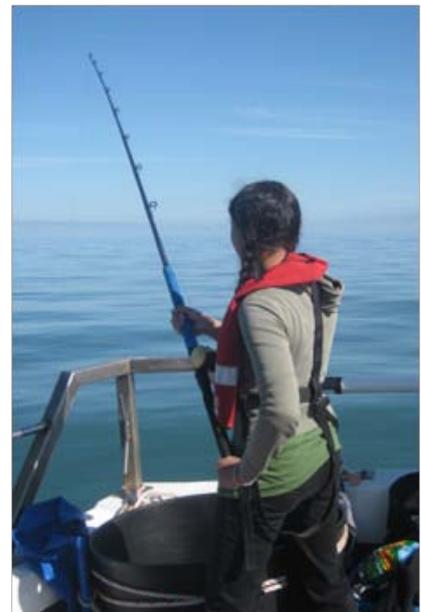




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## Sea Angling 2012 – a survey of recreational sea angling activity and economic value in England.



November 2013



Marine  
Management  
Organisation



substance.  Cefas



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In collaboration with the Inshore Fisheries and Conservation Authorities in England<sup>5</sup> and a steering group comprised of policy makers, government scientists, academic scientists, and the angling community<sup>6</sup>

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# Synthesis of findings

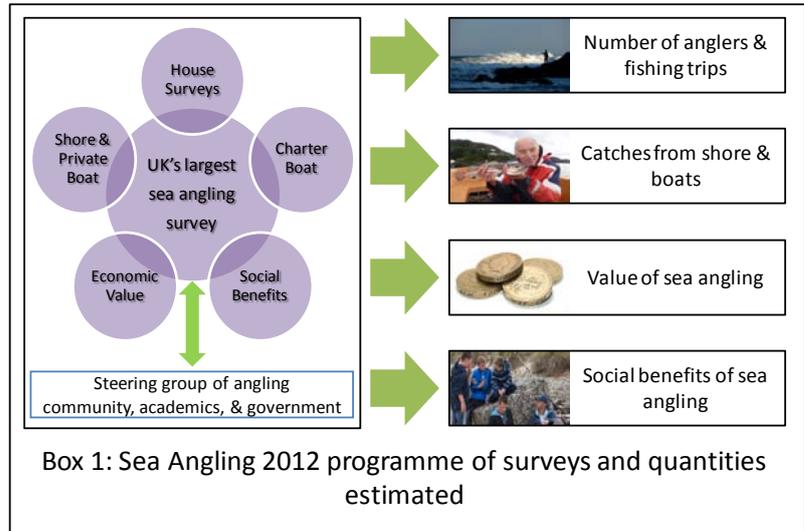
**Sea Angling 2012** was established to find out **how many people go sea angling** in England, **how much they catch**, **how much is released**, and **the economic and social value** of sea angling (Box 1).

This will help local and national policy makers make balanced, well-informed decisions on sustainable development of all forms of sea fishing, and help other organisations – such as

sea angling bodies – to develop their own policies. The surveys also met UK obligations under European law to estimate recreational catches of several species including bass and cod. Data were collected from over **11,000 sea anglers** in England through an Office of National Statistics (ONS) household survey, face-to-face interviews with anglers by Inshore Fisheries and Conservation Authorities (IFCA), catch diaries and online surveys.

The surveys estimated there are **884,000 sea anglers in England**, with 2% of all adults going sea angling. These anglers make a significant contribution to the economy - in 2012, sea anglers resident in England spent **£1.23 billion on the sport, equivalent to £831 million direct spend once imports and taxes had been excluded**. This supported **10,400 full-time equivalent jobs** and almost **£360 million of gross value added (GVA)**. Taking indirect and induced effects into account, **sea angling supported £2.1 billion of total spending, a total of over 23,600 jobs, and almost £980 million of GVA**.

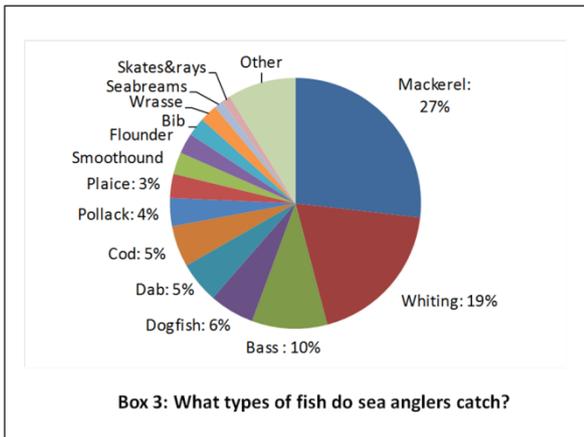
Sea angling also has important social and well-being benefits including providing **relaxation, physical exercise**, and a route for **socialising**. Anglers felt that **improving fish stocks** was the most important factor that would increase participation in sea angling.



	Number of days fishing	Mean number of fish caught per day	Total annual number of fish caught
Shore angling	2.7 million	1.6	4.3 million
Private & rented boats	1 million	4.8	4.8 million
Charter boats	0.1 million	9.8	1 million

Box 2: What did sea anglers catch?

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

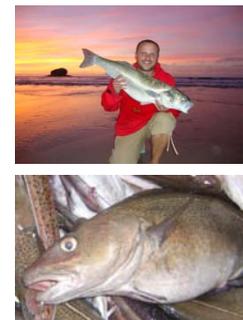


The most common species caught, by number, were **mackerel and whiting**, (Box 3). **Shore anglers released around 75% of the fish caught**, many of which were undersized, and **boat anglers released around 50% of their fish**.

The *Sea Angling 2012* surveys of shore and boat catches give the **most comprehensive estimates ever for England**, and have been carried out using **rigorous statistical**

**protocols**. Estimating total annual catch weights of species proved particularly challenging for shore angling and private boats due to difficulties in estimating the number of days fished from the ONS household survey, and in encountering private boats whilst landing. Total annual catch estimates for bass and cod, as required for the EU Data Collection Framework, are shown in the table below. The figures for shore and private boats are the extremes of a range of estimates from several different approaches to analysing the data<sup>1</sup>. The charter boat estimates may also have some bias if the sampled boats had different catch rates, on average, to boats not participating in the survey. These uncertainties should be taken into account when using the results.

<i>Annual catch weights (tonnes)</i>		Shore	Private and rental boats	Charter boats	Total
<b>Bass</b>	Total	98 t - 143 t	<b>194 t - 546 t</b>	44 t	<b>380 t - 690 t</b>
	Kept	38 t - 56 t	<b>142 t - 367 t</b>	31 t	<b>230 t - 440 t</b>
<b>Cod</b>	Total	95 t - 138 t	<b>172 t - 595 t</b>	175 t	<b>480 t - 870 t</b>
	Kept	75 t - 109 t	<b>158 t - 582 t</b>	159t	<b>430 t - 820 t</b>



Recent surveys in France indicated that recreational fishers caught and kept around 940t of bass in the English Channel, of which 80% (750t) was by sea anglers<sup>2</sup>. This is of similar magnitude to the *Sea Angling 2012* estimates for England, given the uncertainties in the estimates. The total annual kept catch of North Sea cod taken by recreational fishers in Germany, Sweden, Denmark and the Netherlands is estimated to be around 1,200t<sup>3</sup>. The UK commercial landings of bass in 2012 were 897t, mostly into England. The commercial landings of cod into England from the North Sea, Channel, Celtic Sea and Irish Sea in 2012 were 1,500t.

The information and knowledge acquired in conducting this project will be valuable in determining the design of future data collection surveys.

<sup>1</sup> Figures in normal or bold type for shore or private boats are from the same estimation method.

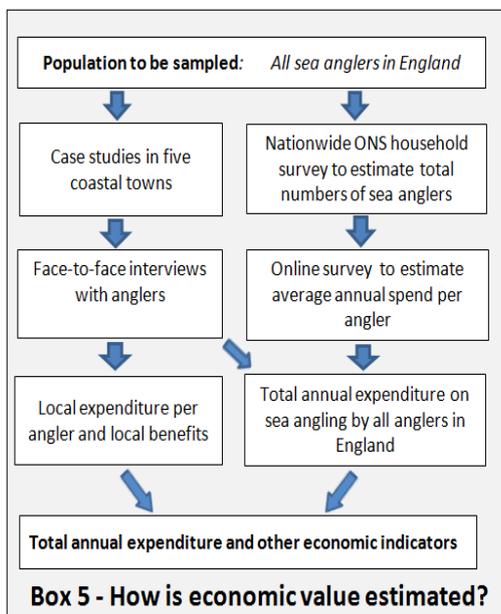
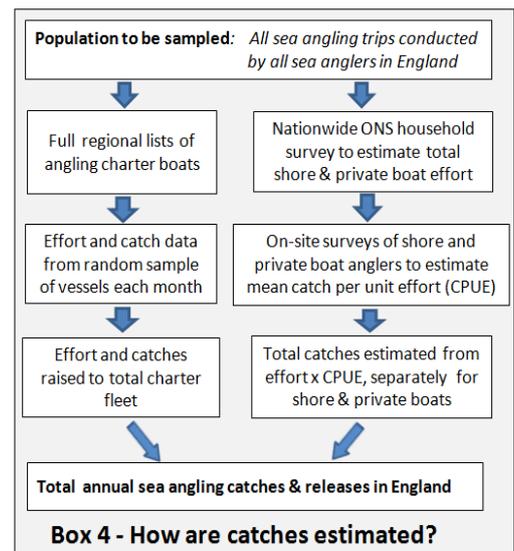
<sup>2</sup> <http://www.ices.dk/community/groups/Pages/WGCSE.aspx>

<sup>3</sup> <http://www.ices.dk/community/groups/Pages/WGRFS.aspx>

## How the *Sea Angling 2012* surveys were carried out

Almost a million people go sea angling in England each year, over a long and varied coastline, at all times of day and year. How is it possible to estimate how many fish all these anglers catch, or how much they spend on the sport? Fortunately, there is a lot of experience worldwide in doing just that, and we have taken advice from experts in the USA, Australia and elsewhere on how to do it.

To estimate the total catches of the angling charter boat fleet in England, we first of all compiled a list of vessels that was as complete as possible. We took a random sample of vessels every month, recorded their catches and then expanded the total catches of the sampled vessels to all vessels in the fleet (Box 4). A different approach was needed for shore or private boat anglers for whom there are no records. A nationwide Office of National Statistics (ONS) survey was used to estimate the number of days fishing by all the anglers during the year (the angling **effort**). Surveyors from the Inshore Fisheries and Conservation Authorities interviewed anglers at random all round the coast during the year to find out their daily catches (the catch per unit effort – **CPUE**). The total annual catch was calculated by multiplying the total effort by the average CPUE (Box 4).

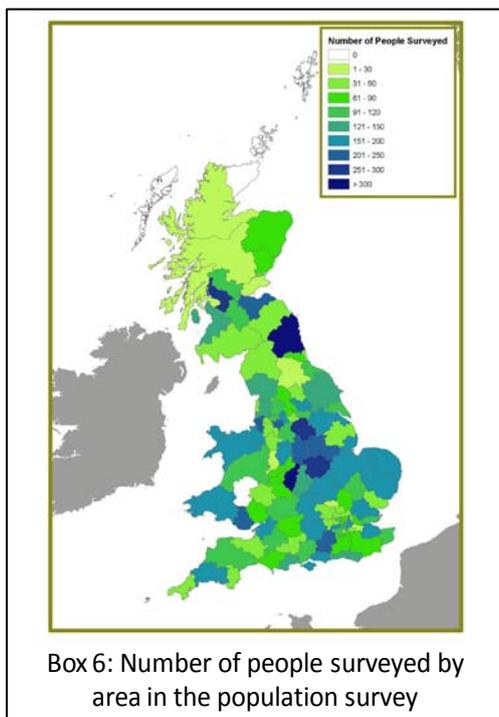


The economic value and social benefits of sea angling were estimated within *Sea Angling 2012* to understand the importance of sea angling in England. This shows the pattern of direct spending by sea anglers and how this spending supports other economic activity in England through supply chains (Box 5). We used the ONS household survey to estimate the total number of people who went sea angling in 2012, then ran a well-publicised online survey throughout 2012 to collect data on expenditure and social benefits from a representative sample of these anglers. Other surveys were carried out in face-to-face interviews with sea anglers at five case study locations and supporting data were collected from angling businesses.

There are a number of different survey methods available, each with advantages and disadvantages. For this reason, *Sea Angling 2012* has tried out a number of different on-site and online methods with the aim of providing the most comprehensive data ever collected on sea angling in England, and to find out what would be the most cost-effective way to carry out any future surveys.

Detailed technical reports on each of the surveys can be found in the Technical Annex to this report and can also be accessed at [www.seaangling2012.org.uk](http://www.seaangling2012.org.uk). A brief summary of each of the reports is given below.

## Estimating the number of sea anglers and number of trips made by sea anglers in England



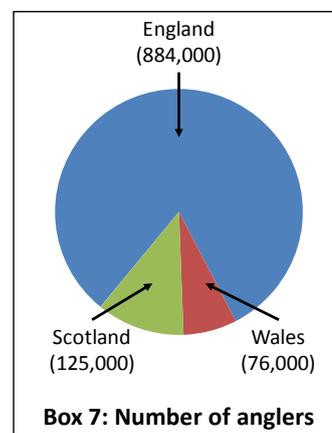
Box 6: Number of people surveyed by area in the population survey

We used the Opinions and Lifestyle survey, run by the Office for National Statistics (ONS), to estimate the number of sea anglers in England and how often they go fishing from shore, private or charter boats, and to collect other information about them and their fishing patterns. Each month in 2012, 67 postal sectors (58 from England, 3 from Wales and 6 from Scotland) were selected at random, and 30 addresses were randomly selected from each sector to participate. From these, 12,619 private households provided face-to-face interviews during 2012 (Box 6).

The respondents were asked if they or other members of the household had gone sea angling in 2012. If so, a wide range of other questions were asked about their sea angling activity, for example what types of angling they participated in during the previous three months, how many days were spent

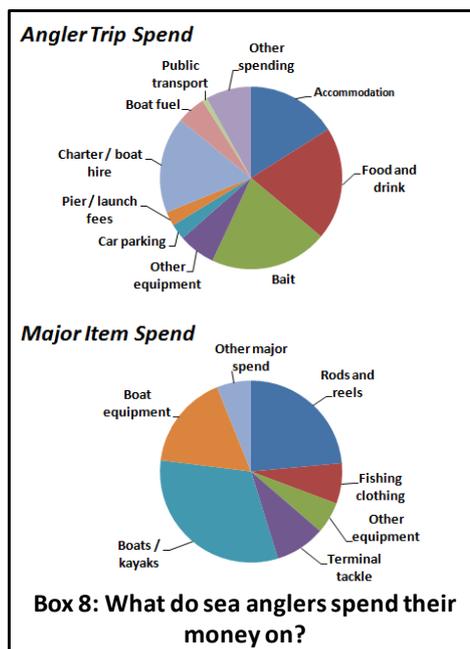
sea angling in England, where the angling mainly took place, and how many hours they typically went fishing on a day-trip. From the responses given, it was possible to estimate how many people went sea angling in Great Britain and in England in 2012, and to make some inferences on their fishing effort. These estimates are needed for the calculation of annual catches and economic value of sea angling from the other *Sea Angling 2012* surveys.

Around 2.2% of the adult population of Great Britain (GB), representing 1.08 million people, went sea angling in 2012 - 884,000 from England, 76,000 from Wales and 125,000 from Scotland (Box 7). Shore angling was the most popular activity followed by private boats and charter boats. The ONS survey uses a proven, statistically-sound design. However, relatively few sea anglers were interviewed because many live close to the coast. Although the overall estimate of number of anglers is robust, it is likely that finer details such as days fished are very imprecise. As a result, the ONS survey is unlikely to be a solution for future population surveys of effort.



Box 7: Number of anglers

## Estimating the economic and social value of sea angling in England



Recreational sea angling is a leisure activity that has many social benefits including health and well-being. It is also a major economic activity - total resident sea angler spending in 2012 was estimated from our surveys to be £1.23bn (split between spend categories as shown in Box 8) equivalent to £831million direct spend excluding imports and taxes. This directly supported 10,400 FTE jobs and almost £360 million of gross value added (GVA). The total economic impact was £2.1bn of spending, supporting 23,600 FTE jobs and almost £980 million of GVA once indirect and induced effects were accounted for. Coastal communities benefit when good fishing attracts anglers. Estimates at case study sites in this research suggest between 1,000 and 4,000 angling trips can generate one FTE job per year in those locations.

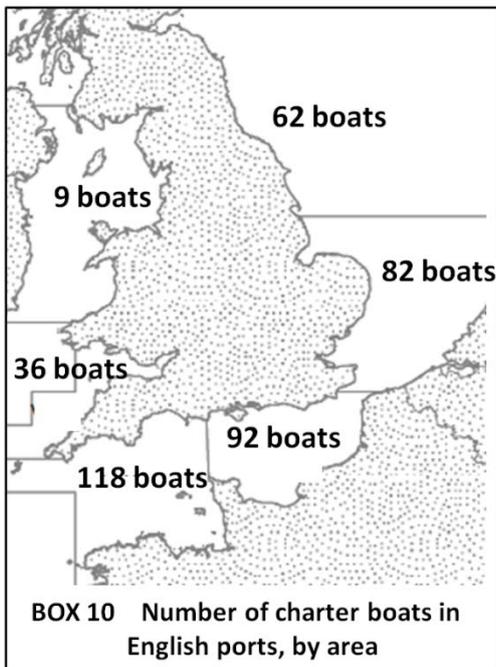
The annual spend on sea angling varied enormously between individuals – being a very expensive activity for some (e.g. tackle, boats, equipment) and a very low cost activity for others. The average spend per individual in the sea angling population was estimated to be £1,394 per year - £761 on trip-related costs and £633 on major items.

Data for estimating spend per angler were obtained from 2,512 respondents to an online survey and from 340 face-to-face interviews at five case study locations (Weymouth, Deal, Liverpool, Northumberland and Lowestoft) where local businesses were also surveyed. Average angling trip expenditure varied widely between case study locations, from £36 in Lowestoft to £167 in Weymouth where spend on accommodation and charter boat fees was relatively high. The total annual spend in England was estimated by raising the mean spend per angler to the total number of sea anglers in England estimated from the Office of National Statistics Survey. All data were re-weighted using demographic and frequency-of-angling data from the surveys to reduce bias.

In the social benefits survey, 47% of respondents said that ‘being outdoors and active’ was their main motivation for going sea angling, and 55% said it was to ‘relax and get away from things’. Sea angling contributes to health and well-being with 69% of sea anglers saying it is their main way of ‘experiencing nature’ and 70% saying that it is important to their quality of life. Better fish stocks were cited most often as the factor that would increase participation, although cost, time and family commitments were also important.



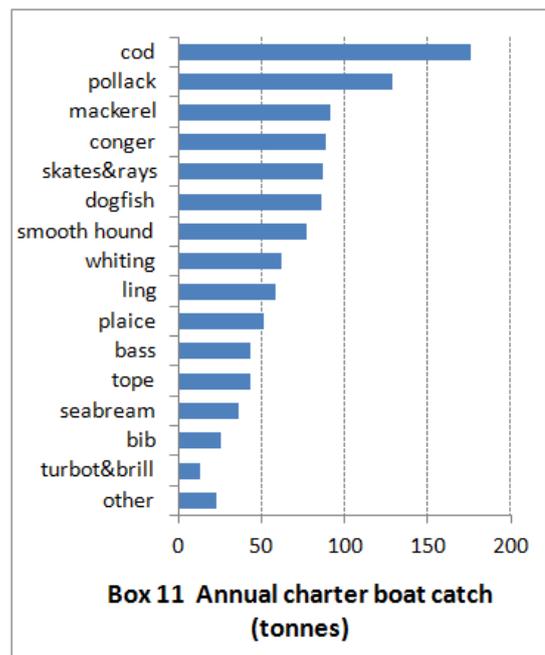
## Estimating the activities and catches of charter boats



Charter boats operate all around the UK, and are hired out for specialised or more general angling, or for activities such as diving or wildlife-watching. Using the internet, magazines and local contacts, we identified 399 charter boats in England (Box 10). The owners of 166 vessels agreed to participate in a survey during 2012 and 2013. Every month, 34 vessels were selected at random from across six regions, and the skippers were asked to complete a one-month diary documenting all activity or non-activity, catches, and sizes of fish caught. Around 60% of the diaries were returned. Angling activity was highest in summer. To calculate the annual catches of all boats in each region, the non-sampled boats were assumed to have the same average catch rates as the sampled vessels.

The largest annual catches, including released fish, were of cod (175 tonnes) and pollack (129 tonnes). Catches of other species are shown in Box 11. The total retained catch weights of cod and bass were 159 and 31 tonnes respectively. No catches of blue, porbeagle or mako sharks were recorded, possibly due to specialist shark angling boats not participating or, by chance, not being included in the random vessel draws.

Around 48% of all fish were released. Some species, including tope, smooth hounds, dogfish and conger eels, were almost always released. Large and robust species are likely to have a high post-release survival if handled with care, but survival rates of other species are poorly understood and depend on a range of factors.



A large proportion of vessel owners declined to take part in the study for reasons including fears about the purpose and likely impact of the survey. Exclusion of these vessels is a source of bias, as they may on average have different catch rates to those that did participate. Also, there are likely to be other charter boats not identified in the initial screening exercise. No diaries were returned for the Irish Sea, so no estimates were possible in this region, and no estimates of catches of large pelagic sharks could be made.

## Estimating the activities and catches of anglers fishing from the shore and from private or rented boats

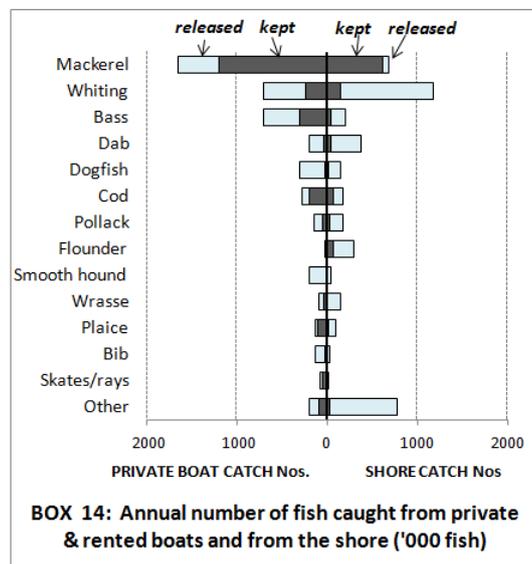
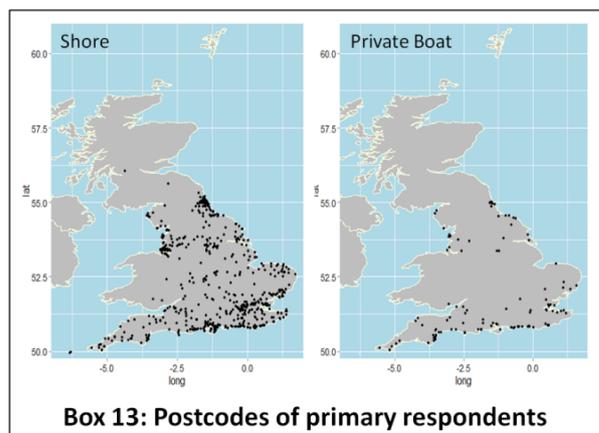


There is no list of anglers who fish from the shore or private or rented boats, so the number of angler-days spent on each type of angling in 2012 was estimated from the ONS household survey, with adjustments using data from direct interviews with anglers. We estimated there were between 3 – 4 million days of shore angling effort and 0.5 – 1 million days of private and rented boat effort in 2012.

Estimating the mean catch rate of each species was a huge challenge given the length and diversity of coastline. The Inshore Fisheries and Conservation Authorities (Box 12) surveyed almost 2,000 randomly-selected shore and boat landing sites during 2012, and 2,030 shore anglers and 410 private boat anglers were

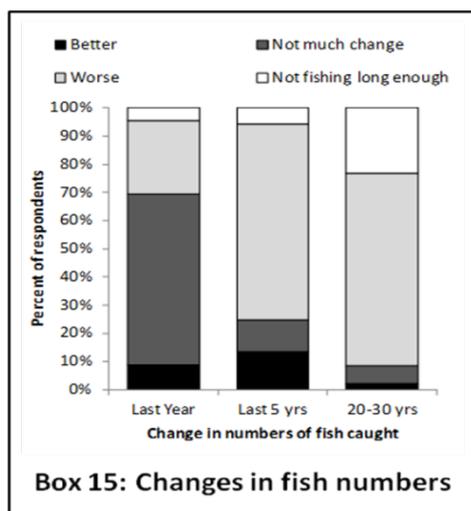
interviewed. Private boat landings were unpredictable and difficult to intercept. The majority were encountered from July to September.

Almost all interviewed anglers were residents of England, particularly the coastal counties (Box 13). Total annual catches were calculated for each type of angling by multiplying the estimate of total annual angler-days by the mean catch per day from the on-site surveys. The data can support estimates of catch for England as a whole, but are not sufficient for estimates at smaller spatial scales.



The main species caught, in terms of numbers of fish, were mackerel, whiting and bass (Box 14). The largest bass catches were recorded by anglers fishing from private or rented boats. Shore anglers released around 75% of the fish that they caught. Private boat anglers had a smaller release rate of around 50%, partly due to the larger average size of fish, or other factors such as the condition of fish brought up from deep water.

## Collecting data on catches, angling activity and opinions through an online survey



An online survey was run throughout 2012 to seek information on sea angling activity, catches and opinions. Immediately after each quarter of the year, a publicity campaign invited anglers to complete the survey, recalling catches and activity for that quarter.

The survey attracted 227 respondents, far fewer than in the online survey of economic value, suggesting sea anglers were less willing to report catches than the amount they spend. This may be due to the complexity of the survey or concerns about use of the data.

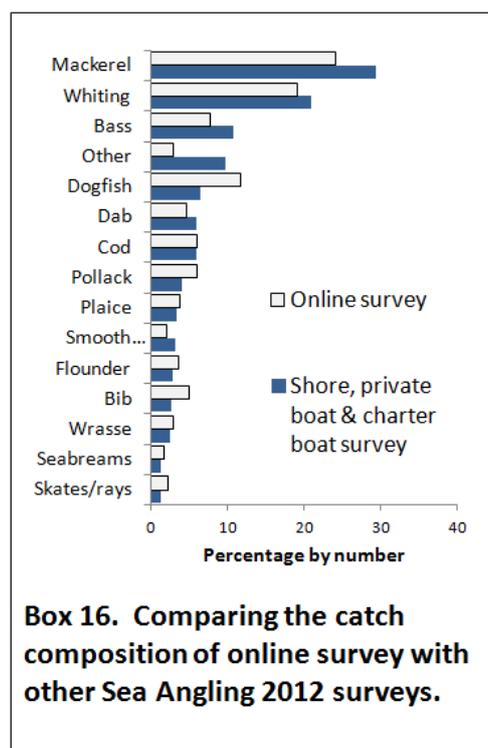
Occasional or less successful anglers may also be less likely to complete the survey.

Respondents were self-selecting and unlikely to be representative of all sea anglers. On average they were more avid and successful anglers than those interviewed in the other more statistically designed *Sea Angling 2012* surveys, reporting higher catch rates, more days fished, and higher membership of clubs and national angling bodies. The sample was too small to be divided up and re-weighted to have the same demographic and avidity composition as respondents to the Office of National Statistics household survey, as was done with the much larger sample from the online economic survey.

Information on trends is likely to be less affected by the non-representative nature of the sample of anglers. Anglers felt that fish numbers and size had declined over the past five years, and to a greater extent over the last 20-30 years (Box 15).

The species composition of fish catches in the online survey was similar to the combined catches for the *Sea Angling 2012* charter boat and shore and private boat surveys (Box 16). The online survey mostly showed similar patterns of release rates to the other surveys, for different species and types of angling.

Any future use of online surveys to estimate catches would depend on finding ways to greatly increase the response rate across the population of anglers, as well as having a better targeted nationwide household survey to re-weight the online results.



## Estimates of bass catches and releases



Bass is a premier angling species in Europe, and there are requirements under the EU Data Collection Framework regulation to estimate recreational catches in specified sea areas. This is to ensure that the stocks can be managed sustainably, based on a more complete understanding of fishery catches. A focus of *Sea Angling 2012* was to provide estimates of total annual sea angling catches of bass in England, separately for kept and released fish. Shore

anglers released around 80% of bass they caught. The release rates were lower for private boats (around 60%) and charter boats (around 40%) mainly due to the larger sizes of fish caught. Released fish make up a much smaller fraction of catch weight.

Estimating total catches around England's long and diverse coastline was a huge challenge. Despite the statistical rigour of the surveys, it proved difficult to

obtain an accurate picture of the total number of days fished by shore and private boat anglers. A range of methods of estimating seasonal and annual shore and private boat effort was used to calculate annual catches. The figures for shore and private boats in Box 17 are the extremes of the range of estimates from these different methods. The charter boat estimates may also have some bias if the sampled boats had different catch rates, on average, to boats not participating in the survey. Each of these is a point estimate that also has an associated random sampling error. These uncertainties should be taken into account when using the results.

The sea angling catch estimates are comparable with the results of recreational fisheries surveys in other countries (Box 18)<sup>4</sup>. The estimate for France is for the English Channel only, and around 80% of the catch was by sea anglers. The recreational catches in each country are consistently around a third of the commercial fishery landings. There will be additional angling catches in Wales. The UK commercial landings of 897t were mostly into England.

<i>Annual catch weights (tonnes)</i>		<b>Shore</b>	<b>Private and rental boats</b>	<b>Charter boats</b>	<b>Total</b>
<b>Bass</b>	<b>Total</b>	<b>98 t - 143 t</b>	<b>194 t - 546 t</b>	<b>44 t</b>	<b>380 t - 690 t</b>
	<b>Kept</b>	<b>38 t - 56 t</b>	<b>142 t - 367 t</b>	<b>31 t</b>	<b>230 t - 440 t</b>

**Box 17. Annual sea angling catches of bass in England**

*Figures in normal or bold type for shore or private boats are from the same estimation method.*

Country	Recreational fishery: annual kept catch	Commercial fishery landings 2012
England	230 t – 440 t	897 t (UK total)
France	940 t	2,492 t
Netherlands	128 t	372 t
<b>TOTAL</b>	<b>1,300 – 1,510 t</b>	<b>4,060 t (all countries)</b>

**Box 18: Sea angling catches of bass compared with commercial landings in 2012.**

<sup>4</sup> <http://www.ices.dk/community/groups/Pages/WGCSE.aspx>

## Estimates of cod catches and releases

Cod occur all round England, and are commonly targeted by shore anglers in autumn and winter, and by boat anglers at all times of year. Two pieces of fisheries legislation in the EU require Member States to estimate recreational catches of cod: the EU Data Collection Framework requires estimates for all types of recreational fishing in the North Sea and eastern Channel, and the Control Regulation requires estimates for species subject to an EU recovery plan, which has included cod in all areas, but applies only to registered charter vessels.

*Sea Angling 2012* surveys showed that shore anglers released around 60% of the cod they caught. The release rates were lower for private boats (around 30%) and charter boats (around 20%) mainly due to the larger sizes of fish caught. Released fish make up a much smaller fraction of catch weight due to their lower individual weight.

As for bass, a range of different methods of estimating seasonal and annual shore and private boat effort was used to calculate annual catches. The figures

<i>Annual catch weights (tonnes)</i>		<b>Shore</b>	<b>Private and rental boats</b>	<b>Charter boats</b>	<b>Total</b>
<b>Cod</b>	<b>Total</b>	95 t - <b>138 t</b>	<b>172 t</b> - 595 t	175 t	<b>480 t</b> - 870 t
	<b>Kept</b>	75 t - <b>109 t</b>	<b>158 t</b> - 582 t	159t	<b>430 t</b> - 820 t

**Box 19. Annual sea angling catches of cod in England**

*Figures in normal or bold type for shore or private boats are from the same estimation method.*

for shore and private boats in Box 19 are the extremes of the range of estimates from these different methods. The charter boat estimates may also have some bias if the sampled boats had different catch rates, on average, to boats not participating in the survey. Each of these is a point estimate that also has an associated random sampling error. These uncertainties should be taken into account when using the results.

Several European countries have carried out recreational fishery surveys of cod<sup>5</sup>. Estimates for the North Sea, Skagerrak and eastern Channel are shown in Box 20. The results for England as a whole are not out of line with other countries given the relative population sizes and lengths of the coastline.

The commercial landings of cod into England from the North Sea, Channel, Celtic Sea and Irish Sea in 2012 were 1,500t.

Country	Recreational fishery: annual kept catch
England	430 t – 820 t
Germany	30 t
Denmark	537 t
Sweden	226 t
Netherlands	360 t

**Box 20: Annual sea angling catches (kept fish) of cod from *Sea Angling 2012* and recent surveys in other European countries.**

<sup>5</sup> <http://www.ices.dk/community/groups/Pages/WGRFS.aspx>

## Collecting data on sea angling from visitors to the Isles of Scilly

The Isles of Scilly were not included in the *Sea Angling 2012* shore and private boat survey, and a separate small survey was carried out during summer 2012 to find out more about the role of sea angling in the activities of tourists to the Isles, how much they spent on sea angling related items, and what species were caught from the shore and from boats. A short questionnaire was developed by Cefas in collaboration with staff of the Isles of Scilly Inshore Fisheries and Conservation Authority (IFCA), and circulated around hotels, guest houses, and camp sites (Box 21). Completed questionnaires were returned to the IFCA and compiled into a spreadsheet for analysis. This survey was intended to help improve understanding of sea angling tourism, and not to make any estimates of total catches or expenditure.

Only a small proportion of people who went sea angling had gone specifically to the Isles of Scilly for that purpose, and for most it was an incidental pastime which attracted only a relatively small expenditure on items directly

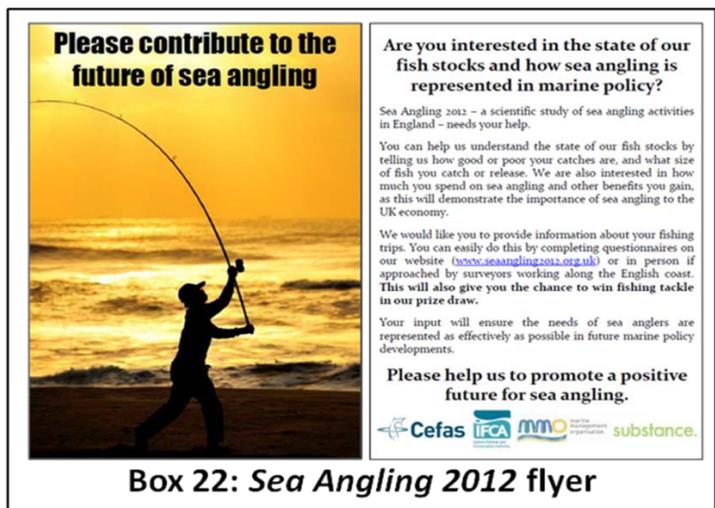
**Box 21: Isles of Scilly tourist survey questionnaire**

related to sea angling such as bait, tackle or boat fees. Most fish caught were pollack, mackerel and wrasse. Release rates of around 60% on average were in the range of values recorded for shore and boat angling on mainland England. The parties associated with each primary respondent had on average caught around five fish per day, for all species combined.

## Involving anglers and other stakeholders in the project

From the start of this project, we wanted to ensure that the views and knowledge of anglers, angling bodies, policy makers, local authorities (IFCAs), survey experts and other angling stakeholders from business and the media were taken into account. This is essential so that the surveys are carried out to a high standard, and that the results are transparent and credible. At the start of the project, a steering group was set up that included a broad range of these stakeholders. They provided advice on survey methods and communications, helped develop credibility and trust, ensured that the data are of use to angling organisations to develop their own policies, and provided support in many other aspects of the project.

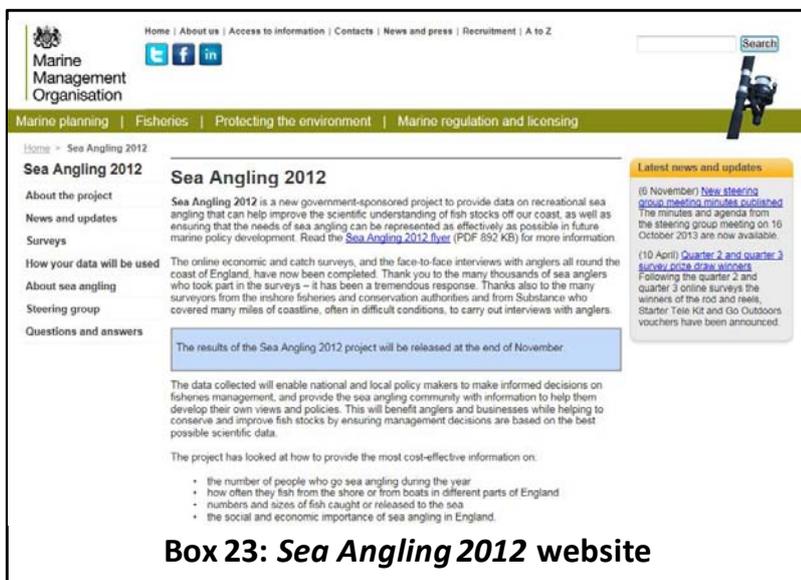
The experience of the steering group was important in shaping the project and many changes were made to the surveys as a result of steering group discussions. For example, the economic survey was extended to include social benefits on the advice of the steering group, and significant changes to both survey design and analyses were also made. The angling community know far more about anglers and angling than scientists, and scientists know more about scientific methods than the angling community. Working together led to the experience and knowledge of all parties being incorporated and enhanced the quality of the data leading to greater utility for scientists and the angling community alike. We would like to thank those members of the steering group for their significant contributions throughout the project and others that contributed through the steering group (a list of steering group members and their associated organisations is on the back page of this report).



**Box 22: Sea Angling 2012 flyer**

Significant effort was also made to engage with anglers to ensure that they were informed about the project. Since the start of the *Sea Angling 2012* surveys, 20,000 flyers were distributed by the IFCA's to local tackle shops and at fishing shows to publicise the survey to sea anglers (Box 22). Articles were written in the angling press, the Defra "Fishing Focus" newsletter, and a radio interview was given.

A website was set up containing information about *Sea Angling 2012* (<http://www.seaangling2012.org.uk> – Box 23) that also linked to the online catch and economic surveys. A number of press releases were made to publicise the surveys, and were sent to many angling organisations, internet fora and other media. E-mail shots were also made to anglers who agreed to receive more information following the National



**Box 23: Sea Angling 2012 website**

Angling Survey. This publicity worked well as the *Sea Angling 2012* website was the twelfth hit on a Google search for 'sea angling' and top hit on a search for 'sea angling project' (figures correct on 25 October 2012 from <http://www.google.co.uk>). The impact of this publicity was demonstrated in the almost 3,000 anglers that responded to online surveys and the low refusal rates to complete face-to-face surveys.

# Technical Annexes: Survey Reports

Annex 1: A household survey of recreational sea angling.



Annex 1\_ONS  
SA2012 Report.pdf

Annex 2: The Economic and Social Value of Recreational Sea Angling in England



Annex 2\_Economic +  
Social SA2012 Report

Annex 3: A survey of charter boat sea angling catches in England



Annex 3\_Charter  
Boat SA2012 Report.

Annex 4: An on-site survey of recreational sea angling catches from the shore and from private and rental boats in England in 2012



Annex 4\_Shore +  
Private Boat SA2012

Annex 5: An online survey of recreational sea angling catches in England



Annex 5\_Online  
Catch SA2012 Report

Annex 6: Angling tourism study in the Isles of Scilly



Annex 6\_IOS Tourist  
SA2012 Report.pdf

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- substance: Adam Brown
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We would like to thank the other people who have contributed to the steering group meetings at different times, and the IFCA surveyors who visited almost 2,000 stretches of shoreline interviewing almost 2,500 shore and private boat anglers, and distributing around 20,000 flyers.