Survey are used. For Scotland, use is made of the Scottish Input Output Tables and Scottish Annual Business Statistics down to local authority level. Irish estimates are based on the Republic's input output tables and national accounts, and are disaggregated only to NUTS2.

- food and drink: additional disaggregation of production and consumption;
- materials: timber, pulp, paper and so on by product and process;
- chemicals: some products;
- electronics, instruments and so on by disaggregated products;
- construction: by activity/market;
- hospitality to four-digit;
- transport by product/market/mode;
- education by level;
- private households with employed persons.

Depending on the client base and the stability or otherwise of the industry, not every industrial submodel is used every year.

Absorption

Household consumption is estimated to NUTS1 level by disaggregating the appropriate national SUTS table (Table 4) using the Expenditure and Food Survey. Below NUTS1, disaggregation is modelled based on household disposable income per capita and house price surveys.

NPISH consumption (non-profit institutions serving households) is estimated using demographic and occupational structure, weighting according to the population in appropriate age groups, student numbers from the Census of Population, and employment in higher and further education and membership organisations.

Collective consumption is estimated on a 'who benefits' basis using the Public Expenditure Statistical Analysis (PESA) estimates published by the Treasury. This broadly reflects the methods now used by the Scottish Executive in its annual publication GERS, Government Expenditure and Revenue in Scotland.

Regional estimates of fixed capital formation have not been available in the regional accounts since 2000. After that date, NUTS1 figures are based on ABI2 data and housing statistics, with geographical disaggregation to NUTS3 based on turnover and profits.

Stock changes are allocated based on weights averaging production and absorption.

Trade

DREAM® trade is a complete model of the internal and external trade of Great Britain and Ireland for the 123 goods and services of the United Kingdom IO classification. It is based on production and absorption as outlined above, together with a DREAM® input output model of the Republic of Ireland, in which production and absorption are informally disaggregated to the Republic's two NUTS2 areas.

The data sources, in addition to those given for production and absorption, are:

- UK national accounts SUTS;
- Northern Ireland Manufacturers' Sales and Export Survey;
- HMRC regional trade estimates;
- the Scottish Input Output Tables, which in turn are based on an unpublished origin and destination survey by the Scottish Executive;
- the SCDI Survey of Scottish Manufactured Exports;
- the Scottish Global Connections Survey;
- Republic of Ireland Trade Statistics;
- United Nations Comtrade Commodity Trade Statistics.

Initial estimates are prepared using the production/absorption estimates as origin-destination values in a 'gravity' model. In such a model, the trade between two areas is proportional to total flows from the origin and total flows to the destination, and inversely related to the distance between them. The importance of distance is summarised in a friction coefficient describing the inverse relationship.

Origin and destination for each product and territory combination are based on production and absorption above.

The friction coefficient of the gravity model for each product is primarily based on the only official internal trade statistics for Great Britain, the Scottish Executive origins and destinations survey which reports trade between Scotland and the other constituent countries. Where this is problematic (for example, if a Scottish trade flow reported by the Scottish Executive is greater than a UK flow estimated by ONS), some coefficients are imposed based on experience elsewhere, notably the Canadian inter-provincial input output tables which are the most detailed intra-national trade statistics in the world.

The distance parameter of the trade model is based on road distances between NUTS3 areas (NUTS4 in Scotland, NUTS2 in the Republic of Ireland). Adjustments based on crossing time and frequency are made for ferry routes. In the case of crossings to Northern Ireland, the distance equivalent is an empirical estimate based on the NIMSAES. A national border effect is estimated for the Republic of Ireland, in addition to a ferry adjustment for the Republic's trade with Great Britain.

Trade estimates are then constrained successively to the various sources. The first constraints are based on international trade data and the final constraints are the production/absorption estimates again, to ensure consistency with the national accounts. Intermediate data sources are sometimes in conflict (for example, Irish exports to the UK differ from UK imports from Ireland) and on occasions, some adjustment is needed.

12.5 Appendix E: Bibliography

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