

# ***A review of the PACEC reports (2006 & 2014) estimating net economic benefits from shooting sports in the UK***

## **Summary of the Main Review**

PACEC produced two major reviews of the economic, environmental, and social benefits of shooting sports in the UK, in 2006 and 2014. We were asked by the ‘*League Against Cruel Sports*’ to review and assess these two major studies. This review concentrates on issues of economic impacts, on methodological aspects of the work, the overall robustness of the approaches taken, and the conclusions drawn.

## **A. Conclusions**

Our work was undertaken in two linked stages. Firstly, we carried out a review of the 2006 PACEC report on the sporting shooting industry in terms of the estimates of the economic benefits of the industry. We were then asked to review the follow-up 2014 PACEC report. Many of the methods used by PACEC in the 2006 report were replicated in the 2014 report, so the structure of this review is very similar. Where similar data were generated in the two PACEC reports, a comparison of the two sets of findings is provided. Overall, the main conclusions of our review of the 2006 report still hold, but the detailed commentary is adjusted to take into account some changes in methodologies used by PACEC.

## **Overall, assessment of the reports and the assertions:**

The two PACEC reports each represent a considerable body of work and of information generated. Broadly speaking, the basic assertions that the sport shooting industry has a significant impact on the economy, the environment and the communities involved, cannot be disputed. The range of expert evaluations, which we received, confirmed the view that this is a substantial piece of research and the reports are impressive as evidence-based advocacy statements. Indeed, a number of expert reviewers found the sheer size and wealth of information too much to evaluate easily or effectively. Others felt that the political sensitivity of the issues, from either side of a debate, made it difficult to assess the reports impartially.

However, a detailed, critical review of the reports and in particular, of their methodologies, reveals

serious issues in taking the findings at face value.

**1. It is not possible to accept the estimates of Gross Value Added (GVA) of the sporting shooting sector given in either the PACEC 2006 or 2014 report. The associated estimates of employment associated with the industry are also open to question, and the impression that the industry adds to social well-being and environmental conservation is based on limited and partial information. The problems with the two reports which lead to these conclusions can be summarised as follows:**

1. Although PACEC have collected data that allow an estimate in each report, the guidelines of the Office for National Statistics (ONS) on the inclusion of gross profits and losses in GVA estimates were not followed. *See Section C2.1 below*
2. The distinction that should be made between a *sectoral analysis* and an *impact analysis* is not always clear. This results in the inclusion of some items and calculations in the GVA and employment estimates, which are inappropriate and inflate the figure. The idea of “*GVA supported*” by the sporting shooting sector (2006 report) represents this conceptual fudge. This phrase was amended to “*GVA attributable*” to the sport shooting industry in the 2014 report. The economic models for the study, presented in Chapter 3 of both PACEC reports, are more appropriate for an impact study. *See Section C2.4 below*
3. The assumption that ONS input-output multipliers can be used (even if this was an impact study) is fallacious since not all activity, including supplier activity, is undertaken in areas of economic spare capacity. This cannot be remedied by looking at the actual distribution of employment or GVA for the industry in the reports because the methodology for allocating such economic activity to the regions report is not itself reliable. *See Section C2.4.2 below*
4. There is a lack of transparency about the way in which some calculations are undertaken in the main PACEC report, particularly in relation to multipliers. Although better in the 2014 report, calculations beyond first round suppliers are not shown, neither are they easy to infer. The geographical distribution of the jobs associated with the industry has been undertaken using a largely arbitrary methodology and cannot be taken as reliable. *See Section C2.4.1 below*
5. The methodology for the allocation of participants’ expenditure between the sporting

shooting industry and other activities is open to question, although has been tightened up in the 2014 report compared to the 2006 report. *See Section C2.4.1 below*

6. The existence of subsidies available to the sector, particularly in relation to woodland and sustainable farming (which are often jointly produced with the game shooting sector), are not discussed in either report, but would be needed for an assessment of the size of the sector for GDP as opposed to GVA. This discussion should be present in any inclusive economic assessment and placed as a comment on the validity of the GVA estimate as a reliable indicator of the economic significance of the sector. *See Section C2.3 below*
  7. The current discussions between HMRC (HM Revenue & Customs) and the industry, which focus on the apparent self-employed status of casual staff regularly employed in the industry, suggest the possibility of under-collection of National Insurance and income tax. This could also be construed as a subsidy. *See Section C2.7 below*
  8. The view of the 2006 PACEC report that social and environmental costs are broadly balanced with social and environmental benefits, cannot be accepted because of serious problems with the contingent valuation study they used to support this conclusion. *See Appendix 1.*
  9. The survey of industry participants in the 2014 PACEC report to find their views on the role of the industry in promoting social well-being, social cohesion and environmental conservation, is a very partial and incomplete analysis. There is no discussion whatsoever of environmental costs, nor the views of non-participants. *See section C3*
2. **The overall conclusion for both reports is**
1. That **the estimate of GVA is very much on the high side**, but as will be discussed in *Section B* below, there are problems with defining the GVA of a sector that allow for some ambiguity.
  2. That the estimate for jobs “*supported*” or “*attributable*” to the industry in both reports is **not a valid economic category** and gives rise to excessive claims; and that estimates for the distribution of such jobs to the different regions of the UK is based on untenable assumptions. *See Section C2.4 below*
  3. That information on the social and environmental costs and benefits of the industry

included in the reports remains **extremely limited**. Further work in terms of an up-to-date review of literature and further primary studies would be necessary to remedy this. That is beyond the scope of our current review.

4. That more conservative assumptions about the allocation of participant spending to the industry in the 2014 report have resulted in slightly more realistic estimates.

## **B. Difficulties in establishing the correct figures**

While a number of criticisms are made of the PACEC report in the conclusions above, it is acknowledged that any study of this kind would encounter difficulties in establishing the correct figures for the sector. PACEC do make clear some of their reservations about their own figures while presenting a pragmatic way forward. The main difficulties in establishing correct figures in the report are:

1. **Lack of clarity in the research question.** Some of the difficulties referred to above may have come from a lack of clarity in the terms of reference given to PACEC, particularly in relation to vagueness in the definition of economic benefit. The nature of the counter-factual questions implicitly asked, but not directly stated, may also have had an effect. *See Section C2.5 below*
2. **Problems with the Standard Industrial Classification System.** The ONS publishes the GVA of the main sectors of the economy, but the sporting shooting sector is not neatly arranged within the Standard Industrial Classification (SIC). Rather, it is spread across a number of different industrial categories, and is often mixed together with other sub-categories in an unhelpful way. Indirect methods therefore need to be used to estimate the GVA of the sector, and the method used by PACEC is largely based on estimates of direct and indirect employment.

See <http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/standard-industrial-classification/index.html>

3. **Difficulties with the GVA concept.** The GVA concept has been developed so that the ONS has a consistent set of sector estimates, which add up to the total GVA for the economy. In order to avoid double counting of inputs that are also the outputs of other industries, it differs from the value of the output of the specific industries. The extent to which it is valid to add output from other industries when discussing the GVA of a given industry is open to

debate and is discussed further in *Section C2 below*.

- 4. Problems with estimating and allocating subsidy by sector.** Subsidies to woodland management and sustainable farming referred to in section A.1.3 above are relevant to the assessment of the economic significance of the industry. The way in which such subsidies should be included in the calculation would depend on the target and purpose of the subsidy. If it was a subsidy to support an ailing agricultural and horticultural industry, it should be subtracted from GVA in assessing economic significance. However, if its main purpose is to increase biodiversity and increase the country's carbon sink, then it can be disregarded in the calculations. If readers are tempted to think this 'environmental benefit' should be added to the output of the sporting shooting industry they need to be reminded that it has already been paid for by the taxpayer through the subsidy. A similar argument can be used to question whether such environmental benefits should be included in contingent valuation estimates, which PACEC did in their 2006 report. *See Section C3.2 below*. There would be an additional problem in attempting to identify those subsidies affecting land involved in live game shooting. Then, where joint production with agriculture occurred, there would be issues raised of issues of how to apportion the subsidy.

#### **A range of alternative possible assessments**

In order to deal with this range of problems, a set of alternative estimates of the economic significance of the sector is presented below in Table 1. The assumptions and methodology behind each of these alternatives is given in Section C below, and a short note on the problems associated with each measure is included in the table. Each estimate is based on information presented in the original PACEC reports.

**Table 1. Alternative measures of economic significance**

Measure	PACEC 2006	PACEC 2014	Notes / internal section reference for detailed calculation
Gross Output based on participant expenditure	£782 million	£887 million	Includes intermediate products and therefore double counting. <b>C2.1</b>
Gross Output based on provider income	n.a.	£1.1 billion	Not available in 2006. <b>C2.1</b>
GVA at market prices based on participant spending	£283 million	£267 million	To obtain the figure for GVA at basic prices it would be necessary to subtract indirect taxes. <b>C2.2.1</b>
GVA at market prices based on provider income	n.a.	£480 million	There is an unexplained discrepancy between provider income and participant expenditure. <b>C2.2.2</b>
PACEC “supported “ or “attributable” GVA	£1.6 billion	£2.0 billion	Really an impact study, not a sectoral study <b>C2.4</b>
Contribution to GDP based on participant expenditure	Less than £283 million	Less than £267 million	Subsidies are difficult to estimate and apportion between farming and game shooting but would need to be subtracted in some cases. <b>C2.3</b>
PACEC jobs estimate	70,000	74,000	Based on shaky survey data in 2006 and probably in 2014. Once again, an impact study, not a sectoral study.
Direct jobs	31,000	35,000	Many of the “jobs” are not treated by the industry as employment, and are ‘casualised’ and poorly paid. <b>C2.6</b>
Compromise jobs Estimate 1	34,000	37,000	Also based on questionable survey data in 2006 and probably 2014, but including relevant first round suppliers. <b>C2.6</b>
Compromise jobs Estimate 2	38,000	42,000	Also based on questionable survey data in 2006 and probably 2014, but including some more ambiguous first round suppliers. <b>C2.6</b>

\*Footnote: Estimates for GVA have been revised since the review of the 2006 PACEC report. The device of using capital expenditure as a proxy for depreciation results in a higher, but more reasonable estimate. A revised estimate of GVA using capital expenditure as a proxy for depreciation has been used in the final report and results in slightly higher figures.

## C. Main report on the review

### 1. Introduction

There are two major arguments put forward in the PACEC 2014 report on the sporting shooting industry. One argument is that the industry contributes substantially to the economy in terms of jobs and output, and this is supported by an estimate of the GVA (Gross Value Added) of the industry in Chapter 3. This largely replicates the findings of the 2006 report (Chapter 3) but with some minor adjustments in methodology. The second argument, (2014 Chapter 4), is that the industry contributes to social well-being and environmental conservation in a substantial way. This is a change of approach from the 2006 report, (Chapters 4/5), which attempted to arrive at a value for social and environmental costs and benefits using a contingent value study. As with the 2006 report, considerable reservations can be placed against both the GVA and the social / environmental conclusions of the 2014 report.

### 2. What is the right way to assess the economic significance of the sector?

Before discussing whether the PACEC reports provides a good estimate of the economic significance of the sporting shooting industry, it is necessary to consider what a ‘good estimate’ would consist of. There is unfortunately no straightforward answer to this question, but it is possible to classify a number of possibilities so the reader can judge which is appropriate in a given circumstance. Figures from the PACEC report are used to provide a range of estimates for each approach, which are summarised in Table 1 above.

#### 2.1 Gross output (GO)

The simplest approach to assessing the economic value of an industry is to work out the value of the output of the industry by asking how much consumers have paid for it. The resulting Gross Output valuation is a “willingness to pay” approach which fits in well with the utilitarian basis of modern neoclassical economics.

Gross Output can be measured either at *market prices*, which is what the consumer pays, or at *basic prices*, which is market prices less any indirect taxes levied on the product. Although market prices reflect more effectively, what the consumer is willing to pay, the basic price approach fits in better with how National Accounts are worked out in practice.

The estimate of Gross Output at market prices, implicit in the data in the PACEC 2006 report, is £750 million (direct expenditure by participants on shoots) with further revenue of £32 million

selling game, leading to a total of £782 million. The equivalent figures from the 2014 report are £860 million of direct expenditure and £27 million for the purchase of game, leading to a total of £887 million. There are also indirect expenditures totalling a further £1,228 million in 2006 and £1,610 million in 2014), but most of this expenditure would not be classified as being a part of the sporting shooting industry itself. A discussion of the range of additional items that could be included can be found in **Section C2.6 below**.

The value of Gross Output seems like a common-sense answer to the question, but unfortunately, it includes some double counting of the output of other industries. If we added up all the Gross Outputs of all the industries in the national economy, it will come to more than the Gross Output of the whole economy. This is because the outputs of some industries are the inputs of other industries. For example, part of the output of the firearms industry (rifles and bullets) is an input to the sporting shooting industry, so this output would be counted twice. Outputs, which are used as inputs to other industries, are called 'intermediate products'. The output of the whole economy is measured by only adding up the final products, which the consumer buys. In addition, some of the inputs may be imports from another country and may therefore not contribute to the UK economy. The problem of double counting is resolved by measuring the Gross Value Added (GVA) of each organisation or industry.

## **2.2 How do you get from GO to GVA?**

The main purpose of estimating the GVA of each sector is to help in the compilation of national accounts, which calculate the value of Gross Domestic Product (GDP), the most widely used measure of the output of the whole economy. The estimate of the size of each industry is a side effect. In order to get from Gross Output at basic prices to Gross Value Added at basic prices, all you need to do is subtract the value of intermediate products that are purchased from other industries

**Gross Output (basic prices) – Purchase of Intermediate Products = Gross Value Added (GVA)**

Another way of calculating GVA at basic prices is to add together the gross wages and gross profits (or, to be consistent, subtract the losses) of the organisations in the industry. After each organisation has paid their indirect taxes to the government and paid their suppliers for the purchase of intermediate products, any residual revenue will go to either the workers as gross wages or the owners as profits. The owners and workers have worked together to add value to the economy by transforming intermediate products into final products.



## **Gross value added = gross wages + gross profits**

The PACEC reports use gross wages only as the basis for their estimate of GVA. It is however possible to make an estimate of gross profits / losses using figures provided by the reports. This enables a more reliable calculation of GVA at market prices.

### **2.2.1 GVA using the participant expenditure approach**

In the 2006 report, the total costs of the industry were estimated as £850 million of which £190 million was wages. Together with the £14 million estimate of the value of gamekeepers' rents foregone on provided housing, and the £63 million estimate of tips given to employees by participants, this makes a total for gross wages of £267 million. In the 2014 PACEC report, total costs were estimated as £1.1 billion, of which £370 million is in wages. Estimates of gamekeepers' rents and tips were not available in the 2014 report and so appear not to be included in the 2014 GVA estimate. This makes direct comparison of the two reports a little difficult, but calculations are made on the figures given by PACEC below.

The difference between costs of £850 million and revenue of £782 million (see Gross Output calculations above), suggest a net loss of £68 million for the industry for the 2006 report. However, for GVA calculations, the gross profit or loss is used. Technically, gross profit or loss should be calculated by adding back in depreciation of capital used by the providers. However, since this figure is not available, capital expenditure (£84 million) is used as a proxy. This is a reasonable approach to take if the capital expenditure is largely replacement expenditure. On this basis, the net loss turns into a small gross profit of £16 million, which added to the gross wages results in a GVA of £283 million. In the 2014 report, participant expenditure and game sales came to £887 leading to a net loss of £213million. Since capital expenditure was reported as £110 million, this leads to a gross loss of £103 million for the 2014 report.

**GVA = £267 million + £16 million = £283 million      (2006 report)**

**GVA = £ 370 million - £103 million = £267 million      (2014 report)**

The calculation given above is for GVA at market prices since indirect taxes levied on the industry are not discussed in the report and are not available through HMRC. Any indirect taxes levied would reduce the figure for GVA at basic prices.

### **2.2.2 GVA using the provider income approach**

In the 2014 report, separate information was given about provider income that was reported at £1.1 billion, just balancing costs. This leads to an estimate of £110m gross profit once capital costs are subtracted. PACEC do not explain the large difference between provider income and participant expenditure. Since this leads to a large difference in the estimate of gross profit and therefore GVA, it is a serious omission.

**GVA = £ 370 million + £110 million = £480 million      (2014 report)**

Whichever way the figures are calculated, it is clear that the Gross Output and the GVA approaches produce very large differences in the result. Gross Output overstates the value of the industry by including intermediate products, which are really the output of other industries. However, some of these purchases are clearly part of the industry, in a sense, and some suppliers would no doubt see themselves as part of the sport shooting industry and identify with it.

The PACEC reports deal with this by adding some of these intermediate expenditures back in, and so moving back towards a Gross Output approach. In addition, they add in some of the expenditures of the participants, entailed in participating in the sporting activities. The way that PACEC makes these calculations in the two reports moves on from a sectoral analysis and becomes an impact study. In order to make further progress in understanding the report it is therefore necessary to explain the difference between these two approaches, but first, a short aside on the relationship between GVA and GDP.

### **2.3 A note on GVA and GDP**

GDP at market prices is the standard measure for the size of the economy as a whole, and can be estimated using output, income or expenditure approaches. The GVA approach is often used to measure of the output of an industry or local area. The relationship between GVA and GDP for the whole economy is **GDP = GVA + taxes on products – subsidies on products**

<http://www.ons.gov.uk/ons/guide-method/method-quality/specific/economy/national-accounts/gva/relationship-gva-and-gdp/gross-value-added-and-gross-domestic-product.html>

However, information is not readily available on a sectoral basis for indirect taxes and subsidies. Where subsidies are significant, the contribution of a sector to GDP would be less than indicated by the GVA. It might be argued that payment for planting woodland, which is often beneficial to the game industry, is not in fact a subsidy, but a payment by the government for increased biodiversity

and for a carbon sink. If this is the case, then such payments need not be subtracted from the industry GVA when thinking about their likely contribution to GDP. However, since the taxpayer has paid once already for this service, it would be inappropriate to include it again in the contingent valuation in Chapter 5 of the 2006 report.

Based on this discussion, it can be said that the contribution of the game shooting industry to GDP would be not more than the £267 million in the 2014 report (£283 million in 2006). This is calculated for GVA at market prices based on participant expenditure, and is likely to be less but by an amount that cannot be calculated from the available information.

## **2.4 Impact studies**

The way in which impact studies are undertaken owes much to the methodology used to obtain funding from the EU. Such projects are usually in areas of persistently high unemployment where the use of Keynesian and input-output multipliers is appropriate to assess local economic impacts. In the past, English Partnerships also developed methodologies for this kind of assessment in the UK. Many of the techniques used in EU assessments are absent from the *Treasury Green Book* on investment appraisal good practice, which concentrates almost exclusively on Cost Benefit Analysis. The *Treasury Green Book* approach is based on neoclassical economics, taking the view that for most of the economy a reduction in the output of one industry will be offset by an increase in another as the forces of supply and demand operate. The opposite assumption will often be made in EU style impact analysis because the project being assessed will often take place in an area of persistently high unemployment.

### **2.4.1 Calculations: data sources and multiplier effects**

In many of the areas of the country where the sports shooting industry operates, there may be unemployment problems of this kind, but certainly not in all areas. The supply industries may also be located in areas of relatively full employment. Both the 2006 and 2014 PACEC reports use a multiplier of 2.4 (PACEC 2006 Appendix 6.7; 2014 A4.6) obtained from ONS input output tables. The 2014 report provides a better explanation of how these calculations were undertaken. GVA is estimated for the first round suppliers using supplier information or GVA to turnover ratios from ONS figures. The multiplier of 2.4 is then applied for the rest of the supply chain. This is rather an odd procedure, as it would be more normal to apply the multiplier directly to employment or GVA in the core industry being considered. Better referencing of the ONS sources for these calculations would also enable these calculations to be reviewed more thoroughly.

Given the limitations of the survey data noted by PACEC themselves in the 2006 report, some doubt can also be cast on the accuracy of GVA to turnover ratios sourced from supplier information. Their report notes in Section A6.1 on methodology in relation to surveys of the supply industry,

*“...the number of responses in each category was so low that giving detailed sets of results for the survey would be disclosive”.*

In Section A6.2, the basis for deciding whether to accept quite widely varying figures from suppliers or alternatively from providers/participants seems arbitrary. Data on the supply industry seem very questionable. A similar discussion of the 2014 data is missing from that report, but there is no reason to suppose it has improved. Indeed sometimes, the 2014 report relies on information from the 2006 report e.g. in A4.3 (2014) Table A4.5 – the 2006-survey information was used to find retention of first round supplier expenditure in the local area.

Participants provide their own split between expenditure on vehicles, vets *etc.* which is attributable to their participation in sporting activities, and which is attributable to other activities, or would take place anyway. Greater direction appears to be given to respondents in the 2014 report to avoid over-estimation of these expenditures. However, this is offset by the alarmist nature of some of the questions in the survey, which might encourage respondents to over-estimate their expenditure.

Using the PACEC (2006) final figure of £1.6 billion for the industry and the estimate of £283 million for GVA using ONS methodology and based on PACEC figures (see Section C2.3 above), a multiplier of 5.7 is implied which is extremely improbable, even for a Type 2 multiplier (which includes supply chain and expenditure ripple or Keynesian effects). The equivalent figure for 2014 is a multiplier of 7.5, although if the provider income method is used (see Section C2.2.2 above) the result is a slightly more reasonable estimate of 4.2.

#### **2.4.2 The location of employment/GVA associated with the industry**

Both the 2006 and 2014 reports attempt to locate the jobs associated with the industry on a regional basis. No doubt, this was part of the remit given to them by their client, and they are to be congratulated on making a heroic effort to meet this remit. However, the assumptions they have had to make in arriving at their conclusions do not warrant close inspection. Nevertheless, there is much more detail on the methodology used in these calculations in the 2014 report than was the case in 2006. The survey approach used shows that initial first round expenditure is local, but the jobs associated with these expenditures will not all be local, depending on where the businesses source their own supplies. A related example to illustrate this point would be to consider the economic

impact of locating a supermarket in an area of high unemployment. This would create a number of low paid jobs, but most of the expenditure by the customers of the supermarket would end up as revenues of the companies, which supply the supermarket from around the world.

PACEC acknowledge the difficulty in allocating jobs in the supply chain to different areas of the country. As they say in A4.2

*“Because participants are active in more than one region ...participants’ expenditure was allocated pro-rata to provider expenditure”*

In A4.4: *“Expenditure falling outside the local area was allocated to all 11 regions in proportion to the size of their economy”* and in A4.6 the *“rest of the supply chain is calculated using 2.4 multiplier. Half is allocated to the local economy and half is distributed among the regions pro-rata to the size of the economy.”*

Clearly, these approaches to allocating jobs and GVA around the country are largely arbitrary rules of thumb that give a result, but not one in which we can have much confidence.

## **2.5 Issues of total versus marginal analysis**

It is likely that the 2006 PACEC study was undertaken in the shadow of the fox hunting debate with the question of banning other game industry activities at the forefront of policy makers’ minds. The unstated counter-factual question lying behind the report was *“what would happen if this industry was closed down?”* This question was articulated clearly in survey questions for the 2014 report. The policy of closing down the industry altogether lies at one extreme of possible policy options.

Alternative counter-factual questions that could be asked include:

1. Whether all aspects of the industry were beneficial;
2. Whether different ways of conducting the industry might be more beneficial than current practice;
3. Whether the existing scale of the industry was appropriate given social and environmental considerations;
4. Whether the existing tax and subsidy arrangements were fair and efficient.

Discussions of adjustment at the margin (marginal analysis) would need a very different kind of analysis than that undertaken.

## **2.6 How big is the industry?**

As an estimate of the economic significance of the industry, the PACEC figures of £1.6 billion (2006 report) or £2 billion (2014 report) are clearly too big, but on the other hand the GVA figures of £283 million (£267 million in the 2014 report) are probably too small. Exactly what should be included is a matter of judgement, but clearly, transport and accommodation are part of their respective industries and should not be included. Second round expenditure should also be excluded.

On the other hand, firearms, magazines and dog training specific to hunting could probably be included, as should some downstream expenditure such as taxidermy. Unfortunately, GVA estimates are not available for these industries, but the employment approach can be investigated in this way, subject to reservations about the supply survey noted above. Using what is necessarily a somewhat arbitrary definition of what is and is not in the industry, it could be argued that the following first round supplier or downstream employments could be included in the definition. This is because they could have been provided by the industry but have simply been outsourced, or that they are an integral part of the industry and its production costs:

	<b>2006 report</b>	<b>2014 report</b>
Land management services	150	160
Pest control services	25	7
Sales and marketing	180	140
Membership / insurance	310	310
Game farm	300	180
Magazines	130	100
Feed/fertiliser/trees/seeds/fencing	760	490
Building road /track /property	860	610
Art/ craft	185	144
Taxidermy	14	11
<b><i>Total Category 1 employment</i></b>	<b><i>2,914</i></b>	<b><i>2,152</i></b>

A second category of employment could be defined where an unidentifiable quantity is linked to the sport shooting industry, but on the other hand might easily take place anyway.

	<b>2006 report</b>	<b>2014 report</b>
Shooting school	460	360
Firearms and ammunition	590	820
Dogs including training and kennelling	1700	2000
Vet	560	730
Vehicles (producer only)	110	73
Vehicle running	690	780
<b>Total Category 2 employment</b>	<b>4,110</b>	<b>4,763</b>

On the other hand, other items listed in the first round are clearly parts of other industries that may be in this instance connected to the game shooting industry, but have their own separate existence

	<b>2006 report</b>	<b>2014 report</b>
Accommodation / food	5,700	5,200
Travel	1,300	1,700
General goods	1,100	1,000
General services	510	920
Utilities / communication	56	55
<b>Total Category 3 employment</b>	<b>8,666</b>	<b>8,875</b>

If we add Category 1 employment to those employed directly in the industry we arrive at an estimate of 33,914, (rounded to 34,000) for the 2006 report and 37,152 (rounded to 37,000) for the 2014 report (see compromise jobs estimate 1 in Table 1 above). If we also add in Category 2 employment the total goes up to 38,024, rounded to 38,000, for 2006 and 41,915 (rounded to 42,000) for 2014 (compromise jobs Estimate 2 in Table 1 above).

## **2.7 Employment, self-employment and the minimum wage**

The figures for total direct employment in the industry and total payment made for staff in both the PACEC 2006 and 2014 reports suggest an extremely low rate of pay, possibly below the minimum wage if tips are excluded. Average wages come out at £6,129 (£190 million divided by 31,000) before tips and in kind housing in 2006 and £8,612 when these benefits are added in (£267 million divided by 31,000). The equivalent figure for 2014 is £10,571 (£370 million divided by 35,000). Two possible conclusions arise from this – either these are extremely low value jobs which are not really worth protecting, or else these are not really jobs at all, but a kind of paid hobby engaged in on a casual and irregular basis. One source (below) suggests that beaters get about £25 and pickers up about £40 (which also covers the costs of their dogs). If that is per day, then that is equivalent to £125 to £200 per week, and therefore between £6,000 and £10,000 *per annum* (in 2013). This is the same period covered by the 2014 PACEC report.

<http://www.nationalgamekeepers.org.uk/media/uploads/cat-249/KtBsummer12-beaters38.pdf>

This is consistent with the implied level of pay in the PACEC 2006 report. In addition, there is a lot of current discussion in the industry (below) about pressure from HMRC to regard casually employed beaters and pickers up as employed rather than self-employed, with the implication that National Insurance payments should be due on this kind of employment, together with minimum wage legislation.

<http://www.moderngamekeeping.com/tag/beaters-pay/>

## **2.8 Loss making and tax avoidance**

Loss making activities can be used to avoid the payment of taxes on income and profits. Such activities may be regarded as a form of tax avoidance. Whilst frowned upon, tax avoidance as opposed to tax evasion, is not illegal. Rather than pay taxes on profits from an enterprise, losses on a related loss-making enterprise can be set against the profitable activity to reduce liability. It is not possible to say that the game industry necessarily engages in this kind of tax evasion. In some cases, such as pest control for example, the losses may be a necessary cost to ensure agricultural productivity (although they may not be the least cost method of achieving this end). Nevertheless, this raises a question that can be fairly asked in relation to any given sport shooting related activity.

## **2.9 Separation of different parts of the industry**

Although, as PACEC note in both reports, individual producers in the sport shooting industry often



produce more than one type of game activity, nevertheless different analyses are needed for different parts of the industry. Pest control is clearly one area, which is really best seen as a service industry for agriculture and horticulture. Although cheaper, or more humane methods of achieving these aims could be considered, including the re-introduction of top predators other than humans. Driven or beaten game is introduced largely for the sole purpose of hunting, and the levels of such activity may need to be adjusted in terms of adverse ecological impacts. Importantly, the value of this kind of activity should be considered in relation to the value and employment prospects of other uses of the land. Restrictions on the level of activity may increase price, so revenues may not decline in line with output, but this is partly dependent on the availability and price of good international substitutes.

### **3.1 Social and environmental costs**

In both reports, PACEC rightly attempt to indicate what impact the shooting sport industry makes on society and the environment. The environmental and social costs and benefits of an activity do not pass through the market, and are therefore not included in the GVA estimate for the value of the industry. These costs and benefits are part of the impact of the industry and estimates of their value should be considered when evaluating the contribution of the industry in a wider sense.

In the 2006 report, PACEC used a contingent valuation study, which concluded that these costs and benefits largely balance each other out. There are a number of well-known problems of bias in contingent valuation studies, which are unfortunately present in this work. PACEC did not continue this approach in the 2014 study. The considerable defects of the approach are discussed in Appendix 1 of this review. Their decision not to repeat this exercise in the second report, or even to refer to the results of the earlier study, presumably indicates their recognition that this was not a viable way forward.

### **3.2 The cost of the conservation contribution**

In their 2014 report, PACEC take a number of approaches to the social and environmental aspects of the industry. Firstly, they use provider survey information to attempt to place a cost on the contribution of the industry to wildlife and habitat management. Providers indicated that £230 million or 21% of all their expenditure was on wildlife and habitat management (this was a decline from the figure of £250 million reported in 2006). Within this, they identified £47 million of operational expenditure on habitat and wildlife management and £46 million of related capital expenditure on fencing roads tracks and vehicles, together making £93 million. They also claimed

that £140 million was spent on staff for these activities. PACEC's rather questionable rounding conventions suggest that they have rounded £233 million pounds of expenditure down to £230 million here – otherwise the figures do not add up. The analysis of different activities is then broken down by labour input to total 16,000 FTEs (by implication £8,750 each, further corroborating the low paid and possibly illegal nature of employment in this industry). It may be that these jobs are primarily part-time or casual work.

The reader is no doubt supposed to be concerned that 22% of providers said that without shooting they would manage their land with less effort, and that a further 44% would manage their land with much less effort. The alternative costs of wildlife and habitat management, put at £7,900 per provider (or 99 days where a labour input option was answered), seem to be intended to raise concerns over any restrictions which might be imposed. Furthermore, the conservation status of much of the land is presented as being a result of the industry's activities rather than because of any regulatory restrictions. Realistically, there is a balance and whilst game management may support many aspects of nature conservation, this is not entirely the case.

While it is legitimate, where an estimate is not available, to use costs of providing an environmental service as a proxy for the resulting environmental benefit, it seems likely that PACEC have overstated their case here. Pest control by farmers for example, is a legitimate part of their business, and game shooting for this purpose might be considered an input into the farming sector of the economy, rather than a separate sector of its own. Any losses made in this activity could be the cost of pest control. Unfortunately, information about losses in this sector of the game shooting industry seems to be unavailable. It is possible to dispute whether game shooting is the most cost effective way of managing pests, but if the alternative were more expensive, then that would increase costs to the farming industry. More information on alternatives in this area would be necessary before coming to any firm conclusions.

The discussion of pest control for farmers is not separated from the discussion of the management of habitat and wildlife for driven game, which is an entirely different business (see discussion in Section C2.9 above). Expenditure in this area, which appears to be for wildlife and habitat management is largely for the purpose of the sport itself, or else is required by the regulation of conservation designated land. It is undoubtedly the case that the landscape resulting from the requirements of the driven game shooting industry has attractive characteristics, which may be enjoyed by members of the public, but costs to the environment from the industry exist too, and they are not discussed here.

The conclusion to this discussion is that more information about the conservation contribution of the industry, and alternatives to the *status quo*, would be necessary before drawing any firm conclusions about the usefulness of taking these costs as a proxy for value to the environment, as seems to be implied. The discussion is limited and partial, with a clear bias towards the industry.

### 3.3 ‘Happiness’ economics and the ‘Big Society’

The second approach that PACEC take in Chapter 4 of the 2014 report is to use participant survey data to report on the perceived benefits to society and the environment of the sporting shooting industry. This information is largely confined to participants in the industry, as the analysis of respondents to the survey in Appendix A of the report indicates. Although questionnaires were made available to a wide range of organisations, some of whose members may not have direct involvement in sporting shooting (e.g. The Countryside Alliance), the large majority of respondents were from organisations that could be identified as part of the ‘shooting lobby’. Nearly sixty-six percent of responses came from members of the following organisations:

1. Association of Professional Shooting Instructors
2. British Association for Shooting and Conservation
3. Clay Pigeon Shooting Association
4. National Rifle Association
5. National Small Bore Rifle Association
6. United Kingdom Practical Shooting Association

No doubt, many respondents gave their answers in good faith, but it is possible that their concerns about threats to their way of life, will have occasionally led them to overstate their case. This would be triggered in part by questions in the survey asking about their likely response if sporting shooting was no longer allowed, while not mentioning less extreme policy options. While not specifically mentioning this in their methodology, the approach is based on the concept of 1) “happiness” economics and 2) the “Big Society” approach to social aspects of the economy.

- 1) See <http://www.iea.org.uk/sites/default/files/publications/files/upldbook416pdf.pdf>
- 2) See <https://www.gov.uk/government/publications/building-the-big-society>

GVA and GDP measure the material benefits of the economy, but this is not necessarily correlated with happiness. Survey data to measure people's reported happiness have been widely used as an adjunct to more conventional measures of economic success in recent years. The idea of the Big Society is that the market part of the economy needs to be supplemented by a voluntary sector to meet social objectives.

PACEC have used these two now fashionable approaches, to argue that the sport shooting industry contributes to well-being and, through its voluntary activities, adds to social benefits and community solidarity. It is difficult to argue with this conclusion, other than to question whether respondents may have been strategic in their answers given the alarmist tone of survey questions about closing the industry down. Those sectors of the population concerned with animal welfare may also be surprised that no discussion of the wellbeing of the wildlife itself was included, nor the wellbeing of those concerned with the welfare of animals and birds. These are necessary adjuncts to a balanced discussion.

As with the first half of the chapter, this is a very limited and partial attempt at considering social and environmental benefits. Its main shortcoming is that it concentrates almost exclusively on the responses of the participants of the industry themselves, and manages to neglect environmental costs of the industry altogether.

PACEC miss an obvious opportunity to monetize the voluntary input of participants of the industry by estimating hours of conservation work and multiplying it by the minimum wage or by a standard figure (around £50 per person day) adopted by funding bodies such as the National Lottery Fund and agencies like Natural England.

Taken together with the rejection of the 2006 contingent valuation approach, this suggests a strategic decision in the study. It seems that with the exception of provider expenditure on habitat and wildlife management, there is an avoidance of any estimation of social and environmental costs and benefits.

#### **4.1 General conclusions**

1. While the "GVA supported" (2006) or "GVA attributable" (2014) concepts of the size of the sporting shooting industry are not acceptable, there are problems with alternative measures such as GVA or Gross Output, which are designed mainly to provide consistent estimates of sector size across the whole economy. A range of measures, as suggested in Table 1 above, might be more helpful.

2. The estimates for GVA and employment in the industry are based on an impact study approach, which will be inappropriate for some areas of the country where employment levels are relatively high. A sectoral approach is more appropriate but suffers from the difficulty that there is no official SIC definition of the industry.
3. Although some information about profits and losses are implicit in both PACEC reports, there remain uncertainties in this area, which in turn add to uncertainty about any GVA estimate. The data are based on surveys which are not as reliable as PACEC themselves would like (see C3 above). In addition, there seems to be an unexplained difference between participant expenditure and provider income (not reported on in 2006) in the 2014 report. In this review, the participant expenditure approach has been taken for consistent analysis across both reports.
4. The subsidies available to agriculture and landowners in general, for changes in practice, particularly in relation to woodland, may be beneficial to the sport shooting industry as well. Separating the benefits where industries are producing jointly is difficult, but may be an area for further research.
5. The 2006 PACEC contingent valuation study of the environmental costs and benefits of the industry are not considered sufficiently rigorous to be dependable. The conclusion that the environmental costs and benefits are broadly in balance therefore cannot be accepted on the information provided. The cost of contribution to conservation approach in the 2014 report suffers from conflation of different parts of the industry and is more persuasive in relation to farming pest control. ‘The Big Society’ and ‘Happiness Economics’ approaches, also attempted in 2014, are interesting, but limited, and partial in execution. More work is needed in this area.
6. The value of the implied subsidy to the industry resulting from non-payment of national insurance contributions and PAYE, together with possible costs to the DWP as a result of any payment of wages below the minimum wage, could also merit further research. *See C2.7 above*
7. Greater separation of the industry is desirable to analyse policy options, but PACEC seem determined to conflate data, which makes the information more opaque than necessary.

8. **It is not possible to accept the estimates of Gross Value Added (GVA) of the sporting shooting sector given in either the PACEC 2006 or 2014 reports. The associated estimates of employment associated with the industry are also open to question, and the impression that the industry adds to social well-being and environmental conservation is based on limited and partial information.**
9. There is a problem with defining the industry since there is no Standard Industrial Classification (SIC) for the sector. There are 35,000 direct jobs in the industry (PACEC, 2014) but an analysis which widens the scope of the industry to include relevant first round suppliers suggests total jobs could be 42,000 (Cormack & Rotherham, 2014). Since this is one seventh higher in terms of jobs, GVA could be increased by this factor to give an estimate of £267m x 7/6 = £311m (ONS/Treasury Green Book approach). Of course this does not include any multiplier effects, but even with this the maximum would be £311m x 2.4 = £746.4m, assuming all second and third round *etc* expenditure would not take place if the industry did not exist. **This seems highly unlikely, but it suggests a range of ‘values’ for the sector at between £267m and £746.4m according to standard Treasury guidance.**

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## **TECHNICAL APPENDIX 1. CONTINGENT VALUATION BIAS PROBLEMS IN THE 2006 REPORT**

The 2006 PACEC report used the contingent valuation method to assess the social and environmental costs and benefits. The conclusion that they came to was that benefits and costs of this type balanced each other out. By contrast, the 2014 report did not discuss any social and environmental costs at all and made no back reference to the 2006 contingent valuation study.

The Contingent Valuation Methodology is prone to a number of biases, and it is not clear that adequate steps have been taken to avoid these biases. Furthermore, it is not the most appropriate method for assessing some of the social costs and benefits, where actual resource costs are involved and should be estimated instead. A particular weakness of this study is that the list of costs and benefits seems to have been defined by participants in industry, and appears to be incomplete. Finally, option and existence valuations, important for studies involving threatened species, do not appear to have been collected.

A brief list of common biases follows

- 1. Sample bias** – the basis for sampling the respondents in the PACEC is not clear and needs some clarification. It is not possible to say whether the sampling process has been correctly carried out.
- 2. Instrument bias** – there does not seem to be a choice of instrument through which payment would be made (e.g. council tax). Without an appropriate instrument for payment, estimates can be regarded as suspect, and indeed this may partly account for the relatively low valuations recorded for the great majority of respondents.
- 3. Information bias** – it is not clear from the study what information the respondents were provided with before arriving at their contingent valuations. In particular, responsibility of the industry for the stated benefits and costs is not clear. The list of costs and benefits appears to have been arrived at by consulting the industry and its participants, which may also be open to question. If the benefits and costs were presented to respondents in this way, the results would not be reliable.
- 4. Strategic behaviour bias** – Because respondents in a contingent valuation study are not required to make actual payments, there is a danger that they indulge in strategic behaviour, exaggerating their prices in order to influence the outcome of the study. There is some



evidence from the existence of a few outliers with very high contingent valuations, that this may have been the case in this study. The way in which this bias is normally dealt with is to ask the respondents for both, willingness to pay (WTP) for a change and willingness to accept value (WTA) if the change does not take place, in different parts of the questionnaire. Questionnaires where the WTA and WTP do not agree are discarded. In the PACEC study, only WTP is used for benefits and only WTA for costs, so the study is open to this kind of bias.

5. **Inexperience in the market bias** – Because participation in a market is a learned behaviour, the respondents of a contingent valuation study should be given some guidance about the ranges of payments to be made. There is no information about this in the PACEC study, so it is not possible to comment on this possible bias.
6. **Aggregation bias** can occur when benefits or costs are aggregated together even when it is clear that they are alternatives and cannot be simultaneously achieved. The study needs to be checked for examples of this.
7. **Double counting** – as noted above *in Section 2.3*, where respondents are already paying for a particular benefit through their taxes, it is inappropriate for their willingness to pay to be included in the contingent valuation as they are already paying for this benefit. It may be that this is the case in relation to woodland.

In addition, there are different types of valuation used in contingent valuation studies. User and non-user valuations are obtained in the PACEC study, but the subtle distinction between option, bequest and existence valuations is not made. The valuation of non-users is therefore somewhat limited.

### **CV study conclusions**

The conclusion of this section is that the contingent valuation study was not carried out with sufficient rigour for its results to be reliable, and therefore the conclusion in the study that environmental costs and benefits largely balance each other out, and can therefore be safely ignored, is in turn not acceptable. The current situation is that we do not know the balance of costs and benefits in this industry although a full literature review might yield some results. Other types of valuation study, such as the cost of meeting a sustainability constraint or minimum environmental standard, might be usefully explored.