National Audit Office

Briefing
for the House of Commons
Environmental Audit Committee

Environmental protection

JUNE 2014

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Summary

1 The National Audit Office has prepared this briefing in response to a request from the Environmental Audit Committee (EAC) to update our 2010 briefing on environmental protection. The briefing includes an assessment of progress in the ten areas of environmental protection covered in our 2010 report: atmospheric pollution and climate change; air pollution; biodiversity; forestry; soil; flooding and coastal protection; waste; the freshwater environment; water availability; and the marine environment. We focus here on environmental protection within England, rather than on the UK's efforts to promote and secure environmental protection abroad.

2 This briefing draws primarily on a review of relevant literature including key programme and policy documents, official targets and statistics, independent evaluations, and select committee reports.

3 Many of the environmental issues covered in this briefing represent long-term challenges. It is difficult to assess performance on environmental protection since 2010 because up-to-date performance information is not always available and indicators can be affected by natural variability from year to year masking underlying trends. Also, in the context of large scale environmental systems four years is not long, and the impact of recent changes may not yet have taken effect.

4 Our review highlights the following issues:

- The government published a Natural Environment white paper in 2011 which has set the direction for the government's approach to the natural environment in England over this parliament. In February 2014, the government reported that it had implemented two-thirds of the commitments of the white paper with many others well under way. However, it acknowledged that the white paper sets long-term ambitions and that ongoing work would be needed to address them. A key advisory body to government, the Natural Capital Committee, recognises there has been some recent progress but does not consider that it is yet on a trajectory to meet the white paper's ambition that this would be the first generation to leave the environment of England in a better state than it inherited.

- Overall, the government's approach to environmental protection has been informed by its wider objectives to encourage economic growth and streamline regulations, and constrain public sector spend and reduce the deficit. The government has established new partnerships and advisory groups with the aim of facilitating wider involvement in environmental protection, and making the most of 'green' market opportunities. The Department for Environment, Food & Rural Affairs (Defra) has identified some 336 proposals to streamline environmental, marine and agriculture regulations and expects to make the bulk of these reforms in 2014-15.

The Department has committed to maintaining existing levels of environmental protection through this reduction in regulation. The information that is available suggests total spend on environmental protection as we define it in this report has probably declined since 2010-11, though it is difficult to assess this accurately because of current limitations in the UK's environmental accounts.

- The government continues to use a narrower definition of environmental taxes than that used by the Office for National Statistics. On its own definition, the government expects to meet its commitment to increase the proportion of tax revenue from environmental taxes. The latest Office for National Statistics numbers, which include petrol and aviation duties excluded from the government's analysis, show a fall in this proportion between 2010 and 2012.

- On **climate change**, the UK overachieved on its emissions reduction targets under the Kyoto protocol for the period 2008 to 2012, but further policies will need to be implemented if the UK's domestic carbon emissions targets for 2023 to 2027 and beyond are to be met.

- The UK meets European **air quality** limit values for particulate matter and sulphur dioxide, but not for nitrogen oxides. In 2012, 21 EU member states were in breach of the nitrogen dioxide limits (although four have negotiated time extensions on compliance). In February 2014 the European Commission started legal proceedings against the UK for failing to meet limits for nitrogen dioxide.

- The government launched a new strategy for **biodiversity** in 2011 to focus conservation on whole natural systems rather than on individual species or sites. The latest biodiversity indicators show a mixed picture, with some improvements and some deterioration. For example, the extent of protected areas at land and at sea has increased, but the percentage of UK habitats of European importance in favourable or improving conservation status has deteriorated.

- The government is aiming to protect, improve and expand public and private **forests** and considers there is scope to increase cover from 10 to 12 per cent by 2060. The net rate of new tree planting will need to be double of that which is funded through Forestry Commission grants to achieve 12 per cent cover by 2060. The government does not maintain clear numbers on deforestation.

- Over half of the carbon stored in the UK's **soil** is stored in peatlands. The condition of upland peat in areas of Sites of Special Scientific Interest in England is now largely classed as 'recovering'. There are limited plans for the restoration of other upland peat sites.

- The Environment Agency increased the number of homes protected from **flooding** by some 104,100 over 2011-12 and 2012-13. The government estimates that as at December 2013, 2.4 million properties were at risk of flooding from rivers or the sea, and three million properties were at risk of flooding from surface water. In the winter of 2013-14, the UK suffered widespread and persistent flooding and although over 7,000 properties were flooded, in around 1.3 million instances properties were protected by the Environment Agency and local defences.

- The UK has met its 2010 target under the EU Landfill Directive for the amount of biodegradable municipal **waste** sent to landfill, and the government expects to meet the 2013 and 2020 targets. However, it is not on track to meet the EU target of 50 per cent of household waste recycled or prepared for reuse by 2020. It also currently cannot demonstrate progress against an EU target to recover a minimum of 70 per cent of construction and demolition waste by 2020, although it is in the process of compiling the data which it believes will demonstrate this progress.
- Only one quarter of the water bodies which make up the **freshwater environment** in England have good ecological status using EU classifications. There has been no significant change in this figure since 2010.
- The 2014 Water Act seeks to ensure more sustainable water resource management to improve **water availability**. Between 2011 and 2012, there was a 20 per cent increase in estimated water abstraction in England and Wales, which Defra attributes largely to increased use of hydropower.
- For the **marine** environment, the European Union has reformed the Common Fisheries Policy, through regulations which seek to ensure that legally binding fishing limits are set at sustainable levels. Recent data suggests that just less than half of fish stocks around the UK were fished sustainably in 2011, and over half were fished sustainably in the North East Atlantic in 2013. This represents a considerable improvement from 2008 when only a third of stocks were fished sustainably both around the UK and in the North East Atlantic.

Scope and structure of the report

5 The brief is structured as follows:

- Part One summarises overarching developments in the government's approach to environmental protection since 2010.
- Part Two gives more detail on changes and progress in ten areas of environmental protection: atmospheric pollution and climate change; air pollution; biodiversity; forestry; soil; flooding and coastal protection; resource efficiency and waste; the freshwater environment; water availability; and the marine environment.

Part One

Overarching changes to the government's approach to environmental protection

1.1 In this briefing we use the term 'environmental protection' to mean maintaining, or restoring natural resources such as plants, animals and fish, water, soil and the air. The UK has agreed to a wide range of global and regional agreements to protect the environment. The UK government and devolved administrations have also set national targets and ambitions. This report reviews the government's domestic environmental protection activities, but the government also has an important role in promoting environmental protection internationally. For example, the UK is responsible for less than one and a half per cent of global carbon emissions. It is therefore working internationally, both bilaterally and as part of the EU, to encourage efforts to reduce emissions and to secure a new global agreement on climate change in 2015. Such activity is beyond the scope of this report.

1.2 The following sections set out how the government's overall approach to protecting the environment in England has changed since 2010, covering the main developments in:

- strategy;
- institutions;
- expenditure;
- taxes; and
- regulation.

Strategy

1.3 In 2011, the government set out its vision for the natural environment over the next 50 years in a natural environment white paper, setting an ambition that this would be the first generation to leave the natural environment of England in a better state than it inherited. The white paper built on UK National Ecosystem Assessment, an extensive survey of the UK's environments and ecosystems, which had been initiated in response to a 2007 recommendation from the Environmental Audit Committee. The National Ecosystem assessment reviewed the services provided by the environment in the UK, such as pollination and water supply. Its conclusions included that about 30 per cent of services across different habitats were in decline, that nature was consistently undervalued in decision-making, and that a more integrated approach to ecosystem management was required.

1.4 The 2011 white paper argued that a healthy, properly functioning natural environment is the foundation of sustained economic growth, prospering communities and personal well-being. Key ambitions include:

- 'landscape scale' conservation, to join up fragmented habitats and ensure an integrated approach;
- valuing of nature, to ensure that nature is properly accounted for in decision-making; and
- engagement of business and local communities, to ensure all parts of society recognise and realise the benefits of the natural environment and play their part in conserving it.

1.5 In February 2014, the government reported that it had implemented two-thirds of the commitments of the white paper with many others well under way. However, it acknowledged that the white paper sets long-term ambitions and that ongoing work would be needed to address these. One of these commitments was to establish a Natural Capital Committee to provide independent advice to the government on the sustainable use of England's natural capital. The Natural Capital Committee, which was established in 2012, has since published two reports on the state of natural capital. In its latest report, published in March 2014, it concluded that despite recent progress in some areas, the UK is not on a trajectory to meet the government's long-term vision of being the first generation to leave the natural environment in a better state than it inherited. It argued that a range of benefits that we receive from natural assets are at high or very high risk, and improvements in urban air quality and better management of marine fisheries would be of particularly high value to society. It welcomed the recent changes to the European Common Fisheries Policy as an important step. The Committee has been set up for an initial period of three years and will be reviewed in 2014-15.

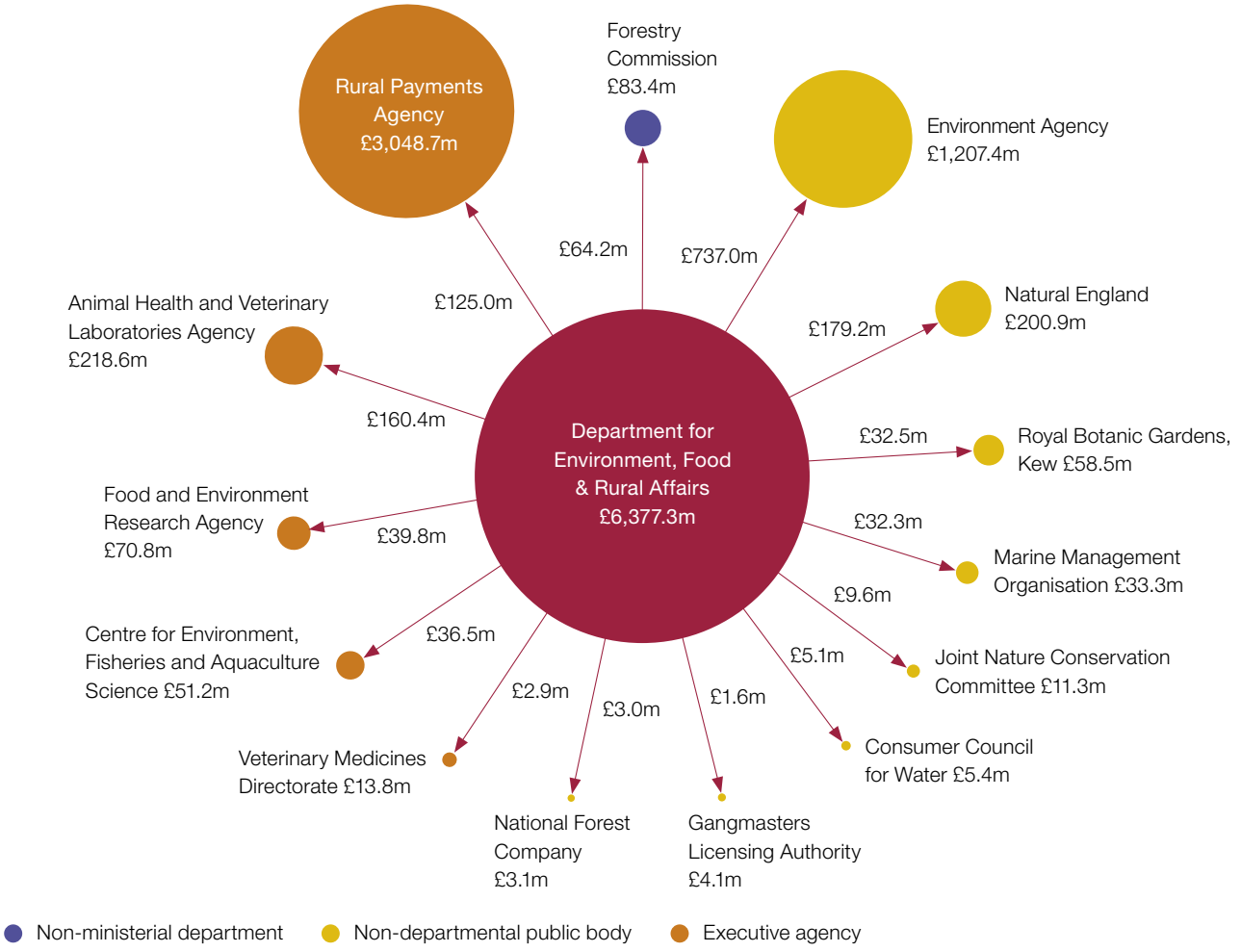
1.6 The Wildlife and Countryside Link, an umbrella organisation for environmental groups, reviewed progress against government environmental commitments and areas of action in 2013, and concluded that although some policies are delivering positive results, overall progress over the year to November 2013 had remained static. The Department for Environment, Food & Rural Affairs (Defra) has challenged the methodology used by the Wildlife and Countryside Link in this report and does not share its overall conclusions.

Institutions

1.7 Defra remains the lead department for environmental protection and funds a number of organisations with responsibilities for aspects of environmental protection, including the Environment Agency, Natural England and the Forestry Commission (**Figure 1**). The Department of Energy & Climate Change (DECC) is responsible for coordinating government efforts to mitigate climate change.

Figure 1

Where the Department for Environment, Food & Rural Affairs spent its money in 2012-13



Notes

1 Figures are in millions rounded to the nearest decimal place.

2 The £6.4 billion in the central bubble represents total gross expenditure for the departmental group. In 2012-13, the Department received some £4.07 billion of income, of which funding under the European Union Common Agricultural Policy (CAP) accounted for £3.31 billion; the departmental group's net operating cost in 2012-13 was £2.31 billion.

3 The figures next to each arrow represent funding Defra provides to each body; the figures next to each outer bubble are gross expenditure for each organisation.

4 Rural Payments Agency funding reflects its role as a competent authority for all CAP payments.

5 The Department also sponsors the Covent Garden Market Authority, Agriculture and Horticultural Development Board, and the Sea Fish Industry Authority which are not shown in the diagram as they do not receive grant-in-aid from the Department.

6 The Environment Agency funding figure excludes grant-in-aid passed on to the Agency by the Department from the Welsh government.

7 In 2012-13, the Forestry Commission received £64.2 million from Defra as shown but £7.7 million of this was not spent.

Source: Annual report and accounts of the Department for Environment, Food & Rural Affairs and its arm's-length bodies, 2012-13

1.8 As part of its wider programme of public sector reform, the government carried out a fundamental review of the functions and ways of working of the Environment Agency and Natural England. This review concluded that the two organisations should be retained as separate non-departmental bodies but recommended reforms to enable the two organisations to work together in a more seamless way to create efficiencies. A joint action plan published in December 2013 details what the bodies are doing to implement the review's conclusions. Actions proposed include developing working protocols on water quality and biodiversity issues in order to ensure that advice on planning applications is consistent and complementary; developing options for joint charging arrangements for pre-application planning advice to developers; and sharing more office space. A progress report is expected in June 2014.

1.9 The 2011 natural environment white paper prompted the establishment of new partnerships and advisory groups to help deliver its themes:

- To promote an integrated landscape approach to environmental objectives and better involve local people: the formation of a green infrastructure partnership (initially run by Defra but transferred to a non-governmental organisation in April 2014) and 48 local nature partnerships and 111 water catchment partnerships. Each seeks to bring together a range of different stakeholders, including environmental groups, planners and developers businesses, and central government, with the aim of creating a more ecologically coherent and socially valuable network of green spaces.
- To improve the valuing of nature in decision-making: the formation of the Natural Capital Committee and the Ecosystem Markets Task Force. The Natural Capital Committee was established to provide independent advice to government on the sustainable use of natural assets. The Ecosystem Markets Task Force was a business-led initiative intended to identify 'green' market opportunities which protect and improve natural capital. The task force concluded its research in a March 2013 report and expects to reconvene in spring 2014 to assess progress against its recommendations. The task force's top five priority recommendations cover: biodiversity offsetting; using farm waste to generate energy; supporting local wood fuel and local woodland management; certification and labelling; and water catchment management.

Expenditure

1.10 The government does not publish an estimate of total government spend on environmental protection as we define it in this report. Nevertheless, there are two data sources that are relevant to understanding historic trends: the expenditure of the two main departments with responsibility for environmental protection, Defra and DECC; and statistics in the UK environmental accounts. We also discuss in this section reforms planned to the European Common Agricultural Policy, as this will have important implications for future spend on environmental protection in the UK.

Defra and DECC expenditure

1.11 Budget reductions for DECC and Defra have affected programme spend and funding for non-departmental bodies with environmental protection responsibilities. Both Defra and DECC are required to make budget reductions in non-capital expenditure between 2010-11 and 2014-15, as part of resource constraints across government (**Figure 2**). DECC has an increase in its budget for capital expenditure over the same period.

Figure 2

Planned budget changes for the Department for Environment, Food & Rural Affairs and the Department of Energy & Climate Change

Defra: planned budget reductions, 2010-11 to 2014-15

£ billion	2010-11 outturn (cash)	2014-15 planned (cash)	Percentage change (cash)	Percentage change in real terms
Resource	2.367	1.907	-20%	-26%
Capital	0.568	0.498	-12%	-19%

DECC: planned budget changes, 2010-11 to 2014-15

£ billion	2010-11 outturn (cash)	2014-15 planned (cash)	Percentage change (cash)	Percentage change in real terms
Resource	1.149	1.086	-5%	-13%
Capital	2.014	2.237	+11%	+2%

Notes

1 Defra's budget shown here is that set by Parliament; it does not include, for example, funding under the European Common Agricultural Policy.

2 The percentage change in real terms is shown after accounting for inflation using the GDP deflators, available at: www.gov.uk/government/uploads/system/uploads/attachment_data/file/269879/GDP_Deflators_Qtrly_National_Accounts_December_2013_update.csv/preview

Source: National Audit Office analysis of the 2012-13 Annual Report and Accounts for the Department for Environment, Food & Rural Affairs, and for the Department of Energy & Climate Change

1.12 Funding for Defra and DECC does not represent total government spend on the ten areas of environmental protection discussed in this report. In particular, the bulk of DECC's expenditure, and the main reason for the increase in capital budget between 2010-11 and 2014-15, is funding for the Nuclear Decommissioning Authority, which is not within the scope of this briefing though it has environmental benefit. Total spend on the two departments also does not reflect projects and programmes run by other government departments, such as initiatives by the Department for Transport to reduce emissions from road traffic.

The UK Environmental Accounts

1.13 The Office for National Statistics (ONS) publishes an estimate of government expenditure on environmental protection in the UK environmental accounts. In line with UN standards for classifying government expenditure ONS defines environmental protection expenditure as spend on activities whose primary purpose is the prevention, reduction and elimination of pollution and other forms of degradation of the environment, which is a subset of the issues we cover in this report. UN standards also recommend governments collect data on spend on natural resource management, such as upkeep spend on fisheries and water resources, but the UK does not yet report this data.

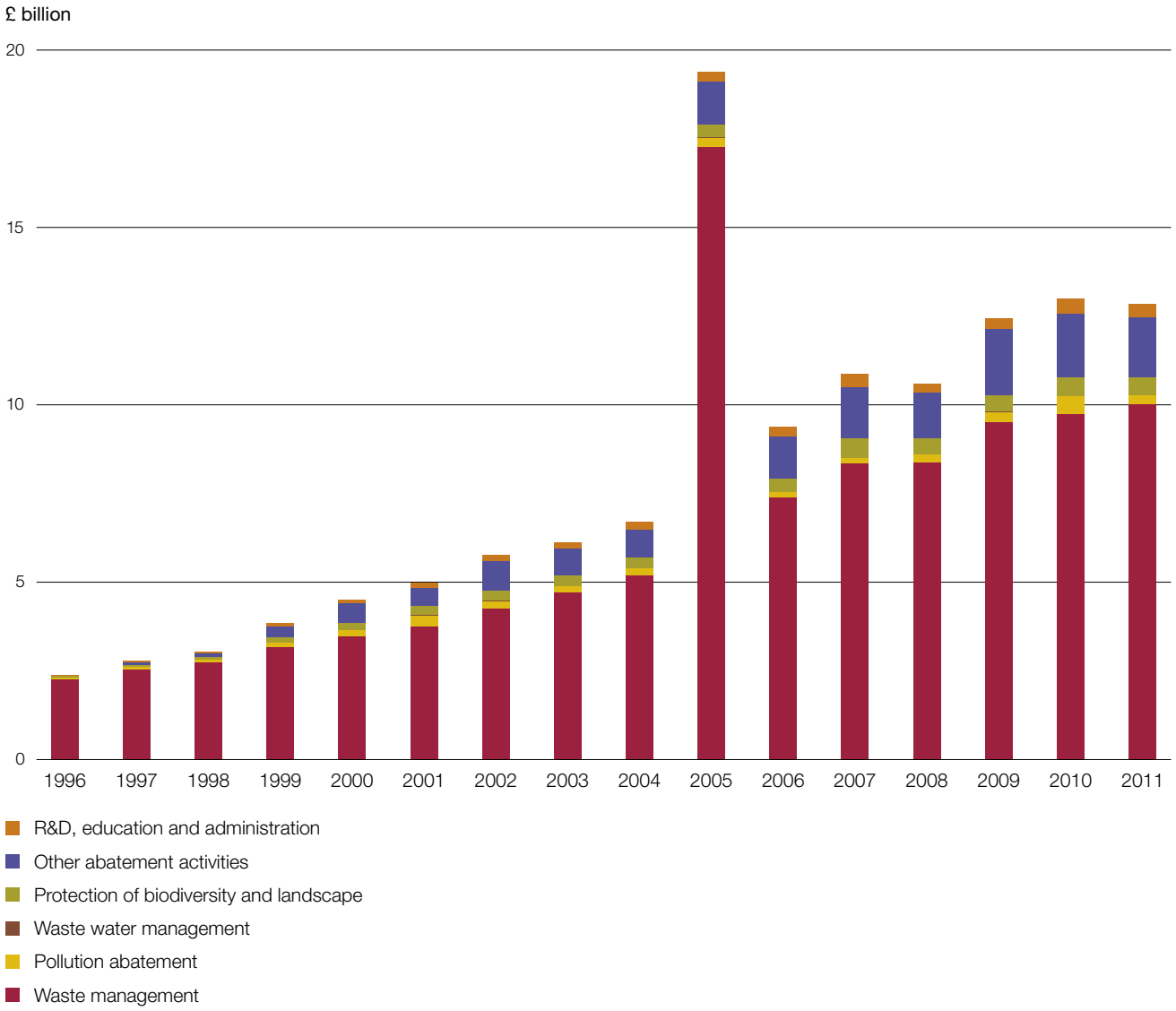
1.14 The ONS data for 1996 to 2011[1] shown in Figure 3 suggests that in 2011 the government spent £12.9 billion on preventing and reducing pollution and degradation of the environment (equivalent to 0.85 per cent of gross domestic product). Most of the expenditure arises from waste management, which includes for example, local authority bin collection services (**Figure 3**).

1 The latest data available is 2011; 2012 data will be included in the 2014 Environmental Accounts which ONS expects to publish in June 2014.

Figure 3

UK government environmental protection expenditure, 1996 to 2011
(in 2011 prices and in £ billion)

In 2011, the government spent £12.9 billion preventing and reducing pollution and degradation to the environment



Source: Office for National Statistics, UK Environmental Accounts 2013

1.15 ONS intends to develop these statistics by:

- Reviewing the definition of environmental protection. At present the data is based on departments identifying environmental protection spend in administrative information provided to HM Treasury, and departments may assign spend to one category only, even where an activity has multiple functions. ONS intends to review the data to capture spend with multiple objectives, such as that on agri-environment schemes funded through the European Common Agricultural Policy.
- Analysing trends in order to be able to provide full and frank commentary on the dataset and investigate potential anomalies. For example, ONS considers the sharp increase in 2005 was due to the decommissioning of British Nuclear Fuels, but as decommissioning takes place over a number of years it is not clear why this led to such a spike in a single year.

Annual reporting to the European statistics organisation Eurostat will become mandatory from 2017, and these amendments are intended to help ensure the UK is fully compliant with Eurostat's requirements.

Common Agricultural Policy reform

1.16 In December 2013, EU member states approved new regulations for the Common Agricultural Policy (CAP), to be implemented in 2015, with important implications for spend on environmental protection measures on agricultural land. Farming practices can have significant implications for environmental protection as they affect the quality of habitats for a number of wild species, and impact on soil, water and air quality. Agricultural land represents some 70 per cent of land in the UK.[2] The CAP is a system of agricultural subsidies and programmes which includes environmental measures. The overall budget for the CAP has fallen, but it nevertheless represents £15 billion of available funding in England over the seven years from 2015.

1.17 From 2015, 30 per cent of direct payments to farmers under the CAP will be dependent on farmers meeting environmental criteria. These criteria are less rigorous than originally proposed, and cover crop diversification, designating permanent grassland areas on sites covered by the Birds or Habitats Directives, and maintaining 'ecological focus areas' within farmland. The UK has yet to decide on some of the details of how it will implement the new regulations, such as what should constitute an ecological focus area, and expects to publish further guidance in summer 2014.

2 At June 2012, the Utilised Agricultural Area (UAA) in the UK was 17.2 million hectares, 70 per cent of the UK land area. The UAA is made up of arable and horticultural crops, uncropped arable land, common rough grazing, temporary and permanent grassland and land used for outdoor pigs.

1.18 The government has also committed to transfer 12 per cent of the budget for farmers' direct payments in England to rural development schemes, with the option of increasing this to 15 per cent following a review in 2016 (15 per cent is the maximum transfer permitted under the CAP reforms). The government anticipates that the main rural development scheme in England will be a new environmental land management scheme which will bring together and build on three pre-existing agri-environment schemes: the Environmental Stewardship; the England Woodland Grant Scheme; and Catchment Sensitive Farming. The new scheme would focus on projects with multiple potential benefits, such as benefits for biodiversity, water quality and flood risk. The government anticipates a budget of £3.1 billion for the environmental land management scheme for the period 2014–2020, representing the bulk of spending on rural development schemes in England.

Taxes

1.19 In May 2010, the government committed to increase the proportion of tax revenue from environmental taxes. The Office for National Statistics defines an environmental tax as any tax whose tax base is a physical unit (or a proxy of a physical unit) of something that has a proven, specific negative impact on the environment. This is in line with European standards for environmental statistics. Under this definition, environmental taxes made up 8.1 per cent of total taxes and social contributions in 2012, the same proportion as in 2011, and a fall from 8.3 per cent in 2010.

1.20 In 2012, the government published its definition of environmental taxes, which it defines according to the following principles:

- the tax is explicitly linked to the government's environmental objectives;
- the primary objective of the tax is to encourage environmentally positive behaviour change; and
- the tax is structured in relation to environmental objectives (for example, the more polluting the behaviour, the greater the tax levied).

The government therefore defines six taxes as environmental taxes: the climate change levy; the carbon price floor; the carbon reduction commitment; the aggregates levy; the landfill tax; and the EU emissions trading scheme. These together represented 0.4 per cent of tax take in 2010-11 and 2011-12 and are anticipated to increase to 0.6 per cent in 2013-14 and to 0.7 per cent by 2015-16.

1.21 The main difference between the ONS definition and the government's definition of an environmental tax is that the government does not include petrol and aviation duties. It excludes these currently on the basis that these are primarily designed to raise revenue or to achieve other objectives, The Environmental Audit Committee has criticised the government's definition of environmental taxes and favours ONS's definition. The Committee has argued that the effect of a tax is more important than why it was introduced and therefore considers that motoring taxes and air passenger duty should be included.

Regulations

1.22 Defra has had responsibility for streamlining environmental regulations, as part of the government's 'red tape challenge'. It has also taken the lead on reviewing regulations in the marine and water, and agricultural sectors. It has identified a total of 336 proposals for reform, which it expects will reduce compliance costs for business by £300 million per year from April 2015. As at April 2014, some 20 per cent of Defra's commitments for reform had been implemented. The Department has committed to implement 75 per cent of the reforms by April 2015.

1.23 Planning policies and regulations have implications for a range of environmental protection issues, as they govern the circumstances in which development is permitted and any conditions that may be attached. In 2012, the government published the National Planning Policy Framework, which sought to consolidate over 1,000 pages of national planning policy into one document. This framework introduced a presumption in favour of sustainable development, with the aim of ensuring that development is not held up unless it would be against the collective interest to do so. The Environmental Audit Committee raised concerns that this presumption could lead to too great an emphasis on economic growth at the expense of environmental objectives. In launching the framework the Minister for Decentralisation and Cities Greg Clarke accepted 30 of the Environmental Audit Committee's 35 recommendations in whole or in part, and explicitly stated that policies protecting the green belt, Sites of Special Scientific Interest and national parks could not be over-ridden by the presumption.

Part Two

Key issues facing the main areas of environmental protection

2.1 This part of the briefing summarises the key issues in relation to environmental protection. The ten areas covered are:

- atmospheric pollution and climate change;
- air pollution;
- biodiversity;
- forestry;
- soil;
- flooding and coastal protection;
- resource efficiency and waste;
- the freshwater environment;
- water availability; and
- the marine environment.

Atmospheric pollution and climate change

The issue

2.2 The Intergovernmental Panel on Climate Change considers that it is between 95 and 100 per cent probable that the main cause of global warming between 1951 and 2010 was human-induced greenhouse gas emissions, and that continued emissions of greenhouse gases will cause further global warming and climate change. The UK is committed, under the Climate Change Act 2008, to setting reducing five-year 'carbon budgets' leading to a reduction in carbon emissions of at least 34 per cent by 2020, 50 per cent by 2025, and at least 80 per cent by 2050 compared to a 1990 baseline.

Developments in the government's approach since 2010

2.3 The government published a 'Carbon Plan' in December 2011, setting out its proposals and policies to meet the carbon budgets. The plan lists carbon reduction policies, their expected emissions savings, and scenarios for how the fourth carbon budget (covering the period 2023 to 2027) could be met. The introduction of this plan marked a change in accountability arrangements, with government departments no longer responsible for a proportion of carbon budgets, but instead accountable for the delivery of individual policies.

2.4 Carbon-saving policies introduced since 2010 include:

- '**Electricity Market Reform**' (EMR). The Energy Act 2013 provides for measures designed to attract investment in low-carbon electricity generation, including contracts for difference – long-term contracts for low-carbon generation. The first set of contracts for difference are pending EU state aid approval.
- The '**Renewable Heat Incentive**' (RHI). A system of fixed tariff payments for the generation of heat from renewable energy sources. The non-domestic scheme started in 2011 but the domestic scheme was delayed until introduced in 2014.
- The **Green Deal.** Launched in January 2013, is a new financing framework to support energy efficiency improvements. The connected **Energy Company Obligation** creates a legal obligation on energy suppliers to improve the energy efficiency of homes; the government is consulting on proposals to revise the timetable and targets for this.
- The **carbon price floor.** A tax introduced in April 2013 which sets a minimum price that electricity generators have to pay to burn fossil fuels, designed to 'top up' the price of carbon under the EU emissions trading scheme. In the March 2014 budget, the government announced a reform of the carbon price floor, effectively freezing the minimum carbon price until 2019-20 at around 2015-16 levels.

Performance

2.5 The UK overachieved on its emissions reduction targets under the Kyoto protocol over 2008 to 2012, reducing emissions by 22.5 per cent against the baseline, compared with a target 12.5 per cent reduction. It has also met the first carbon budget which

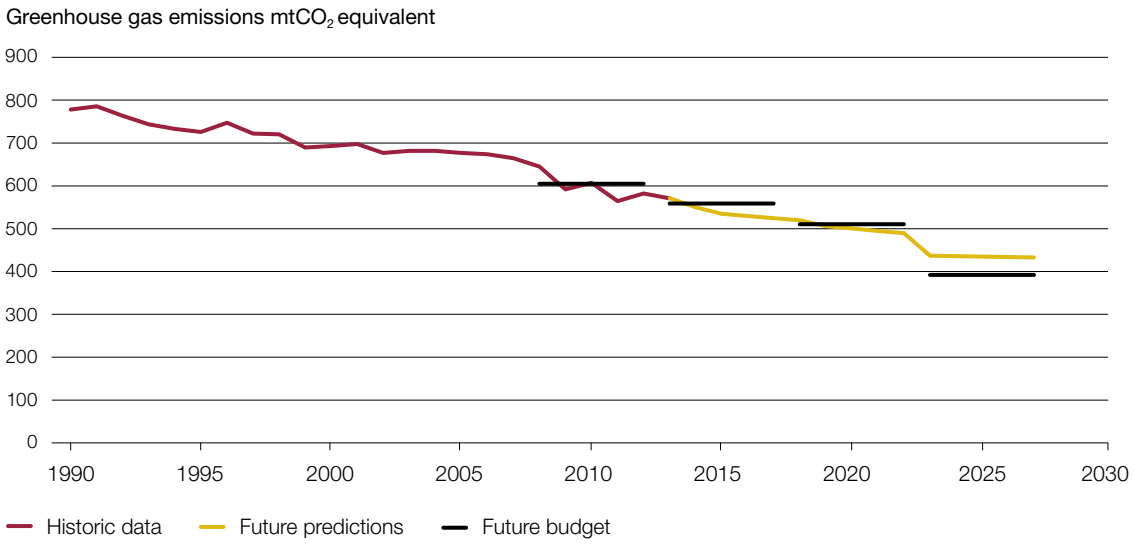
covers the same period. The Committee on Climate Change has warned that the pace of emissions reductions will need to increase markedly to meet the third and fourth carbon budgets. In its 2013 annual progress report, the Committee reported that the UK had made good progress on household energy efficiency, investment in renewable power generation, new car efficiency and waste emissions reduction. However, progress was very limited on solid wall insulation, low-carbon heat and energy efficiency improvement in non-residential and commercial buildings, partly as a result of low uptake of the Renewable Heat Incentive and Green Deal schemes. In 2012, the UK generated some 4 per cent of energy from renewables, against an EU target for the UK of 15 per cent by 2020. **Figure 4** shows that the government expects to meet the third carbon budget, but further policies will be needed to meet the fourth.

Future issues

2.6 The government is reviewing the fourth carbon budget in 2014 to assess the alignment between the traded sector of the budget and the EU Emissions Trading Scheme. The Committee on Climate Change has advised that there has been no change in circumstances that would justify a lowering of ambition.

Figure 4
Actual and projected UK greenhouse gas emissions

UK greenhouse gas emissions (actual and predictions, 1990 to 2027). The government expects to meet the first three carbon budgets, but further carbon-saving policies will have to be adopted to meet the fourth



Notes

1 Figures shown include the UK's share of emissions traded under the EU Emissions Trading Scheme.

2 Figures shown are emissions generated within the UK. The government also estimates the UK's carbon footprint, which takes account of the emissions embedded in the goods and services that the UK imports and exports. On this basis total greenhouse gas emissions are estimated to have been some 870 $mtCO_2e$ in 2011, around half as much again as UK generated emissions in that year. Total greenhouse gas emissions on a consumption basis are classed as experimental statistics because of inherent uncertainties in the data.

Source: National Audit Office analysis of Department of Energy & Climate Change data

Air pollution

The issue

2.7 Air quality can affect health and quality of life, with air pollution linked to the incidence of stroke, heart disease, lung cancer, and respiratory diseases, including asthma. Air pollution also affects ecosystems, leading to acid rain and nitrogen pollution (eutrophication). Road traffic is a significant source of airborne pollutants. The Department for Transport forecasts that the volume of road traffic could increase by some 43 per cent by 2040 compared with 2010 levels, but expects air pollution from traffic to decline substantially over the same period as a result of more effective European emission standards for new vehicles and the uptake of ultra low emission vehicles. Other sources of air pollution include the burning of coal and heavy oil in power stations and refineries, shipping, domestic coal use, agriculture and quarrying.

Key developments in the government's approach since 2010

2.8 In 2011, Defra and the devolved administrations published updated air quality plans for the achievement of European nitrogen dioxide limits. These plans included 90 UK and national measures that had been introduced since the limits were agreed in 1999, or were expected to be implemented shortly, and which were expected to help reduce nitrogen dioxide pollution. The measures included grants to encourage a shift to transport by rail and ship rather than by road (known as 'modal shift'), and further electrification of the rail network.

2.9 The government is supporting development of the market in ultra low emission vehicles. It has established an Office for Low Emission Vehicles to take this forward, and in September 2013 launched a new strategy. This aims for a UK car fleet with zero tail-pipe emissions by 2050 and proposed funding of £900 million to 2020 and over £1 billion to 2023 jointly with industry for an Advanced Propulsion Centre.

Performance since 2010

2.10 Emissions of a number of airborne pollutants, including nitrogen oxides, remained fairly steady between 2010 and 2012, the latest year for which data is available, but have declined over the long term, with the greatest reductions taking place in the 1990s (**Figure 5**). The UK meets European limit values for particulate matter and sulphur dioxide, but not for nitrogen oxides. In some UK zones, target values were also exceeded for nickel and benzo[a]pyrene and for the long-term ozone objectives for human health and vegetation.

2.11 With regard to nitrogen dioxide (arising mainly from diesel engines), the UK did not meet the 2010 targets set out by the EU Ambient Air Quality Directive in 40 out of 43 zones. In June 2011, the government applied for time extensions for 24 of the 40 zones. For the other 16 zones, including Greater London, the government concluded that it would be impossible to demonstrate full compliance with the limits by 2015. In May 2013, the Supreme Court ruled that the UK is in breach of its obligations

to comply with the EU nitrogen dioxide limits, and in February 2014 the European Commission launched legal proceedings against the UK for failing to meet these limits. The Commission may also take action against other member states failing the nitrogen dioxide limits (21 were in breach in 2012 although four had time extensions).

2.12 The Environmental Audit Committee criticised government progress in tackling air pollution in a 2011 report, arguing that a step change in approach was needed and had not yet happened. It concluded that air quality targets would never be met without a significant shift in transport policy, and that local authorities needed the information and power to do more to improve local air quality. In May 2014, the Committee announced it would re-examine action on air quality in a forthcoming inquiry.

Future issues

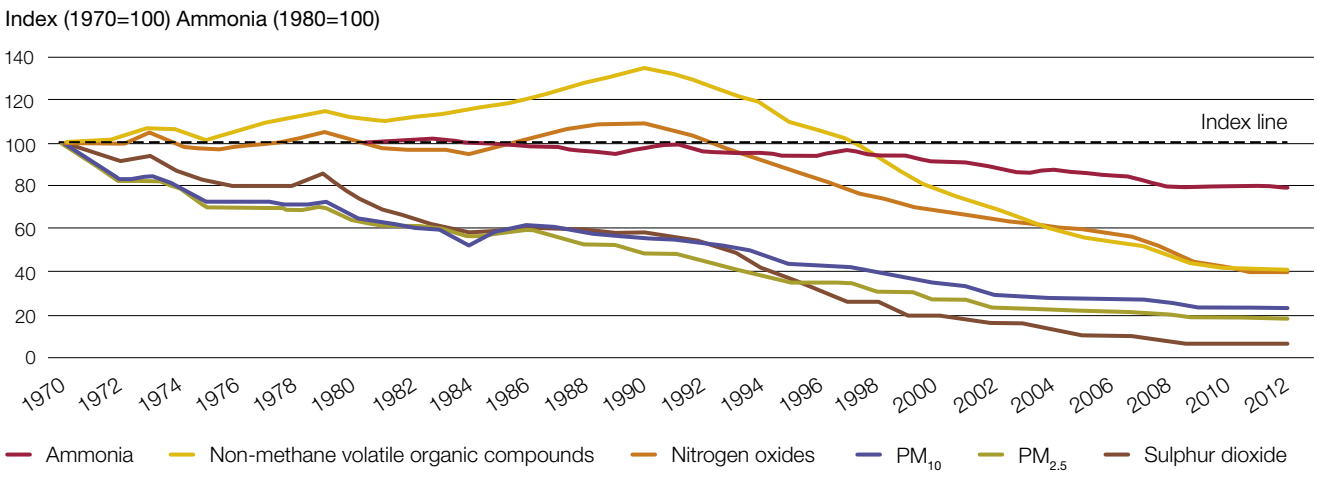
2.13 In December 2013, the EU proposed a new 'clean air policy package'. This would set emission limits for key pollutants in 2020 and 2030 and new legislation to reduce pollution from medium-sized combustion installations, such as those that supply large buildings or small industry premises. It would also set new obligations regarding the monitoring of black carbon, with a view to paving the way for possible future emission ceilings for this component of particulate matter that contributes to climate change by scattering solar radiation. It estimates that if the package were implemented in full, it would halve the number of premature deaths in the EU due to particulate matter and ozone, compared to 2005 levels.

2.14 As part of the government's Red Tape Challenge, Defra are reviewing the Clean Air Act and associated instruments, with the aim of streamlining and updating the legislation. The Clean Air Act 1993 regulates and prohibits particular emissions such as dark smoke emissions, as well as regulating chimney heights.

Figure 5

Trends in UK sulphur dioxide, nitrogen oxides, non-methane volatile organic compounds, ammonia and particulate matter (PM_{10} $PM_{2.5}$) emissions, 1970 to 2012

Emissions of a number of airborne pollutants have declined over the long term



Source: Defra National Statistics Release: Emissions of air pollutants in the UK, 1970 to 2012

Biodiversity

The issue

2.15 Biodiversity is the variety of plant and animal life found on earth. It is integral to the ecosystem services that nature provides to society, such as the value of pollination to agriculture, and it provides the source of a range of goods that we consume or use, including timber.[3] The main pressures facing biodiversity in the UK: are habitat loss and degradation; environmental pollution; invasion by non-native species; and climate change.

Key developments in the government's approach since 2010

2.16 Following the June 2011 white paper on the natural environment, in August 2011 Defra published *Biodiversity 2020: a strategy for England's wildlife and ecosystem services*. This seeks to radically change the government's approach in order to focus conservation on whole natural systems rather than individual species or sites. As part of this strategy the government established 12 nature improvement areas in 2012, intended to form a bigger and more connected network of sites for wildlife. It also published a new set of 24 'biodiversity 2020 indicators' in 2012, which comprised 49 individually assessed measures. In October 2013, Defra published the first assessment of progress against these measures.

Performance since 2010

2.17 The 2013 assessment concluded that there have been improvements against 13 measures of biodiversity over the latest five years for which there is data available, while 13 measures have deteriorated over the same period. Eleven measures showed little or no overall change. (The indicators for nine measures are in development so were not assessed. A further three had insufficient data.)

2.18 However, there is no 2012 or 2013 data for a number of these measures, and five rely on data from 2007 and earlier, making it difficult to assess recent trends. Those measures for which there is 2013 data show a mixed picture of performance (**Figure 6**).

Future issues

2.19 The government intends to review its approach to biodiversity offsetting in light of the results of six pilots which finished at the end of March 2014, and following an Environmental Audit Committee review published in November 2013. Biodiversity offsets are conservation activities elsewhere designed to compensate for losses at sites which are being developed.

3 This section deals solely with terrestrial biodiversity. Marine biodiversity is covered in paragraphs 2.61 to 2.68.

Figure 6
Selected UK biodiversity performance measures

Biodiversity indicators show a mixed picture of performance between 2008 and 2013

Indicator	2008–2013
Extent of protected areas at sea	Improving
Percentage of UK species of European importance in favourable or improving conservation status	Improving
Sites of Special Scientific Interest in a favourable condition	Deteriorating
Percentage of UK habitats of European importance in favourable or improving conservation status	Deteriorating
Public sector expenditure on biodiversity	Deteriorating
Proportion of population visiting the natural environment several times a week	Little or no change
Extent of protected areas on land	Little or no change
Percentage of woodland certified as sustainably managed	Little or no change

Source: Department for Environment, Food & Rural Affairs, Biodiversity indicators 2020: 2013 assessment, October 2013

2.20 The Environmental Audit Committee has recommended that the government implement new legal powers to tackle invasive non-native plants and animals. The European Parliament approved new legislation to stem the spread of invasive species in April 2014 which will ban the possession, transport, selling or growing of species which are deemed to be of concern. The government expects to publish its response to the Committee's report before the 2014 Parliamentary summer recess.

Forestry

The issue

2.21 Woodlands provide environmental, social and economic benefits. They support complex ecosystems, helping to protect biodiversity; they absorb and filter water, helping to prevent flooding and maintain water quality; and they capture and store carbon, helping to mitigate climate change. They have recreational and aesthetic value and managed woodlands support the construction, furniture, paper and biomass industries. Woodlands are under pressure from climate change and a growing threat from new pests and diseases, as well as encroaching development and unsustainable management.

Key developments in the government's approach since 2010

2.22 The government set out its vision for the future of England's forests in January 2013 in its Forestry and Woodlands Policy Statement. The statement sets priorities for future policy implementation, focused on protecting, improving and expanding public and private woodland. It also covers the future of the Public Forest Estate (the 16 per cent of England's woodland managed by the Forestry Commission), which the government says is to be held in trust for the nation under a legally established operationally independent management body.

Performance since 2010

2.23 *Protection of existing woodland*. Plant health is one of Defra's top priorities. The Tree Health and Plant Biosecurity Expert Taskforce was established in November 2012 and published its final report in May 2013 on how tree and plant threats could be mitigated. Defra has accepted all the recommendations and has produced a prioritised plant health risk register, undertaken work on contingency planning, and appointed a senior level chief plant health officer. In April 2014, the government published a plant biosecurity strategy, which sets out a new approach to protecting plants, and a tree health management plan.

2.24 *Woodland quality*. As at March 2014, 55 per cent of England's woodlands were managed under the 'UK Forestry Standard', which sets good practice guidelines for sustainable forest management intended to lead to improvements such as: better flood risk management; safeguarding of clean water supplies; conservation and enhancement of biodiversity; and production of sustainable timber. The percentage of English woodlands meeting the forestry standard has increased slightly from 52 per cent in April 2011 to 55 per cent as at March 2014, though some of this increase is due to more comprehensive reporting. The government's ambition is for two-thirds of all woodland in England to meet this standard by 2018, rising eventually to 80 per cent if markets develop.[4] This will require a significant acceleration in the shift to active management.

4 As outlined in January 2013 in its Forestry and Woodlands Policy Statement.

2.25 *Woodland cover.* Woodland cover in England reached 10 per cent in 2013, the highest level in over 600 years. In its 2013 Forestry and Woodlands Policy Statement the government states that there is scope for woodland cover in England to increase from 10 to 12 per cent by 2060.

2.26 The creation of new woodland in England through grant aid administrated by the Forestry Commission has been around 2,500 hectares annually since 2008 (**Figure 7**). In addition some new woodland is created without grant aid. The National Forest Inventory, which shows net woodland change, shows strong growth in overall forest cover in England since 2010. Felling licenses (issued under the Forestry Commissioners' powers to control tree felling) are, in almost all cases, conditional on restocking taking place. However, removal of woodland for development authorised by planning permission does not require a felling license, and the government does not maintain clear numbers on this type of deforestation. The government has not set targets for new tree planting, with the 2011 Carbon Plan, for example, making only a general commitment to 'support for woodland creation'.

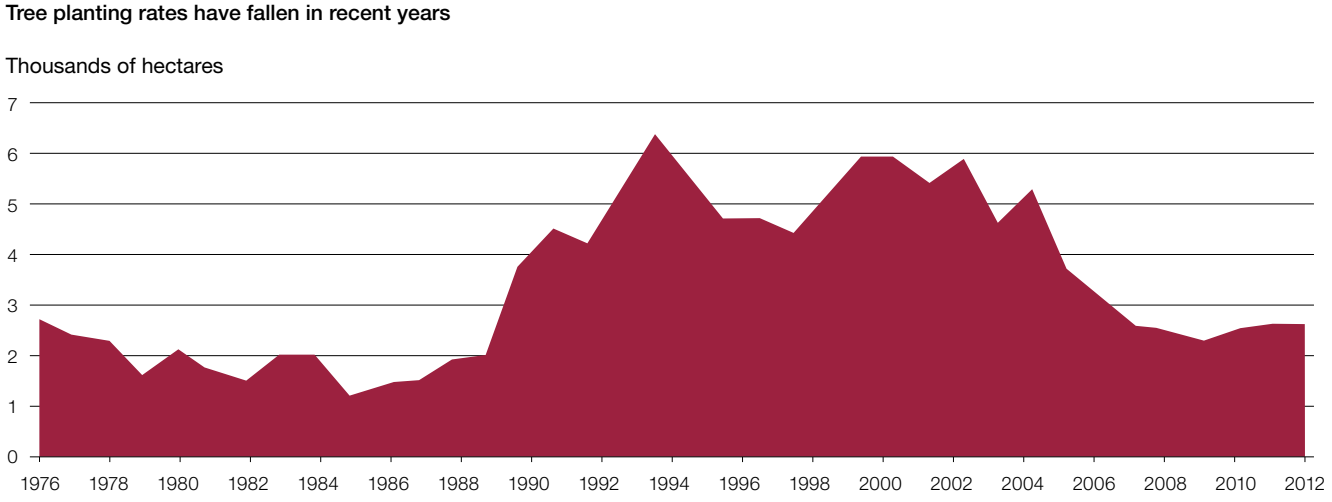
Future issues

2.27 The Forestry Commission and Defra reported on forestry functions in July 2013. In January 2014, ministers decided that the government's key forestry functions will continue to be delivered by the Forestry Commission with enhanced working arrangements between Defra and the Commission to strengthen integration between policy and delivery.

2.28 The future of the Rural Development Programme in England, which has provided significant EU and national funding for forestry, is subject to agreement with the European Commission. The government anticipates that from 2015 the new Rural Development Programme in England will seek to further fund the creation and maintenance of woodland and help improve forest productivity.

Figure 7

New Forestry Commission grant-aided planting in England (gross hectares of woodland created)



Source: Forestry Commission

Soil

The issue

2.29 Maintaining good quality soil is essential for: food production; carbon storage; water filtration and flood management; and for supporting biodiversity and wildlife. Intensive agriculture, ongoing and industrial-legacy pollution and urban development can degrade soil quality, for example through compaction, erosion or contamination. A 2011 study by Cranfield University, sponsored by Defra, suggested the total annual costs of soil degradation in England and Wales could be much higher than previous estimates once the costs of carbon emissions from degraded soils are included, at £1.2 billion a year.

Developments in the government's approach since 2010

2.30 In 2011, Defra set an ambition that by 2030 England's soils would be managed sustainably, including stopping the horticultural use of peat by 2030. It committed to an additional new programme of soil research between 2011 and 2015, of which five projects are under way, with two due to publish in 2014 (covering soil compaction in grasslands; and waterlogging of agricultural soils in England and Wales) and three in 2016 (lowland peatland systems in England and Wales; impacts from a loss of soil depth; and scaling up the benefits of soil protection from the field to the landscape scale). This programme of research has a budget of £3.2 million.

2.31 As part of the government's drive to eliminate unnecessary regulations, the Prime Minister's Business Taskforce on EU regulation recommended to national governments and EU leaders that the European Commission should withdraw its proposed Soil Framework Directive. The directive has been pending for eight years as a result of a blocking minority which includes the UK. The Taskforce's October 2013 report argued that the proposal would duplicate existing requirements under the Common Agricultural Policy and could impose costs on individual farmers of £4,000 a year without any additional benefits for soil protection. The directive was formally withdrawn by the Commission in May 2014.

Performance since 2010

2.32 There have been improvements to the health of upland peatlands in England in the ten years to 2013, although the overall level of degradation is still very high. The UK's peatlands play a particularly important role in storing carbon dioxide, with some estimates saying that they account for over half of the 10 billion tonnes of carbon stored in UK soil (a far greater amount than the 150 million tonnes stored in woodlands). In 2013, the Committee on Climate Change reported that 12 per cent of the Sites of Special Scientific Interest (SSSI) in upland areas in England associated with deep levels of peat were in a favourable[5] condition in 2013, a fall from 16 per cent in 2003 (**Figure 8**).

5 A favourable condition indicates that site meets the agreed standards for the ecological features for which it was designated. For upland areas associated with deep peat (upland blanket bog) SSSIs the main ecological features for designation are mosses that actively form peat and hence capture and store carbon.

At the same time, there had been a noticeable increase in the proportion of these SSSI sites undergoing restoration, with the proportion classed as 'unfavourable but recovering' increasing from 16 per cent in 2003 to 85 per cent in 2013. However, for the two-thirds of upland peat in England and Wales not designated as SSSI, the Committee found limited evidence of plans for restoration. Lowland peatlands account for about half of all England's peat and are under pressure due to intensive farming practices. There are particular problems in the East Anglian Fens, where recent estimates suggest that the fertile peat topsoil could largely disappear within a few decades.

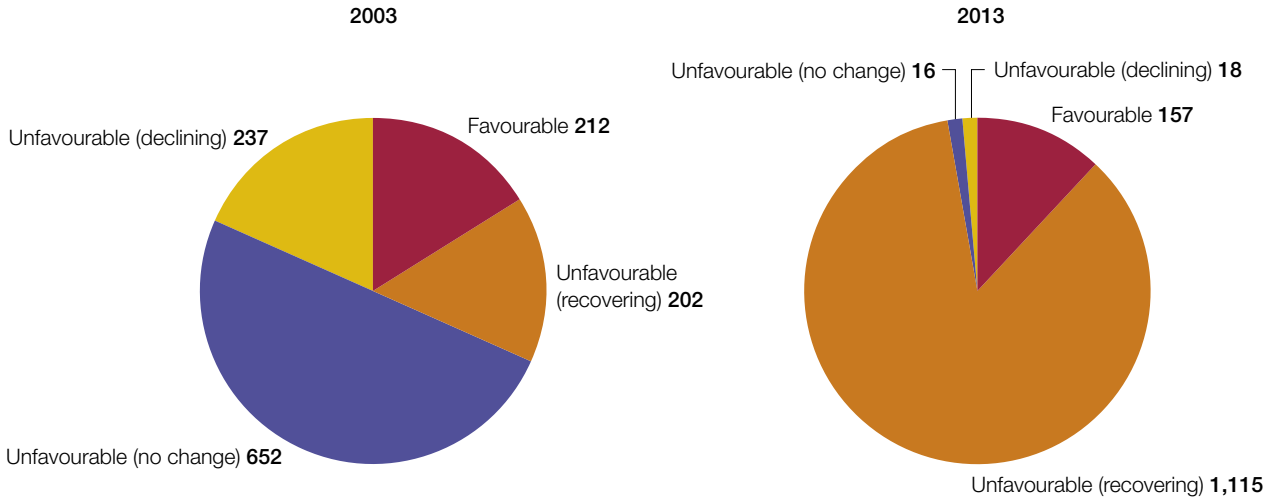
2.33 Sales of peat for horticultural use in the UK fell between 2011 and 2012. In 2012, 2.2 million cubic metres of peat (800,000 of which was UK cut) was sold in the UK compared to 2.8 million in 2011 (1.1 million of which was UK cut).

Future issues

2.34 Defra is phasing out its funding for clean-up of contaminated land. A survey of activities on contaminated land by local authorities is due to be published in 2014, to follow up a previous survey published in 2007.

Figure 8

The condition of Sites of Special Scientific Interest in England in upland areas associated with deep levels of peat, between 2003 and 2013 (km^2)



Source: Committee on Climate Change

Flooding and coastal protection

The issue

2.35 Flooding causes damage to property, infrastructure and agricultural land, impacts on people's health and safety and causes disruption to daily life. Coastal erosion can cause permanent loss of property and infrastructure. Some five million properties in England are at risk from flooding. Climate change is expected to increase the risk of river and coastal flooding in the UK as a result of sea level rise and increased rainfall intensity. The government has estimated that the annual cost of damage to properties from flooding in England and Wales could rise from £1.2 billion in 2012 to between £2.1 billion and £12 billion by the 2080s if no adaptation action is taken, and as a result of population growth.

Developments in the government's approach since 2010

2.36 The government published its first *National flood and coastal erosion risk management strategy for England* in 2011. This sets out a framework to be used by stakeholders including councils, water and sewerage companies and highway authorities to understand and manage the risk of flooding and coastal erosion.

2.37 In April 2012, the government introduced a new approach to funding flood defence with the aim of increasing overall investment in flood risk management and encouraging greater local input. The reforms made government money available towards any eligible scheme instead of funding the full costs of a limited number of projects as before. The scale of central grants available depends on a scheme's anticipated benefits, such as the number of houses protected. Over time this may lead to the Environment Agency part-funding projects with lower benefit–cost ratios than on average it would have previously supported, but the Agency expects its approach to deliver better value for money in the longer term, by incentivising greater local contributions and so increasing the total amount of flood risk works undertaken.

Performance since 2010

2.38 The Environment Agency estimates that as at December 2013, 2.4 million properties were at risk of flooding from rivers or the sea, and three million properties were at risk of flooding from surface water. These numbers include some properties at risk of both and as a result it is not yet clear how the total number of properties at risk has changed since the last equivalent assessment for 2009. The Environment Agency is in the process of preparing a detailed combined risk assessment and expects to report on this by 2017. The Environment Agency is on track against its key performance indicators for flood management, reporting in 2013 that it had: maintained 98 per cent of flood and coastal risk management assets at or above the required condition; increased to 62 per cent the proportion of properties at high risk of flooding that can receive direct warnings from the Environment Agency; and increased the number of homes protected from flooding by 104,100 over 2011-12 and 2012-13. In the winter of 2013-14, the UK suffered widespread and persistent floods with around 7,000 properties affected, although in around 1.3 million

instances properties were protected from flooding by the Environment Agency and local defences. The Agency's target for additional homes protected from flooding is less than what was achieved under the previous spending review period (**Figure 9**) though the Agency considers it is more stretching as the 'quick wins' have already been completed.

2.39 In 2012, the Committee on Climate Change raised concerns about the level of development in areas at risk of flooding. The government considers that stronger national planning policy on avoiding development in flood risk areas and managing any residual risks published in December 2006, and taken forward in the National Planning Policy Framework (March 2012) should be tackling the problem. The number of new homes built in areas of flood risk has declined, with 13,700 new homes built in areas of flood risk in 2009 and 7,900 in 2011. This will at least in part reflect overall reductions in housebuilding over this period.

Future issues

2.40 The Committee on Climate Change has argued that urban areas need to be better designed to manage surface flows of water and incorporate sustainable drainage as surface water flooding in towns and cities is increasingly a result of paving over green spaces such as gardens. The Committee found that the area of hard surfacing has increased in England's towns and cities between 2001 and 2011 primarily in domestic gardens. In 2011, 48 per cent of gardens in England's towns and cities were paved over, compared to 28 per cent in 2001.

2.41 The National Audit Office is scoping a study looking at how the Environment Agency predict and respond to flood risk. This will look at the flood model, the funding model and flood defence infrastructure.

Figure 9
The Environment Agency's key performance indicators on flooding and coastal protection

	2010-11	2011-12	2012-13	2014-15 target
Additional households protected from flooding since April 2011 (cumulative)[1]	n/a[2]	43,000	104,100	165,000
Percentage of flood and coastal risk management assets at or above required condition	98.2%	98.7%	98%	–[3]
Percentage of properties at high risk of flooding able to receive direct warnings	57%	60%	62%	66%

Notes

1 The National Audit Office has reviewed the data system that underpins the measure of additional households protected from flooding as part of our review of Defra's data systems for 2012-13. We found some weaknesses which the Department was addressing.

2 In the last spending review period a total of 182,000 households were given improved flood protection against a target of 145,000.

3 This target is being revised while the Environment Agency consider the implications of the 2013-14 flood events on its assets and future investment programme.

Source: Environment Agency Annual Reports and Accounts and Corporate Plan 2014–2016

Resource efficiency and waste

The issue

2.42 Waste represents a cost to the UK economy and the disposal and treatment of waste has environmental impacts. Some 3.7 per cent of the UK's greenhouse gas emissions came from the waste sector in 2012, mostly methane emissions from decomposing organic waste. It is estimated that the no or low cost savings opportunities from greater resource efficiency (using resources in a sustainable manner while minimising impacts on the environment) for UK business could generate £23 billion a year, of which £18 billion relates directly to waste.

Developments in the government's approach since 2010

2.43 The government set out its commitment to move towards a 'zero waste economy' in its review of waste policy in England in June 2011. The government defines a zero waste economy as one where resources are fully valued, financially and environmentally. It does not consider it is practical to expect no waste at all to be generated, but instead seeks to reduce waste and increase recycling and reuse so that landfill is a last resort. The review serves as the implementation plan for waste policies for the rest of this Parliament, and has led to:

- Defra's waste prevention programme for England, published in December 2013. This aims to help people and organisations save money by encouraging businesses to build waste reduction into their business models and by promoting a culture of valuing resources through using products for longer, repairing broken items, and enabling the reuse of unwanted items by others.
- Defra's Quality Action Plan, published in February 2013. This sets out an ambition to promote high-quality recycling and to deliver recycled products of sufficient quality to meet the standards of the relevant recycling sectors.

2.44 Under the EU Landfill Directive the UK must reduce biodegradable municipal waste sent to landfill to 75 per cent (2010), 50 per cent (2013) and 35 per cent (2020) of the 1995 level. The UK met the 2010 target, and in February 2013 Defra calculated that no further waste infrastructure was needed to meet the remaining targets beyond that already in the pipeline. It therefore withdrew grant funding from four local authority waste infrastructure projects. Defra will continue to provide grant funding to 28 local authority projects. These plants treat waste and divert biodegradable municipal waste from landfill. The National Audit Office is reviewing Defra's oversight of three of these projects (Norfolk, Surrey, and Herefordshire & Worcestershire).

Performance since 2010

2.45 Total waste in the UK amounted to 2,056 kg per capita in 2010, compared to an average across the EU of 1,845 kg per capita. The main components are construction and demolition waste (around 49 per cent), commercial and industrial (24 per cent), and municipal waste collected by local authorities (13 per cent). Construction and demolition

(C&D) waste forms a significant contribution to landfill. The EU Waste Framework Directive requires member states to recover a minimum of 70 per cent of C&D waste by 2020 and to report on progress in 2013 and every three years until 2020. The latest data for C&D waste is for 2010, and is based on a 2008 survey. Defra considers that the UK is on track to meet or exceed the target. It lacks the evidence to reliably demonstrate this, but is compiling data which it believes will show that the UK is on track. The latest data for commercial and industrial waste also relates to 2010 and is based on a 2009 survey.

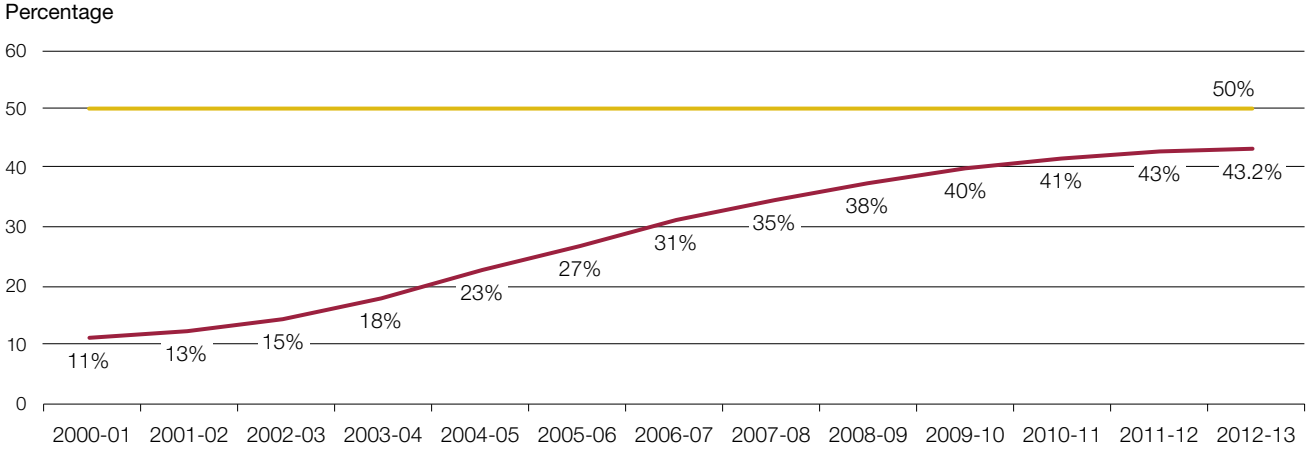
2.46 Most waste collected by local authorities is from households, and the EU Waste Framework Directive includes a target to recycle or prepare for reuse 50 per cent of household waste by 2020. Households in England generated 22.6 million tonnes of waste in 2012-13, 4.6 per cent lower than in 2010-11. However, the increase in household waste recycling rates in England has plateaued and there is a risk that the EU target will be missed (**Figure 10**). The performance of different local authorities varies widely, ranging from 12 per cent to 67 per cent. Of the 352 local authorities in England, 38 recycled less than 30 per cent of their waste while 73 recycled more than 50 per cent. The Environment, Food and Rural Affairs Committee, is conducting an inquiry into recycling and treatment of municipal waste in England.

Future issues

2.47 In November 2013, the government signalled its intention to reduce its activities on resource efficiency and waste from 2014-15, in response to pressures on public funding. From 2014, the government will focus on the areas that it considers only government can address such as setting packaging targets, producing materials recovery facilities regulations and promoting voluntary approaches to reduce food and packaging waste. It will withdraw from policy work on commercial and industrial waste, and construction and demolition waste, and energy from waste, where it says that businesses are better placed to act and have commercial opportunities to do so.

Figure 10
Household waste recycling rates in England

Household recycling rates in England since 2000 have plateaued and are below the EU's 50 per cent target



Source: Department for Environment, Food & Rural Affairs, statistics on waste managed by local authorities in England in 2012-13

The freshwater environment

The issue

2.48 The freshwater environment includes streams, rivers and lakes, as well as wetlands and floodplains. In England there are some 136,000 kilometres of rivers, over 5,700 permanent lakes and some 234,000 ponds. These provide water resources for irrigation, public domestic supply and for use by industry. The freshwater environment also helps dissipate floods, supports a range of wild fish and plants, and provides socially valued landscapes and waterscapes. The 2011 natural environment white paper sets an ambitious long-term goal of all water bodies in England to be in excellent health by 2050.

Key developments in the government's approach since 2010

2.49 The main change since 2010 has been the introduction of a catchment-based approach, where water is managed within areas defined by the flow of rainfall. The aim of this approach is to better engage key stakeholders that use water or influence land management within each catchment area, such as farmers, councils and businesses, and help them coordinate their actions to improve water quality. There are 87 catchment areas in England, including cross-border areas. Defra has specified that catchments must support River Basin Management Plans (as required under European directives).

2.50 In 2012, Defra launched a catchment restoration fund to support projects from not-for-profit groups to: restore natural features in and around watercourses; reduce the impact of man-made structures on wildlife in watercourses; and reduce the impact of diffuse pollution from rural and urban land use.

Performance since 2010

2.51 There has been little change in the ecological status of England's surface water bodies since 2010 (**Figure 11**).[6] In 2013, the Environment Agency assessed 25 per cent of surface water bodies in England as of good ecological status. It believes that its efforts to date will deliver significant improvements but does not expect that the government's ambition that 32 per cent of these water bodies will be at a good ecological status by 2015 will be met. The EU Water Framework Directive requires all water bodies to be at good ecological status by 2027 at the latest, with 'good' defined as deviating only slightly from pristine conditions, but with exemptions where gaining this status is impractical or too expensive. The UK's progress against the target is affected by the country's long history of intensive land use and diffuse pollution – unplanned and unlicensed pollution from farms, roads, houses or old mines – remains a problem. Four demonstration catchment areas are leading research into ways of tackling diffuse water pollution from agriculture.

6 Ecological status as defined in the European Union's Water Framework Directive. The directive defines biological quality (such as fish); hydro morphological quality (such as river bank structure); physical-chemical quality (such as oxygenation); and chemical quality (such as river basin specific pollutants). A water body only has 'good ecological status' if it passes all of these qualities.

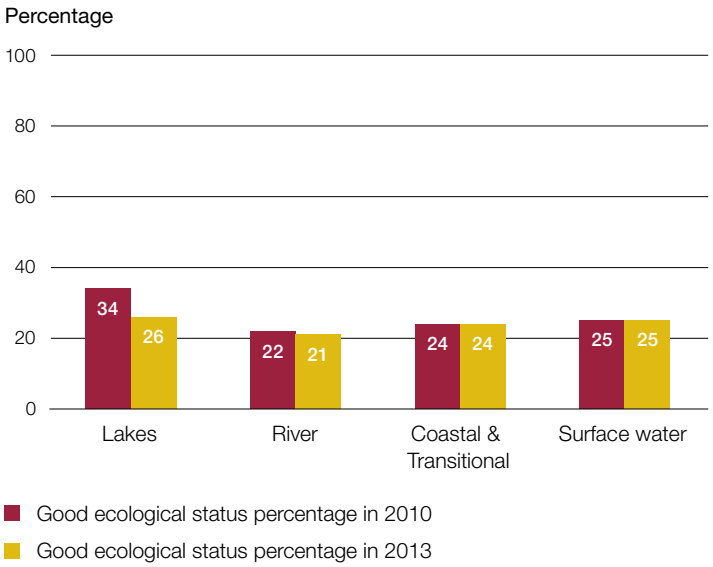
2.52 The government also does not expect to meet the Water Framework Directive requirements for groundwater. The Directive sets a requirement that all groundwaters achieve good status by 2015, unless certain exemptions apply. Good status covers measures of the amount of groundwater (see the section on water availability, paragraphs 2.54 to 2.59) and its quality, referred to as quantitative and chemical status respectively. Eighty-eight per cent of groundwater bodies in England showed good chemical status in 2013, compared with 84 per cent in 2009.

Future issues

2.53 The government will publish river basin management plans by the end of 2015 setting out the extent and nature of improvements it is seeking to the water environment up to 2021 and beyond. These will need to take account of the costs versus benefits for the various improvement options, the priorities for further investment and the relative contributions needed from stakeholders.

Figure 11

Water quality in England: percentage of water bodies in good ecological status



Note

1 The Environment Agency considers the apparent deterioration in the status of lakes is due to the introduction of a better methodology for assessment.

Source: Environment Agency

Water availability

The issue

2.54 Water resources in England and Wales are likely to come under increasing pressure as a result of a growing population and the effects of climate change. The Office for National Statistics estimates that the population of England and Wales will rise from 57 million in mid-2012 to 66 million by 2035. The impact of climate change on water availability is uncertain, but if the expected hotter weather with dryer summers, more frequent drought conditions and more extreme weather events materialise, then water stress will increase.

Developments in the government's approach since 2010

2.55 The 2011 white paper *Water for Life* set out the government's vision for more sustainable water resource management. This is being taken forward through a range of policy interventions, including: proposals for abstraction reform; guidance to water companies for the latest Water Resource Management Planning round; and the Water Act 2014. The Water Act 2014:

- reforms the water supply market to make it more open to new businesses, including small businesses such as farms, and to join up the national water supply network;
- gives Ofwat a new overarching duty to take greater account of long-term water resilience, and new powers for ministers to direct a company to plan to maintain water supplies at a specified level to cope with droughts (for example, by specifying the frequency that a company can implement hosepipe bans);
- removes the statutory right of water companies in England and Wales to compensation when an abstraction licence is revoked or varied; and
- aligns the frequency of water companies' reporting cycles for water resource management and drought planning.

Performance since 2010

2.56 The latest estimates of direct freshwater abstraction for England and Wales show an increase of 20 per cent from 2011 to 2012 mainly due to increased use for electricity supply (**Figure 12**). Defra attributes this change largely to an increase in water abstracted for hydropower. Defra expects the sector's demand for water to increase further, for example the use of water in carbon capture and storage technology would dramatically increase a power station's demand for water (although this could be tidal rather than freshwater depending on where the power station is located). A 2014 report by researchers at Newcastle University warned that water availability could pose a risk to the security of energy supplies.

2.57 The Environment Agency told us that in 2013, 33 per cent of the areas they assessed had no water available for abstraction at low river flows. The figure for 2008 was 35 per cent, although methodological changes in measurement undermine the comparability of the figures.

2.58 Nine of the 24 water company areas in England and Wales are classified as experiencing serious water stress (meaning that household demand for water is, or is likely to become, a high proportion of the rainfall available to meet that demand).

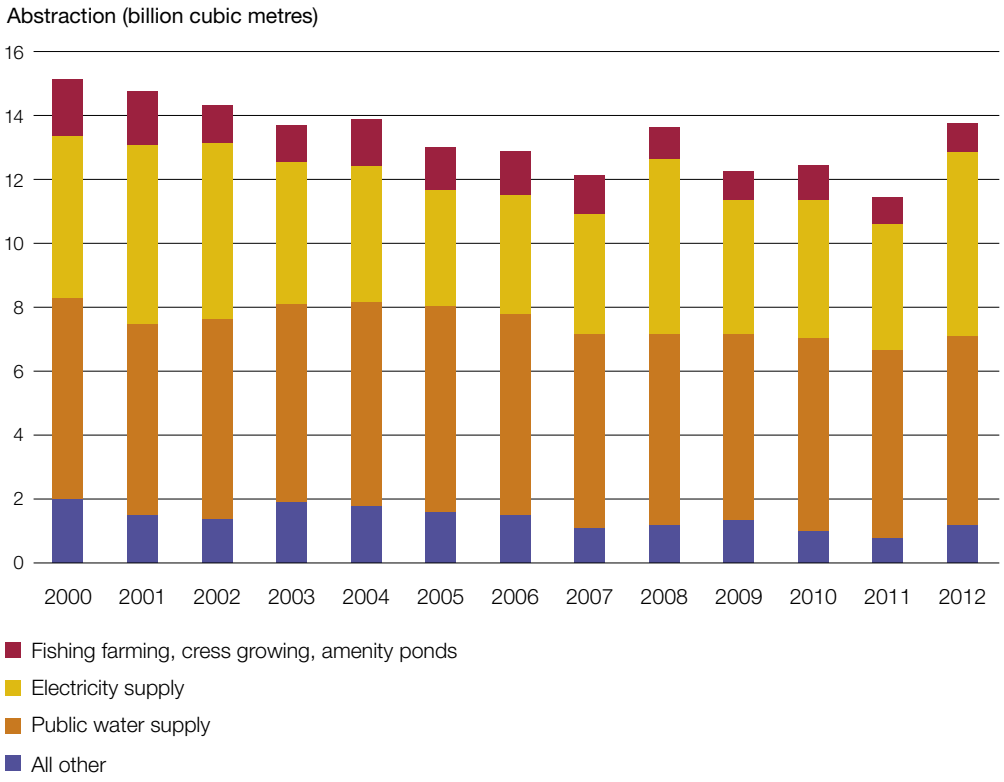
2.59 In 2012-13, the 22 water companies of England and Wales reported, in aggregate, the lowest level of water leakage since records began in the early 1990s. In 2012-13, only one (Portsmouth Water) of the 22 companies did not met targets set by Ofwat for leakage, compared to six not meeting leakage targets in 2009-10.

Future issues

2.60 In December 2013, the UK and Welsh governments consulted on a range of proposals to reform the abstraction management system. These included linking the amount of abstraction allowed more closely with how much water is available; making trading water quicker and easier; and giving licence holders a greater incentive to use their water more responsibly. As part of the process of developing and assessing options for reform the government has sought input from the electricity generation sector. The UK and Welsh governments are now considering the proposals further.

Figure 12

Estimated water abstraction from non-tidal surface and groundwater in England and Wales, 2000–2012



Source: Department for Environment, Food & Rural Affairs

The marine environment

The issue

2.61 The UK's marine ecosystems include over 8,000 different species, including many that are of national and European importance because they represent a large proportion of the world's breeding population of that species. The UK fishing industry was the second largest (by weight of landings) or third largest (by value of landings) in the European Union in 2011 and in 2012, the UK had over 6,000 fishing vessels and over 12,000 fishermen. Coastal areas have recreational and amenity value and are important for the tourist trade. The UK marine environment is under pressure from overfishing of some stocks and climate change is affecting habitats and species.

Developments in the government's approach since 2010

2.62 The government is in the process of implementing the EU's 2008 'Marine Strategy Framework Directive', which requires member states to achieve 'good environmental status' in Europe's seas by 2020, where good environmental status covers ecological diversity, cleanliness and productivity. As part of this Defra held a public consultation in 2014 on how best to monitor the marine environment around the UK and is currently evaluating the feedback.

2.63 The European Union has reformed the Common Fisheries Policy, through regulations which seek to ensure that legally binding fishing limits are set at sustainable levels by 2015 where possible, and by 2020 at the latest. Reform will introduce new management regimes such as regional decision-making and the phasing in, by 2019, of a ban on the practice of 'discarding' of quota species, where dead and dying fish are thrown overboard before the catch is landed. The government is in the process of implementing these wide-ranging reforms.

2.64 In 2011, the UK adopted a new approach to managing the seas, introducing a requirement for marine plans. The intention is that these plans will provide the strategic direction for local decisions on the use of marine resources and the management of marine activities, such as renewable energy, fishing and recreation, as well as nature conservation. England's first marine plans were adopted in spring 2014 and plans for all 11 English areas should be completed by 2022.

Performance

2.65 The findings of the latest comprehensive assessment of the UK's marine environmental status include that between 2005 and 2010 the diversity and abundance of 'demersal' fish (those that live on or near the bottom of the sea) had improved appreciably because of better fishing management practices; overall water bird populations were facing few or no problems in most regions; and more estuaries were cleaner, leading to improved fish numbers and diversity. However, seabirds and harbour seals had started to decline in some regions with no clear explanation why.

2.66 The proportion of fish stocks fished sustainably has improved over the long term, and recent data shows a continuation of this trend (**Figure 13**). The International Council for the Exploration of the Sea (ICES) estimates that in 2011, 47 per cent of shared fish stocks around the UK were fished sustainably, up from 33 per cent in 2008. The most recent ICES data for the North East Atlantic, which includes all fisheries around the UK, shows that in 2013, 59 per cent of stocks were being fished inside safe biological limits, up from 32 per cent in 2008.

Future issues

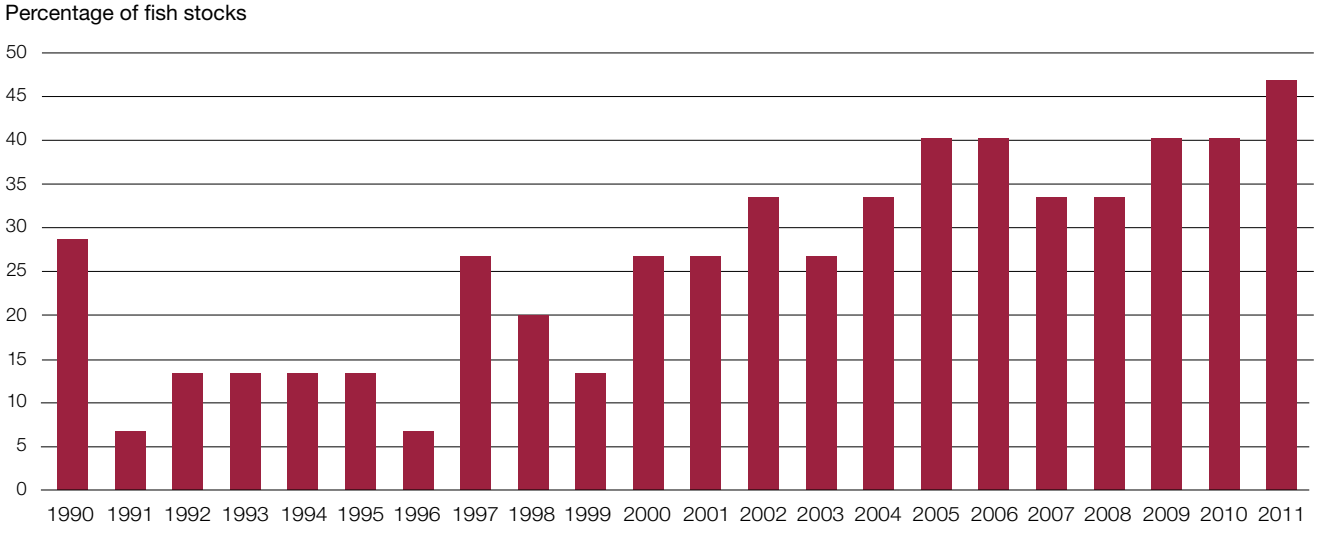
2.67 Following the 27 marine conservation zones (MCZs) designated in November 2013, the government aims to increase the number of MCZs in 2015 and 2016 in order to complete its contribution to establishing an ecologically coherent network of marine protected areas in the North East Atlantic, and meet a pledge made at the 2002 World Summit on Sustainable Development. MCZs together with 'European Marine Sites' and 'Sites of Special Scientific Interest' are types of 'marine protected areas' which seek to conserve the diversity of nationally rare or threatened coastal and marine habitats. The government is also planning to introduce further special areas to protect seabirds.

2.68 The government has revised its approach to the management of UK commercial fisheries in European Marine Sites with the aim of ensuring that these sites have the right level of protection and comply with legal obligations under EU Directives. It is taking a phased approach, and has reviewed first those fishing activities most likely to impact on the most sensitive and vulnerable features. Seventeen new byelaws have been implemented and a timetable to address outstanding areas and integrate management of fishing activities in MCZs is being finalised.

Figure 13

Percentage of fish stocks harvested sustainably and at full reproductive capacity in the UK, 1990 to 2011

The percentage of fish stocks around the UK fished sustainably has improved over the long term. (Percentages relate to stocks for which data are available)



Source: International Council for the Exploration of the Sea and Centre for Environment, Fisheries and Aquaculture Science

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