Protecting and improving Scotland's environment

AUDIT SCOTLAND

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Contents

Summary

Scotland has made mixed progress against environmental targets.

Introduction

1. The environment is one of Scotland's greatest assets. Ensuring that it is protected and improved is central to sustainable development and meeting the Scottish Government's aim of achieving sustainable economic growth. One recent estimate suggested that Scotland's environment was worth £17.2 billion per year and supported 242,000 jobs.[1] Key Scottish industries such as food and drink and agriculture and tourism are dependent on the quality of the environment.

2. In 2006, the Scottish Environment Protection Agency (SEPA) published *State of Scotland's Environment*.[2] It concluded that the Scottish environment is generally of good quality but identified certain areas where further progress is needed. This study reflects these areas and provides an overview of the Scottish public sector's performance against targets for:

- improving air quality (Part 1)
- protecting and improving the water environment (Part 2)[3]
- protecting and improving **biodiversity** (Part 3)
- improving waste management (Part 4).

3. We have tried to minimise the use of technical language, but in some instances this is unavoidable and we have therefore included a glossary of terms at Appendix 1. The terms included in the glossary are highlighted in bold the first time they are used in the report.

4. The four areas identified above are not independent of each other. This can make it hard to identify simple cause and effect. For example, improving air quality may improve the water environment by making it less acidic, and this in turn may help to improve biodiversity.

5. Climate change is likely to affect Scotland's environment as temperatures rise, patterns and timing of rainfall change and storminess increases. The Climate Change (Scotland) Act 2009 sets a target of reducing greenhouse gas emissions by 80 per cent by 2050. The Scottish Government has, for the first time, prepared an assessment of the impacts of its planned spending on greenhouse gas emissions.[4] This study did not consider the Scottish public sector's performance in understanding and reducing greenhouse gas emissions or adapting to climate change, as the Scottish Parliament was considering the Climate Change (Scotland) Bill during 2009 when this study was undertaken. Climate change will be a focus for future work by Audit Scotland.

6. In addition to the long-term risk of failing to protect and improve the environment, there are more immediate financial risks. Many of Scotland's environmental laws and targets come from Europe. The European Court of Justice can fine member states if European laws are not implemented and its targets are not met. The United Kingdom (UK) is a member state. As part of the UK, if Scotland was responsible for failing to meet targets, it would have to pay the fine. These fines could potentially be up to £127 million each year.[5] To date, the Scottish Government has successfully managed this risk and has not had to pay any fines in relation to European environmental laws and targets.

The overall quality of Scotland's environment is good but there is a risk that some targets will not be met

7. Protecting and improving the environment contributes to all five of the Scottish Government's strategic objectives (wealthier and fairer, smarter, healthier, safer and stronger, and greener) and directly to three of its national outcomes. There are three national indicators in the Scottish Government's national performance framework that relate to the areas covered in this study. Two relate to biodiversity and one to waste management (Exhibit 1, overleaf).

8. Several public bodies are involved at a national level in protecting and improving the environment and councils play a key role at a local level (Appendix 2). Councils' single outcome agreements (SOAs) with the Scottish Government contain indicators reflecting local and national priorities. These indicators reflect councils' central role in the management of waste. All 32 councils include an indicator relating to waste management in their SOA. Councils' SOAs have less focus on the other three areas addressed by this study. Nineteen councils have an indicator relating to biodiversity, ten have an indicator specifically about air quality and seven have an indicator about protecting and improving the water environment.

9. Despite the overall good quality of the Scottish environment a number of targets have not been met or are at risk of not being met in the future (Exhibit 1, overleaf). Improving the environment further and meeting European and Scottish targets will be challenging and, in some cases, will require different behaviours and approaches to those that have been

1 *The Economic Impact of Scotland's Natural Environment*, Scottish Natural Heritage Commissioned Report No. 304, RPA and Cambridge Econometrics, 2008.
2 *State of Scotland's Environment 2006*, Scottish Environment Protection Agency, 2006.
3 This study did not consider the marine environment, as the Scottish Parliament was considering the Marine (Scotland) Bill during 2009 when this study was undertaken.
4 *Carbon Assessment of the 2010-11 Draft Budget*, Scottish Government, 2009.
5 *Handling EU obligations: a guide for Scottish Government officials*, Scottish Government, June 2009.

Exhibit 1

Summary of performance against environmental targets

There has been mixed progress against environmental targets.

Outcomes	To value and enjoy our built and natural environment and protect it and enhance it for future generations.	To reduce the local and global environmental impact of our consumption and production.	We live in well-designed, sustainable places where we are able to access the amenities and services we need.

National indicators	Air quality	Water environment	Biodiversity	Waste
			Increase to 95 per cent the proportion of protected nature sites in favourable condition by 2010 Increase the index of abundance of terrestrial breeding birds 	Reduce to 1.32 million tonnes biodegradable municipal waste sent to landfill by 2010 

Other key indicators and targets	Air quality (see Part 1)	Water environment (see Part 2)	Biodiversity (see Part 3)	Waste (see Part 4)
	Benzene 1,3-butadiene Carbon monoxide Lead Nitrogen dioxide Nitrogen oxides Ozone Particulate matter (PM_{10}) Particulate matter ($PM_{2.5}$) Polycyclic aromatic hydrocarbons Sulphur dioxide	All water bodies to reach good ecological status by 2027 All urban areas to have appropriate sewage collection systems by 2005 All bathing waters to meet European standards by 2015 All shellfish waters to meet minimum standards by 2012	Halt the loss of biodiversity by 2010 17 Scottish biodiversity indicators 7 indicators 3 indicators 4 indicators 3 indicators*	Increase the amount of municipal waste being recycled to 40 per cent by 2010 Stop growth in the amount of municipal waste by 2010

Key

- Target being met
- Plans in place to meet target
- Target at risk of not being met
- Target not met
- * Data not available

Source: Audit Scotland

adopted in the past. For example, controlling sources of pollution from industry has been successful in improving air quality and the water environment. However, to improve air quality further, the amount of pollution that comes from road transport needs to be reduced. To improve the water environment, a greater focus on **diffuse pollution** and on restoring the natural form of water bodies (eg, rivers, lochs and coastal waters) is needed.

10. Tackling these issues will require improved coordination and joint working across different policy areas. In some areas this is already taking place. For example, the Scottish Government has provided guidance for policymakers across a wide range of different areas, including energy, planning, tourism and agriculture, about how they can contribute to improving the water environment.[6] In other areas, for example, air quality and transport policy, there is less coordination.

11. To protect and improve the environment, and meet European and Scottish targets, public bodies must promote cultural and behavioural change. For example, SEPA and Scottish Natural Heritage (SNH) must continue to work in partnership with land managers to tackle diffuse pollution from agriculture and improve biodiversity. In some cases, public bodies do not have control over all the factors that could protect and improve the environment (eg, engine standards are reserved to the European Union).

12. Several of the targets for protecting and improving the environment extend well into the future. For example, the Scottish Government aims to raise the standard of most Scottish waters to **good ecological status** by 2027 and to recycle or compost 70 per cent of all **municipal waste** produced by 2025. Strong leadership and commitment are needed to ensure these long-term targets are met, particularly during a period of financial constraints when there may be pressures to divert funds to more immediate targets.

13. In some cases, Scottish environmental targets are more ambitious than European targets. For example, Scotland aims to recycle 60 per cent of its municipal waste by 2020 compared to the European target of 50 per cent. Scotland has tighter limits for three air pollutants than elsewhere in the UK or Europe. The costs of going beyond the required European targets were not estimated when these targets were set.

Better coordination of environmental and transport policies is needed to improve air quality

14. Air quality in Scotland is generally very good. However, in 12 council areas (38 per cent), there are 21 locations where air quality is poor and there is a risk of not meeting European targets. This compares with 59 per cent of councils in England with poor air quality, 42 per cent in Northern Ireland and 36 per cent in Wales.

15. In 19 of the Scottish locations where there is poor air quality, improving the quality of air is dependent on reducing the level of pollution from road transport. Improving air quality in these locations requires better integration of environmental and transport policy at both a national and local level. As the level of emissions coming from industry has reduced, the relative importance of road transport as a cause of poor air quality has increased.

Scotland's water environment is good quality but new European targets mean it is now assessed differently

16. In the past, work to improve the water environment has tended to focus on improving the quality of the water itself. In 2000, 73 per cent of Scottish rivers were either excellent or good quality. By 2006, this had increased to 87 per cent. In particular, Scottish Water has invested significantly in new infrastructure and facilities (£593 million between 2003/04 and 2008/09) to improve the quality of the water environment. This investment has often focused on improving the quality of discharges into water bodies, for example from sewage treatment works.

17. In 2000, the European Union (EU) introduced a law that required member states to improve all European water bodies to meet a minimum standard of good ecological status by 2027. Good ecological status goes beyond just the quality of the water. It also looks at how far the natural shape and structure of a body of water has been altered by human activity and how the water is used. This broader definition of the water environment means that 65 per cent of Scotland's waters currently meet the European target.[7] This compares with an average of 29 per cent in England and Wales.[8] This does not mean that there has been any fall in the quality of Scotland's waters, rather they are now being judged against a broader range of criteria. The Scottish Government's plans will increase the number of waters with good ecological status to 72 per cent by 2015 and 97 per cent by 2027.

6 *Implementing the Water Environment and Water Services (Scotland) Act 2003: Promoting an Integrated Approach – A Policy Statement*, Scottish Government, 2008.
7 See Part 2 for further details. This value applies to the Scotland river basin district. In the cross-border Solway/Tweed river basin district, 49 per cent of waters currently meet the European target.
8 Department for Environment, Food and Rural Affairs.

18. Achieving these targets will require more focus on aspects of the water environment which have historically been less of a priority. These areas include:

- diffuse pollution
- how water is used for purposes such as hydro-electric power generation, agriculture and the supply of drinking water
- how the shape and structure of water bodies have been altered by human activity.

19. How land is used and managed has an effect on the water environment and on biodiversity. Two major Scottish Government funding schemes for land managers (the Single Farm Payments system and the Scotland Rural Development Programme) contribute to the protection and improvement of the water environment and also to biodiversity (see Parts 2 and 3). This study did not consider these schemes in detail but they represent a significant source of funding for land managers and contribute to the protection and improvement of the environment (see Appendix 3 for more details). In addition, forests and woodlands are important for biodiversity and can affect air quality and the water environment.

There is mixed progress in protecting and improving biodiversity

20. Scotland has many plant and animal species. These species and the places they live make up Scotland's biodiversity. The Scottish Biodiversity Strategy aims to halt the loss of biodiversity by 2010. This reflects a Europe-wide aim to stop the loss of biodiversity on the same timescale.

21. The goal to stop the loss of biodiversity across Europe by 2010 will not be achieved.[9] In Scotland, there has been mixed progress against the 17 different indicators of the condition of Scotland's biodiversity. In 2009, seven indicators showed improvement, three showed deterioration, and for the remaining seven there was no clear trend or long-term data were not available.

22. Nearly a fifth of Scotland's land area is identified as being important for the protection of biodiversity in the form of protected areas. The Scottish Government's target is for 95 per cent of these areas to be in **favourable condition** by 2010. In 2009, 79 per cent of protected areas were in favourable condition and the target is at risk of not being met. The main reasons for the poor condition of the remaining protected areas are overgrazing and the presence of species that are not native to Scotland.

23. All Scottish public bodies have a duty to further the conservation of biodiversity. The existence of this duty is having limited effect due to the lack of sufficient guidance to public bodies on how to implement the duty and the absence of any monitoring or reporting system to enforce it.

Councils' plans for waste management after 2010 are insufficient to meet European targets

24. Over the last decade, Scotland has made significant progress in improving its waste management. In 1998, Scotland recycled four per cent of its municipal waste.[10] Ten years later, in 2008/09, Scotland recycled or composted 34 per cent of its municipal waste. This is in line with the rest of the UK – 34 per cent in England, 33 per cent in Wales and 29 per cent in Northern Ireland. Scotland has succeeded in reducing the total amount of municipal waste sent to **landfill** by a third, from three million tonnes in 1998 to two million tonnes in 2008/09.[11]

25. Audit Scotland published a report on *Sustainable waste management* in 2007.[12] Since then, the Scottish Government has changed its overall approach to waste management and has already met the European target to reduce the amount of **biodegradable municipal waste** sent to landfill by 2010. It plans to improve waste management further through its Zero Waste Plan, which will set out targets for waste management until 2025. Meeting these targets will be challenging and will require investment by councils in waste management facilities and further changes in public behaviour.

26. Councils' SOAs include targets to reduce the amount of municipal waste sent to landfill. However, collectively, the current targets in the 32 SOAs are not enough to meet European targets for the amount of waste that is sent to landfill after 2010.

9 *The Message from Athens*, European Commission, April 2009.
10 *Waste Data Digest 1*, Scottish Environment Protection Agency, 2001.
11 *Ibid* and *Landfill Allowance Scheme Reports*, Scottish Environment Protection Agency.
12 *Sustainable Waste Management*, Audit Scotland, September 2007.

Part 1. Air quality

Road transport is the main cause of Scotland's remaining air quality problems.

Key messages

- Scotland has tighter limits than the rest of the UK for three air pollutants. However, the Scottish Government has not assessed the cost of achieving these tighter limits.
- Air quality in Scotland is generally good but there is poor air quality in 21 locations across 12 council areas.
- Road transport is the main cause of local air quality problems. There is a lack of coordination between air quality and transport objectives at both a national and a local level.
- Councils are not using all the available Scottish Government funding for improving air quality.

Poor air quality reduces life expectancy and affects human health

27. Air quality is poor when the level of pollutants in it may have a harmful effect on human health or on the environment. On average across the UK, poor air quality reduces life expectancy by up to eight months. In local areas with poor air quality, the effect on human health and life expectancy is greater. The health costs of poor air quality in the UK may be up to £20 billion each year.[13] Poor air quality can also damage soils, plants and water.

Scotland's air quality targets reflect European requirements

28. The EU aims to reduce the number of premature deaths from diseases related to poor air quality by 40 per cent by 2020. Two European laws set upper limits for air pollutants to help achieve this objective.[14] The *Air Quality Strategy for England, Scotland, Wales and Northern Ireland* sets upper limits for 11 air pollutants (Exhibit 2).[15, 16]

29. The Scottish Executive set tighter limits than the rest of the UK for three air pollutants – **particulate matter**

Exhibit 2

Eleven pollutants that can cause poor air quality in Scotland

Road transport and industry are key sources of air pollutants.

Pollutant	Main sources	Potential effects
Benzene	• Road transport • Industry	May cause cancer.
1,3-butadiene	• Road transport • Industry	May cause cancer.
Carbon monoxide (CO)	• Road transport	Reduction in the supply of oxygen to the heart.
Lead	• Burning fuel, iron and steel	Effects on the kidneys, joints, and digestive, reproductive and nervous systems.
Nitrogen dioxide (NO_2)	• Road transport • Industry	Impact on lungs and airways, and increased response to allergens.
Nitrogen oxides (NO_x)	• Road transport • Industry	Can have a negative effect on vegetation and habitats.
Ozone (O_3)	• Formed by the reaction of sunlight, acting on road transport and industrial emissions	Irritation to the eyes and respiratory system. Can have a negative effect on vegetation and habitats.
Particulate matter ($PM_{2.5}$)	• Road transport • Industry • Construction • Natural sources • Burning coal, oil and wood	Respiratory and cardiovascular illness.
Particulate matter (PM_{10})		
Polycyclic aromatic hydrocarbons (PAHs)	• Burning coal and wood	May cause cancer.
Sulphur dioxide (SO_2)	• Industry • Burning fuel	Irritation to the eyes and respiratory system. Can have a negative effect on vegetation and habitats.

Source: Scottish Government

13 *Air Quality Strategy for England, Scotland, Wales and Northern Ireland*, DEFRA, July 2007.
14 Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe, May 2008; and Directive 2001/81/EC on National Emission Ceilings for Certain Atmospheric Pollutants, October 2001.
15 *Air Quality Strategy for England, Scotland, Wales and Northern Ireland*, DEFRA, July 2007.
16 One pollutant in the *Air Quality Strategy for England, Scotland, Wales and Northern Ireland* – 1.3-butadiene – is not covered by European law.

(PM_{10} and $PM_{2.5}$) and benzene.[17] Background levels of these pollutants are generally lower in Scotland. The Scottish Executive set tighter limits to ensure Scotland made the same improvement in air quality as the rest of the UK. The Scottish Executive did not assess the cost of achieving these tighter limits.

30. The Scottish Government and councils are required to ensure that PM_{10} levels are under the Scottish limit, rather than the less challenging EU limit.[18] The Scottish limit for $PM_{2.5}$ is not yet statutory but the Scottish Government is keeping this under review.

SEPA controls industrial activities that can affect air quality

31. Industrial activities can cause poor air quality. SEPA controls around 2,200 industrial sites that have the potential to cause poor air quality. SEPA grants permits to industries that release air pollutants, limiting the amount of pollutants that can be released, and checks compliance with the permits.[19] Overall, the level of compliance with these permits has improved over the ten years to 2008/09, as SEPA's target for compliance has increased from 80 per cent to 92 per cent (Exhibit 3).

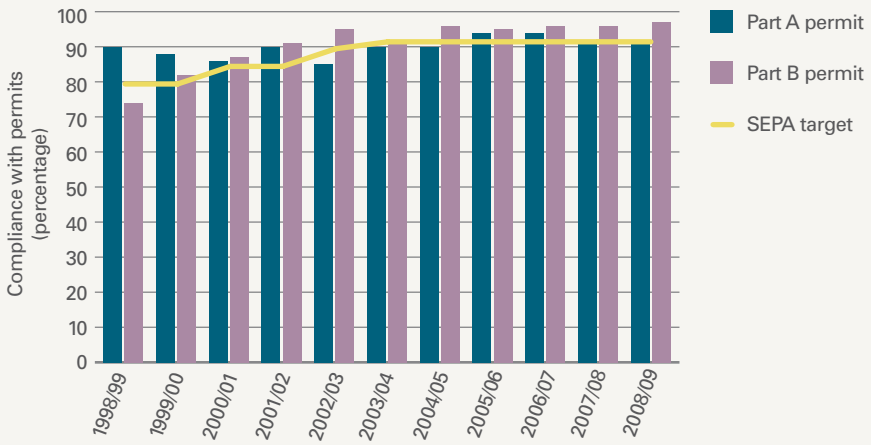
32. Power stations are major sources of emissions of sulphur dioxide and nitrogen oxides. Since 2000, emissions of sulphur dioxide from power stations and other large combustion plants in Scotland have fallen by 57 per cent and emissions of nitrogen oxides have fallen by 29 per cent.[20]

33. Following the 'polluter pays' principle, the law requires SEPA to recover the costs of its work to control industrial activities that could affect air quality. SEPA's spending on activities relating to air quality has increased since 2000/01, from £2.2 million to £6.4 million in 2008/09. This represented 16 per cent of all SEPA's regulatory work. In 2008/09, SEPA recovered 83 per cent (£5.3 million) of these costs from the industries it regulates. The remaining £1.1 million was met by SEPA's general grant-in-aid funding from the Scottish Government.

Exhibit 3

Compliance with SEPA's Pollution Prevention and Control permits, 1998/99 to 2008/09

Overall, compliance has improved, as SEPA's target has increased.



Note: Part A permits are for industries which release pollutants to air, water and land. Part B permits are for industries which only release emissions to the air.
Source: Scottish Environment Protection Agency

Twelve councils have air quality problems

34. Scotland is below upper limits for six of the 11 pollutants identified in the *Air Quality Strategy for England, Scotland, Wales and Northern Ireland*. However, upper limits for particulate matter (PM_{10}), nitrogen dioxide, sulphur dioxide and ozone are being exceeded in some areas of Scotland. Particulate matter ($PM_{2.5}$) is not widely monitored in Scotland, but recent research suggests that the upper limit is at risk of being exceeded at some roadside locations.[21]

35. In areas where upper limits for air pollutants are at risk of being exceeded, councils must declare an air quality management area (AQMA).[22] An AQMA defines an area in which one or more air pollutants are likely to exceed the upper limits set in the *Air Quality Strategy for England, Scotland, Wales and Northern Ireland*. An individual council can have more than one AQMA.

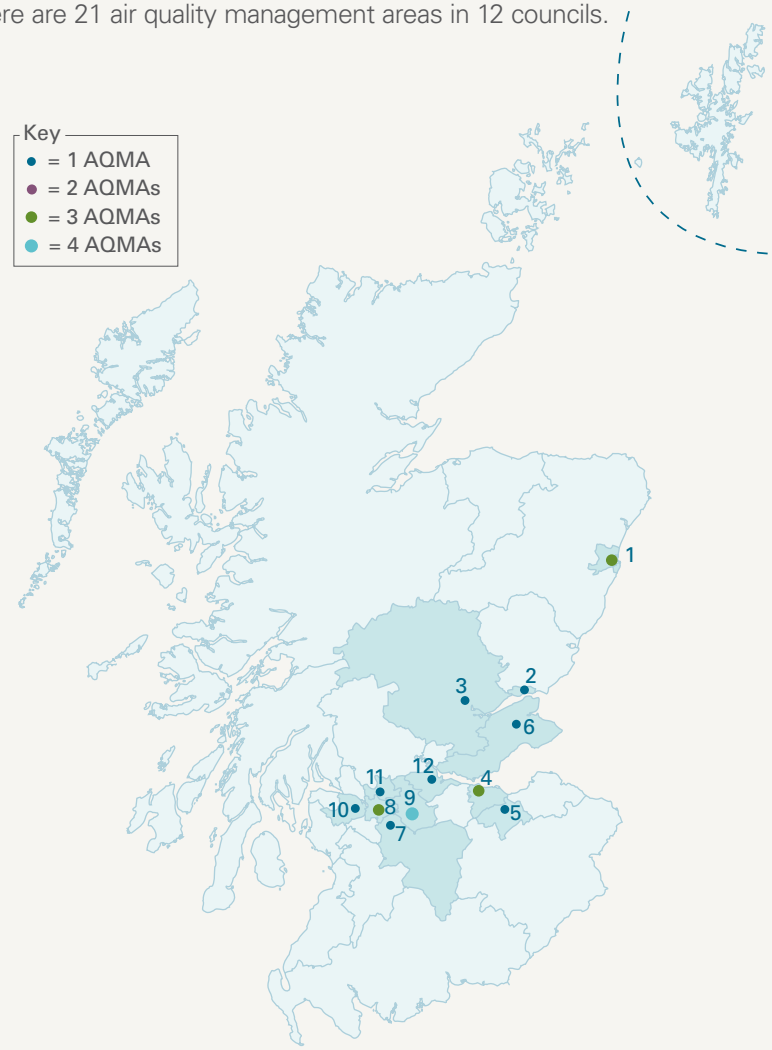
36. Since 2000, 21 AQMAs have been declared across 12 councils in Scotland (Exhibit 4, overleaf). The majority of AQMAs in Scotland have been identified because of pollution from road transport, with two exceptions. Falkirk Council's AQMA in Grangemouth is related to sulphur dioxide emissions from industry.[23]

17 Prior to September 2007, the Scottish Administration was referred to as the Scottish Executive. It is now called the Scottish Government. When dealing with the earlier period this report refers to the Scottish Executive but in all other instances it refers to the Scottish Government.
18 *Air Quality (Scotland) Amendment Regulations 2002*, June 2002.
19 *Pollution Prevention and Control (Scotland) Regulations 2000*, September 2000.
20 *Key Scottish Environment Statistics 2009*, Scottish Government, August 2009.
21 *Measurement of PM_{10} and $PM_{2.5}$ in Scotland with Gravimetric Samplers*, AEA Technology on behalf of the Scottish Government, June 2009.
22 Environment Act 1995.
23 Falkirk Council is in the process of declaring a further three AQMAs, relating to nitrogen dioxide from road transport.

Exhibit 4

Air quality management areas in Scotland

There are 21 air quality management areas in 12 councils.



Where?	Pollutant	Dates declared
1 Aberdeen City	NO_2 and PM_{10}	June 2001 (1), Dec 2008 (2)
2 Dundee	NO_2	July 2006
3 Perth and Kinross	NO_2 and PM_{10}	May 2006
4 City of Edinburgh	NO_2	Dec 2000 (1) & 2006 (1), March 2009 (1)
5 Midlothian	PM_{10}	April 2008
6 Fife	NO_2 and PM_{10}	Dec 2008
7 South Lanarkshire	PM_{10}	Nov 2008
8 Glasgow City	NO_2 and PM_{10}	Jan 2002 (1), July 2007 (2)
9 North Lanarkshire	PM_{10}	Dec 2005 (3), June 2008 (1)
10 Renfrewshire	NO_2	Sept 2005
11 East Dunbartonshire	NO_2 and PM_{10}	Dec 2005
12 Falkirk	SO_2	Nov 2005

Source: Audit Scotland

The AQMA in Midlothian is related to the domestic burning of solid fuel. No AQMAs have been declared for ozone, which is monitored and managed at a national level.

37. Eight councils have declared AQMAs as they are at risk of exceeding the Scottish limit for particulate matter (PM_{10}). One of these councils, Glasgow, is one of eight urban areas in the UK where the higher European limit for particulate matter (PM_{10}) is also being exceeded. The EU has allowed member states to apply for a time extension until 2011 to lower levels of PM_{10} to within EU limits.[24] The Scottish Government, together with the UK Government, has applied for this time extension along with 17 other EU member states.

38. Councils which have declared an AQMA must develop an air quality action plan, setting out how they plan to improve air quality in that area. Air quality action plans can include measures such as improving traffic management; the use of cleaner engines in council vehicles, buses and taxis; and increasing awareness of air quality issues. Despite these action plans, no council with an AQMA has improved local air quality sufficiently to be able to revoke an AQMA.

39. SEPA offers information and advice to councils on local air quality management and councils must consult SEPA on AQMA action plans. For example, SEPA has worked with Falkirk Council to help prepare its air quality action plan for the Grangemouth AQMA. SEPA also has powers, with the approval of Scottish ministers, to direct councils that are not fulfilling their air quality management responsibilities.[25] Councils must comply with these directions, although to date SEPA has not used these powers.

40. Ten councils have specific air quality indicators in their SOAs. A further 18 councils have specific

24 Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe, May 2008.
25 Environment Act 1995.

indicators on reducing private transport use or increasing public transport use, which may help to improve air quality (although this is dependent on reductions in emissions from public transport, in particular buses). Of the 12 councils with an AQMA, five have specific performance indicators for air quality in their SOAs and a further six have indicators on transport use.[26]

Most air quality problems in Scotland are a result of road transport

41. One of the three objectives of *Scotland's National Transport Strategy* is to 'reduce emissions to tackle the issues of climate change, air quality and health improvement'.[27] The majority of air quality problems in Scotland are related to emissions from road transport, in particular buses and heavy goods vehicles. For example, the City of Edinburgh Council found that buses contributed over 50 per cent of all emissions of nitrogen oxides at four of five sites monitored in the city centre in 2001.[28]

42. There are significant challenges and barriers to councils in reducing emissions from road transport. Some of the potential mechanisms for reducing emissions may not be readily publicly acceptable (eg, road charging). Others are reserved to the EU (eg, engine standards) or the UK government (eg, fuel duty).

43. The Scottish Government issued revised guidance to councils on local air quality management in February 2009.[29] The guidance states that air quality teams should work with transport and planning colleagues to develop air quality strategies and action plans and should ensure that they are consistent with local transport strategies. Some air quality action plans aim to raise awareness of air quality issues among transport and planning staff.

44. Councils have powers to check emissions from vehicles and issue fixed penalty notices if emissions are too high. Councils also have powers to establish low emission zones (LEZs) to improve air quality in areas where air pollution levels are dangerous to health. LEZs are areas in which vehicles with emissions over a certain level are either banned or charged to enter. There are currently over 80 LEZs in operation or planned across nine countries in Europe – Austria, Czech Republic, Denmark, Germany, Italy, Netherlands, Norway, Sweden and the UK (Case study 1).[30]

45. No councils in Scotland have implemented a LEZ. However, Glasgow City Council has committed to introducing LEZs at a number of locations for the Commonwealth Games in 2014.[31] In 2009, the council commissioned a feasibility study with a view to introducing LEZs more permanently. The study found that the most effective option to reduce emissions from road transport is to introduce LEZs in the three areas covered by AQMAs. Buses and taxis would only be allowed to enter these areas if their emissions were below a certain level. Glasgow City Council is also working with local transport operators to introduce limits on emissions from buses from 2010. These measures are expected to help improve air quality in Glasgow, by reducing emissions of nitrogen dioxide and particulate matter (PM_{10}).

Case study 1
Low emission zones in Europe

A low emission zone (LEZ) covering Greater London has been in place since February 2008. Lorries, buses and coaches which do not meet emissions standards are charged £200 a day for entering the LEZ. The zone is enforced using cameras, which read vehicles' number plates and check a database to see if the vehicles meet emission standards or are exempt from the daily charge. Any vehicles which do not meet emissions standards and enter the LEZ without paying the daily charge face a fine of up to £1,000. The LEZ will be extended to include large vans and minibuses at a later date, and tougher emissions standards will be introduced in January 2012.

In Sweden, a LEZ has been operating in central Stockholm since 1996. All vehicles over 3.5 tonnes that are older than eight years old are banned, including buses. Vehicles between eight and 12 years old that have been fitted with a new engine and/or an emissions control device are exempt from the ban. The zone is enforced using a permit system and visual inspections. Vehicles driving illegally in the LEZ are subject to a fine. The LEZ is estimated to have reduced emissions of particulate matter from heavy vehicles by 40 per cent.[1]

Note: 1. *Service Contract for "Ex-Post" Evaluation of Short-Term and Local Measures in the CAFÉ Context,* AEA Technology, January 2005.
Source: Transport for London and AEA Technology

26 Dundee City Council's SOA has a local outcome to 'meet national air quality standards and address other air pollution issues'. However, it does not include a specific performance indicator for air quality or transport use. The five councils with an AQMA that have specific air quality indicators in their SOAs are East Dunbartonshire, Falkirk, Fife, Glasgow City and Midlothian.
27 *Scotland's National Transport Strategy*, Scottish Executive, December 2006.
28 *Review and Assessment of Air Quality: Stage Four*, City of Edinburgh Council, May 2002.
29 *Local Air Quality Management Policy Guidance*, Scottish Government, February 2009.
30 www.lowemissionzones.eu
31 *Draft Air Quality Action Plan*, Glasgow City Council, 2008.

Councils have not used all the available funding to improve air quality

46. The Scottish Government has provided £5.3 million to councils to improve local air quality over the ten years since the process of identifying AQMAs began in 1998/99. Three-quarters of this funding (£4.1 million) has been spent on identifying and improving understanding of local air quality problems. However, as the number of AQMAs has increased, councils have begun to spend a higher proportion of this money on taking action to improve local air quality (Exhibit 5).

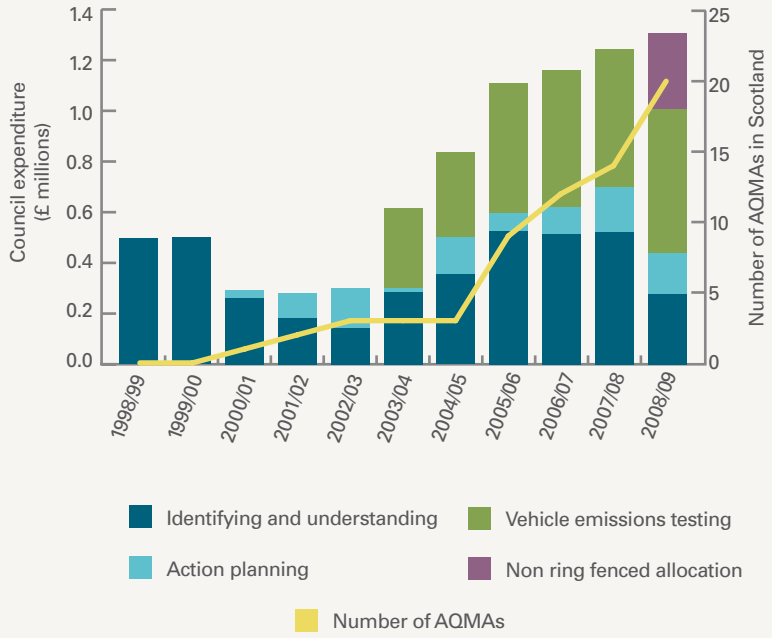
47. In addition, the Scottish Government provided £2.8 million to councils between 2003/04 and 2008/09 to test emissions from vehicles. Thirteen councils have used Scottish Government funding to introduce vehicle emissions testing for the general public, some of them in partnership with other councils. For example, East Lothian, Falkirk, Midlothian and West Lothian Councils are working together to provide free vehicle emission testing.

48. In 2007/08, the Scottish Government made a £1 million annual grant available to help councils reduce emissions from their vehicle fleets by offering to provide 30 per cent of the cost of emissions reduction measures. No councils applied for this grant in the first two years. However, in 2009/10 the Scottish Government provided £44,000 to Dundee City Council to reduce emissions from its refuse collection vehicles. The Scottish Government widened the scope of this grant in 2009/10 to cover 100 per cent of any measures included in an AQMA action plan. To date, only three of the 12 councils with AQMAs have applied for funding totalling £0.32 million (Aberdeen City, Glasgow City and Perth and Kinross).

Exhibit 5

Council spend on improving air quality, 1998/99 to 2008/09

The proportion of council spending on implementing actions to improve air quality has increased as the number of AQMAs has risen.



Notes:
1. Expenditure figures from 2005/06 onwards are based on actual spend by councils. Due to data availability, figures prior to 2005/06 are based on the amount awarded to councils.
2. In 2008/09, the annual £0.3 million allocation to councils for air quality work was no longer ring-fenced, so it is not possible to identify what this allocation was spent on.
Source: Scottish Government

Recommendations

- The Scottish Government should improve the coordination of policies on air quality and road transport at a national level.
- In councils with poor air quality caused by pollution from road transport, air quality teams should work with transport and planning colleagues to identify and implement actions to reduce emissions from road transport.
- Councils with AQMAs should review their action plans, identify funding to implement actions to tackle poor air quality, and set timescales for when they expect to be able to revoke their AQMAs.

Part 2. The water environment

Meeting European targets for improving the water environment will require different approaches.

Key messages

- The quality of Scotland's water environment has improved significantly.
- Over half of Scotland's waters currently meet the European standard of good ecological status. Scotland plans to ensure that nearly all waters meet this standard by 2027.
- Pollution from agricultural sources is now the leading threat to the water environment. SEPA must continue to work in partnership with land managers to address this.

Scotland's waters are important to its economy

49. Scotland has over 2,000 rivers, nearly 50,000 square kilometres of coastal and estuarine waters, over 300 lochs and over 60,000 square kilometres of groundwater. The quality of these waters is important to key Scottish industries (eg, whisky production, agriculture and tourism). Good water quality is important for protecting the health of people who drink it, eat food grown in Scotland's waters, and swim in them. Improving water quality also contributes to improving the biodiversity of the water environment (Part 3).

SEPA plays a central role in protecting and improving the Scottish water environment

50. SEPA grants permits to control activities that could affect the water environment.[32] In 2008/09, there was 90 per cent compliance with these permits. SEPA aims to recover the costs of its regulatory work from those who are granted permits. In 2008/09, it spent £20.5 million on controlling activities that can affect the water environment and successfully recovered £19.5 million (95 per cent).[33] This represented 59 per cent of all SEPA's regulatory work.

Three European laws seek to improve the water environment

51. There is a large amount of European law that aims to improve specific aspects of water quality and protect human health. Three key pieces of European law that aim to protect water quality are:

- the Urban Waste Water Treatment Directive, which requires all urban areas to have suitable infrastructure to collect and treat waste water (domestic sewage and water used in industrial processes)
- the Bathing Water Directive, which requires all waters identified as bathing waters to meet strict microbiological standards. There are currently 77 coastal bathing waters and three inland bathing waters in Scotland
- the Shellfish Waters Directive sets standards for the quality of coastal waters where shellfish are grown and harvested for food. There are currently 78 identified shellfish waters around the coast of Scotland.

52. In addition to its central role of providing drinking water to customers, Scottish Water collects and treats sewage and waste water so that it can be released into the environment without causing damage. Scottish Water is one of the key operators to which SEPA grants permits.

53. Between 2003/04 and 2008/09, Scottish Water invested over £3.2 billion in improving Scotland's water and wastewater treatment facilities and networks. Of this, £359 million has been invested in wastewater facilities to deliver water quality improvement in accordance with these three European directives.

All but one urban area in Scotland will have an appropriate sewage collection system by the end of 2011

54. Between 2003/04 and 2008/09, Scottish Water invested £292 million to meet the requirements of the Urban Waste Water Treatment Directive. This has enabled progress towards the directive's goal of all urban areas having appropriate waste water treatment collection systems by 2005. When Scottish Water was formed in 2002, a quarter of waste water treatment collection systems in Scotland were not appropriate. By the end of 2009, this had reduced to one per cent. All but one urban area in Scotland are scheduled to have an appropriate sewage collection system by the end of 2011, with the final one scheduled for completion in 2014.

The quality of bathing waters in Scotland has improved

55. The first European Bathing Water Directive was introduced in 1976. It required all waters used for bathing to achieve good or excellent standards during the bathing season (1 June to 15 September). In 2002, sewage pollution was the main cause of poor bathing water quality. Between 2003/04 and 2008/09, Scottish Water invested £41 million in improving its sewage treatment facilities to meet the requirements of the Bathing Waters Directive. By the end of this period, diffuse pollution from agriculture had become the main cause of poor bathing water quality.[34]

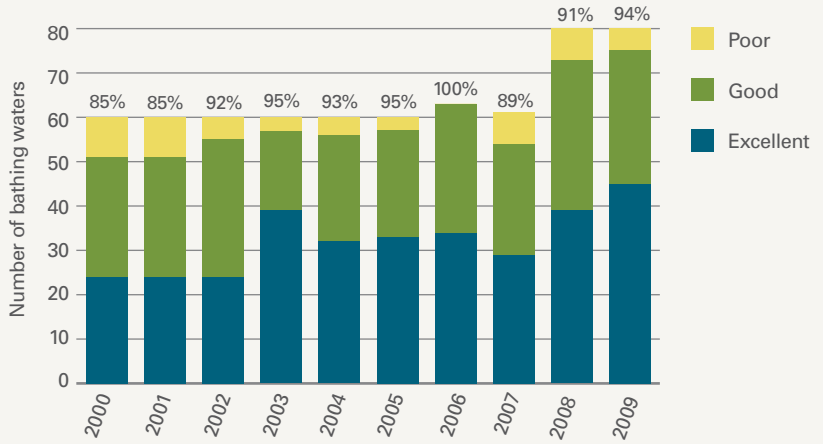
56. Between 2000 and 2006, there was an overall improvement in the quality of Scottish bathing waters (Exhibit 6). In 2006, all Scottish bathing waters were of good or excellent quality. However, in the three years from 2007 to 2009, a small number of bathing waters were of poor quality due, in part, to wet summers. Heavy rain washes more pollutants off the land and can cause sewer overflows which affect the quality of bathing water.

32 The Water Environment (Controlled Activities) (Scotland) Regulations 2005.
33 Scottish Environment Protection Agency, Annual Report and Accounts 2008/09.
34 *Better Bathing Waters*, Scottish Executive, 2006.

Exhibit 6

Bathing water quality in Scotland, 2000–2009

The number of bathing waters of good or excellent quality has improved.



Note: The numbers at the top of each bar show the percentage of bathing waters of good or excellent quality each year. Scotland currently has 77 coastal bathing waters and three inland bathing waters. The number of areas classified as bathing waters can change each year, and increased from 61 to 80 in 2008.
Source: Scottish Environment Protection Agency

57. The EU revised the Bathing Water Directive in 2006, introducing higher minimum standards that must be met by 2015. Applying the new standards to existing performance suggests that up to a third of Scotland's bathing waters would fail to meet the new targets.[35] Bathing waters in the southwest of Scotland are most at risk of failing to meet the new standards as diffuse pollution from agriculture (especially from the dairy industry) is the main source of pollution. The Scottish Government and SEPA are working with farmers to improve agricultural working practices to tackle this problem.

All of Scotland's shellfish growing waters meet minimum European standards

58. Scotland has identified 78 waters for the production of shellfish such as oysters and mussels. The Shellfish Waters Directive requires all identified waters to meet minimum physical and chemical standards and to seek to meet a higher guideline standard by 2012. In 2007, all of Scotland's waters for growing shellfish met the minimum standards and about 54 per cent of these waters met the higher guideline standard.

59. SEPA has plans for how every shellfish water can move towards meeting the higher guideline standards. These plans frequently refer to the need to improve the performance of Scottish Water's sewage and wastewater treatment works to improve the quality of shellfish waters. To date, Scottish Water has invested £26 million to meet the requirements of the Shellfish Waters Directive. It plans to invest a further £20 million to improve its wastewater treatment works at Loch Ryan (north of Stranraer) to meet the combined requirements of the Shellfish Waters Directive and the Urban Waste Water Treatment Directive.

Scotland's water environment is now assessed against a wider range of criteria

60. Both SEPA's control of individual sources of pollution, and Scottish Water's investment to address specific water quality issues, have contributed to improving the overall quality of Scotland's waters. Until 2006, the condition of Scotland's water bodies (eg, rivers, estuaries, coastal waters and lochs) was assessed solely in terms of the quality of the water itself. The quality of rivers improved from 73 per cent being in good or excellent quality in 2000 to 87 per cent in 2006 (Exhibit 7, overleaf). The quality of estuaries and coastal waters has remained steady over the same period, with 97 per cent of estuaries and 99 per cent of coastal waters being of good or excellent quality in 2006.

61. In 2000, the European Water Framework Directive came into force.[36] After 2006, and under the terms of the Water Framework Directive, Scottish water bodies have been assessed against a broader range of criteria (see box below).

Ecological status

According to the Water Framework Directive, the overall status of a water body is expressed in terms of ecological status which is defined by several factors:

- Pollution from both individual and multiple sources.
- Changes to its natural form (eg, straightening a river).
- The use of water (eg, irrigation and drinking water supplies).
- Presence of non-native species.

A water body is of high or good ecological status if it has a healthy ecology, is only slightly different from its natural state, and can be used for the supply of drinking water and activities such as fishing.

35 *Better Bathing Waters*, Scottish Executive, 2006.
36 The Water Framework Directive became Scottish law through the Water Environment and Water Services (Scotland) Act 2003.

62. The Water Framework Directive requires plans to be put in place to improve all European water bodies so they are of good ecological status by 2027, where it is technically feasible and economically proportionate.

SEPA has prepared plans to improve Scotland's water environment

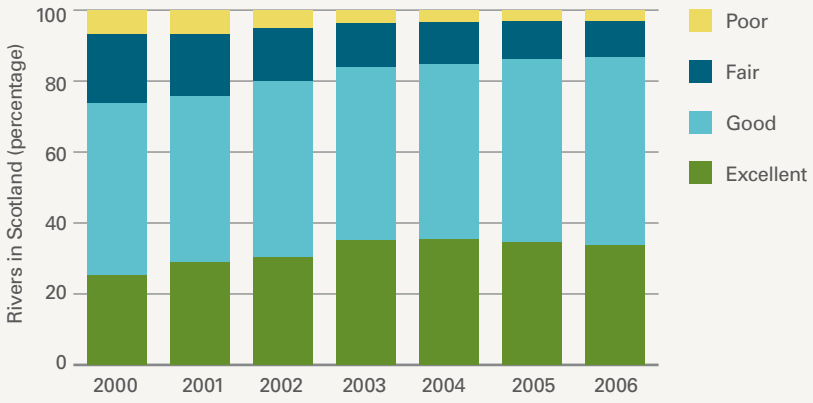
63. To meet the requirements of the Water Framework Directive, SEPA has developed two river basin management plans to protect and improve Scottish water bodies. The development of these plans involved a wide range of public bodies including councils, Scottish Water, SNH and Forestry Commission Scotland. It also involved the private sector and other stakeholders such as the chemical industry, the energy sector, the agricultural sector and non-governmental organisations. All public bodies have a duty to consider river basin management plans if undertaking an activity which may affect a river basin district.[37] All councils have a role in the development of river basin management plans. Seven councils have an indicator in their SOAs about protecting and improving the water environment.

64. Scotland's two river basin management plans were published in December 2009. One is a cross-border plan, which covers the areas that drain into the Solway Estuary in South West Scotland and the Tweed catchment in South East Scotland. The second is a plan for the rest of Scotland (Exhibit 8). The Solway/Tweed river basin management plan is jointly produced by SEPA and the Environment Agency. These river basin management plans cover the period from 2009 to the end of 2015, and set draft targets for the next two planning cycles. They will be reviewed for the periods 2016 to 2021 and 2022 to 2027.

Exhibit 7

Water quality in Scotland's rivers, 2000-2006

Eighty-seven per cent of Scotland's rivers were in good or excellent quality in 2006.

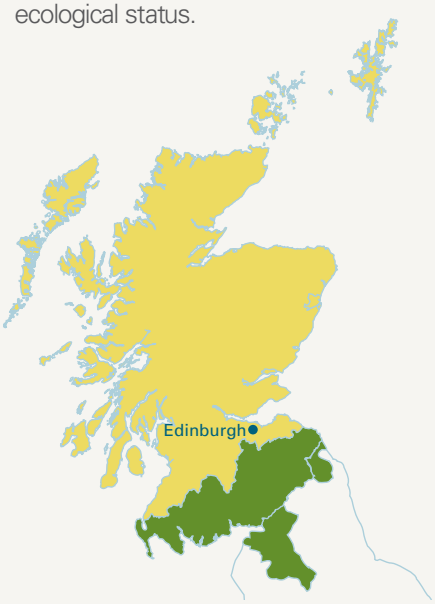


Source: Scottish Environment Protection Agency

Exhibit 8

Percentage of Scotland's water bodies with good or high ecological status

Plans are in place to improve the percentage of Scottish water bodies with good ecological status.



Scotland river basin district

Target	Present	Planned	
(%)	2008	2015	2027
100	65	72	97

Solway/Tweed river basin district

Target	Present	Planned	
(%)	2008	2015	2027
100	49	56	91

Source: Scottish Government

65. In 2008, 65 per cent of waters in the Scotland river basin district and 49 per cent of waters in the Solway/Tweed river basin district were of good or high ecological status (Exhibit 8). This does not mean that there has been any decline in the quality of Scottish water bodies from the data presented in Exhibit 7. Rather, Scottish waters are now assessed against a broader range of criteria (see box on page 15). The two Scottish river basin management plans aim for most water bodies to reach good or high ecological status by 2027. Three per cent of waters in the Scotland river basin district and nine per cent of waters in the Solway/Tweed river basin district are not planned to achieve good ecological status by 2027.[38]

37 Water Environment and Water Services (Scotland) Act 2003.
38 These waters do not have to achieve good ecological status by 2027, due to disproportionate cost, technical infeasibility or the potential for natural recovery.

66. The number of water bodies of good or high ecological status in Scotland is greater than in England and Wales. Of the ten river basin districts in England and Wales, the number of water bodies that were of good or high ecological status in 2008 ranged from 18 per cent (Anglian and Humber) to 43 per cent (Northumbria).

Diffuse pollution, changes to water bodies' natural form and the use of water are now the main pressures affecting Scottish water bodies

67. There are five main pressures affecting Scottish water bodies (Exhibit 9):

- diffuse pollution
- changes to water bodies' natural form
- the use of water
- point source pollution
- non-native species.

68. Diffuse pollution from agriculture is now the most significant pressure on rivers, lochs, groundwaters and identified bathing waters. Potential pollutants such as animal waste and fertilisers can be washed off the land and into water, affecting its quality. The ecological status of 20 per cent of rivers, 15 per cent of lochs and 20 per cent of groundwaters is moderate, poor or bad due to diffuse pollution from agriculture (Case study 2).[39] Diffuse urban pollution is caused when rain washes pollutants such as oil and chemicals out of urban areas and into water bodies. Five per cent of rivers are affected by diffuse urban pollution.

69. Human activities have altered the natural state of many of Scotland's water bodies, which affects their ecological status. The ecological status of over a quarter of rivers in the Scotland river basin district is less than good mainly due to historical engineering work and agricultural

Exhibit 9

Percentage of waters in the Scotland river basin district affected by different pressures

Diffuse pollution is the main threat to waters in the Scotland river basin district achieving good ecological status.

Type of water body	Total length/area	Percentage of length or area under pressure from:				
		Diffuse pollution	Changes to natural form	Use of water	Point source pollution	Non native species
Rivers	20,819 km	26	24	19	17	2
Lochs	961 km^2	30	35	38	20	2
Coastal waters/ estuaries	46,401 km^2	5	2	0.1	6	0.4
Groundwater	66,567 km^2	25	0	3	15	0

Source: Scottish Environment Protection Agency

Case study 2

Tackling diffuse agricultural pollution

At present, diffuse agricultural pollution cannot be fully addressed by the same permit-based approach that is used to control significant threats to the water environment from single, identifiable sources (see paragraph 50). There are different mechanisms available to tackle diffuse agricultural pollution:

- General binding rules – these provide a statutory basis for best agricultural practice and represent the lowest level of regulatory control. Farmers must comply with general binding rules but do not need a permit to carry out a particular practice.
- Promotion of best practice – the Scottish Government promotes the Prevention of Environmental Pollution from Agricultural Activity (PEPFAA) code, which encourages practices such as fencing-off river banks, developing manure application plans and the safe disposal of sheep dip.
- Economic support – Single Farm Payments require farmers to protect the water environment and one of the key objectives of the Scottish Government's Scotland Rural Development Programme (SRDP) is to improve the water environment (see Appendix 3).

The Scottish Government has established Scotland's Environmental and Rural Services (SEARS) partnership to streamline how public bodies liaise with farmers and land managers.[1] SEPA has trained staff from the other SEARS partners to provide advice and check compliance with general binding rules on diffuse agricultural pollution on its behalf. In 2008/09, this ensured that overall there was more checking of compliance with general binding rules but 900 fewer inspections by SEPA itself.

Note: 1. Nine public bodies are members of SEARS: Animal Health, the two national park authorities, the Crofters' Commission, the Deer Commission for Scotland, Forestry Commission Scotland, SEPA, SNH, and the Scottish Government's Rural Payments and Inspections Directorate.
Source: Scotland's Environmental and Rural Services

39 *Significant water management issues in the Scotland river basin district*, Scottish Environment Protection Agency, 2007.

activity. Electricity generation (hydropower) activity has significantly altered the form of nearly a third of lochs in the Scotland river basin district.

70. The amount of water in a water body and how it is used also affects its ecological status. Electricity generation, drinking water supply and agricultural use of water (eg, irrigation) affect the ecological status of 19 per cent of rivers and 38 per cent of lochs in the Scotland river basin district.

71. Although it is not such a significant pressure, pollution from individual sources remains a threat to the good ecological status of a number of water bodies. Between 2003/04 and 2008/09, Scottish Water invested £234 million to tackle this sort of pollution and contribute to meeting the specific requirements of the Water Framework Directive. This investment did not address pollution from all sewage and wastewater sources. Pollution from these sources remains a problem for 14 per cent of rivers and nine per cent of lochs in the Scotland river basin district.

72. Non-native species may have entered the environment due to deliberate action or accidental release. There are over 1,000 non-native species in Scotland. Their presence in a water body affects its ecological status but only a small number of Scottish water bodies are affected in this way.

Part 3. Biodiversity

There has been mixed progress in protecting and improving Scotland's biodiversity.

Key messages

- There has been mixed progress in protecting and improving Scotland's biodiversity.
- The Scottish Government's target for 95 per cent of all protected areas to be in favourable condition by 2010 is at risk of not being met. Its target to increase the number of terrestrial breeding birds is being met.
- The duty on all public bodies to promote biodiversity has had limited impact, due to a lack of sufficient guidance on how to implement it and the absence of any monitoring or reporting system to enforce it.

Scottish biodiversity objectives are linked to European and UK priorities

73. Biodiversity describes the variety of different species that exist and the habitats that they depend on. Biodiversity is essential to ensure natural systems continue to operate and support life. The destruction of habitats, pollution, the arrival of non-native species, and the effects of climate change can all lead to the loss of biodiversity.

74. In 2004, the EU set out to stop the loss of biodiversity across Europe by 2010.[40] It identified over 1,000 individual plant and animal species and over 200 different habitats to be protected. There are over 26,000 protected areas of European significance – 385 of these are in Scotland.

75. The UK biodiversity action plan (UK BAP) sets out how the UK's biodiversity is protected.[41] It identifies around 1,200 species and habitats that are priorities for conservation, around 200 of which are in Scotland.

76. The Scottish Biodiversity Strategy describes Scotland's contribution towards UK BAP priorities and the European goal to halt the loss of biodiversity.[42] The strategy is supplemented by the Scottish biodiversity list, which identifies a further 1,000 rare species and habitats that are found in Scotland. Exhibit 10 illustrates how European, UK and Scottish biodiversity strategies and targets are connected.

77. Progress against the Scottish Biodiversity Strategy is reported every three years against 22 indicators. Seventeen of these indicators assess the state of Scotland's biodiversity. Some of these are reflected in the Scottish Government's national performance framework (Exhibit 11, page 22).[43] There are five additional indicators that assess people's awareness, understanding and enjoyment of biodiversity.[44]

There are three approaches to protecting biodiversity

78. There are three complementary approaches to protecting biodiversity:

- The protection of individual species.
- The protection of areas where there are important species and habitats.
- The protection of biodiversity more generally, through the **ecosystem** approach.[45] This involves emphasis on action to protect biodiversity across entire ecosystems and all the species and habitats within them, rather than focusing on individual species and habitats.

79. A key way of protecting individual species and habitats is by identifying protected areas. There are a range of different types of protected areas in Scotland. Some protected areas exist to protect individual species. Others protect a particular habitat and all the species in it. In total, there are 1,892 different protected areas in Scotland, covering around 19 per cent of Scotland's land area. They include sites of European importance (Special Protection Areas, Special Areas of Conservation), National Nature Reserves and Sites of Special Scientific Interest. They range from the very large (eg, the Cairngorms nature reserve – 25,950 hectares) to the very small (Tynron juniper wood in Dumfries and Galloway – seven hectares). These protected areas contain 5,436 individual 'features' (eg, species, habitats, rock formations) that have been identified as needing protection.

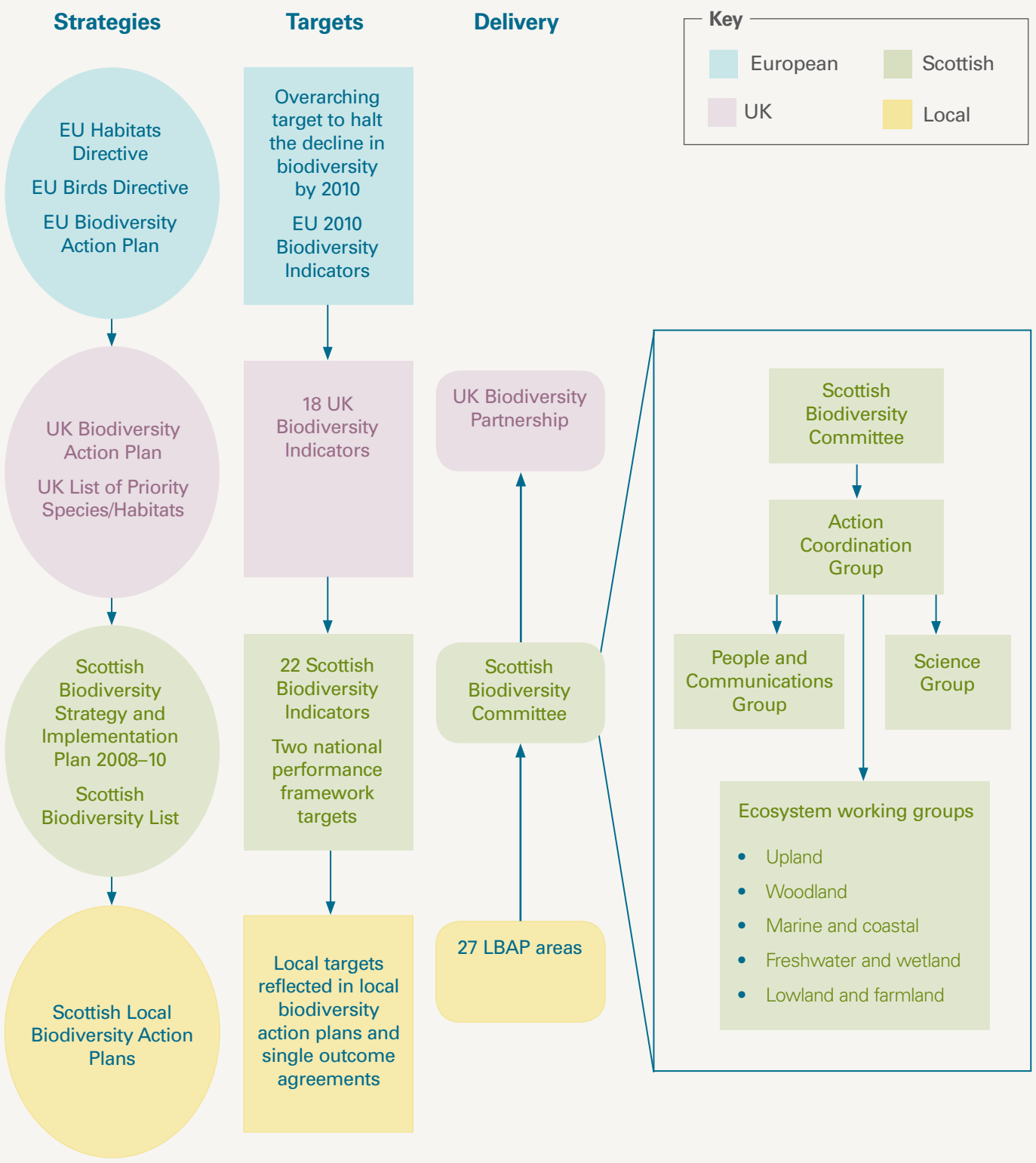
80. Features within protected areas can be classified as favourable, unfavourable or destroyed. Features in a favourable condition are those which have been successfully conserved or are recovering. The condition of features in an unfavourable condition is unlikely to recover and may worsen.

A number of public bodies are responsible for protecting and improving biodiversity

81. SNH is the main public body with responsibility for biodiversity. It manages some protected areas and distributes grants and provides advice to landowners who own the remaining protected areas.

40 *Message from Malahide: Halting the Decline of Biodiversity – Priority Objectives and Targets for 2010*, European Commission, May 2004.
41 *Biodiversity: the UK Action Plan*, DEFRA, January 1994.
42 *Scotland's Biodiversity Strategy*, Scottish Executive, 2004.
43 There is one other indicator in the national performance framework related to the state of biodiversity: to ensure 70 per cent of key commercial fish stocks are at full reproductive capacity and harvested sustainably by 2015. This was not examined in this study.
44 This study focused on the state of biodiversity and did not examine performance against these five indicators.
45 An ecosystem is a unit of living organisms that share the same habitat and interact with each other and their environment. An ecosystem can be any size (eg, a rainforest or a pond).

Exhibit 10
Overview of biodiversity strategies, targets and delivery bodies



Source: Audit Scotland

Exhibit 11

The state of Scotland's biodiversity in 2009

There has been mixed progress against the 17 indicators that assess the state of Scotland's biodiversity.

Scottish biodiversity indicators	Progress	National performance framework indicators
Improve:		
1. Status of UK BAP priority species	Baseline	
2. Status of UK BAP priority habitats	Baseline	
Increase:		
3. Percentage of notified species in favourable condition	↑	Increase to 95 per cent the proportion of protected nature sites in favourable condition
4. Percentage of notified habitats in favourable condition	↑	
5. Number of sites occupied by otters	↑	
6. Proportion of commercially exploited fish stocks that are at full reproductive capacity	↔	
Increase the abundance of:		
7. Terrestrial breeding birds	↑	Increase the abundance of terrestrial breeding birds
8. Wintering water birds	↑	
9. Breeding seabirds	↓	
10. Butterflies	↔	
11. Moths	↔	
12. Marine plankton	↔	
Improve the diversity of:		
13. Vascular plants	↓	
14. Woodland structure	Baseline	
15. Freshwater macro invertebrates	↑	
16. Estuarine fish	↑	
Decrease:		
17. Number of non-native species	↓	

Key

↑ Indicator improving ↓ Indicator deteriorating

↔ No clear trend Baseline

Note: Baseline means only baseline data are available and so no trend can be established.
Source: Scottish Natural Heritage

SNH also works to protect and promote biodiversity more widely, beyond protected areas.

82. Since 2004/05, SNH has spent over £100 million on activity to protect and improve biodiversity, with the majority being spent on managing protected areas. However, spending on supporting wider biodiversity action has increased in recent years, and accounted for 37 per cent of direct expenditure on biodiversity in 2008/09, compared to 19 per cent in 2004/05 (Exhibit 12).

83. In 2002, the Scottish Executive set up a framework for protecting and improving biodiversity. A review of this framework in 2007 found it to be 'complex, inconsistent and … not cost-effective'.[46] As a result, a revised framework for managing the protection of biodiversity was launched in September 2008. This consisted of an overarching Scottish Biodiversity Committee, chaired by the Minister for the Environment, beneath which sit three cross-cutting groups and five working groups focused on particular ecosystems (Exhibit 10, page 21). An implementation plan for 2008–10 identifies actions to be taken by each of these groups to help deliver the objectives of the Scottish Biodiversity Strategy. The revised structure seeks to place greater emphasis on protecting whole ecosystems, rather than individual species and habitats.

84. A wide range of public bodies are represented on the Scottish Biodiversity Committee's subgroups, including SNH, Forestry Commission Scotland, SEPA, Scottish Water, the Scottish Government and councils through their involvement in LBAPs (see below). The Scottish Biodiversity Committee has met three times since the revised framework was launched. It is too early to assess how effective the restructuring has been and no timescales have been set for reviewing it.

 Review of Biodiversity Delivery Structures in Scotland, Hambrey Consulting, 2008.

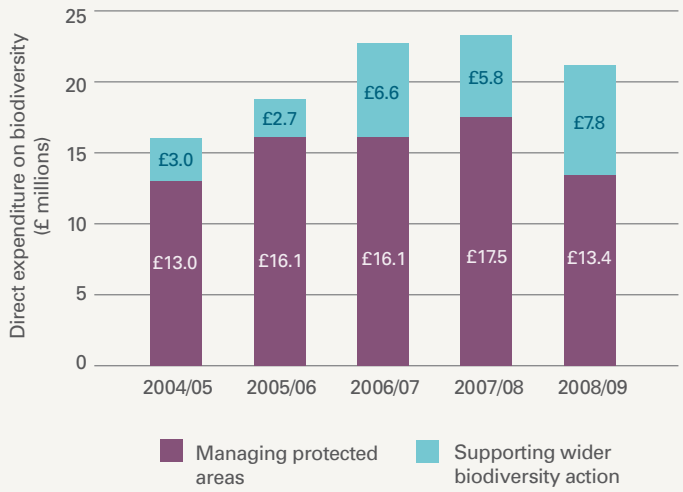
85. Locally, measures to improve biodiversity are coordinated through Local Biodiversity Action Plans (LBAPs). There are 27 LBAP areas in Scotland, covering all 32 council areas.[47] Each individual LBAP identifies actions to protect specific species or habitats found in the area, which have been identified as priorities for conservation in the UK BAP. LBAPs are delivered in partnership by councils, other public bodies, landowners, local voluntary groups and charities. The revised structure of the Scottish Biodiversity Committee subgroups is designed to improve the integration of LBAP activity into the national management of biodiversity, which had previously been poor.[48] The Convention of Scottish Local Authorities (COSLA) is working with its members to integrate LBAPs within the community planning process and to improve joint working with national bodies such as SNH, SEPA and Forestry Commission Scotland.

86. All Scottish public bodies have a duty under the Nature Conservation (Scotland) Act 2004 to further the conservation of biodiversity. Some public bodies (eg, Highland Council and SEPA) have produced plans setting out how they will implement this duty and 19 councils have an indicator relating to biodiversity in their SOAs. However, the duty has had limited overall impact due to a lack of sufficient guidance to public bodies on how to implement the duty and the absence of any monitoring or reporting system to enforce it. In a recent survey of Scottish public bodies, almost half of all respondents felt there is insufficient guidance available to support them in fulfilling their biodiversity duty.[49]

Exhibit 12

Scottish Natural Heritage's direct expenditure on supporting biodiversity, 2004/05–2008/09

Spending on supporting wider biodiversity action has increased relatively.



Source: Scottish Natural Heritage

There has been mixed progress in protecting and improving Scotland's biodiversity

87. The European Commission recognises that its goal to stop the loss of biodiversity across Europe by 2010 will not be achieved.[50]

88. In Scotland, there has been mixed progress against the 17 indicators which monitor the state of biodiversity. In 2009, seven indicators showed improvement, three showed deterioration, and four showed unclear trends (Exhibit 11). No trend could be established for three of the indicators, as only baseline data are available.

89. There is scope to improve the availability and accuracy of the data used to monitor progress against the Scottish biodiversity indicators. A report on the indicators in 2007 identified the need 'to improve the statistical accuracy, precision and representative range of some indicators'.[51] However, there has been no improvement in the level of confidence in the accuracy of the data being collected. In 2009, SNH reported that there was a high level of confidence in the data for eight indicators, a satisfactory level of confidence for seven indicators, and a low level of confidence for two indicators.

90. There has also been mixed progress against the two biodiversity indicators in the Scottish Government's national performance framework. The first target, to increase the long-term abundance of terrestrial breeding birds, is being met. Terrestrial breeding birds are a useful indicator of the overall state of biodiversity, and good data on their abundance have been available for a number of years.

91. The second target, to increase the proportion of protected areas in favourable condition to 95 per cent by 2010, is at risk of not being met. In order to meet this target, 95 per cent of features in protected areas must be in favourable condition or be likely to recover. In June 2009, 79 per

47 Twenty LBAPs cover individual council areas. The remaining seven LBAPs cover 12 council areas.
48 *Review of Biodiversity Delivery Structures in Scotland*, Hambrey Consulting, 2008.
49 *Scoping Biodiversity Guidance for Public Bodies*, SNIFFER, May 2009.
50 *The Message from Athens*, European Commission, April 2009.
51 *Scotland's Biodiversity Indicators*, Scottish Government, 2007.

cent of features in protected areas were in a favourable or unfavourable but recovering condition.[52] This is compared to 71.5 per cent in 2005.

92. Five per cent of features in protected areas will not recover because the cause of their unfavourable condition cannot be tackled. For example, sea bird populations in some locations are falling as their food sources move due to changes in seawater temperature. Therefore, in order to meet the Scottish Government's target, the remaining 16 per cent of protected areas need to be brought out of unfavourable condition by 2010. This will be highly challenging and the target is at risk of not being met.

93. Many of the protected areas with features in unfavourable condition are challenging to address, as they extend over large areas and are owned by several private landowners. The main reason for features being in unfavourable condition is overgrazing by deer, cattle and sheep. The Scotland Rural Development Programme is a key source of funding for land managers wishing to protect and improve biodiversity (see Appendix 3).

94. SNH is responsible for addressing 80 per cent of features in unfavourable condition. Forestry Commission Scotland, the Deer Commission for Scotland and SEPA have responsibility for addressing the remaining 20 per cent of features in unfavourable condition. These public bodies need to continue to work with land managers to bring these features into favourable condition.

Recommendations

- The Scottish Government should provide clearer guidance to public bodies on delivering biodiversity at a local level and meeting their statutory duty to further the conservation of biodiversity.
- Scottish Natural Heritage should continue to improve the availability and accuracy of data, to better monitor progress against Scottish biodiversity indicators.

Part 4. Waste management

Councils do not have sufficient plans to meet landfill and recycling targets beyond 2010.

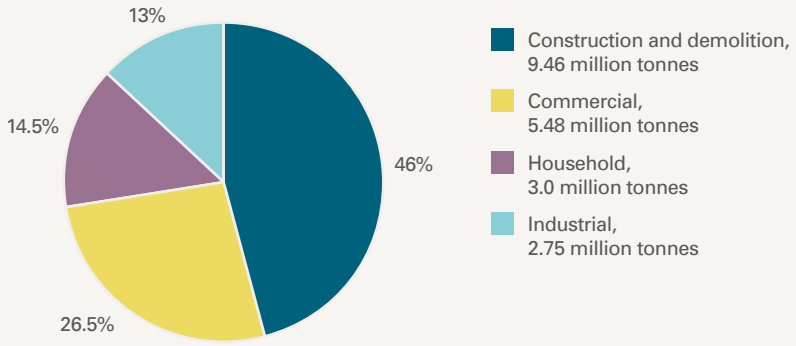
Key messages

- The Scottish Government has introduced a new approach to waste management since the publication of Audit Scotland's *Sustainable waste management* report in September 2007.
- Scotland has already met the European target for reducing the amount of waste sent to landfill by 2010, although the national recycling target is at risk of not being met.
- Collectively, councils' plans are not sufficient to meet landfill and recycling targets beyond 2010.

Exhibit 13

Sources of waste in Scotland, 2007/08

Household waste accounts for less than 15 per cent of the waste produced in Scotland.



Source: Scottish Environment Protection Agency

There is a new approach to waste management in Scotland

95. Audit Scotland published a report on sustainable waste management in September 2007.[53] In January 2008, the Scottish Government announced a new approach to waste management.[54] In addition to reducing the amount of waste going to landfill and increasing the amount of waste being recycled, the new approach places greater emphasis on stopping waste being produced and on increasing re-use. It also stresses the importance of reducing waste from non-household sources (ie, waste resulting from commercial, industrial, and construction and demolition activities) which accounts for 85.5 per cent of the waste produced in Scotland (Exhibit 13).

96. The Scottish Government has consulted on a national Zero Waste Plan, reflecting both its new approach to waste management and the new European Waste Framework Directive.[55, 56] The final version of the Zero Waste Plan will be published in 2010, and the Scottish Government has committed to reviewing the plan regularly.

97. The Scottish Government's new approach to waste management gives greater responsibility to individual councils to increase their rates of recycling and composting and reduce the amount of waste sent to landfill. Until January 2008, councils were working together to develop plans for shared facilities to dispose of non-recycled waste (eg, energy-from-waste plants). With the announcement of the Scottish Government's new approach to waste management, which included a limit on the amount of waste to be treated by energy-from-waste, the development of these joint plans stopped. However, some councils, such as City of Edinburgh and Midlothian, are working together to develop new plans for shared waste facilities to help meet national targets.

Scottish targets for recycling are higher than those set by the European Union

98. As part of its new approach to waste management, the Scottish Government introduced new national targets (Exhibit 14). These targets were developed following a review of different methods for disposing of municipal waste.[57] This assessment found that the best environmental option combined high levels of recycling and composting with energy-from-waste and minimal landfill. The review did not assess the financial costs and practicality of achieving these levels of recycling.

99. The Scottish target for the amount of municipal waste being recycled by 2020 is ten per cent higher than that set by the EU. The Scottish Government did not assess the cost of achieving this higher target, but has subsequently commissioned a cost-benefit analysis of its new waste targets.

100. The European target for the amount of biodegradable municipal waste sent to landfill by 2010 is one of the 45 national indicators in the Scottish Government's national performance framework.[58]

53 *Sustainable waste management*, Audit Scotland, September 2007.
54 The Cabinet Secretary for Rural Affairs and the Environment set out the new waste policy in an announcement to the Scottish Parliament on 24 January 2008.
55 *Scotland's Zero Waste Plan: Consultation*, Scottish Government, August 2009.
56 Directive 2008/98/EC on Waste, November 2008.
57 *Life Cycle Assessment of Municipal Waste Management Options in Scotland*, Scottish Environment Protection Agency, October 2007.
58 Directive 1999/31/EC on the Landfill of Waste, April 1999.

Exhibit 14

Current European and Scottish waste management targets

The Scottish target for recycling municipal waste by 2020 is more challenging than that set by the EU.

European Union targets	Scottish Government targets
The amount of municipal waste being prepared for re-use or recycled (by weight) increased to 50 per cent by 2020.	The amount of municipal waste being recycled or composted increased to: • 40 per cent by end of 2010 • 50 per cent by 2013 • 60 per cent by 2020 • 70 per cent by 2025.
The amount of biodegradable municipal waste sent to landfill reduced to: • 1.32 million tonnes by 2010[1] • 0.88 million tonnes by 2013 • 0.62 million tonnes by 2020.	A maximum of five per cent of municipal waste to be sent to landfill by 2025.
The amount of construction and demolition waste being recycled increased to 70 per cent by 2020.	No separate Scottish target on construction and demolition waste. Scotland must meet European target.
	Maximum of 25 per cent of municipal waste treated by energy-from-waste by 2025.
	Stop growth in the amount of municipal waste by 2010.

Note: 1. This EU target is a national indicator in the Scottish Government's national performance framework.
Source: Audit Scotland

Construction and demolition waste accounts for almost half of the waste generated in Scotland

101. The European Waste Framework Directive includes a target for increased recycling of construction and demolition waste by 2020. There is currently a lack of accurate data on the amount of construction and demolition waste recycled. The Climate Change (Scotland) Act 2009 allows Scottish ministers to require businesses to provide information to SEPA on the waste that they produce. The draft Zero Waste Plan highlights the need to improve the quality of data on construction and demolition waste, and consults on setting a Scottish target on preventing construction and demolition waste.

Funding arrangements for waste management have changed

102. The Scottish Executive set up the Strategic Waste Fund to provide councils with dedicated funding to improve waste management. Between 2000/01 and 2007/08, councils spent £350 million from the Strategic Waste Fund. Following the announcement of the Scottish Government's new approach to waste management, the Strategic Waste Fund stopped operating at the start of 2008/09. The Scottish Government transferred awards made in principle before this date into the general local government settlement (a total of £202 million for the period 2008/09 to 2010/11).

103. The Scottish Government established a Zero Waste Fund, totalling £152 million for the three years 2008/09 to 2010/11. Councils will receive around £80 million of this fund. Although it is not ring-fenced, the funding is intended to help councils make progress towards meeting EU landfill targets in 2013.

104. Almost £56 million of the Zero Waste Fund is allocated to support six organisations and two projects that contribute to improving Scotland's waste management performance.[59] The Scottish Government is currently reviewing the operation of these organisations and projects in order to establish a simpler system for improving waste management and will make its decision on a new system by spring 2010.

105. The remaining £16 million of the Zero Waste Fund is being used to fund specific recycling projects. For example, £0.6 million was spent on food waste collection trials in seven councils across Scotland in 2008/09. In January 2009, the Scottish Government announced a £5 million capital grant to develop plastic recycling facilities in Scotland.

59 The six delivery bodies are WRAP Scotland, Envirowise, Scottish Waste Awareness Group, Community Recycling Network for Scotland, Remade Scotland and Keep Scotland Beautiful. The two projects are the Eco-Schools programme and National Industrial Symbiosis Programme.

Businesses and organisations can bid for a share of the £5 million, which will be made available from the Zero Waste Fund during 2009/10 and 2010/11.

Scotland has already met the European landfill target for 2010

106. Scotland is likely to meet two of its three waste management targets in 2010. It has already reduced the amount of biodegradable municipal waste sent to landfill to below the European target. In 2008/09, 1.26 million tonnes of biodegradable municipal waste was sent to landfill, compared to the target of 1.32 million tonnes. When the *Sustainable waste management* report was published, the most recent available data were for 2005/06 when 1.54 million tonnes of biodegradable municipal waste was sent to landfill.[60]

107. The Scottish target to stop the increase in the amount of municipal waste produced in Scotland is also being met. The total amount of municipal waste produced fell by 3.7 per cent between 2007/08 and 2008/09.[61]

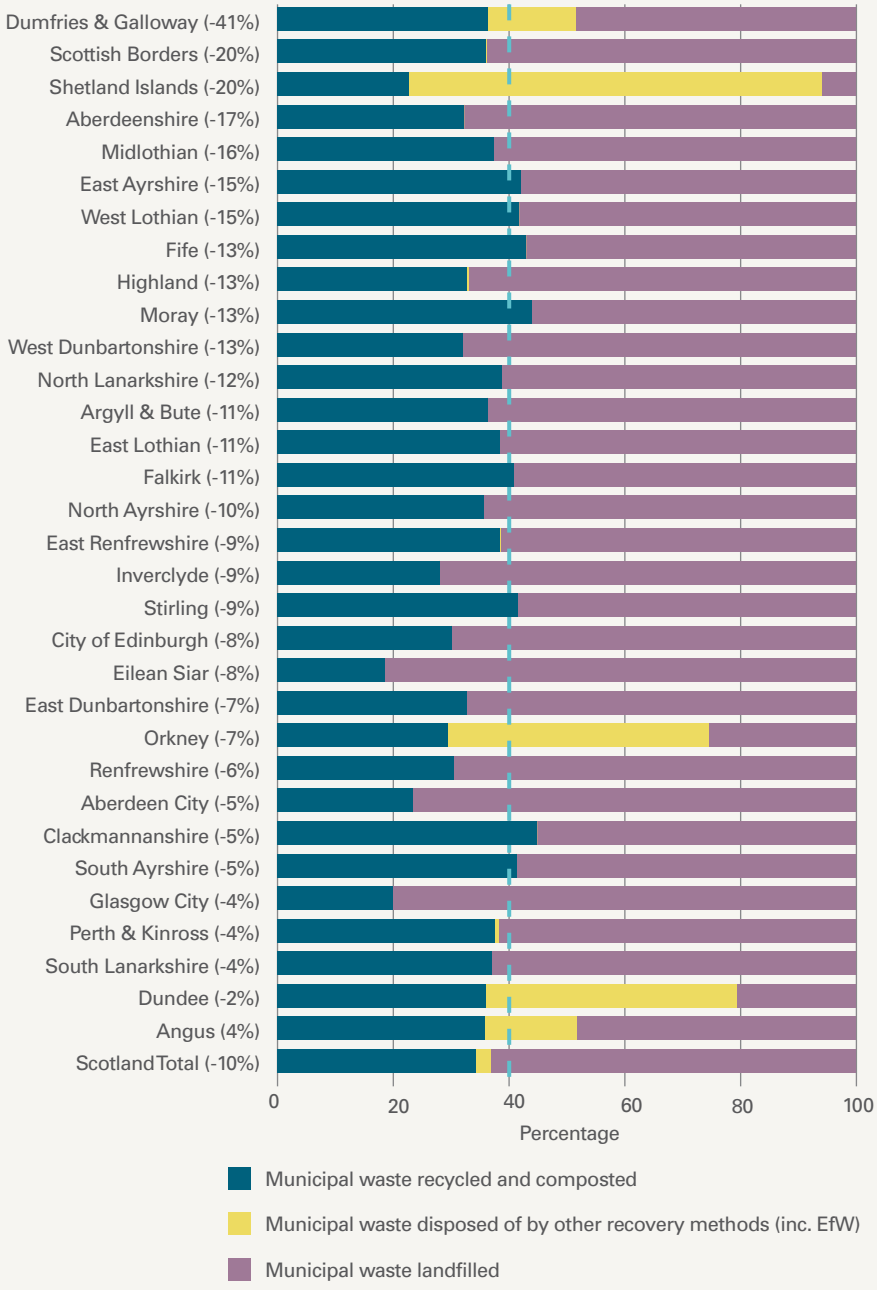
108. Over the last decade Scotland has made significant progress in improving recycling rates. In 2008/09, Scotland recycled 34 per cent of its municipal waste, compared to four per cent in 1998.[62] Recycling rates in Scotland increased by 2.6 per cent between 2007/08 and 2008/09.[63] If levels of recycling continue to increase at a similar rate, Scotland may not meet its target for recycling 40 per cent of municipal waste by 2010.

109. Half of the municipal waste in Scotland is produced in a quarter of council areas.[64] Recycling and composting rates vary across councils in Scotland, from 45 per cent in Clackmannanshire to 19 per cent in Eilean Siar in 2008/09 (Exhibit 15).

Exhibit 15

Council recycling and landfill rates, 2008/09

There is varied performance against the Scottish target to recycle 40 per cent of municipal waste by 2010.



Note: The numbers in brackets show the change in the landfill rate in each council between 2005/06 and 2008/09.

Source: Scottish Environment Protection Agency

60 *Landfill Allowance Scheme Reports*, Scottish Environment Protection Agency.
61 *Ibid.*
62 *Waste Data Digest 1*, Scottish Environment Protection Agency, 2001.
63 *Landfill Allowance Scheme Reports*, Scottish Environment Protection Agency.
64 These eight councils are Glasgow City (11 per cent), Fife (eight per cent), Edinburgh (seven per cent), North Lanarkshire (seven per cent), South Lanarkshire (six per cent), Highland (five per cent), Aberdeenshire (five per cent) and Aberdeen City (four per cent).

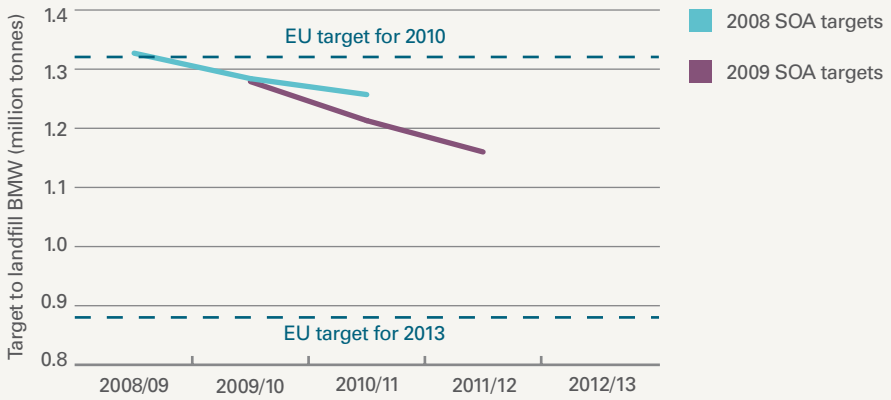
In 2008/09, eight councils recycled and composted over 40 per cent of waste (compared to one in 2005/06).[65] Only two councils recycled and composted less than 20 per cent of waste (compared to ten in 2005/06).[66]

110. The amount councils spend on collecting and disposing of waste continues to rise. Between 2005/06 and 2007/08, the total cost of waste collection and disposal per property increased by 15 per cent, from £117 to £134 per property.[67] Audit Scotland's *Sustainable waste management* report highlighted that the cost of recycling increases with the rate of recycling, as councils extend recycling schemes to areas where separate collections of recyclables are more expensive (eg, high-rise housing). In 2007/08, councils spent a total of almost £340 million on waste collection and disposal. The amount spent varied among councils, from £100 to £221 a year per property.[68]

Exhibit 16

Targets in single outcome agreements for the amount of biodegradable municipal waste sent to landfill

Councils' plans for the amount of biodegradable municipal waste (BMW) to be sent to landfill will not meet European targets after 2010.



Note: Where targets for the amount of BMW sent to landfill have not been set, the actual amount of BMW landfilled between January and December 2008 has been used. Where the target deadline is before the end of the period covered by the SOA, the previous year's target has been extended to the following year(s). Where targets have not been set for every year covered by the SOA, but have been set for a deadline beyond that covered by the SOA, targets have been estimated based on 2007/08 baseline figures and assuming a steady annual reduction in the amount of BMW landfilled towards the deadline.
Source: Audit Scotland

Councils do not have adequate plans to meet landfill and recycling targets beyond 2010

111. Meeting targets for landfill and recycling beyond 2010 will be very challenging, as the necessary reductions in landfill and increases in recycling become more demanding. The achievement of European and Scottish targets for waste management after 2010 requires individual councils to continue to increase recycling rates and reduce the amount of waste sent to landfill. However, some of the mechanisms to do this are reserved to the UK government (eg, landfill tax), or may not be readily publicly acceptable (eg, charging households for the amount of waste they produce).

112. The concordat between the Scottish Government and COSLA requires councils to give a clear commitment, through their SOAs, to achieving national priorities. All 32 SOAs reached in June 2009 include indicators on the amount of waste produced, the amount of waste sent to landfill or recycling rates. The targets agreed in 2009 are more challenging than those agreed in 2008. However, taken together, the current targets in the 32 agreements are unlikely to be sufficient to meet European targets for reducing the amount of biodegradable municipal waste that is sent to landfill beyond 2010 (Exhibit 16). However, in 2008/09, councils were able to divert more waste from landfill than indicated in their SOAs.

113. A study by Remade Scotland reviewed councils' targets for recycling, based on plans in place in March 2009.[69] It found that the 40 per cent recycling target for 2010 could be met but the 50 per cent recycling target for 2013 is likely to be missed by a significant margin.

Councils need additional waste management facilities to meet national landfill and recycling targets

114. By 2025, councils will have to collect, recycle and compost 70 per cent of municipal waste. This will require additional waste management facilities, such as recycling and composting centres. The final version of the national Zero Waste Plan will identify the facilities Scotland needs to treat waste, divert waste from

65 The councils that recycled more than 40 per cent were Clackmannanshire, East Ayrshire, Falkirk, Fife, Moray, South Ayrshire, Stirling and West Lothian.
66 The councils that recycled less than 20 per cent were Eilean Siar and Glasgow City. Eilean Siar accounts for 0.7 per cent of Scotland's total municipal waste, compared to Glasgow City, which accounts for 11 per cent.
67 *Statutory Performance Information*, Audit Scotland, 2007/08.
68 *Ibid.*
69 *Scottish Recycling Study*, Remade Scotland, June 2009. Remade Scotland is a Scottish Government funded initiative with the aim of stimulating, developing and strengthening the market for recyclable material in Scotland.

landfill and increase recycling rates. As recommended in Audit Scotland's *Sustainable waste management* report, councils may need to work together to provide cost-effective facilities. Specific developments may be included in a new national planning framework in 2012. Any waste management facilities included within the framework are unlikely to be developed in time to contribute towards the 2013 targets for recycling and landfill, but may help towards achieving targets in 2020.

115. The Scottish Futures Trust will have a role in delivering the new Zero Waste Plan for Scotland, by coordinating investment in waste treatment facilities.[70] It will offer support to councils that are developing waste management facilities and seek opportunities for collaboration between councils in these projects.

116. In addition to the development of new waste facilities by councils, behavioural change is essential to increasing recycling rates. Although recycling rates are high in areas where kerbside collection is available, there is scope to further increase the volume and type of waste collected and the frequency of recycling. For example, 76 per cent of people with access to kerbside paper recycling collection services use them every time. In areas where a kerbside collection is not provided, only 41 per cent of people use alternative paper recycling facilities.[71]

Recommendation

- The Scottish Government and individual councils should agree plans that together combine to meet European Union and Scottish targets for the amount of waste recycled and sent to landfill.

70 *Scottish Futures Trust Business Plan 2009/10*, Scottish Futures Trust, May 2009.
71 *Scottish Environmental Attitudes and Behaviours Survey 2008*, Scottish Government, March 2009.

Appendix 1.

Glossary

Biodegradable municipal waste	Municipal waste that decays quickly and naturally, such as food, garden waste and paper.
Biodiversity	The variety of different species that exist and the habitats that they depend on.
Diffuse pollution	Pollution that comes from a variety of sources (eg, run-off from roads and farmland), rather than a single source.
Ecosystem	A unit of living organisms that share the same habitat and interact with each other and their environment. An ecosystem can be any size (eg, a rainforest or a pond).
Energy-from-waste	The incineration of waste, using the energy produced to generate electricity, heat, steam or hot water.
Favourable condition	The desired status for areas identified for the protection of species or habitats.
Good ecological status	The desired status of all water bodies. This includes the quality of the water, how water is used, the shape and structure of the water body and the presence of species that are not native to Scotland.
Groundwater	Water found underground.
Landfill	An area designated to receive solid waste, such as municipal waste or construction debris.
Macro invertebrate	An animal without a backbone, that is large enough to be seen with the naked eye (eg, a snail or a crayfish).
Municipal waste	Household waste and any other waste collected by local authorities, including garden waste and recyclables.
Particulate matter	Fine particles in the atmosphere, which come from sources including road traffic, construction work and natural sources (eg, sea salt). PM_{10} refers to particles of ten micrometres or less and $PM_{2.5}$ refers to even smaller particles of 2.5 micrometres or less.
Point source pollution	Pollution from a single source (eg, discharge into a water body from a sewage treatment plant).
Vascular plants	Plants with roots, stems and leaves, which are used to move water and nutrients through the plant. Vascular plants include most large terrestrial plants, such as trees, shrubs, flowering plants, grasses and ferns.

Appendix 2.

Roles of public bodies involved in protecting and improving the environment

	Air quality	Water environment	Biodiversity	Waste management
Scottish Government	Leads delivery of the *Air Quality Strategy for England, Scotland, Wales and Northern Ireland* in Scotland.	Develops policies to maintain and improve the quality of fresh and marine waters.	Leads delivery of the Scottish Biodiversity Strategy.	Leads delivery of the national waste plan and manages the central Zero Waste Fund.
Councils	Monitor air quality and identify and manage local Air Quality Management Areas.	Contribute to river basin planning.	Deliver Local Biodiversity Action Plans in partnership with other bodies.	Provide and fund waste management services.
Scottish Environment Protection Agency	Regulates and advises on industrial activities that can generate airborne pollution, and offers information and advice on local air quality management.	Regulates and advises on activities which impact on the water environment, and leads the river basin planning process.	Contributes to the protection of biodiversity through regulation and advice relating to water, air and land.	Regulates and advises on waste management.
Forestry Commission Scotland		Protects and enhances water quality through sustainable forest management.	Conserves and improves the biodiversity of Scotland's forests and woodlands.	
Scottish Natural Heritage		Leads the protection and improvement of water-related protected areas.	Conserves and enhances Scotland's wildlife, habitats and landscapes. Coordinates and monitors delivery of the Scottish Biodiversity Strategy.	
Scottish Water		Manages water resources to supply safe drinking water. Collects, treats and disposes of sewage in accordance with environmental standards.	Contributes to maintaining and improving protected areas in the water environment.	Management and safe disposal of a range of wastes, recovery and recycling of sewage sludge.
All public bodies		Have a duty to consider river basin management plans.	Have a duty to further the conservation of biodiversity.	

Appendix 3.

Land use and the environment

Single Farm Payments

The Scottish Government plans to pay £433 million during 2009/10 to farmers in the form of Single Farm Payments. In exchange for these payments, farmers have to maintain land in good agricultural and environmental condition and meet certain statutory management requirements which contribute to protecting the water environment and biodiversity. The Scottish Government is currently reviewing the Single Farm Payments system.

The Scotland Rural Development Programme

The Scotland Rural Development Programme (SRDP) runs for six years from 2007 to 2013. It will provide a total of £1.6 billion to promote economic, environmental and social development in rural Scotland. It is funded by money from the Scottish Government and the European Union. Two of its five objectives are to improve the water environment and biodiversity in rural Scotland.

The SRDP is made up of seven different funding streams.[1] Around 50 per cent of SRDP funding is included in a competitive scheme called the Rural Development Contracts – Rural Priorities scheme.[2] This is a competitive scheme that land managers must apply to. To date, the Scottish Government has approved a total of £157 million of funding to land managers under this scheme. Almost half of this funding (£75 million) has been allocated to 1,371 projects that protect and improve biodiversity. A further £4.4 million has been allocated to 105 projects that protect and improve the water environment.

The other seven funding streams are non-competitive and provide funding to eligible rural businesses and communities and land managers. Some of the funding provided through these streams (eg, the Less Favoured Area Support Scheme) require land managers to operate in a way that protects the water environment and biodiversity (ie, maintain good agricultural and environmental condition).

The SRDP will be reviewed during 2010.

Forestry

Seventeen per cent of Scotland is forested. The Scottish Government has an aspiration to increase this to 25 per cent by the second half of the 21st century.[3]

The UK Forestry Standard sets standards for the sustainable management of forests and is supported by best practice guidelines.[4] The Scottish Forestry Strategy creates a vision for forestry over the first half of the 21st century and includes actions aimed at protecting and improving the environment.[5]

Forests and woodlands are important for the protection of biodiversity and provide habitats for key species such as red squirrels and capercaillie. Forests can place pressures on the water environment through diffuse pollution and acidification. The Forests and Water Guidelines seek to control these pressures by linking compliance with these guidelines to the provision of forestry grants and the achievement of certification under the UK Woodland Assurance Scheme.[6]

The impacts of forestry related activities mean that three per cent of rivers and 18 per cent of lochs in the Scotland river basin district do not achieve good ecological status.[7] Forestry Commission Scotland is targeting action on these water bodies. The targeted planting of woodlands and trees can also help to reduce pressures from diffuse pollution from agriculture and reduce the impacts of air pollution.

Forestry Commission Scotland has estimated that it will spend around £44 million (47 per cent of its total budget) in 2009/10 on securing a 'high quality, robust and adaptable environment'.[8]

1 Crofting Counties Agricultural Grant Scheme; Food Processing, Marketing and Co-operation Grant Scheme; Forestry Commission Challenge Funds; the LEADER initiative; Less Favoured Area Support Scheme; Rural Development Contracts; and the Skills Development Scheme.
2 *Scotland Rural Development Programme – First Stage Review*, May 2009.
3 *The Scottish Government's Rationale for Woodland Expansion*, Forestry Commission Scotland, 2009.
4 *UK Forestry Standard*, Forestry Commission, 2004.
5 *Scottish Forestry Strategy*, Forestry Commission Scotland, 2006.
6 *Forests and Water Guidelines*, Forestry Commission, 2003.
7 *Significant Water Management Issues in the Scotland River Basin District*, Scottish Environment Protection Agency, 2007.
8 *Corporate Plan 2008–11*, Forestry Commission Scotland, 2008.

Appendix 4.

Membership of the project advisory group

A project advisory group provided independent advice and feedback at key stages of the project.

Member	Organisation
Lloyd Austin	Head of Conservation Policy, RSPB Scotland
Anil Gupta	Environment and Regeneration Team Leader, COSLA
Catherine MacCulloch	Policy Adviser, Forestry Commission Scotland
Ron Macdonald	Head of Policy and Advice, Scottish Natural Heritage
Janice Milne	Head of Environmental Policy, Scottish Environment Protection Agency
Chris Nevin	Strategic Support Leader (DG Environment), Scottish Government
Mark Williams	Environmental Regulation and Climate Change Manager, Scottish Water

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