

**EXPLANATORY MEMORANDUM TO**  
**THE EELS (ENGLAND AND WALES) REGULATIONS 2009**

**2009 No. 3344**

1. This explanatory memorandum has been prepared by the Department for Environment, Food and Rural Affairs and is laid before Parliament by Command of Her Majesty.

**2. Purpose of the instrument**

2.1 This instrument provides the Environment Agency with the powers to implement measures necessary to meet our obligations under Council Regulation (EC) No. 1100/2007 establishing measures for the recovery of the stock of European eel.

**3. Matters of special interest to the Joint Committee on Statutory Instruments**

3.1 None

**4. Legislative Context**

4.1 This instrument implements Council Regulation (EC No. 1100/2007 of 18 September 2007 establishing measures for the recovery of the stock of European Eel. The Regulation requires Member States to implement a number of short- and long-term measures to achieve a target of ensuring that at least 40% of the potential production of adult eels return to the sea to spawn on an annual basis.

**5. Territorial Extent and Application**

5.1 This instrument applies to England and Wales, but does not apply to that part of the River Tweed and its catchment areas as lies in England. This area is, instead, managed by Scotland under the Scotland Act 1998 (River Tweed) Order 2006.

**6. European Convention on Human Rights**

As the instrument is subject to negative resolution procedure and does not amend primary legislation, no statement is required.

**7. Policy background**

• *What is being done and why*

7.1 Advice from the International Council for the Exploration of the Sea (ICES) in 2006 indicated that the stock of the European eel (*Anguilla anguilla*) is outside safe biological limits across European waters. The population has declined significantly, reducing to 5% of the original 1980s stock levels. In response to this advice, the European Union adopted Council Regulation (EC) No 1100/2007, which requires Member States to undertake a series of measures aimed at the recovery of eel stock. The goal is to achieve 40% escapement of adult eels, relative to that in absence of anthropogenic factors, to sea to spawn.

Eleven Eel Management Plans have been prepared, one for each River Basin District identified in England and Wales. The plans outline the current situation and how we intend to achieve the targets required by the European Regulation. Such measures include a reduction in fishing pressure, improving access and habitat quality, and reducing the impacts of entrainment.

- **Consolidation**

7.2 None.

## **8. Consultation outcome**

8.1 A public consultation on improving the access of all migratory and freshwater fish, including eels, to breeding, nursery and feeding grounds through the introduction of passes and the introduction of screens to prevent entrainment, was held earlier this year. Out of the 53 responses received from various sectors, 74% supported the proposals described in the consultation. Please see paragraph 20 and 21 of the Impact Assessment.

8.2 The Environment Agency undertook a consultation on proposals to manage the eel fisheries with interested stakeholders, including individual licence holders and their representatives on the Agency's Regional Fisheries, Ecology and Recreation Advisory Committees (RFERACs), the large majority of which agreed with the suggested approach taken. Please see paragraph 22 of the Impact Assessment.

## **9. Guidance**

9.1 No guidance will be produced.

## **10. Impact**

10.1 The measures that will reduce fishing pressure (close seasons) and the requirement to submit data on catches will affect all eel fishermen and elver station operators (referred to in the instrument as aquaculture production businesses). However, no additional costs have been highlighted for small businesses.

10.2 The measures that will require the installation of passes at obstructions and screens at abstraction and discharge points that prevent the migration of eels, could potentially affect small/medium sized property development companies. The impact on businesses will be minimised by prioritising those obstructions and abstraction/discharge points that are critical to the passage of eels and which would otherwise prevent the achievement of the targets set in the Eel Management Plans.

10.3 An Impact Assessment is attached to this memorandum.

## **11. Regulating small business**

11.1 The legislation applies to small businesses. Actions undertaken to minimise the impact has been described in section 10 above.

## **12. Monitoring & review**

12.1 A review of the measures that have been implemented and the instrument will be undertaken within three years, in line with a report that the European Regulation requires to be submitted to the European Commission outlining the efficacy of the programmes.

## **13. Contact**

Chetal Moghraby, at the Department for Environment, Food and Rural Affairs Tel: 0207 238 1201 or email: [chetal.moghraby@defra.gsi.gov.uk](mailto:chetal.moghraby@defra.gsi.gov.uk), can answer any queries regarding the instrument.

## Summary: Intervention & Options

<b>Department /Agency:</b> <b>Department of Environment, Food and Rural Affairs</b>	<b>Title:</b> <b>Impact Assessment of measures for the recovery of the European eel</b>	
<b>Stage:</b> Final	<b>Version:</b> 3	<b>Date:</b> 11 December 2009
<b>Related Publications:</b> Council Regulation No. 1100/2007 of 18 September 2007 establishing measures for the recovery of the stock of European eel		

### Available to view or download at:

<http://www>.

**Contact for enquiries:** Chetal Moghraby

**Telephone:** 0207 238 1201

### What is the problem under consideration? Why is government intervention necessary?

In most of the marine and freshwater environment, living things are treated as open access resources; it is not possible to exclude most users from these environments, as property rights are not well defined. In effect, such environments can be regarded as public goods. Consequently, individuals do not have the economic incentive to operate in ways that conserve fish stocks, particularly that of eels. Government intervention is therefore necessary to introduce measures to address the concerns in the stark decline in these species, as the stock is outside safe biological limits across European waters.

### What are the policy objectives and the intended effects?

Advice from the International Council for the Exploration of the Sea (ICES) in 2006 indicated that the stock of the European eel (*Anguilla anguilla*) is outside safe biological limits across European waters<sup>1</sup>; stating that measures need to be introduced to reduce the exploitation of all life stages of the eel and restore their habitats.

Council Regulation No 1100/2007 establishing measures for the recovery of the stock of European eel was agreed to enable cohesive measures to be taken by all Member States. The key objective is to ensure that at least 40% of the potential production of silver eels returns to the sea to spawn. This will be achieved by reducing exploitation of all life-stages of the eel and restoration of their habitats.

### What policy options have been considered? Please justify any preferred option.

- i) Baseline: Do Nothing (i.e. maintain existing byelaws and data requirements, rely on voluntary action to deal with obstructions to migration)
- ii) Implement Eel Management Plans measures immediately (i.e. introduce close seasons for one year (2010/11), new system to trace eel catches, require eel passes and screens to enable and protect eel migration)

**When will the policy be reviewed to establish the actual costs and benefits and the achievement of the desired effects?** Member States are required to report to the Commission initially every third year, and six years after three triennial reports. The Environment Agency will be required to outline the monitoring, effectiveness and outcome of measures introduced following implementation. The success of works carried out will be demonstrated by progress towards meeting the escapment target of silver eel biomass. Stock assessments are carried out at regular intervals: the Agency already has baseline data and these assessments will provide further information.

<sup>1</sup> Report of the 2006 session of the Joint EIFAC/ICES Working Group on Eels Rome, 23-27 January 2006. ICES CM 2006/ACFM:16.367pp.

**Ministerial Sign-off** For final proposal/implementation stage Impact Assessments:

***I have read the Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options.***

Signed by the responsible Minister:

Huw Irranca-Davies

.....Date: 15th December 2009

## Summary: Analysis & Evidence

<b>Policy Option:</b> Option 2	<b>Description:</b> Implement measures immediately
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<b>COSTS</b>	<b>ANNUAL COSTS</b>	Description and scale of <b>key monetised costs</b> by 'main affected groups'	
	<b>One-off</b> (Transition) <span style="float: right;"><b>Yrs</b></span>		
	<b>£ 333,000</b>	Owners/operators of obstructions/abstractions incur annual costs of installing eel passes/screens (£4.6m p.a.), close seasons represent a reduction in the value of the elver and eel fishery (£333,000 for 2010), Environment Agency administration costs (£140,000 p.a.)	
	<b>Average Annual Cost</b> (excluding one-off)		
<b>£ 4.6m</b>	<b>20</b>	<b>Total Cost (PV)</b>	<b>£ 74.6m</b>
<b>Other key non-monetised costs</b> by 'main affected groups'			
All key costs identified at this stage have been monetised.			

<b>BENEFITS</b>	<b>ANNUAL BENEFITS</b>	Description and scale of <b>key monetised benefits</b> by 'main affected groups'	
	<b>One-off</b> <span style="float: right;"><b>Yrs</b></span>		
	<b>£ N/A</b>	Benefits are non-monetised.	
	<b>Average Annual Benefit</b> (excluding one-off)		
<b>£ N/A</b>	<b>20</b>	<b>Total Benefit (PV)</b>	<b>£ N/A</b>
<b>Other key non-monetised benefits</b> by 'main affected groups'			
The introduction of measures would ensure that eel stocks are better managed, meeting our biodiversity obligations, and ensure a reverse decline and an improvement. This will see benefits to the ecology of the water environment, with a subsequent benefit to commercial fisheries and recreational anglers who rely on the improved status of these stocks. This will also avoid a penalty of 50% reduction in fishing effort being imposed by the European Commission, and potentially infraction proceedings which will not only be high in costs but cause embarrassment to the UK.			

**Key Assumptions/Sensitivities/Risks**  
 Assume the number of fishers obtaining licences remains constant, and that costs of providing eel passes and screens remains constant. The total costs presented of introducing eel passes and screens are at the higher end of the estimation, assuming that there are more complex structures. A potential risk to owners of obstructions is the introduction of unsuitable fish pass, which following an assessment will need to be removed and the correct type installed. Only a proportion of owners/occupiers of abstractions and discharges will be required to screen, following an assessment by the Agency. Should the restocking target not be met in any given year, there is a risk that glass eel/elver fisheries will be closed. Due to the state of the stocks, significant improvements may not be realised for some time and a complete closure of the fisheries may be necessary to ensure that the improvements are robust. A key risk is potential high infraction costs from the EU Commission should these measures not be approved.

Price Base Year 2009	Time Period Years 20	<b>Net Benefit Range (NPV)</b> <b>£ N/A</b>	<b>NET BENEFIT (NPV Best estimate)</b> <b>£ N/A</b>
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What is the geographic coverage of the policy/option?	England and Wales
On what date will the policy be implemented?	January 2010
Which organisation(s) will enforce the policy?	Environment Agency

What is the total annual cost of enforcement for these organisations?		£ N/A		
Does enforcement comply with Hampton principles?		Yes		
Will implementation go beyond minimum EU requirements?		No		
What is the value of the proposed offsetting measure per year?		N/A		
What is the value of changes in greenhouse gas emissions?		N/A		
Will the proposal have a significant impact on competition?		No		
Annual cost (£-£) per organisation (excluding one-off)	Micro	Small	Medium	Large
Are any of these organisations exempt?	No	No	N/A	N/A
<b>Impact on Admin Burdens Baseline</b> (2005 Prices)			(Increase - Decrease)	
Increase of £ 1,940	Decrease of £ 0		<b>Net Impact</b>	£ 1,940

Key:

(Net)

## SECTION 1: Introduction, background, and rationale for Government intervention

### Introduction

1. This Impact Assessment (IA) sets out the costs and benefits of measures to implement Council Regulation (EC) 1100/2007 establishing measures for the recovery of the stock of European Eel (the "EU Eel Regulation"). The EU Eel Regulation requires that Member States set out a number of short and long term measures intended to achieve the goal of ensuring that at least 40% of the potential production of silver eels, relative to that in absence of anthropogenic factors, returns to the sea to spawn. The UK has submitted 15 Eel Management Plans which set out how we intend to address fishing effort, restocking<sup>2</sup>, physical obstructions to eels' migration, and the need to make further habitats available to eels.
2. Two options have been set out in this Impact Assessment:
  - i. Baseline (i.e. maintain existing byelaws and data requirements, rely on voluntary action to deal with obstructions to migration)
  - ii. Introduce new close season for 2010/11, new system to trace eel catches, require eel passes and screens to enable and protect eel migration.
3. For each of the options an analysis of the costs and benefits has been undertaken as detailed below.

### Background

4. Eels (*Anguilla anguilla*) are migratory fish spending their adult lives in freshwater, estuaries and coastal waters and returning to the sea to spawn (further information on the life-cycle of the eel is presented in Annex 2). European eels derive from a single reproductive stock. The eel was once common around Britain, being present in most rivers, streams and lakes that are accessible from the sea. Commercial eel fisheries were the most valuable inland fisheries in England and Wales and provided significant benefits to the rural economy. However, populations of eels in Europe have declined to a perilous state, with a 95% reduction in numbers of glass eels for Europe as a whole since the 1980s; across waters in England and Wales this represents a reduction of 70%. This reduction is thought to be related to factors such as pollution, parasites, barriers to freshwater migration, over fishing and possibly oceanographic changes between the spawning grounds and the coast of Europe.
5. Surveys conducted by the Environment Agency show eel to be present in nearly all river systems in England and Wales, although there are some areas where they are scarce or absent, particularly the upper reaches of rivers.
6. In 2006, the International Council for the Exploration of the Seas (ICES) recommended that a recovery plan for European eel is urgently needed<sup>3</sup>. It recommended that the plan should include measures to reduce exploitation of all life stages and restore habitats, and that, if no such plan is agreed, exploitation should be reduced to the lowest possible level.
7. In response to this advice, the European Union adopted Council Regulation No 1100/2007 of 18 September 2007 establishing measures for the recovery of the stock of European Eel<sup>4</sup>. This requires Member States to set out a number of short and long term measures intended to achieve the goal of ensuring that at least 40% of the potential production of adult eels returns to the sea to spawn on an annual basis; relative to the best estimate of escapement that would have existed if no anthropogenic influences had impacted the stock.

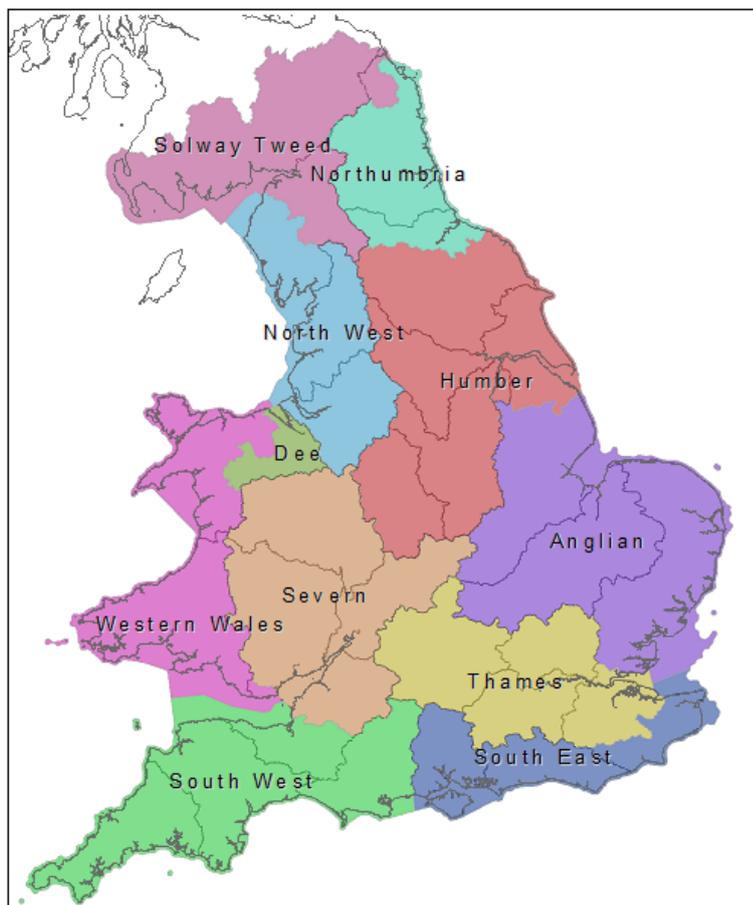
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<sup>2</sup> Stocking is the act of introducing reared (or trans-located) fish to supplement existing stocks to support a fishery or maintain a depleted fish population. It should be noted that eels cannot be spawned in aquaculture and therefore all eel used for restocking will come from the wild.

<sup>3</sup> Report of the 2006 session of the Joint EIFAC/ICES Working Group on Eels Rome, 23-27 January 2006. ICES CM 2006/ACFM:16.367pp.

<sup>4</sup> Available at [http://ec.europa.eu/fisheries/press\\_corner/press\\_releases/archives/com05/com05\\_54\\_en.htm](http://ec.europa.eu/fisheries/press_corner/press_releases/archives/com05/com05_54_en.htm).

8. The UK submitted 15 Eel Management Plans<sup>5</sup> in December 2008 for approval by the European Commission, 11 of which cover England and Wales (Figure 1); the Solway Tweed management plan is trans-boundary with Scotland. These plans are likely to be formally approved by the Commission in January 2010, however the measures identified in the plans need to be implemented in accordance with the Regulation ahead of the 2010 fishing season. Member States are required to make an initial report on the efficacy of their programmes in 2012.



**Figure 1. Water Framework Directive River Basin Districts in England and Wales used for Eel Management Plans**

9. The Management Plans covering the English and Welsh River Basin Districts were drawn up by the Environment Agency, with input from the Welsh Assembly Government and the Scottish Government, and assessed by the appropriate scientific agencies.
10. Through the Marine and Coastal Access Act 2009<sup>6</sup>, the Environment Agency will have new and flexible powers for the effective management of fisheries and their enforcement. This will enable better protection of all fish stocks, including eels, and their habitats in England and Wales. These provisions will allow the Agency to make emergency byelaws to respond effectively and promptly to unforeseen threats to fish stocks; modify the existing fishing licensing regime and introduce an authorisation regime for some fishing activities (which includes fishing for eels); and introduce other regulatory measures, such as close seasons etc, to provide better protection for species at all life stages. In order to meet the requirements of the EU Eel Regulation however, more is needed and sooner, in particular to address management of fisheries in 2010 and access to habitats; as the powers provided for through the Act will not come into effect before the beginning of the 2010 season. These deficiencies are addressed in this Order and also includes other measures outside of the scope of the Marine and Coastal Access Act 2009; this includes the introduction of a new system to trace eel catches and the requirement to install eel passes and screens to enable free passage.

### Sectors and groups affected

<sup>5</sup> All 15 Eel Management Plans are available at <http://www.defra.gov.uk/foodfarm/fisheries/freshwater/fishman.htm#EELS>.

<sup>6</sup> Available at <http://www.defra.gov.uk/foodfarm/fisheries/freshwater/sffrev.htm> and [http://www.opsi.gov.uk/acts/acts2009/pdf/ukpga\\_20090023\\_en.pdf](http://www.opsi.gov.uk/acts/acts2009/pdf/ukpga_20090023_en.pdf).

11. The provisions on close seasons, the period of time in which fishing for certain species is prohibited, and catch returns, data that is required to be submitted on catches of eels, will impact on all fishers and dealers of eels.
12. On the other hand, those provisions on obstructions to the migration of eels, such as weirs, dams or sluices, will impact on some owners of existing obstructions (including the Environment Agency, water companies, British Waterways, Network Rail, Highways Agency and local councils) and on developers of new obstructions such as property developers (it is now popular to convert mills into high-cost housing developments) or renewable energy developers. Screening provisions will particularly affect water supply and power generation industries.
13. The individuals and organisations that will be affected by these additional powers will essentially be across the spectrum of business sizes. It will affect some businesses more than others but it is believed that this will be proportionate to the activities and their impact on eel stocks.

### **Value of Fisheries**

14. Research commissioned jointly by the Environment Agency and Defra into the economic value of inland fisheries<sup>7</sup>, has looked at economic aspects of fish and fishing in freshwaters. Expenditure by freshwater anglers in England and Wales supports about a billion pounds of household income, equating to 37,000 full-time jobs. A separate study assessed the total economic value of salmon<sup>8</sup>. It concluded that, on average, the public would be willing to pay £15.80 per household per year to prevent “a severe decline in salmon populations across [England and Wales], with 95 percent of salmon being lost for at least 25 years”. Aggregated across all households in England and Wales, this amounts to a value of around £350 million per year.
15. Figure 2<sup>9</sup> below shows the marked decline of commercial landings of eels across Europe over the last 20 years, with minimal changes to the landings in England and Wales. It is estimated that the total value of commercial eel fisheries (glass, yellow and silver eels) in England and Wales is in the order of £1.6m annum<sup>10</sup>; though this varies widely from year to year. It should be noted that catch has fallen since the publication of this figure in 2001.

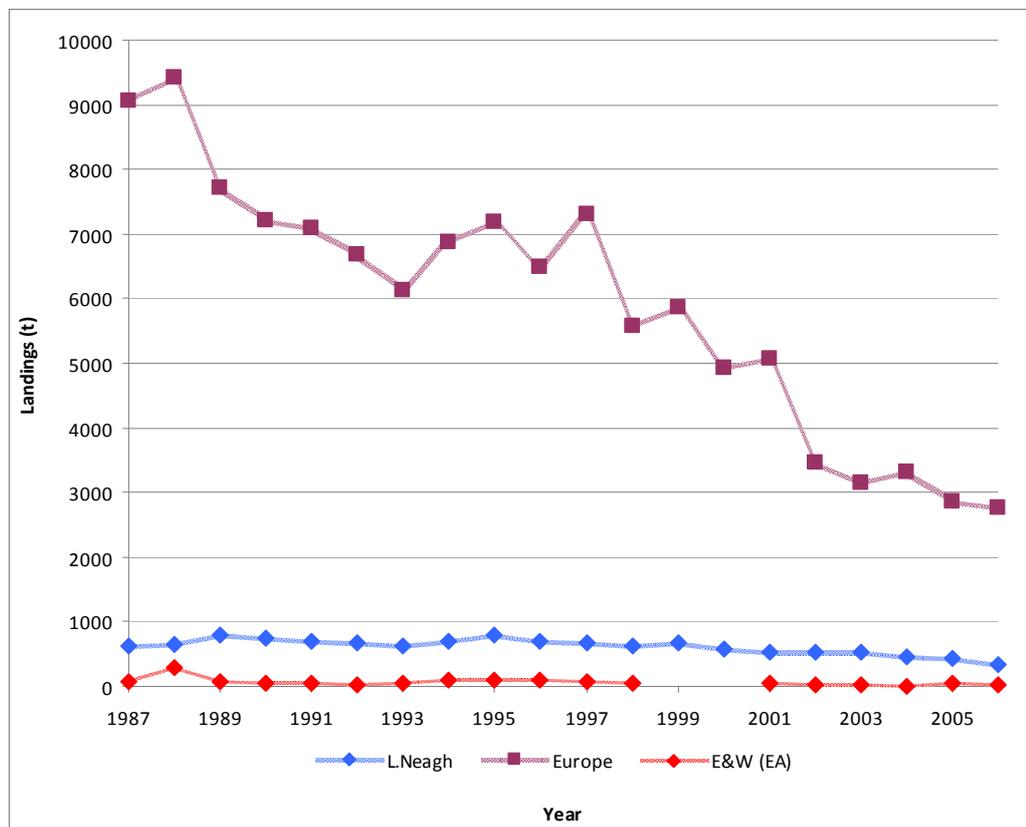
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<sup>7</sup> Economic Evaluation of Inland Fisheries: Welfare benefits of inland fisheries in England and Wales. Lawrence K.S., Spurgeon, J. (2007) <http://publications.environment-agency.gov.uk/pdf/SCHO1207BNNV-e-e.pdf>

<sup>8</sup> Economic Evaluation of Inland Fisheries: The economic impact of freshwater angling in England and Wales. Radford A., Riddington G., Gibson H. (2007) <http://publications.environment-agency.gov.uk/pdf/SCHO1207BNNW-e-e.pdf>

<sup>9</sup> ICES/EIFAC 2008. Report of the 2008 session of the Joint EIFAC/ICES Working Group on Eels. Leuven, Belgium, 3-9 September 2008. EIFAC Occasional Paper. No. 43, ICES CM 2007/ACFM: 43. Copenhagen, ICES. 2008. 213 pp + Annexes 432 pp.

<sup>10</sup> Knights B. 2001. Economic Evaluation of Eel and Elver Fisheries in England and Wales (Module C). Environment Agency R&D Technical Report W2-039/TR/2, 50 pp.



**Figure 2 Graph showing commercial landings of eels in Loch Neagh (Northern Ireland), Europe and England and Wales.**

16. More detail on where these fisheries take place can be found at Annex 2.
17. The analysis outlined in the paragraphs above provides an indication of the economic value and, thereby, the importance of fishing in freshwater, and indicates the importance of regulation and protection of the natural environment to increase fish stocks.

#### **Rationale for Government Intervention**

18. As with most of the marine and aquatic environment, eels are an open access resource. Due to the difficulty in assigning property rights, it is very difficult to exclude individuals from these environments. Such public good properties can lead to the over-exploitation of the eel population, requiring measures to restore the stock to biologically safe levels.
19. According to assessments for the UK Eel Management Plans, eel stocks are in a seriously depleted condition in inland waters in England and Wales. The current state of the eel stocks demonstrates that further Government intervention is required if they are to be managed to their full potential<sup>11</sup> and achieve their Eel Management Plan targets. Current legislation dates from an era when eels were regarded as not being worthy of the level of protection afforded to salmonids, possibly even being seen as vermin where they were present in salmon or trout fisheries. Fish conservation has much higher status than it did in the 1970s, when current legislation was made. Although eel stocks are in decline, the associated fisheries can be very valuable economically, and are therefore unlikely to reduce their effort voluntarily. In addition to a high level of illegal fishing (e.g. fishing without a licence), there is also a significant amount of unreported catch. Measures are particularly necessary to ensure that significant levels of restocking takes place, and that eels have free access to further habitats and to their breeding grounds.

#### **Consultation**

20. A public consultation on the Government proposals to introduce measures to improve the passage of migratory and freshwater fisheries, through the introduction of fish passes and screens, was launched earlier this year. A summary of all responses received and the Government Response was published

<sup>11</sup> The Salmon and Freshwater Fisheries Review makes the case for Government intervention. It was published in 2000, and the Government response to the recommendations in 2001. Both can be accessed at; <http://www.defra.gov.uk/foodfarm/fisheries/freshwater/sffrev.htm>.

on 22 October 2009.<sup>12</sup> Of the 53 responses received from a variety of sectors, 74% of the respondents supported the proposals as presented. Some respondents suggested that further consideration should be given to potentially exempting some structures, screening requirements and funding sources.

21. Earlier this year the Better Regulation Executive undertook a review to consider all forthcoming regulations and the potential impact that these may have on businesses, given the current financial and economic climate. Following this exercise, the Free Passage of Fish Order was identified as a measure having significant impact on businesses, and implementation of the Order has been delayed until May 2011.<sup>13</sup> However, it was also recognised that the measures required to meet the EU Eels Regulation could not be delayed any further. Therefore, the provisions for the installation of an eel pass and screen will therefore be included in the separate Eels Order, as described here.
22. The Environment Agency launched a consultation on the measures necessary to regulate and manage the eel fisheries in England and Wales<sup>14</sup>, to ensure that the requirements of the EU Regulation were met. Consultees included licensed eel fishers and the Regional Fisheries, Ecology and Recreation Advisory Committees (RFERAC), who provide advice to the Agency on fisheries, angling, recreation, ecology, navigation and conservation issues. A large majority of the respondents supported the measures as presented. It should be noted that all of byelaws that have been presented will be consulted on with interested stakeholder prior to their introduction.

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<sup>12</sup> Summary and Government Response to the Consultation on the Modernisation of Salmon and Freshwater Fisheries Legislation; New Order to Address the Passage of Fish 16 January – 22 April, published October 2009; available at <http://www.defra.gov.uk/corporate/consult/fisheries-legislation/summary-responses.pdf>.

<sup>13</sup> The Government's Forward Regulatory Programme, 15 October 2009, available at <http://www.berr.gov.uk/files/file53203.pdf>.

<sup>14</sup> Commercial netting of eels and elvers; National eel fisheries byelaw consultation – phase 2, 15 June – 7 September; available at [http://www.environment-agency.gov.uk/static/documents/Business/Eel - English \(Eng logo\) - final.pdf](http://www.environment-agency.gov.uk/static/documents/Business/Eel_-_English_(Eng_logo)_-final.pdf).

## SECTION 2: OPTIONS

### OPTION 1: BASELINE (i.e. maintain existing byelaws and data requirements, rely on voluntary action to deal with obstructions to migration)

#### Data Requirements

23. Article 7 of the EU Eel Regulation requires Member States who permit fishing for eels less than 12 cm in length<sup>15</sup> to 'reserve at least 60% of the eels less than 12cm in length caught by the fisheries in the Member States during each year to be marketed for use in restocking in eel river basins ... for the purpose of increasing escapement levels of silver eels'. Reaching this target will involve a phased approach, starting in the first year at 35% with an incremental increase of at least 5% each year thereafter, and must achieve the 60% target by 31 July 2013. Should the target not be met in any given year, then further measures must be taken to reduce effort.
24. To ensure this target is met in England and Wales, the Environment Agency will need to know the amount of eels caught, together with information on their end destination. Eel fishers are required, by an Environment Agency byelaw, to submit annual catch returns, detailing the weight of eels, elvers and glass eels caught, and the waters fished. The catch returns are an important source of information, used by the Environment Agency and Cefas, to assess the status of eel stocks in England and Wales.
25. The quality of catch returns has consistently been poor. Between 7% to 15%<sup>16</sup> of licence holders either submit no data, or incomplete data, and in addition comparison of catch data with information on eel exports for England and Wales from HM Revenue & Customs (HMRC) suggests a significant level of under-reporting, by between 5 and 15 times for glass eel and about 6 times for yellow and silver eel combined, with rates differing from year to year. Figure 3<sup>17</sup> below shows that catch data for elvers<sup>18</sup> (Figure 3a) and eels at other life stages (Figure 3b) in England and Wales, and reflects the under reporting of catches by fishermen; in comparison to the figures received from customs exports. A large majority (greater than 85%) of all adult eels are currently exported, as in the past a higher proportion were retained within the UK. Although the Environment Agency can prosecute those who do not comply, they cannot refuse a licence request, and fines for byelaw offences do not act as an incentive for improved behaviour against the high prices glass eels and elvers have commanded; e.g. up to £600 per kg between 2004-06.<sup>19</sup>

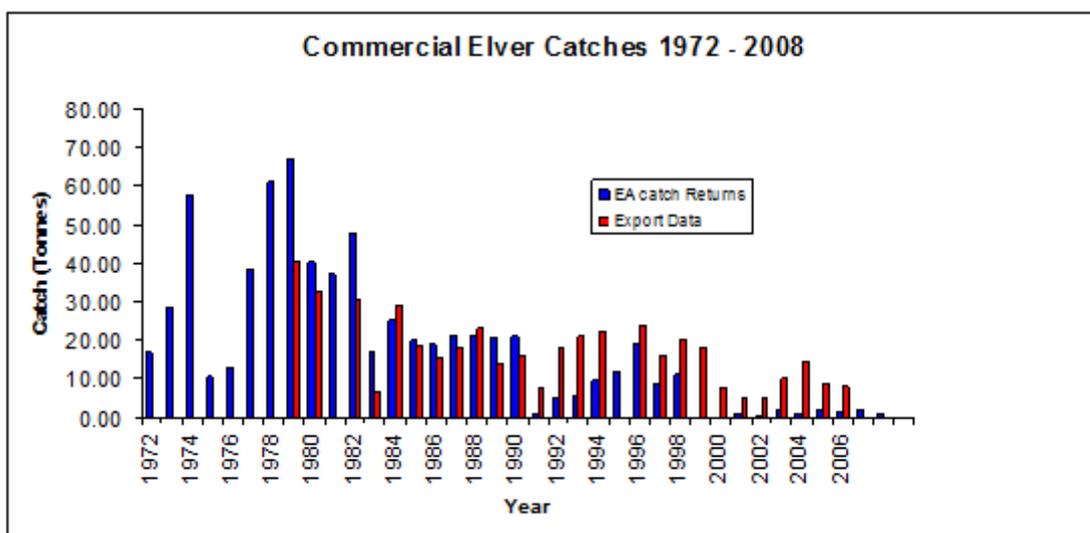


Figure 3a

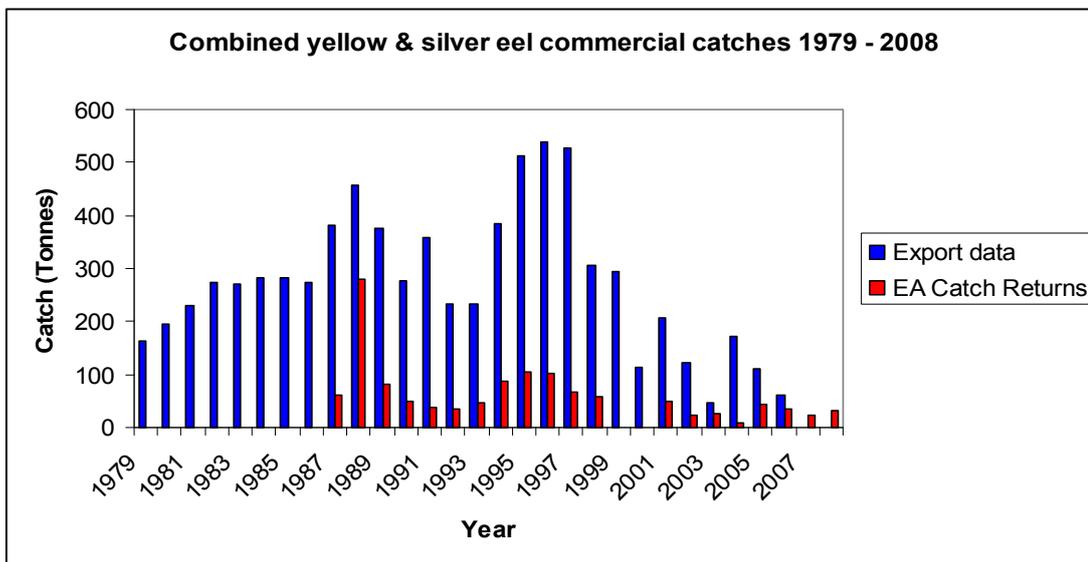
<sup>15</sup> This includes glass eels and elvers.

<sup>16</sup> Environment Agency estimate

<sup>17</sup> ICES/EIFAC 2008. Report of the 2008 session of the Joint EIFAC/ICES Working Group on Eels. Leuven, Belgium, 3-9 September 2008. EIFAC Occasional Paper. No. 43, ICES CM 2007/ACFM: 43. Copenhagen, ICES. 2008. 213 pp + Annexes 432 pp.

<sup>18</sup> Elvers are juvenile eels.

<sup>19</sup> An Environment Agency estimate.



**Figure 3b**

26. Whilst we know broadly of how eels (at all life stages) taken from English and Welsh river systems are utilised, this is not sufficient to inform the Environment Agency whether we are meeting the targets for restocking set through the EU Eel Regulation. Elver stations<sup>20</sup> are required, along with all other authorised aquaculture production businesses, to keep data on site as under the Aquatic Animal Health Directive (AAHD) 2006/88/EC<sup>21</sup>, and make it available upon the request of inspectors during site visits. However, the Agency will require information on the movement of stock on a regular basis during the fishing seasons to indicate whether that season's restocking target will be met, and to give time for the Agency to take any necessary action.

#### *Close Seasons/Times*

27. Closed seasons are used to curtail fishing effort at times of particular pressure on fish, such as when migrating or spawning, and are used to restrict overall effort on a depleted stock. This is achieved by reducing the fishing season period. Current legislation<sup>22</sup> prohibits the use of nets, traps or devices for catching eels (not authorised by the Agency) in any inland waters frequented by salmon and migratory trout before 25<sup>th</sup> June. This prohibition was introduced to protect salmon and migratory trout, and while it offers some protection for eels, it is not sufficient as it does not reflect a season or habitat that benefits eels.
28. The lack of power to set close times specifically for eel fishing is being addressed through the Marine and Coastal Access Act 2009; the Environment Agency will be empowered to make byelaws setting close times of relevance to eel stock protection. The Agency will consult on proposals for a byelaw setting close seasons for eels, elvers and glass eels for the 2011 fishing season, but these new byelaw making powers will not be available sufficiently soon for the Agency to introduce a byelaw in time for the 2010 season<sup>23</sup>.

#### *Traceability scheme*

29. Article 12 of the EU Eel Regulation requires Member States to 'take the measures necessary to identify the origin and ensure the traceability of all live eels imported and exported from their territory'. Such a system will ensure that stock have been caught from legal fisheries within the identified River Basin Districts, consistent with

<sup>20</sup> A station is an aquaculture business, as defined in Article 3.1 of the Aquatic Animal Health Directive 2006/88/EEC, and is the first point of sale of live glass eels and elvers; the station buys all glass eels and elvers from fishermen and then sells them on for aquaculture, stocking or food markets.

<sup>21</sup> The Centre for Environment, Fisheries and Aquaculture Science (Cefas) is the regulatory authority. They will set out the information that needs to be kept as a condition of the authorisation.

<sup>22</sup> Salmon and Freshwater Fisheries Act 1975; section 21.

<sup>23</sup> The Environment Agency is required (by Schedule 26 of the Water Resources Act 1991) to consult on its proposed byelaws. Byelaws typically take one year to be made and confirmed.

approved Eel Management Plans for that Member State and with the rules of the regulating authority.

30. In order to ensure that we have met the requirements of this Article, the Environment Agency will require all live eels imported or exported to be accompanied with a consignment note, throughout its transportation, that declares source of stock, destination and weight. The Aquatic Animal Health Regulations and the Animals and Animal Products (Import and Export) (England) Regulations 2006<sup>24</sup> require transporters of live animals, and their products, to be accompanied with a consignment note. However, these Regulations are concerned with the health of the stock and the prevention of spread of diseases. Therefore, the type of information that must be maintained for these Regulations is not that same as that required by the Agency to ensure that the eel stock were caught legally.

### *Obstacles to migration*

31. Eels may ascend rivers from the sea at various stages in their lives. There are a number of obstructions (such as weirs, dams or sluices) that prevent or reduce this upstream migration, constraining the colonisation of suitable habitat. Glass eels undergo a huge density dependant mortality as they come to the end of this vulnerable life stage and start feeding in rivers and in doing so have the stores needed to pigment and muscle up into young eels. This is a natural process but if habitat (food) availability were increased, the levels of this mortality would decrease accordingly, improving survival rates and likely eel numbers developing into adults. This is thought to be a particular problem in the lower reaches of river basins, which may be the result of the construction of tidal flap gates on land drainage schemes. In some circumstances, barriers are also preventing the downstream migration of adult eels, with resultant impact on subsequent spawning success of the stock. Removing such obstructions or the provision of fish passes or easements<sup>25</sup> in order to make them passable has been demonstrated to be an effective way of increasing the distribution and abundance of fish.<sup>26</sup> Silver eels are especially vulnerable to hydropower turbines when moving downstream.
32. Some water abstractions have the potential to take significant levels of eels (eels are drawn in with the water, and even when they are not macerated by the machinery mortality may be high). Power stations can trap large numbers of eels in their intakes and the development of small-scale hydropower facilities has increased the risk of eels being damaged in turbines or entrained in draw-off and discharge channels. The Stallingborough Power Station (a combined cycle gas turbine power station) on the River Humber was estimated to have entrained 196kg of eels in 1999 and 166kg in 2000. Assuming a mix of males and females and an average weight of 200g, then this equates to some 1,000 eels<sup>27</sup>. A study carried out on the River Dee estimated that 4,867 eels were entrained in a year at 5 abstraction points with one site taking an estimated 3,261 eels on its own<sup>28</sup>.
33. Current legislation<sup>29</sup> provides for the adequate passage of migratory salmonids but ignores the needs of eels (and indeed other migratory species) and no action can presently be required of obstruction owners or occupiers to provide an eel pass, nor of inlet or outfall owners or occupiers to provide screens that are pertinent to eels. Whilst larger eels can use certain types of passes and are protected from entrainment in inlets and outfalls by salmonid screens, this is of limited help given that the movement of eels at all life stages needs to be facilitated.

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<sup>24</sup> Statutory Instrument 2006 No.1471, available at <http://www.opsi.gov.uk/si/si2006/20061471.htm#22>.

<sup>25</sup> Fish passes are structures built on or around weirs and dams that allow fish to bypass the obstructions and continue their migration. Easements are where an obstruction is modified or partially or completely removed to allow fish to pass.

<sup>26</sup> C. Briand, D. Fatin, G. Fontenelle, E. Feunteun. (2005) Effect Of Re-Opening Of A Migratory Pathway For Eel (*Anguilla Anguilla*, L.) At A Watershed Scale *Bull. Fr. Pêche Piscic. (2005)* 378-379 : 67-86; From Sea to Source: Guidance for the restoration of fish migration in European Rivers, Environment Agency.

<sup>27</sup> PROCTOR, N. V. & MUSK, W. A. (2001). Fish impingement assessment: South Humber Bank Power Station. Report to Humber Power Ltd.

<sup>28</sup> APEM (2007). RIVER DEE FISH ENTRAINMENT STUDY. Consultancy Report for United Utilities, APEM Scientific Report UU 886, Stockport, 188 p.

<sup>29</sup> Salmon and Freshwater Fisheries Act 1975 ss9 - 15

34. Improvements to fish passes are currently often made in partnership, between, for example, local fisheries interests, River Trusts and /or conservation bodies and the owners/operators of weirs – with or without Environment Agency involvement. The Environment Agency also uses powers provided in other legislation to provide for sustainable fish stocks. For example, the Environment Agency has a duty to reduce flood risk. Previous land drainage and flood defence schemes along the coast have resulted in a loss of upstream connectivity between marine and freshwater environments. Conventional outfalls are an integral part of these defences, but are a significant obstruction to migratory fish such as eels.
35. The Environment Agency has worked on a novel solution to this issue and in partnership with other agencies, has installed rotary Self Regulating Tide gates (SRTs) to perform Regulated Tidal Exchange (RTE). RTE allows water to enter areas behind existing defences, while retaining close control over the extent of inundation. This extends the window of opportunity for migrating fish such as eels to enter freshwater. Where it is appropriate to do so, the Environment Agency will replace original tidal flaps with one of these devices to open up parts of catchments that are currently inaccessible to fish, without increasing flood risk. However, it is sometimes the case that these flood defence assets are not owned or controlled by the Environment Agency but may still have a significant impact on eel migration e.g. Internal Drainage Boards, Local Councils.

## **Costs**

### *Close seasons*

36. Some 830 fishers were licensed to pursue the various eel fisheries in England and Wales in 2008. At present there is no formal close season for the eel fisheries in England or Wales. Some rivers have restrictions on the use of eel nets before June, but this is solely to prevent illegal salmon netting and are not eel protection measures. Fishing for elvers is governed by the arrival of the glass eels each spring via the Gulf Stream and its inherent inconsistencies. This will cause the elver run to commence any time between January and late February. It is therefore difficult to assess the financial impact of the current close seasons, as the arrival of glass eels can vary from year to year, with fishermen generally producing their largest catches of eels during high Spring tides. Fishing continues as long as glass eels are caught in sufficiently large numbers to be commercially viable, with historically key months being March and April; in some years it has been possible to catch elvers in commercial quantities in February and June.

### *Data Requirements*

37. We estimate that the administrative burden on all fishers to complete catch returns is £2,465 per annum. This is based on 830 fishers, acknowledging that between 7-15% of licence holders submit either no or incomplete data (paragraph 25), taking 10 minutes each to complete the return<sup>30</sup>.

### *Traceability scheme*

38. Currently, the elver stations that have been identified provide their own consignment note when transporting live glass eels/elvers. We estimate that the administrative burden for the elver station holders to fill out consignment notes, for their own purposes, is £7<sup>31</sup>; a total annual cost of £176 for 25 consignment notes.

### *Eel passage*

<sup>30</sup> Times taken are based on Environment Agency assessment. Salary assumed to be £16.23 per hour +30% overheads.

<sup>31</sup> Based on two elver stations, 1 person at each spending 10mins in total filling out the necessary form, with a salary of £16.23 per hr +30% overheads.

39. Approximately 100 eel passes have been constructed in the last 10 years (1997-2007). These have been built as part of passes addressing salmon and sea trout migration, or as part of flood defence schemes by or on a voluntary basis. Costs are in the order of £1,000, with smaller passes costing about £100.
40. Screens are not currently required to prevent the ingress of eels, other than for those abstracting water in Special Areas of Conservation. However, many of the screens that have already been fitted, meeting salmonid requirements under the Salmon and Freshwater Fisheries Act 1975, will provide the necessary protection for yellow and silver eels and no further action will be required. Intakes of power stations in estuaries or lower ends of rivers will require screening to prevent elver entrainment.
41. The administrative burden costs for each owner or developer of obstructions is estimated at £84<sup>32</sup>; a total of some £8,400 for the 100 passes or so that have been built in the last 10 years.
42. Based on this historical data, it is assumed that 200 eel passes will be constructed over the next 20 years.
43. It is the intention of the Environment Agency, even through a change in current legislation, to work with obstruction owners to ensure the free passage of eels to complete their life cycles.<sup>33</sup>
44. Costs to the Environment Agency have been covered by the Grant-in-Aid and are thus not included here.

**Table 1: Total costs to Industry and the Environment Agency over 20 years**

	<b>Total cost (£m)</b>	<b>Cost per annum (£m)</b>
<b>Cost to Industry</b>		
Data requirements	0.05	0.0025
Eel passage	0.2	0.01
Administrative burden	0.016	0.0008
<b>Total</b>	<b>0.27</b>	<b>0.013</b>
<b>Total discounted cost over 20 years (at 3.5%)</b>		<b>0.191</b>

#### **Benefits**

45. In the short term continuing the status quo will present no additional costs to eel fishers or dealers, nor those who own or occupy obstructions to the migration of eels.

#### **Risks**

46. This option does not address the need to curtail fishing effort at the peak migration times in 2010/11, nor will this option provide for a clear indication of whether the UK's obligations on restocking are being met, which will ultimately mean that we are not meeting the requirements of the EU Eel Regulation.
47. There are many rivers where other constraints on eel populations, such as pollution, have been removed, but obstructions remain. Without the introduction of eel passes to provide connectivity, eel stocks could fall unless stocking is maintained. It is also the case that stocks will make slower recoveries, or may not recover at all, if passes are not provided.
48. Whilst many eel passes are built as a result of voluntary agreement between the Environment Agency and the owners and operators of obstructions, it is the case that many owners decline to

<sup>32</sup> An Environment Agency estimate. For each obstruction the assessment is based on; 1 person spending 4 hours in total filling necessary forms, including an application for a land drainage licence, with a salary of £16.23 per hour +30% overheads at the initial outset of designing and introducing a fish pass for an obstruction.

<sup>33</sup> Currently, owners and/or developers of new obstructions who seek licences, such as those for planning or impoundment, will then be notified by the Agency to introduce an eel pass.

give permission or to work with the Agency to provide free passage to fish. This option will not therefore address current obstacles which prevent eels from completing their life cycle.

49. This option will ultimately contribute to further reductions in eel stocks and the UK will not meet its obligations under the EU Eel Regulation, leading to potential infraction proceedings.

**OPTION 2: Introduce new close season for 2010/11, new system to trace eel catches, require eel passes and screens to enable and protect eel migration.**

50. This option introduces new controls on fisheries by introducing a statutory close season for 2010/11, and gives powers to the Environment Agency to rescind eel licences if indications are that the restocking target, and thus ultimately the 40% escapement target, will not be met. This option also requires the provision of eel passes in obstructions, and screens at water abstraction and discharge points.

*Data Requirements*

51. Catch returns will still be required at the end of each season detailing the weight of eels caught, the date of capture, and the waters fished. Fishers will now need to include the weight of any eels retained, alive or dead, and the destination sold stock. These requirements, an improvement to the baseline, make clear [to both fishers and to the courts] the importance of accurate data in efforts to improve eel stocks. In addition to this, elver stations will be required to notify the Environment Agency on a weekly basis of the source of the eels they are selling, together with their intended use (i.e. for aquaculture, restocking, food or other). Therefore, through the information gained from both fishers and elver station owners (buyers of fished elvers), the Agency will be able to ascertain and trace all elvers from their source, i.e. the waters where they were fished, through to the destination of all catch, which has not been previously possible.
52. Much of this data can (and will) be cross referenced; this is not double handling as many eels are not sold live but dead to smokeries or for personal sale and/or consumption.
53. The Environment Agency will close the glass eel and elver fisheries in 2010 if the restocking targets are not reached in that year. The restocking target will be initially based on the catch in 2009, and will be further refined throughout the season following the returns made by the elver stations. In order that the Environment Agency is able to close the fisheries, they will have the necessary powers to withdraw eel licences (during the 2010 fishing season only). A different method will be used in further years; we are looking to use powers introduced through the Marine and Coastal Access Act 2009 to authorise eel fisheries; authorisations will only be granted once an assessment of the stock indicates that the fishery is sustainable, and will not cause damage to the aquatic or marine environment. The Environment Agency will be able to attach conditions to an authorisation, and in addition, will be able to repeal it immediately should a reduction in the fishing effort for eels be considered necessary. However, it should be noted that current estimations indicate that the restocking target for 2010 fishing season is likely to be met<sup>34</sup>, and therefore further measures to curtail fishing effort is unlikely to be unnecessary.

*Close seasons/Times*

54. A close season will be introduced for eels of less than 12 cm length for instruments other than rod and line between 26 May 2010 and 14 February 2011 (inclusive), and for all other eels for instruments other than rod and line between 1 October

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<sup>34</sup> An Environment Agency estimation.

2010 and 31 March 2011 (inclusive). Close seasons in further years will be introduced by the Environment Agency through byelaws.

### *Traceability scheme*

55. The Environment Agency will have the power to require buyers and sellers of all live eels to fill-out and sign their own consignment note, which is to accompany the transported live stock until it reaches the final destination. The initial buyers of the live stock off eels, i.e. direct from the fishers, will be required to declare that the stock bought were caught in a legal fishery. This can be demonstrated through the recording of the fisher's name, licence number, source of eels and weight of stock. The consignment notes that accompany the movement of all stock will detail the date of movement out of the facility, life-stage of the eel, total weight, destination of sold stock (for elvers this will include purpose, i.e. restocking, aquaculture or other) and the water fished (i.e. River Basin District or river source). All consignment notes will need to be signed and dated, thereby declaring that the consignment of eels being transported were legally sourced from a fishery regulated by the Environment Agency.

### *Obstacles to migration*

56. The Environment Agency will have the power to require the provision of an eel pass in any obstruction, both natural (but only those of a temporal nature) and man-made so far as they impede the migration of eels. The owner or occupier of an obstruction with a fish pass will be obliged to maintain the pass. If it is not feasible to establish who owns an obstruction, the Environment Agency will have the power to reduce or remove barriers to the passage of fish. However, account must be taken of the needs of other users and the wider environment.
57. All owners of obstructions will be liable to put in eel passes, where it can be shown that the obstruction hinders the access of fish to their feeding or breeding grounds. It is recognised that this is a significant financial burden, however, at present, this is being met to some degree from the public purse, and it is not reasonable to expect this contribution to increase where the owner derives the benefit from the obstruction. It is not the intention that all owners will be required to carry out modifications on their obstructions; the Environment Agency will prioritise the most critical barriers to eel migration, and we estimate that this will be in the order of 500 obstructions. Works will need to be undertaken over the next 3 years.
58. The Environment Agency will have the power to require that owners or occupiers of artificial channels that either take water out of or feed water into rivers or canals will be obliged to put in place and maintain screens to prevent the ingress of eels. There are many situations where we consider screens will not be necessary; sites where eels are absent, where the flow is such that not many eels will be taken, or abstractions of less than 20m<sup>3</sup> as the numbers of eels taken will not fundamentally impact on stocks. In addition, those who operate in Special Areas of Conservation are already required to screen against the ingress of eels, and will therefore already meet the requirements of this Order. Again, the Environment Agency will prioritise the approximately 430 current abstractions or impoundments and works will be scheduled over the next 5 years.

## **Costs**

### *Data Requirements*

59. Since the applicant for a fishing licence is already required to submit the required catch returns to the Environment Agency at the end of each season, we estimate that there is no additional administrative burden on licence holders (see paragraph 31).
60. There are 2 elver stations. Their records are held electronically and extraction of data takes very little time. We estimate that this takes less than five minutes each week during the season<sup>35</sup>. The total annual administrative burden on elver stations will be approximately £65 per annum<sup>36</sup>.
61. Costs to the Environment Agency are covered by the Grant-in-Aid, and are thus not included here.

<sup>35</sup> The glass eel/ elver season runs from February to May, where the majority are caught between mid-March and late April, and has therefore been calculated on the basis of an 18 week season.

<sup>36</sup> Times taken are based on Environment Agency assessment. Salary assumed to be £16.23 per hour +30% overheads.

#### *Close seasons*

62. As explained at paragraph 36 it is difficult to assess the financial impact of the proposed close seasons. However, by placing the closed season at the beginning and end of the natural season it will mean that although the fishers will be constrained to a specific time period, they will still be able to capture at peak times. Therefore, inclusion of a specific season, as proposed, will ensure that the later run elvers will successfully negotiate the estuary and would form sufficient recruitment for the wider catchments of which these elver rivers are part.
63. Elver and eel fishers could be prohibited from fishing for between 2 and 8 weeks each season. It is estimated that the elver fishery is currently worth approximately £280,000<sup>37</sup>, yellow eel fishery is valued at £90,000 and the silver eel fishery is worth £9,000<sup>38</sup>. The close season could represent a reduction of 9%, 17.6% and 52.8% for the respective fisheries<sup>39</sup>; this represents a total one-off cost of £333,000 across the all the life-cycle of the eel. This total value of landings figure can be regarded as a high end estimate. A different measure of the economic impact is to look at 'value added' i.e. the impact on profits and employee compensation. However, in the absence of reliable variable cost data, this measure cannot be calculated with any degree of accuracy.

#### *Traceability scheme*

64. The elver station holders will already be recording the tracing information (as described in paragraph 55) as part of their requirement to record the movement of stock onto the premises. As both elver stations currently provide consignment notes, we estimate that there will be no additional administrative burden on these businesses.
65. Additionally, all buyers of live yellow and silver eels need to provide tracing information. This will also demonstrate that the any eels bought were sourced from legal fisheries, as well as ensure that any eels sold are accompanied with a consignment note. We estimate that the administrative burden on these buyers is £26<sup>40</sup> for all buyers; a total annual cost of £260 based on each buyer signing 10 consignment notes each year.
66. The Agency will see an increased costs in administrative burden for providing the necessary consignment note booklet, or in electronic format, and this one-off cost is estimated at £500.

#### *Eel passage*

67. The Environment Agency estimates that approximately 500 schemes (involving between 10 – 20 eel passes per scheme) will be required to specifically address the passage of eel migration. Eel passes generally cost significantly less than those required to enable the migration of salmonids and can be in the order of £10,000 per scheme, and therefore a total cost of £5m. However, where other substantial works are ongoing at the same time, the additional cost of building a fish pass or other easement can be much reduced and could become effectively marginal. The cost implications on small business will be negligible; a list of the sectors who we believe will be affected are listed in Annex 1 of this IA, under the 'Small Firms Impact Test'.

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<sup>37</sup> An Environment Agency estimation, based on a total catch of 700kg in the 2008 season at approximately £400 per kg.

<sup>38</sup> An Environment Agency estimate, the value of both the yellow (a total catch of 18,000kg at approximately £5 per kg) and silver (a total catch of 1,800kg at approximately £5 per kg) eel fishery is based on 2008 catches.

<sup>39</sup> An Environment Agency estimate.

<sup>40</sup> Based on five buyers, with each person spending 15mins in total filing out the necessary form, with a salary of £16.23 per hr +30% overheads.

68. The Agency will incur increased costs of overseeing the proper authorisation and then operation of eel passes by owners. This cost is estimated to be an annual cost of £30,000.<sup>41</sup>
69. Administrative burden cost for each owner or developer of obstructions is estimated at £84<sup>42</sup>; a total of some £42,000 for the 500 schemes that will be required to introduce a fish pass.
70. Following the introduction of an eel pass, owners and developers will be required to carry out monitoring work. The Environment Agency will specify what is necessary depending on the size and type of the obstruction and eel pass itself but could be a visual inspection, use of an interceptor or trap or video monitoring. Owners and developers will be required to monitor for as long as it is necessary to determine that the pass is passable; unless it becomes an index monitoring site. Costs range from less than £250 to £1,000. Total monitoring costs are expected to be in the order of £250,000<sup>43</sup>, averaging out to an annual cost of £12,500 over a 20 year period.

### *Maintenance costs*

71. Owners/occupiers will be required to take on the cost of maintenance of their eel pass. These costs will vary from site to site and there is little evidence to give clear indications of their levels. Maintenance costs (for constructions outwith this context, e.g. engineering works such as bridges), are commonly assumed to be around 2% of capital investment costs, which would imply costs of the order of £200 per annum (per scheme), a total of £2m over 20 years, but there is no evidence to support these figures in this context.

### *Screens*

72. Table 2 below shows the differing types of licensed abstractions that will be required to install screens at their in- and outlets. The requirement for other sectors to install screens is likely to be negligible and has therefore not been costed. In addition, those abstracting water in Special Areas of Conservation will already be required to screen against eel ingress, and have also been excluded from the costing below.
73. Whilst the table below sets out the costs should all of these abstractions require screens, it is unlikely that this will be the case in practice. Only a proportion will be required to fit screens; the Environment Agency will develop criteria and guidance on how they will prioritise the various sites to which the new powers would be applied, over the next few years. It is therefore difficult, at this stage, to estimate the total cost of this requirement.
74. Of those that will be required to fit screens, the Environment Agency will be working closely with the industry to ensure any work required aligns, as far as possible, with the industries own programme of works and planning cycles, thereby reducing costs further. For the first five years of the Order, screens will only be required if the owner or occupier of an abstraction/discharge is so notified by the Agency. After that time, all abstractions and discharges will be required to screen for eels, unless they have been expressly exempted by the Agency; for example where there are no population of eels. It is therefore considered that approximately 90 screens will be fitted in current water abstraction and discharge points each year for the first five years.

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<sup>41</sup> These costs will be met under the Water Framework Directive; overall Impact Assessment for the Water Framework Directive (2000/60/EC) is available at <http://www.defra.gov.uk/corporate/consult/river-basin/IA-river-basin-v2.pdf>.

<sup>42</sup> An Environment Agency estimate. For each obstruction the assessment is based on: 1 person; spending 4 hours in total filling necessary forms, including an application for a land drainage licence; with a salary of £16.23 per hour +30% overheads at the initial outset of designing and introducing a fish pass for an obstruction.

<sup>43</sup> An Environment Agency estimate.

75. In addition to this, any new abstraction or discharge owners may be required to introduce a screen and will be notified by the Agency if this is necessary. We estimate that this will amount to an average of 42 each year. Thereafter, only new abstraction or discharge owners may be affected by the requirements of the Order; an annual average of £2.6m (£52m over the 20yr period), the breakdown of costs covering the whole 20 year period is highlighted in Table 3 below. The costs for installing a screen in new schemes are likely to be significantly lower than retrospectively fitting them, as they will be integrated as part of the design in the overall scheme. The number of new abstraction licences for the electricity industry may increase over the years due to the increase in hydropower schemes. However, Government is currently reviewing the abstraction licensing system to ensure better management of water resources, including modification to both legislation and development of strategies to ensure a more structured approach to the management of resources.<sup>44</sup>
76. The cost of installing a screen includes: capital costs; installation costs (associated planning & design); site investigations; preparation; consultancy; installation; testing and commissioning. The cost of a screen is highly dependent on the site, but ranges from £5,000 to £150,000 (including installation costs). The total cost of this will be approximately £32.8m; a list of the sectors who we believe will be affected are listed in Annex 1 of this IA, under the 'Small Firms Impact Test'.

**Table 2: Total cost of installing screens across the differing types of existing licensed abstractions over the first five year period**

	Approximate number of licences	Probable cost of screen (£'000) (assumed)	Indicative cost (£'m)
Public supply	250	65	16.2
Private supply	80	20	1.6
Electricity industry	100	150	15.0
<b>TOTAL</b>			<b>32.8</b>

**Table 3: Annual cost of installing screens across the differing types of new licensed abstractions over the whole 20 year period**

	Approximate number of new licences	Probable cost of screen (£'000) (assumed)	Indicative cost (£'m)
Public supply	10	40	0.4
Private supply	12	15	0.18
Electricity industry	20	100	2.0
<b>TOTAL</b>			<b>2.6</b>

77. There would also be additional administrative costs to the Agency to ensure operators meet the new screening requirements. These are estimated at £250,000 over the first 3 years, and then averaging out to a cost of £83,300<sup>45</sup> per annum thereafter. Over a 20 year period, the average annual cost is therefore £108,000. It should be noted that only a proportion of owners of abstractions and discharges will be required to install screens.

78. Table 4 shows the costs of installing eel passes and screens over 20 years.

<sup>44</sup> Further information on abstraction licensing policy can be found at <http://www.defra.gov.uk/environment/quality/water/resources/abstraction/index.htm>.

<sup>45</sup> An Environment Agency estimate, based on 0.25 to 0.5 FTEs (reducing to approx 0.1 FTEs) per operational area.

**Table 4: Total cost of installing eel passes and screens over 20 years**

	<b>Total cost (£m)</b>	<b>Cost per annum (£m)</b>
<b>Cost to Industry</b>		
Eel passes	5.0	0.25
Administrative burden	0.042	0.002
Monitoring	0.25	0.013
Screens	84.8	4.24
Maintenance costs	2.0	0.1
<b>Total cost to Industry</b>	<b>92.1</b>	<b>4.6</b>
<b>Administrative cost to Environment Agency</b>	<b>2.77</b>	<b>0.14</b>

**Table 4: Total costs to Industry**

	<b>One-off costs (£m)</b>	<b>Cost per annum (£m)</b>	<b>Total cost over 20 years (£m)</b>
<b>Cost to Industry</b>			
Close seasons	0.33	-	-
Eel passes and screens	-	4.6	92.1
<b>Total</b>	<b>0.33</b>	<b>4.6</b>	<b>92.4</b>
<b>Total discounted cost over 20 years (at 3.5%)</b>	<b>74.6</b>		

**Benefits**

79. This option complements the new powers to manage eel fisheries being introduced through the Marine and Coastal Access Act 2009<sup>46</sup>; ensuring that eels are protected during the key migration times, and that the Environment Agency is able to take swift action in closing down eel fisheries if necessary. In areas where the installation of passes are critical to eel migration, the Environment Agency will be able to ensure that urgent action is taken.
80. The installation of passes will help where it reduces the densities of eels below the obstructions, since higher densities would be expected to result in higher mortality rates. Allowing the eels access to more habitat should reduce densities, therefore increasing survival rates. In some circumstances, particularly in the lower reaches of rivers, reducing densities may also increase the proportion of females because sex determination is influenced by local density conditions. As female silver eels return to the sea at larger size, this will potentially result in a relative increase in silver eel biomass.
81. The benefits doubly accrue to the stock by reducing eel removal as well as increasing habitat availability and hence the numbers and size of those eels that survive to maturity. Whilst fisheries will be curtailed in the short term, the aim is that the decline in eel stocks will be reversed, ultimately allowing fisheries in the future that command larger, and more sustainable catches. This will benefit both commercial fishing interests, and the dealers who receive their catches.

<sup>46</sup> The Marine and Coastal Access Act 2009 will extend management powers in the Salmon and Freshwater Fisheries Act 1975, Water Resources Act 1991 (such as the power to limit effort in fisheries through Net Limitation Orders), and protection from certain practices (such as using explosives or electrical devices to take fish) to eels.

82. It should be noted, however, that when increases in stocks are manifest, it may not be easy to clearly attribute credit; the benefits will accrue from the measures set out here (together with fisheries management powers and protections being extended from salmon and sea trout to eels through the Marine and Coastal Access Act 2009) to address fishing effort and obstructions to migrations, as well as from a range of measures the Government has taken to address poor water quality, low water flows, disease, habitat degradation and fishing.

### **Risks**

83. Stocks of eels are at such a low level that it is expected to take some time to see significant improvements. It is possible that, before improvements are sufficiently robust, fisheries might have to be closed for complete seasons, rather than partially as anticipated here.

### **Implementation**

84. The Environment Agency is responsible for implementing the programme of measures as set out in the 11 Eel Management Plans covering England and Wales, together with the Border River Esk area that forms part of the Solway Tweed River Basin District. Following submission to the European Commission, final approval of all of the Eel Management Plans has yet to be received, however it is expected that final approval is likely to be given in January 2010.
85. The Environment Agency will target efforts to address obstructions to eel migration to areas of need or where opportunities arise. It is the Environment Agency's intention to work collaboratively with the owners of existing obstructions. The owners of new obstructions will incur reduced costs, as the construction of passes is less costly where this is part of a larger overall design and build project. Similarly, pass costs can be reduced significantly where installation is carried out as part of repair or reconstruction of an existing obstruction. These same principles will apply to sites where screens to protect eels are required.
86. Some powers to require the construction or alteration of a fish pass already exist in relation to migratory salmonids. However, in practice, these powers are rarely used to force owners to install or repair a fish pass at their own expense, and it is envisaged that this partnership approach will be extended to passes required for eels. The Environment Agency will not require the construction of an eel pass where one is not necessary.

### **Sanctions/ review / enforcement**

87. The penalty for fishing during a close season, or when a licence has been revoked will be £5,000 (level 5 on the standard scale). This is in order to ensure that the fine is set at such a level as to be a deterrent in a fishery which commands very high prices, and to reflect the parlous state of eel stocks. It is consistent with other measures taken to restrict activities which impact on already diminished fish stocks.
88. Enforcement is carried out by enforcement staff of the Environment Agency. The Agency currently spends about £6m on fisheries enforcement; this is not expected to be impacted by the implementation of this policy.
89. There will be fines for failure to provide a fish pass or screen when so required, but the Environment Agency will also have the powers to build a fish pass or insert a screen and recover the costs from the owner/occupier via the courts. Owners/occupiers may be required to monitor passes to confirm their efficacy, and the Agency will have the power to require modifications to the pass if necessary.

90. Member States are required to report to the Commission initially every three years, and then six years after the first three of those reports. The Environment Agency will be required to outline the monitoring, effectiveness and outcome of measures introduced since implementation in 2009. Stock assessments are carried out annually; this will enable the Environment Agency to evaluate increases in stocks of eels in English and Welsh waters. In addition the Government will hold a review five years after the implementation of this Order; we do not expect the el stock to have recovered in this time, but it will be possible to judge whether there are early indications of a stock increase. Experience of the close season during 2010/11 for eels and elvers, including its appropriateness and effectiveness, will inform the Environment Agency's work in drawing up a new byelaw setting long term close seasons.

## **Conclusion**

91. It has not been possible to provide monetised benefits for the conservation of eel stocks, and thereby the benefits to the public and fishers. However, based on the assessments and qualitative evidence provided in the two options presented above, the Government considers that option 2 provides the most effective solution to sustain and help better protect and improve the natural production of eel stocks. It is the Government's belief that without the solutions outlined within option 2 the UK will be unable to meet the goal of ensuring that at least 40% of the potential production of silver eels returns to the sea to spawn on an annual basis. This option will enable the Environment Agency to prioritise and address the most critical obstacles to eel migration and provide it with the necessary powers to ensure it is able to take timely and effective action to address the impact fishing has on eel stocks in England and Wales.

## Specific Impact Tests: Checklist

Use the table below to demonstrate how broadly you have considered the potential impacts of your policy options.

**Ensure that the results of any tests that impact on the cost-benefit analysis are contained within the main evidence base; other results may be annexed.**

Type of testing undertaken	<i>Results in Evidence Base?</i>	<i>Results annexed?</i>
Competition Assessment	No	Yes
Small Firms Impact Test	No	Yes
Legal Aid	No	Yes
Sustainable Development	No	Yes
Carbon Assessment	No	Yes
Other Environment	No	Yes
Health Impact Assessment	No	Yes
Race Equality	No	Yes
Disability Equality	No	Yes
Gender Equality	No	Yes
Human Rights	No	Yes
Rural Proofing	No	Yes

## Annexes

## **Annex I: Outcome of Impact Tests not referred to in the Evidence Base**

### Small Firms Impact Test

The proposals concerning close seasons and data requirements will affect all eel fishermen and elver stations, no additional costs have been highlighted for small businesses.

The proposals concerned with obstructions to the migration of eels could potentially affect small/medium sized property development companies. These include: owners or occupiers of converted mills and other riparian buildings with attached structures; developers/renovators of such obstructions and of low head hydropower schemes on weirs and barrages. Screening requirements will impact on power suppliers and power generation industries, but, apart from low head hydropower schemes, these are unlikely to be small or medium firms.

[Those low head hydropower schemes being built on marginally financial viable sites will be particularly affected as the costs of fish passes will be high enough to make the scheme financially unviable. ]

These provisions are likely to have a positive impact on environmental consultant businesses, who advise on fish pass and screening schemes, and developers of such schemes.

### Competition Assessment

There will be no negative competitive impact arising from this regulation. This regulation neither restricts the ability of firms to choose the price, quality, range or location of their products, nor will it lead to a differentiation in costs between new and existing eel fishers. The regulation is unlikely to affect the market structure; the 2 elver stations will be equally affected by the requirement to provide data, and by any closure, should that become necessary.

The majority of firms affected by the provisions on obstructions are likely to be public organisations or state-regulated monopolistic utility companies which by definition do not operate in open markets. Companies who do operate in an open market and who may be affected by the provisions, such as property developers, will all be affected in a similar way and there will therefore be no effects on competition.

### Legal Aid

The proposal does not create any new criminal sanctions or civil penalties aside from those referenced in the evidence base.

### Sustainable Development

The proposal complies with sustainable development principles in that the primary aim of legislative changes are in order to allow the Environment Agency to effectively conserve the fish stocks for future benefit and control exploitation at sustainable levels.

### Carbon Assessment

The proposal will have no significant effect on carbon emissions. Levels of fishing activity and associated services are likely to remain the same.

However, if eel fisheries are closed there will be reductions in carbon emissions.

### Other Environment

The proposals are designed to allow flexibility towards future challenges that face sustainable fisheries in the future. In that respect, they will allow for a greater capacity for adaptation to the effect of climate change and associated freshwater temperature rises. The proposals aim to improve eel stocks, thereby preserving and enhancing the biodiversity in England and Wales.

### Health Impact Assessment

The proposal will have no significant impact on health, well-being or health inequalities. Studies have shown that fishing has a social benefit contributing to societies overall well-being; in the respect the proposals will have a positive impact as the measures proposed are designed to enhance benefit over the long term.

### Race/ Disability/Gender Equality

None of the proposals discriminate against either race, disability or gender. The proposals do not impose any restriction or involve any requirement which a person of a particular racial background, disability or gender would find difficult to comply with. Conditions apply equally to all individuals and businesses involved in the activities covered by the proposal.

### Human Rights

The proposal is consistent with the Human Rights Act 1998.

### Rural Proofing

The majority of financial benefits that arise from angling and fishing contribute to local communities. As such, the proposals are designed to enhance these benefits and the value of the fisheries to local communities over the long term.

## Annex 2: Background

92. The Environment Agency manage and regulate all eel fisheries in England and Wales. Their responsibilities extend to those parts of the Border River Esk and its catchment area that lies in Scotland, but excludes those parts of the River Tweed and its catchment area that lies in England (fisheries in this area are managed by Scotland. This arrangement has been part of an agreement to ensure that the Border Rivers can be managed on a catchment basis and was formally recognised in the Scotland Act 1998. This Act made separate provision for a Border Rivers Order to be made for managing salmon, trout, freshwater fish and eels on a river basin basis for the Rivers Tweed and Esk.

93. The European eel is one of the most widespread fish species in European waters, and it is thought to comprise a single reproductive stock. The life-cycle of the eel is presented in Figure 4<sup>47</sup> below.

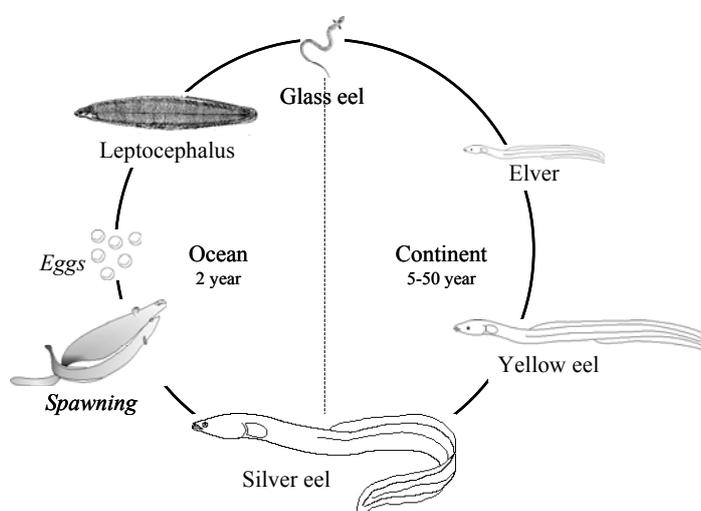


Figure 4. The life cycle of the European eel

The major life stages, as indicated in the figure above, are broken down as follows:

- Glass eel: Young, un-pigmented eel, recruiting from the sea into continental waters.
- Elver: Young eel, in its 1st year following recruitment from the ocean. The elver stage is sometimes considered to exclude the glass eel stage, but not by everyone.
- Bootlace, fingerling: Intermediate sized eels, approx. 10–25 cm in length. These terms are most often used in relation to stocking. The exact size of the eels may vary considerably.
- Yellow eel: (Brown eel) Life stage resident in continental waters. Often defined as a sedentary phase, but migration within and between rivers, and to and from coastal waters occurs. This phase encompasses the elver and bootlace stages.
- Silver eel: Migratory phase following the yellow eel phase, characterised by darkened back, silvery belly with a clearly contrasting black lateral line, enlarged eyes. Downstream migration towards the sea, and subsequently westwards. This phase mainly occurs in the second half of calendar years, though some are observed throughout winter and following spring.

<sup>47</sup> Report of the 2008 session of the Joint EIFAC/ICES Working Group on Eels. Leuven, Belgium, 3–9 September 2008

94. Eel recruitment in Europe as a whole reached a historical minimum in 2001 of 1-2% of the pre-1980 level and has not improved since then<sup>48</sup>. Owing to the uncertainty concerning the eel lifecycle it is not known what brought about this decline. However, factors including poor water quality, loss of habitat, obstructions to both upwards and downwards migration, parasites and diseases, overexploitation and poor marine survival are all thought to play a part. These factors cannot be addressed under the present legislative framework and will therefore continue to contribute to the decline of eel stocks.
95. All life stages of eel are exploited in England and Wales (Figure 5). The main fisheries for glass eel employ dip-nets<sup>49</sup> in estuaries, primarily in those rivers draining into the Bristol Channel, notably the Severn, Wye and Parrett; and also in smaller fisheries such as that in Morecambe Bay<sup>50</sup>. A proportion of eels caught by these fisheries will have to be made available for restocking (under Article 7 of the EU Eel Regulation). Other than the glass eel fisheries, there is a minimum legal landing size for eel of 300 mm in England and Wales.
96. The main fisheries for silver and yellow eels are based in lowland areas in the southern and eastern England within the Humber, Anglian, Thames and South West RBDs, with fyke<sup>51</sup> nets being the preferred method for capture; the exact dimensions and methods are already regulated by the National Eel Byelaws (2004).

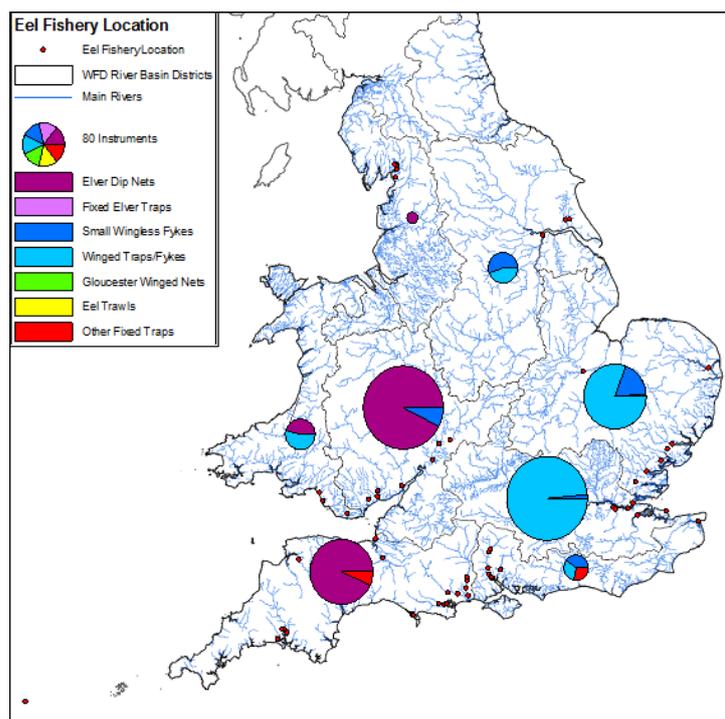


Figure 5. Location of eel fisheries in England and Wales.

<sup>48</sup> Latest ICES advice, May 2005. Available at

<http://www.ices.dk/committe/acom/comwork/report/2005/may/wgeel.pdf>

<sup>49</sup> Hand held nets consisting of a y-shaped wooden frame supporting a net, measuring up to 2m across. The netsman actively stalks fish in estuary pools or shallows at low tide.

<sup>50</sup> KNIGHTS, B., A. BARK, M. BALL, F. WILLIAMS, E. WINTER, and S. DUNN (2001). Eel and elver stocks in England and Wales – status and management options. Environmental Agency, Research and Development Technical Report W248. 294 pp.

<sup>51</sup> Fyke nets are conical nets about 5 metres in length, with a circular or D-shaped opening and funnel entrances. They are approximately 1 metre at its widest point.