

Scottish Government

**Impact Assessments
for the Scotland and
Solway Tweed River
Basin Management
Plans**

Report on Drivers, Policies and Trends

April 2008

Entec UK Limited

Report for

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Executive Summary

Purpose of this Report

This report has been produced for the purpose of information to support the development of the Impact Assessments for the draft River Basin Management Plans for the Scotland and Solway-Tweed River Basin Districts. The report utilises information from public sources to summarise the key drivers, policies and trends which affect the sectors resulting in significant pressures to the water environment. The drivers and trends are then assessed to determine their influence in achieving the Water Framework Directive's Environmental Objectives.

Glossary

AWB - Artificial Water Body
BAT - Best Available Techniques
BWD – Bathing Water Directive
CAP - Common Agricultural Policy
CAR – Controlled Activity Regulations
COMAH - Control of Major Accident Hazards
DEFRA - Department for Environment, Food and Rural Affairs
DWD – Drinking Water Directive
EIA - Environmental Impact Assessment
GAEC - Good Agricultural and Environmental Condition standards
GDP - Gross Domestic Product
GHG - Greenhouse Gas
GROS - General Register Office for Scotland
GVA - Gross Value Added
HMWB - Heavily Modified Water Body
HSE - Health and Safety Executive
IA – Impact Assessment
IPPC - Integrated Pollution Prevention and Control
MtC - Million tonnes of Carbon
NVZ - Nitrate Vulnerable Zone
RBD – River Basin District
RBMP – River Basin Management Plan
RDC - Rural Development Contract
ROS - Renewables Obligation Scotland
RPAC - Regional Priority Area Committee
SACs – Special Areas of Conservation
SEA – Strategic Environmental Assessment
SEPA – Scottish Environment Protection Agency

SPAs – Special Protected Areas

SPP - Scottish Planning Policy

SRDP - Scotland Rural Development Programme

SSAFO - Silage Slurry and Fuel Oil Storage Regulations

SSSI - Site of Special Scientific Interest

SWMI - Significant Water Management Issues

SWAD – Surface Water Abstraction Directive

WFD – Water Framework Directive

UWWTD – Urban Waste Water Treatment Directive

WCA - Wildlife and Countryside Act

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1. Introduction

1.1 Project Outline

Entec were commissioned by the Scottish Government to research and prepare Impact Assessments (IAs) for the implementation of the draft River Basin Management Plans (RBMPs) for the Scotland and Solway-Tweed River Basin Districts. The IAs will enable Scottish Ministers to consider forthcoming policy issues associated with the draft RBMPs and in particular the cost effectiveness of the proposed Programmes of Measures contained within the RBMPs. The intention is to also identify any additional policy advice to the Scottish Environment Protection Agency (SEPA) which may be required to be taken into consideration for the achievement of the Water Framework Directive's (WFD) Environmental Objectives.

1.2 Report Context

The aim of the report on drivers, policy and trends is to form a basis for setting the Scottish baseline for the purpose of the Impact Assessments for the River Basin Management Plans (RBMPs) for the Scotland and Solway-Tweed River Basin Districts. The baseline is identified as the actions that would have been taken to improve the water environment without the Water Framework Directive (WFD) being in place and implemented. A clearly set baseline is required for the accurate identification of the gap between the projected status of a water body and its good status environmental objectives; and subsequently the incremental costs to close the gap and corresponding benefits gained.

The WFD provides for three RBMP cycles of 6 years starting in 2009, 2015 and 2021 with the aim of achieving WFD environmental objectives by 2027. It is important to identify key trends and other legislative drivers that will influence positively or negatively the management of the water environment to 2027. Therefore, this report addresses regulatory policy, drivers and trends where their omission could result in either a failure to meet environmental standards under WFD as a result of not taking into account increased pressures or implementing more measures (bearing higher costs) than is required to ensure compliance.

The report is therefore determined by existing legislation, socio-economic and environmental policies and trends and future policy which is being implemented within the period of the WFD implementation. The review identifies water environment improvements to be delivered by other directives and legislation (e.g. the Urban Waste Water Treatment Directive) and factors this legislation into the assessment as part of the baseline.

1.3 This Report

This report forms the assessment of the Drivers, Policies and Trends for the 'Baseline' assessment of the Scotland and Solway-Tweed River Basin Management Plans. As such the baseline assesses the legislative framework, policy and socio-economic drivers without the implementation of the WFD.

The report is structured as follows:

- Section 2 presents a summary of the European and national environmental legislation which provide a framework for the baseline assessment. It also identifies any reporting requirements under the WFD and any issues for the future development of the IA.
- Section 3 reviews the overall socio-economic drivers and trends within the sectors that could influence the management of the water environment and potentially affected by the RBMP implementation.
- Section 4 takes the information from Section 2 and 3 to assess the negative or positive impact from the specific sector drivers and trends.
- The documents reviewed within the report are presented in Appendix E.

2. Baseline Legislative and Environmental Policy Framework

2.1 Introduction

The Water Framework Directive (WFD) is the most significant European water legislation to emerge to date and is intended eventually to replace the majority of water related European Directives and form a holistic strategy for managing the water environment. Since 1975 many important EC Environmental Directives have been implemented which are either directly or indirectly relevant to the water environment. These Directives contain measures which aim to improve or prevent deterioration in the environmental status of water bodies and will help achieve WFD objectives.

The aspects of these Directives which are pertinent to the description of baseline legislation for the water environment are described in the sections below. European Directives have corresponding national legislation or Regulations which transpose the Directive into Scottish or UK law. Each section describes the Directive and then refers to the corresponding legislation (Acts, Regulations, Orders or Directions) relating to Scotland. Links from the legislation to the WFD, requirements for the River Basin Management Plans (RBMPs) and implications for the Impact Assessments (IAs) for the draft RBMPs are also identified.

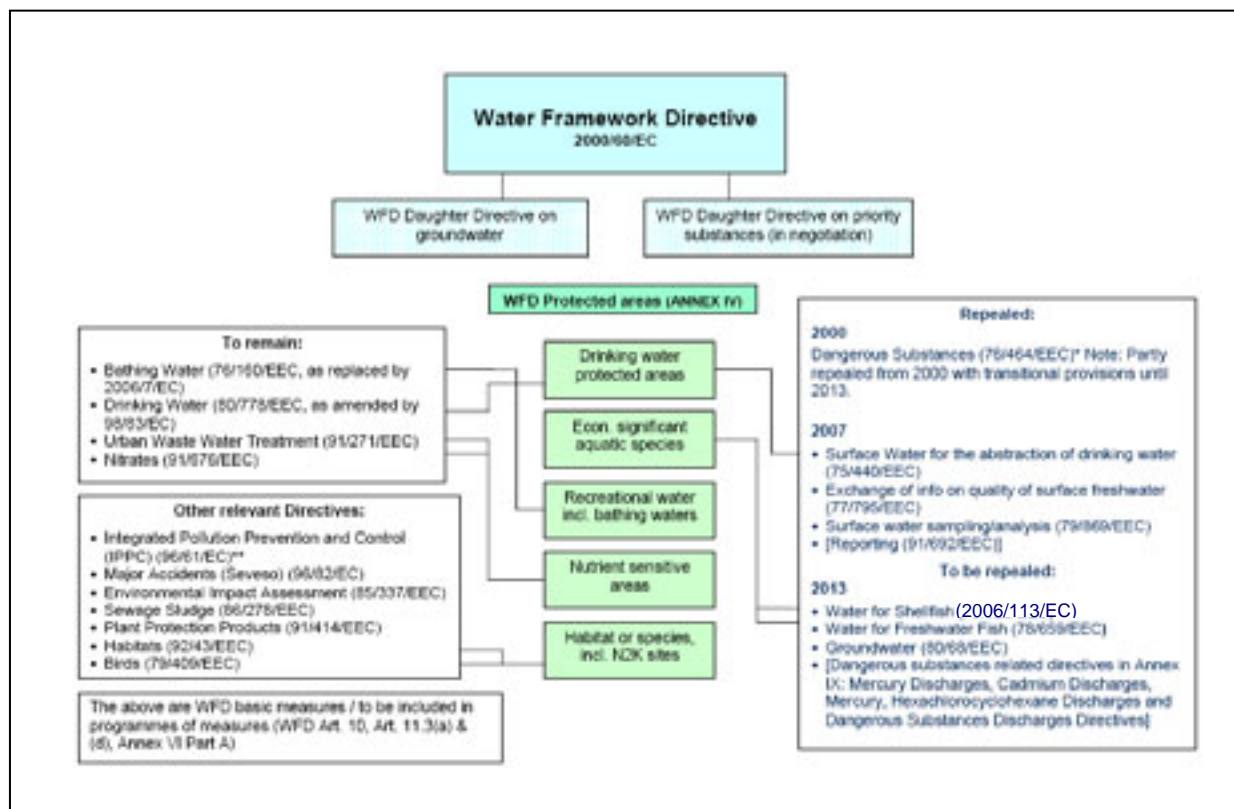
A summary of the Directives and legislation is presented in Table 2.1. Several of the preceding Directives were repealed when the WFD was introduced in 2000, with further repeals in 2007 and the repeal of others to be in 2013. A conceptual summary of the legislation and its linkage with the key elements of the WFD is presented in Figure 2.1.

Table 2.1 Water Related European Directives and Corresponding National Legislation

EU Directive	National Legislation	Related WFD Regulations
Bathing Water (76/160/EEC), as replaced by 2006/7/EC	Bathing Waters (Classification) (Scotland) Regulations 1991 (1991/1609 - S.144) Bathing Water (Scotland) Regulations 2008 (In prep.)	Controlled Activity Regulations, 2005.
Drinking Water (80/778/EEC), as amended by 98/83/EC	The Water (Scotland) Act 1980 Water Supply (Water Quality) (Scotland) Regulations 2001 Private Water Supplies (Scotland) Regulations 2006 Water Industry (Scotland) Act 2002 The Cryptosporidium (Scottish Water) Directions 2003	The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2005.

EU Directive	National Legislation	Related WFD Regulations
Surface Water for Abstraction of Drinking Water (75/440/EEC) and related Directives	Surface Waters (Abstraction for Drinking Water) (Classification) (Scotland) Regulations 1996	The Water Environment (Drinking Water Protected Areas) (Scotland) Order 2005.
Urban Wastewater Treatment (91/271/EEC)	Urban Waste Water Treatment (Scotland) Regulations 1994 (1994/2842:S.144)	Controlled Activity Regulations (2005)
Dangerous Substances (76/464/EEC) and amendments	Surface Waters (Dangerous Substances) (Classification) (Scotland) Regulations 1990 (126/1990) 1992 (574/1992) 1998 (1998/250) 1998 (1998/1344))	Controlled Activity Regulations (2005)
Groundwater Directive (80/68/EEC)	Control of Pollution Act, 1974	Controlled Activity Regulations (2005)
Nitrates (91/676/EEC)	The Designation of Nitrate Vulnerable Zones (Scotland) Regulations 2000 and 2002 The Action Programme For Nitrate Vulnerable Zones (Scotland) Regulations 1998 and 2003	None at present. Future General Binding Rules
Sewage Sludge (86/278/EEC)	Sludge (Use in Agriculture) Regulations 1989 and amendments Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) (Scotland) Regulations 2003 (regulation 8).	None at present. Future General Binding Rules The Water Environment (Oil Storage) (Scotland) Regulations 2006
Plant Protection Products (91/414/EEC)	Plant Protection Products Regulations 2005	None
Birds Directive (79/409/EEC)	Wildlife and Countryside Act (WCA) 1981	None
Habitats Directive (92/43/EEC)	Conservation (Natural Habitats, & c.) Regulations 1994 (as amended)	None
Shellfish Water Directive (2006/113/EC) EU Food Hygiene Regulations (852/853/854)	Surface Waters (Shellfish) (Classification) (Scotland) Regulations 1997 (No.2470 (S.162)) and the Surface Waters (Shellfish) (Classification) (Scotland) Amendment Regulations 2007 (No.427)	
Water for Freshwater Fish (78/659/EEC) as amended by 2006/44/EC	Surface Waters (Fishlife) (Classification) (Scotland) Regulations 1997 (1997/2471 - S.163) The Surface Waters (Fishlife) (Classification) (Scotland) Amendment Regulations 2003 and accompanying Directions	
Integrated Pollution Prevention and Control (96/61/EC)	The Pollution Prevention and Control (Scotland) Regulations 2000 (SSI 2000/323) made under the Pollution Prevention and Control Act 1999.	None
Major Accidents (Seveso) (96/82/EC)	Control of Major Accident Hazard Regulations 1999 (COMAH)	None
Environmental Impact Assessment (85/337/EEC)	The Environmental Impact Assessment (Scotland) Regulations 1999	None

Figure 2.1 Conceptual Summary of Water Related European Directives



from Consultation on River Basin Planning Guidance Volume 2, DEFRA, February 2008

2.2 Bathing Waters and Revised Bathing Waters Directives

The **Bathing Waters Directive (76/160/EEC)** (BWD) sets out water quality standards to protect the health of bathers at designated bathing waters (i.e. beaches, estuaries and lakes) throughout the bathing season. The Directive requires popular bathing waters to be ‘designated’ and monitored for water quality. Water quality parameters primarily focus on human waste from sewage treatment works, or animal wastes from farmland (microbial parameters) although there are a range of parameters, including transparency, oils and colour.

A revised Directive (2006/7/EC) came into force in 2006. It simplifies the number of parameters to be tested, and establishes a clear timetable - 2015 - by which time all Scottish bathing waters must comply with the Directive's standards. The classification scheme has been adjusted to have four categories: poor, sufficient, good and excellent, with the standards in relation to microbiological parameters more stringent than the current Bathing Water Directive. Good roughly equates to guideline under the existing Directive.

Implementation of the Directive

The 76/160/EEC Directive is implemented through the **Bathing Waters (Classification) (Scotland) Regulations 1991 (1991/1609 - S.144)**. The Regulations prescribe a system of classification and sampling of bathing waters based on the requirements of the Directive. Prior to 1991, the Directive had been implemented by administrative means under existing primary legislation. Consultation has recently been concluded on the draft Bathing Water (Scotland) Regulations, 2008: “*Better bathing waters for all: Implementing the revised Bathing Water Directive in Scotland*” (www.scotland.gov.uk/bathingwaterstrategy). The consultation focused on the new regulatory requirements (i.e. information provision, signage, designation process, bathing water profiling and classification) under the Bathing Water (Scotland) Regulations 2008 (to be laid shortly) rather than where existing controls may be used to achieve the required microbiological standards (e.g. Controlled Activities Regulations or actions taken under the programme of measures under the RBMPs).

Links to RBMPs and WFD

The status of protected areas under the WFD (including designated bathing waters) will be reported in the RBMP recognising its status under the classification schemes associated with the WFD and the BWD. The UK is reporting classification against the current BWD in 2009, with the first classification planned against revised BWD in 2015.

Pollution – both diffuse and point source – is assessed against chemical and microbiological parameters under the WFD, the BWD and other directives. Some RBMP measures will be more appropriate than others for specific chemical parameters, whilst other measures (e.g. nitrate vulnerable zones and better storage) within the RBMP could result in improvements for parameters under other Directives (i.e. BWD).

Significant improvements in bathing water quality have been achieved by tightening discharge consents and improving sewerage infrastructure. These improvements have been facilitated by the Scottish Water Quality and Standards (Q&S) programme of investment.

Some bathing waters continue to be affected by diffuse water pollution, i.e. faecal pollution from agricultural and/or urban runoff after heavy rain. Tackling sources of diffuse water

pollution is the next significant challenge for further significant improvements in bathing water quality. This will be delivered through initiatives such as the Scottish Rural Development Programmes (SRDP) which will work closely with farmers and other stakeholders to improve farming practices and through regulatory provisions, such as the diffuse pollution General Binding Rules (GBR).

Implications for the RBMP Impact Assessments

The programme of measures in the first RBMP will holistically address the requirements for meeting both the WFD and the BWD. The key causal factors: point source and diffuse pollution are relevant to achieving the objectives of both Directives.

The Impact Assessments for RBMPs will lead on to considering the implications of any costs of benefits of new actions taken under the programme of measures. Associated with this, there will be a supporting impact assessment looking at the revised BWD focusing on the implications of revised microbiological standards. It should be noted that:

- Any work taken to meet the requirements of the current BWD will be considered as part of the baseline.
- The IAs for the RBMPs will set out the options to manage the pressures on Scotland's water including protected areas.
- Any work taken specifically to meet the requirements of the revised BWD will be reported separately, only where significant costs and benefits for sectors can be isolated. Otherwise it will draw on the overarching RBMP IA.

2.3 Drinking Water

The **Drinking Water Directive (80/778/EEC)** (DWD) as repealed by Directive (98/83/EC) sets standards for the quality of water intended for human consumption. Member States have to monitor the quality of the drinking water supplied to their citizens and of the water used in the food production industry. This has to be done mainly at the tap inside private and public premises for a total of 53 microbiological and chemical water quality standards that must be monitored and tested regularly. Where standards to achieve these Directives are more stringent than those required under WFD to protect ecological health, this will support also the co-delivery of the objectives under the WFD.

The Surface Water Abstraction Directive (75/440/EEC) (SWAD) set out monitoring provisions. This was revoked and replaced by obligations under the Water Framework Directive on 22 December 2007.

Implementation of the Directives

These Directives have been implemented through a number of Acts and Regulations in Scotland. These are predominantly concerned with the protection of public health through the provision of safe drinking water. As such the Regulations set out the framework for the monitoring and supervision of the water industry. The Acts and Regulations also protect the water environment through the requirement to protect the raw water sources from contamination. The key instruments and details related to protection of the water environment are listed below:

- The Water (Scotland) Act 1980
 - Water authorities must supply wholesome water for domestic purposes. It is a criminal offence to supply water unfit for human consumption;
 - Local authorities must take appropriate steps to keep themselves informed about the wholesomeness of public and private water supplies in their area and notify the water authority if not satisfied; and
 - Local authorities are required to secure improvements to private water supplies if they consider them necessary.
- The Surface Waters (Abstraction for Drinking Water) (Classification) (Scotland) Regulations 1996 supported the implementation of SWAD, specifically:
 - Sets raw water standards for the quality of surface water to be used as sources of public water supply;
 - Permits waivers for certain parameters where these have a natural origin; and
 - Require water authorities to classify all their sources of water in accordance with prescribed quality criteria.

The monitoring provisions of SWAD (repealed and revoked in December 2007) and the 1996 Regulations are now replaced by risk-based WFD-compliant monitoring programmes intended to protect and monitor raw water abstractions of drinking water. Scottish Water and SEPA now follow this risk-based approach rather than the monitoring requirements of the 1996 Regulations. Amending Regulations to replace the 1996 Regulations are currently being developed.

- The Water Supply (Water Quality) (Scotland) Regulations 2001
 - Defines wholesomeness by setting standards for around 50 drinking water quality parameters;
 - Sets and defines, the water supply zone as the basic unit for drinking water quality monitoring;
 - Require water authorities to monitor the quality of their supplies;
 - Require water authorities to publish an annual report and keep a public register of water quality in their area.
- The Private Water Supplies (Scotland) Regulations 2006 (which replaced the 1992 Regulations).
 - Defines wholesomeness in the same manner and prescribe the same standards as for public supplies;
 - Require local authorities to classify private supplies according to size and use and to monitor private supplies in their area according to classification; and
 - Require local authorities to secure improvements to private supplies if necessary.

- The Water Industry (Scotland) Act 2002
 - Created the post of Drinking Water Quality Regulator for Scotland (DWQR);
- The *Cryptosporidium* (Scottish Water) Directions 2003
 - Requires cryptosporidium risk assessments for all surface water and groundwater drinking water sources.

Links to RBMPs and WFD

Drinking Water Protected Areas (DWPAs) will be reported in the draft RBMPs. The programme of measures will identify actions taken to deliver the requirements for DWPAs and focus on achieving either the WFD or protected areas standards (whichever is more stringent). Where requirements are specifically related to achieving Habitats and Bird Directives these will not be costed or directly recognised in the IA for the RBMP.

2.4 Waste Water and Discharges

2.4.1 The Urban Waste Water Treatment Directive

The Urban Waste Water Treatment Directive (91/271/EEC) (UWWTD) regulates the collection and treatment of waste water from homes and industry. It protects the environment by ensuring that all significant discharges of sewage from urban waste water and biodegradable waste water from the food-processing industry are treated before they are discharged into the water environment.

The Directive imposes obligations to establish waste water collection and treatment systems within a timescale and to specific standards, depending on the size of the community (agglomeration) and the location of the discharge. Discharges into areas identified as "sensitive" require more stringent treatment than the secondary treatment specified in the Directive. Among other things, the Directive requires appropriate treatment to be provided for discharges from smaller agglomerations and also brings to an end to the disposal of sewage sludge at sea.

The Directive requires Member States to identify sensitive areas of the marine and freshwater environment on the basis of a number of criteria. The types of sensitive areas, and the corresponding higher levels of treatment required, are:

- *areas suffering from eutrophication or which may become eutrophic.* This usually requires the removal of phosphorus from sewage treatment discharges where freshwater is concerned, and nitrogen for marine waters;
- *areas to protect drinking water supplies from excessive nitrates.* Removal of nitrogen from sewage treatment discharges, which may lead to nitrates concentration increases in a drinking water resource; and
- *areas where more stringent levels of sewage treatment are needed to meet the requirements of other EU Directives.* In general, if another Directive requires higher levels of sewage treatment (e.g. disinfection to protect bathing waters), work will have been undertaken or planned under the terms of that Directive, irrespective

of whether or not it has been designated as a sensitive area under the terms of the Urban Waste Water Treatment Directive.

Implementation of the Directive

The Directive is implemented in Scotland through the Urban Waste Water Treatment (Scotland) Regulations 1994 (1994/2842:S.144). The Regulations require Scottish Water to establish "collecting systems" for urban waste water which will be subject to certain treatment by specified dates. This is determined according to the size of the "agglomeration" from which the waste water comes and the nature of the waters into which the treated waste water is discharged. The Regulations also require SEPA to grant and modify discharge consents under Part II of the Control of Pollution Act 1974 (and since 2005 the Water Environment (Controlled Activities) (Scotland) Regulations) in relation to the discharges, which establishes that biodegradable industrial waste water from listed industrial sectors satisfies the requirements appropriate to the nature of the industry concerned. The Regulations place a duty on SEPA to ensure that monitoring of discharges and waters to which the Regulations apply are carried out.

Links to RBMPs and WFD

The programme of measures will identify actions taken to deliver the requirements of the UWWTD where they support achievement of WFD environmental objectives. Where requirements are specifically related to achieving the UWWTD these will not be costed or directly recognised in the IA for the RBMP.

2.4.2 Dangerous Substances Directives

The **Dangerous Substances Directive (76/464/EEC)** requires Member States to introduce measures to eliminate (List I) or to reduce (List II) pollution of the aquatic environment from certain listed substances identified in its Annexes. Discharges have to be authorised and are subject to specific emissions standards, which are laid down on the basis of toxicity, persistence and bioaccumulation within the environment. The 1980 Groundwater Directive repealed the provisions made in this Directive on the protection of groundwater.

Daughter Directives – Dangerous Substances Directives

Several Daughter Directives (82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC & 90/415/EEC) lay down specific limit values for discharges according to the type of industry concerned and the quality objectives for the receiving waters. They also set reference methods of measurement and the limit of detection and add additional List I substances.

Implementation of these Directives in Scotland

Initially, the 1976 Directive and its Daughter Directives, were largely implemented in Scotland through government circulars and letters.

A number of **Surface Waters (Dangerous Substances) (Classification) (Scotland) Regulations (1990 (126/1990) 1992 (574/1992) 1998 (1998/250) 1998 (1998/1344))** prescribe systems for classifying the quality of surface waters by the presence of concentrations of certain List I and List II substances, for the purposes of setting water quality objectives for these waters. In addition, Directions were made to the River Purification Boards and latterly SEPA under s54 of COPA 1974 to impose conditions of consent under Part II of COPA 1974 in order to comply with Directives relating to discharges of dangerous substances. Also a duty was imposed to undertake such monitoring procedures necessary to comply with these Directives.

Links to RBMPs and WFD

The Dangerous Substances Directive was repealed in 2000. There are some transitional provisions until 2013 to ensure that all chemical standards identified under the Dangerous Substances Directive are met.

Actions taken to meet any transitional provisions of this Directive will be reported in the RBMP under the programme of measures where they also contribute to achieving the requirements of WFD. However, these actions will not be costed or directly recognised in the IA for the RBMP unless a substance has also been identified as a specific pollutant and for some daughter directives (e.g. Groundwater Daughter Directive) where there is an additional requirement (e.g. a more stringent standard).

2.4.3 Groundwater Directive (80/68/EEC)

The Groundwater Directive prevents the pollution of groundwater by substances belonging to families or groups of substances described in Lists I and II of its Annex. The Directive's aim is to prevent the discharge of List I substances, and to limit the discharge of List II substances, to groundwater.

The Directive was implemented through the Groundwater Regulations (1998) but the provisions in these regulations have, in Scotland, been repealed and replaced by provisions in the Water Environment (Controlled Activities) (Scotland) Regulations 2005 - also known as 'Controlled Activities Regulations' or 'CAR'.

2.5 Agricultural Practices

2.5.1 The Nitrates Directive

The **Nitrates Directive (91/676/EEC)** aims to protect water quality against nitrate pollution from agriculture in those areas where the water is polluted and to prevent new pollution from arising. In particular, it is about promoting better management of animal manures, manufactured fertilisers and other nitrogen-containing materials spread onto land. The Directive requires Member States to introduce a voluntary code of good agricultural practice to provide a general level of protection against nitrate pollution in all waters; designate high-nitrate areas as Nitrate Vulnerable Zones (NVZs); and to establish action programmes in these areas.

Implementation of the Directive

The Directive is implemented through a number of regulations which designate areas and set action programmes of measures for farmers within NVZ areas to comply with.

The Designation of Nitrate Vulnerable Zones (Scotland) Regulations 2000 and 2002

These instruments designated areas of Moray, Aberdeenshire, Banff and Buchan; Strathmore and Fife; and Lothian and Borders and lower Nithsdale as NVZs. The designations subsumed the existing NVZs at Balmalcolm in Fife and the Ythan catchment in Aberdeenshire.

The Action Programme For Nitrate Vulnerable Zones (Scotland) Regulations 1998 and 2003

These instruments introduced action programmes of measures for farmers in designated NVZs. The action programmes focus on limiting nitrate input to crop requirement and the storage,

timing and amount of application of certain fertilisers to minimise nitrate leaching. Different closed periods have been put in place for different types of fertiliser, and to reflect local environmental conditions in the different NVZs.

Links to RBMPs and WFD

The WFD programme of measures will include measures to deliver the requirements of the Nitrates Directive where they support achievement of the WFD. Where requirements are specifically related to achieving the Nitrates Directive these will not be costed or directly recognised in the IA for the RBMP.

2.5.2 The Sewage Sludge Directive

The **Sewage Sludge Directive (86/278/EEC)** aims to ensure that human beings, animals, plants and the environment are fully safeguarded against the possibility of harmful effects from the uncontrolled spreading of sewage sludge on agricultural land and to promote the correct use of sewage sludge on such land.

The Directive prohibits sewage sludge application to soils unless the concentration of heavy metals in the soil is below certain limits (which vary according to pH) and requires that the use of sludge be monitored to ensure that the soil does not exceed these limits after sludge has been spread. It also requires that sludge is treated before use, unless it is injected or worked into the soil, and that the land receiving sludge cannot be grazed, or crops from the land harvested, for three weeks after sludge has been spread.

Implementation of the Directive

The Directive is implemented in Scotland through the **Sludge (Use in Agriculture) Regulations 1989** and amendments.

Control of Pollution (Silage, Slurry and Agricultural Fuel Oil)(Scotland) Regulations 2003

These are commonly known as the SSAFO Regulations. These Regulations set minimum standards for the construction of all new, substantially enlarged or substantially reconstructed installations for silage and slurry storage. Storage requirements for agricultural fuel oil are now contained in the Oil Storage Regulations, which are effectively part of the Controlled Activities Regulations.

2.5.3 The Plant Protection Products Directive

The Plant Protection Products Directive (91/414/EEC), also known as 'the Authorisations Directive', aims to prevent impacts from plant protection products by controlling the marketing and use of new products. Plant protection products include herbicides (weed killers), insecticides, fungicides, molluscicides (slug/snail killer) and other pesticide products used to protect plants.

The Directive requires that all new plant protection products be approved before they can be sold or used. To gain approval, the producers must submit a complete data package (dossier) identifying the plant protection product (and the active substance contained in it); their physical and chemical properties; their effects on target pests; and any possible effects on workers, consumers, the environment and non-target plants and animals. These dossiers are evaluated at European level and a decision made on whether the new product can be approved and the conditions of its approval across all Member States.

Implementation of the Directive

The Directive is implemented throughout the UK by the Plant Protection Products Regulations 2005 and administered throughout the UK by the Pesticides Safety Directorate.

2.6 Protection of Habitats

2.6.1 Birds Directive (79/409/EEC)

The **Birds Directive (79/409/EEC)** or more formally known as the “Council Directive on the Conservation of Wild Birds” primarily seeks to control the hunting and killing of wild birds and protect their eggs and nests, but also requires Member States to preserve, maintain or re-establish habitats (Special Protection Areas) to maintain the population of all species. This can have positive impacts on water quality and quantity in Special Protected Areas.

Implementation of the Directive

The Directive is implemented through the Wildlife and Countryside Act (WCA) 1981.

The **Habitats Directive 92/43** (see Section 2.6.4 below) replaces certain habitat protection obligations arising from the Birds Directive.

2.6.2 Habitats Directive (92/43/EEC)

The **European Community Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora** usually known as the Habitats Directive, aims to maintain or restore to ‘favourable conservation status’ the species and habitats identified as being of community importance (as specified in Annexes to the Directive). Member States must designate certain of those areas which host these species and habitats as Special Areas of Conservation (SACs), along with sites classified as Specially Protected Areas (SPAs) under the Birds Directive. Member States must also implement the requirements of Articles 6.2, 6.3 and 6.4 of the Habitats Directive by taking appropriate steps to avoid deterioration in the designated areas and requiring (through the national legislation) and that plans or projects likely to have a significant effect on these sites are assessed to ensure that consents are not granted unless it can be demonstrated that there will be no adverse effect on site integrity (unless the criteria required by the derogation provided under Article 6.4 of the Directive can be met). Member States must also introduce a range of measures including the protection of species and habitats listed in the Annexes, undertake surveillance of habitats and species and produce a report every six years on the implementation of the Directive. SACs and Special Protection Areas (SPAs) designated under the Birds Directive form an EU-wide network of protected areas known as Natura 2000.

Implementation of the Directive

In the UK the Directive is implemented on land and inshore waters by the **Conservation (Natural Habitats, & c.) Regulations 1994 (as amended)**, known as 'the Habitats Regulations'. Most SACs in the terrestrial environment (including land or freshwater sites) are underpinned by notification under the Nature Conservation (Scotland) Act 2004 as Sites of Special Scientific Interest (SSSIs). For the limited number of SACs or SPAs which are not underpinned by SSSI notification, positive management is secured when required by wider countryside measures, whilst protection is delivered via the relevant provisions of the Habitats Regulations and the Nature Conservation (Scotland) Act 2004.

Links to RBMPs and WFD

Protected Areas including areas identified under the Habitats and Birds directives will be reported in the draft RBMP. The programme of measures will identify actions taken to deliver the requirements of these and focus on achieving either the WFD or protected areas standards (whichever is more stringent). Where requirements are specifically related to achieving Habitats and Bird Directives these will not be costed or directly recognised in the Impact Assessment for the RBMP.

2.6.3 Shellfish Waters Directive (2006/113/EC)

The original Shellfish Waters Directive (79/923/EEC) has now been repealed by the codified Shellfish Waters Directive (2006/113/EC). The codified Directive maintains all existing measures which provide for the monitoring and assessment of shellfish waters and the setting of the water quality standards they are required to achieve.

The purpose of this Directive is to provide protection and improvement for coastal and brackish waters to support shellfish life and growth, and thus contribute to the quality of shellfish products directly edible by humans. It requires Member States to designate shellfish waters and establish programmes for their improvement where necessary. The improvement programmes must be directed at the waters obtaining the required standards, which are mainly chemical and microbiological.

Scotland has at present 108 designated shellfish waters and the Scottish Government has recently consulted on designating a further 8 waters.

The Shellfish Waters Directive works in parallel with the **EU Food Hygiene Regulations (852/853/854)**, which replaced the **Shellfish Hygiene Directive (91/492/EEC)** in 2006. The Regulations are implemented by the Food Standards Agency Scotland, and set chemical and microbiological standards which must be met by the areas designated as shellfish harvesting areas.

Implementation of the Shellfish Waters Directive

The **Surface Waters (Shellfish)(Classification)(Scotland) Regulations 1997 (No 2470 (S.162))** and the **Surface Waters (Shellfish) (Classification) (Scotland) Amendment Regulations 2007 (No. 427)** prescribe a system for classifying the quality of controlled waters which are coastal or brackish waters which need protection or improvement in order to support shellfish life and growth. They also incorporate the reference methods of measurement, and the minimum frequency required for sampling and analysis, laid down in the Directive for those parameters. The Directive is also transposed by various directions to SEPA.

Links to RBMPs and WFD

The Shellfish Waters Directive will be repealed in 2013. The RBMP programme of measures will include measures to deliver the requirements of this Directive where they support achievement of the WFD. Where requirements are specifically related to achieving this Directive, these will not be costed or directly recognised in the IA for the RBMP.

2.6.4 Fresh Water For Fish Directive (78/659/EC as amended by 2006/44/EC)

This Directive aims to protect or improve running or standing fresh waters which support, or would become capable of supporting, indigenous or other desirable species of fish. It requires

Member States to designate fresh waters for fish (as either salmonid or cyprinid waters) and establish programmes for their improvement where necessary. The improvement programmes must be directed at the waters obtaining the required, mainly chemical, standards. Under the terms of the Directive programmes should aim at ensuring compliance within 5 years.

Implementation of the Directive

Surface Waters (Fishlife) (Classification) (Scotland) Regulations 1997 (1997/2471 - S.163), as amended, prescribe a system for classifying the quality of inland waters which need protection or improvement in order to support fish life. They also incorporate the reference methods of measurement, and the minimum frequency required for sampling and analysis, laid down in the Directive for those parameters. There are also corresponding Directions to SEPA outlining their duties.

The Surface Waters (Fishlife) (Classification) (Scotland) Amendment Regulations 2003 and accompanying Directions to SEPA, clarify the duty to introduce pollution reduction programmes as required by Article 5 of the Directive, and makes further provision in relation to the reduction in the sampling frequency of designated waters which are of appreciably high quality, or the cessation of sampling for non-polluted waters, as allowed by Article 7(2) of the directive.

Links to RBMPs and WFD

The Fresh Water For Fish Directive will be repealed in 2013.

The RBMP programme of measures will include measures to deliver the requirements of this Directive where they support achievement of the WFD objectives. Where requirements are specifically related to achieving this Directive, these will not be costed or directly recognised in the Impact Assessment for the RBMP.

2.7 Controls on Development and Manufacturing

2.7.1 Links to RBMPs and WFD

The following directives may contribute to the management of the water environment. The programme of measures may recognised requirements related to the IPPC Directive where they support achievement of the WFD. Where requirements are specifically related to achieving this Directive these will not be costed or directly recognised in the IA for the RBMP.

2.7.2 The Environmental Impact Assessment Directive (85/337/EEC) as amended

The Environmental Impact Assessment Directive (85/337/EEC), as amended by Council Directive 97/11/EC and by Article 3 of Directive 2003/35/EC (to improve the rights for public participation), requires that before consent is given for certain development projects, an assessment is to be made of the likely significant effects.

An environmental impact assessment (EIA) helps to ensure that the importance of the predicted effects, and the scope for reducing any adverse effects, are properly understood by the public and the relevant competent authority before it makes its decision. The developer must compile detailed information about the likely main environmental effects with public authorities making

available any relevant environmental information in their possession. The developer can also ask the 'competent authority' for their opinion on what information needs to be included. The information finally compiled by the developer, known as an 'Environmental Statement' is consulted on widely.

In Scotland, the Directive has been implemented through a number of Regulations which are linked to individual consent regimes. For example, where this is linked to the granting of planning permission, then the relevant legislation is contained within the Environmental Impact Assessment (Scotland) Regulations 1999.

2.7.3 The Integrated Pollution Prevention Control Directive (96/61/EC)

The Integrated Pollution Prevention and Control (IPPC) Directive (96/61/EC) is designed to prevent, reduce and eliminate pollution at source through the efficient use of natural resources. It is intended to help industrial operators move towards greater environmental sustainability.

Implementation of the Directive

The Directive is implemented by the Pollution Prevention and Control (Scotland) Regulations 2000 which are enforced by SEPA. The activities covered by the PPC Regulations are wide ranging and cover activities arising from energy, metals, mineral, chemical, waste management industries, as well as others such as paper/board production, slaughterhouses, food and drink production, intensive pig and poultry farms. To comply with the regulations, operators need a permit and must use Best Available Techniques (BAT) to prevent emissions to air, land and water or, where that is not practicable, they must reduce them to an acceptable level. In addition, they must: minimise waste and recycle it where they can; conserve energy; prevent accidents and limit their environmental consequences; and return the site to a satisfactory state after operations cease.

2.7.4 The Major Accidents (Seveso) Directive (96/82/EC)

Directive 96/82/EC, also known as the Seveso II Directive, aims to prevent accidents and limit their consequences if they do occur at sites using or storing certain dangerous substances above thresholds laid out in the Directive.

The Directive deals with exceptional risks (fires, explosions and massive emissions of dangerous substances when an activity gets out of control) and requires steps to be taken to prevent major accidents. Operators of establishments where higher threshold quantities of dangerous substances are used or stored must produce a safety report and an on-site emergency plan. In addition, the relevant local authority must produce an off-site emergency plan and the public must be told of safety measures and what to do in the event of an accident.

Implementation of the Directive

The Directive is implemented in Scotland by the Control of Major Accident Hazards (COMAH) Regulations 1999. The Health and Safety Executive (HSE) and SEPA are the joint competent authority for the COMAH Regulations.

Article 12 of the Directive was implemented through the Planning (Control of Major Accident Hazards) (Scotland) Regulations 2000, which are not stand alone regulations, but amended various aspects of existing planning legislation to meet the requirements of Article 12.

3. Overall Socio-Economic Drivers and Trends

3.1 Sustainable Development and WFD

Section 2(4) of the Water Environment and Water Services (Scotland) Act 2003, which is the primary legislation implementing the WFD in Scotland, sets out the requirements for Scottish Ministers, SEPA and responsible authorities to *act in the way best calculated to contribute to the achievement of sustainable development*.

SEPA in developing the draft RBMPs and fulfilling its functions as the competent authority must consider Scottish and UK policies that influence the achievement of sustainable development and economy. Ministers in considering the implications for the draft RBMPs will need to consider how these may support or affect the delivery of their vision and policy objectives for Scotland.

This section reviews and discusses strategic policy documents in UK and Scotland which shape and direct Scotland's economic development and growth. In particular, the section identifies key statements and trends that should be considered within the Impact Assessments for the draft RBMPs (as well as the Strategic Environmental Assessment (SEA) being prepared by SEPA). It identifies these in terms of the positive and negative impacts on management of the water environment.

This section focuses on:

- National context: economic strategy and sustainable development (Section 3.2) and changing demographics (Section 3.3);
- Climate change in terms of its impact on the water environment and planned actions in relation to sectors practices that may need support adaptation (Section 3.4); and
- Key trends in sectors whose activities are identified in SEPA's Significant Water Management Issues (SWMI) reports for Scotland's RBDs (as released for consultation in September 2007) as a key pressure on the environment and/or those sectors who are beneficiary of any continuing and enhanced management of the water environment (Sections 3.5 – 3.10).

3.2 Trends and Strategies for Economic Growth and Sustainable Development

3.2.1 Scotland's Economy

Scotland is experiencing a long-term decline of traditional industries and a growth in service-based activity. Services are now the dominant sector of the economy contributing to the 73.8%

of the GDP in 2004¹. Manufacturing accounts for around 13.8% of GDP and construction a further 6.8%. Mining and energy contribute 3.8% and agriculture the remaining 1.6%.

Annual growth in GDP averaged 1.8% over the past 25 years compared with 2.1% for the UK as a whole.

Scotland has extensive international trade links and some of the sectors of its national economy are particularly export-oriented especially manufacturing.

The Scottish economy has established strengths in tourism, financial services, electronics, whisky and energy. However, the manufacturing sector, electronics and textiles sectors have experienced significant decline, with electronics particularly affected by competition with Asia.

Unemployment is at its lowest levels for several decades and lower than in many European countries. However, there are significant regional disparities.

Significant parts of Scotland are eligible for assistance from the EU Structural Funds Programmes under different objectives, i.e. support for development and structural adjustment in regions whose economic performance is lagging behind the EU average, assistance to areas facing industrial, urban or rural decline or support to tackle long-term unemployment and social exclusion².

3.2.2 Strategic Policy Overview

A number of strategic policies shape and direct Scotland's economic development and growth. The key documents which define strategic goals, targets and the way in which economic prosperity will be secured are the: UK Shared Framework for Sustainable Development³, the UK Sustainable Development Strategy⁴; the Government Economic Strategy⁵; and the draft National Planning Framework (2008b)². Recurring themes in these documents include:

- Commitment to build low carbon economy.
- Aim to ensure economic growth within environmental limits and include issues like climate change and energy, protection of the natural resources and environmental enhancement in the shared priorities for action across the UK.
- Commitment for sustainable economic growth decoupling it from environmental damage.

¹ Scottish Executive (2006d): Scottish Economic Report, December 2006.

² Scottish Government (2008b): The National Planning Framework for Scotland 2. Discussion draft, January, 2008.

³ DEFRA (2005): One Future – Different Paths. The UK's shared framework for sustainable development, 2005.

⁴ Scottish Executive (2005e): Choosing Our Future. Scotland's Sustainable Development Strategy, December 2005

⁵ Scottish Government (2007c): The Government Economic Strategy, November 2007

- The set goal of highly skilled and knowledge-based economy which is innovative, productive, resource efficient, competitive and focused on high value activity.
- A focus on sectors of strategic importance including energy (particularly renewables), food and drink, tourism, financial and business sectors, life sciences and creative industries. In Scotland, the continuing contribution of the rural land use sector and manufacturing has also been highlighted, recognising that these traditional industries are experiencing a long term decline.
- Strategic targets: to raise Scotland's GDP growth rate to the UK level by 2011, to match the GDP growth rate of the small independent EU countries by 2017.

The IA and the SEA for the draft RBMPs will need to consider any implications for achieving the above. Section 3.2.3 – 3.2.6 provides brief summaries of these documents.

3.2.3 One Future-Different Paths. UK Shared Framework for Sustainable Development (2005)

This framework document states that sustainable development in UK should be pursued through *“a sustainable, innovative and productive economy that delivers high levels of employment, and a just society that promotes social inclusion, sustainable communities and personal well-being. This will be done in ways that protect and enhance the physical and natural environment, and use resources and energy as efficiently as possible.”* It outlines the guiding principles, priorities for action (identified below) as well as UK-wide indicators (DEFRA, 2005).

Guiding principles:	Shared priorities for UK action:
– Living within environmental limits	– Sustainable consumption and production.
– Ensuring a strong, healthy and just society.	– Climate change and energy.
– Achieving a sustainable economy.	– Natural resource protection and environmental enhancement.
– Promoting good governance.	– Sustainable communities.
– Using sound science responsibly.	

3.2.4 The UK and Scotland's Sustainable Development Strategies (2005)

The UK Government's Sustainable Development Strategy supports the UK Shared Framework – as did the former Scottish Executive's Sustainable Development Strategy, *Choosing Our Future*. The strategies built on existing work and translate the framework's aims into action, based on the different responsibilities, needs and views. The strategies of the UK and Scotland included further priorities, and were supported by further measures and indicators.

The Scottish Government which took office after the May 2007 Election remains committed to sustainable development, which it pursues through its “Purpose for Government”, five supporting strategic objectives, as outlined in the Government Economic Strategy (2007); and the National Outcomes and Indicators set out in the 2007 Scottish Spending Review⁶. Together, these are known as the National Performance Framework. As well as the Purpose

⁶ Scottish Government (2007): Scottish Budget spending review, November, 2007

Targets on economic growth and sustainability described under Section 3.2.5, the National Performance Framework includes the following outcomes, indicators and targets, among others:

National outcomes :	National indicators and targets:
<ul style="list-style-type: none"> – to “value and enjoy [Scotland’s] built and natural environment and protect and enhance it for future generations”. – to “reduce the local and global environmental impact of [Scotland’s] consumption and production”. 	<ul style="list-style-type: none"> – Reduce overall ecological footprint of Scotland. – Increase to 95% the proportion of protected nature sites in favourable condition. – 50% of electricity generated in Scotland to come from renewable sources by 2020 (interim target of 31% by 2011).

In addition, Scotland’s Sustainable Development Strategy identifies recognises the challenge to make economic growth sustainable, breaking the link with environmental damage. Scotland aims to pursue the goal of sustainable development through sustainable, innovative and productive economy, but simultaneously protecting, enhancing the physical and natural environment and using resources and energy as efficiently as possible.

The Strategy highlights that Scotland wants to focus on innovation and high value activity. It also stresses that smarter use of resources makes good economic sense as it allows business to improve its productivity and competitiveness through a more efficient use of resources. The Strategy addresses the issue of the energy efficiency and its role in tackling climate change. It further highlights a range of business and employment opportunities arising from the shift towards more sustainable development and potential in sectors like waste management, recycling and renewable energy (Scottish Executive, 2005e). The Strategy identifies the following commitments:

Commitments	Targets
Sustainable consumption and production:	achieving more with less by reducing the inefficient use of resources, looking at the impact of products and materials across their whole lifecycle and encouraging people to think about the social and environmental consequences of their purchasing choices
Climate change and energy:	securing a profound change in the way Scotland generates and uses energy, and reducing greenhouse gas emissions
Natural resource protection and environmental enhancement:	protecting country’s natural resources, building a better understanding of environmental limits, and improving the quality of the environment
Sustainable communities:	creating communities that embody the principles of sustainable development locally

Source: Scottish Executive, 2005e

3.2.5 The Scottish Government Economic Strategy (2007)

Sustainable economic growth is the central purpose of the Scottish Government’s work. The Economic Strategy defines the Purpose as: *“to focus the Government and public services on creating a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth”*. The Scottish Government Economic Strategy sets out five strategic objectives of wealthier and fairer, smarter, healthier, safer and stronger, and greener Scotland. The Strategy defines priorities, targets and actions to promote sustainable economic growth and to bring more economic success to the country.

The Strategy highlights that the quality of Scotland's environment and natural heritage is a key asset and a source of comparative advantage and identifies actions to promote economic growth and environmental quality as mutual advancing (Scottish Government, 2007c).

Sustainable economic growth: strategic targets

Over the last thirty years, Scotland's annual average GDP growth (1.8%) was well below that of comparable small European countries and significantly below the UK average. The strategy has set long and short-term targets and the means by which the sustainable rate of economic growth in Scotland can be accelerated include boosting Scotland's productivity, population, participation and ensuring solidarity, cohesion and sustainability (summarised below).

Element	Target
GDP growth rate	Short-term: to raise Scotland's GDP growth rate to the UK level by 2011. Long-term: to match the GDP growth rate of the small independent EU countries by 2017.
Productivity	To rank in the top quartile for productivity amongst its key trading partners in the OECD by 2017.
Participation	To maintain its position on labour market participation as the top performing country in the UK and close the gap with the top 5 OECD economies by 2017.
Population	To match average European (EU-15) population growth over the period from 2007 to 2017, supported by increased healthy life expectancy in Scotland over this period.
Solidarity	To increase overall income and the proportion of income earned by the three lowest income deciles as a group by 2017.
Cohesion	To narrow the gap in participation between Scotland's best and worst performing regions by 2017.
Sustainability	To improve Scotland's environment and to significantly reduce country's negative impact on the global environment. To reduce emissions over the period to 2011 and to reduce emissions by 80 per cent by 2050 ⁷ (Scottish Government, 2007c).

Strategic Priorities

The Strategy identifies pathways or Strategic Priorities through which growth is most effectively driven. These Strategic Priorities critical to economic growth include: *Learning, Skills and Well-being; Supportive Business Environment, Infrastructure Development and Place, Effective Government and Equity*.

Whilst all are relevant to the implementation of the WFD in Scotland, the following points are important to approaches identified in the draft RBMPs and should be considered in the supporting Impact Assessment.

Strategic approaches under *Supportive Business Environment* include among others:

- A strong link between research base and business innovation.
- Focus on a number of key sectors with high growth potential and capacity to increase productivity. These sectors include: energy (particularly renewables),

⁷ The Scottish Government is currently consulting on the proposed Scottish Climate Change Bill. The consultation includes questions on the definition of a statutory target

food and drink, tourism, financial and business sectors as well as creative industries and life sciences.

- Recognition that many of Scotland's sectoral opportunities rest on the delivery of a greener Scotland. Scotland has significant potential in renewable energy and can build on current good practice to take an international lead in building sustainable food and tourism industries.

The Strategy highlights the value of *Infrastructure Development and Place*. Enhancing Scotland's transport services and infrastructure are key to supporting business and employment opportunities. It also stresses the importance of a planning framework that both protects the quality of Scotland's natural and built environment and enables the development of growth-enhancing activities across Scotland, including rural areas.

3.2.6 Draft National Planning Framework (2008)

Vision and targets

While this is not an economic strategy, the second National Planning Framework (on which consultation has recently completed) will guide the spatial development of Scotland to 2030. It sets out strategic development priorities to support the Scottish Government's central purpose - promoting sustainable economic growth.

The Framework takes forward the spatial aspects of the Government Economic Strategy, highlighting the importance of place and identifying key priorities for investment, including investment in infrastructure.

The draft Framework defines the key aims of the strategy for Scotland's spatial development to 2030 which are:

- To contribute to a wealthier and fairer Scotland by supporting sustainable economic growth and improved competitiveness and connectivity;
- To promote a greener Scotland by contributing to the achievement of climate change targets and protecting the quality of the natural and built environments;
- To help build safer, stronger and healthier communities, by promoting improved opportunities and a better quality of life; and
- To create a smarter Scotland by supporting the development of the knowledge economy.

The draft Framework indicates that the aim is to create a knowledge driven economy capable of meeting the challenges of a highly competitive global environment. It stresses that it is important to promote economic diversification, to realise the potential of Scotland's renewable energy resources and to invest in water infrastructure (Scottish Government, 2008b).

Rural Development Planning Policy

Scottish Planning Policy SPP 15: Planning for Rural Development (2005)⁸ defines the approach and objectives that should underpin planning policies and decisions which affect rural areas, mainly new development within the draft National Planning Framework. The overall aim is “to have a prosperous rural economy, with a stable or increasing population that is more balanced in terms of age structure and where rural communities have reasonable access to good quality services”.

These policies are summarised in the box below.

Policy	Influence on water environment policy
Scottish Planning Policy SPP15	<p>New Development</p> <p>New development must be carefully planned to not undermine the character and quality of the countryside.</p> <p>In more densely populated rural areas, most new development will continue to be in, or adjacent to, existing settlements, the natural and historic environment has to be protected and green belts respected.</p> <p>In the less populated areas, encouraging diversification and individuality through renewable energy technologies, tourism and recreation, aquaculture, equestrianism and others.</p> <p>Agriculture and forestry will continue to be important elements of rural life. Prime quality agricultural land should continue to be protected.</p> <p>In crofting areas there is a need to make more land available in appropriate locations for a range of developments.</p> <p>Economic development and diversification</p> <ul style="list-style-type: none"> ▪ support to a wide range of economic activity and environmental enhancement and continued diversification. ▪ diversification in locations where access, particularly by public transport, drainage capacity and IT infrastructure exist or can be provided at reasonable cost. ▪ Promote the role of aquaculture and tourism in the rural development. ▪ Focus on developments with the added value of employment generation or community benefits. ▪ appropriate use of the funds of Common Agricultural Policy to help farm businesses build a more financially and environmentally sustainable future. <p>Environmental quality</p> <ul style="list-style-type: none"> ▪ Some rural areas in Scotland are special in terms of the built, historic and natural environment and therefore any development should be carefully managed. Some of these areas are protected at the European and national scale, others, while highly valued environments, can accommodate certain types of development given that there will be no adverse environmental impact.

3.3 Demographic Trends and Urban Development

3.3.1 Key demographic trends and projections

Changes in number and distribution of population drive the change in the demand for infrastructure (such as water supply, sewerage collection and treatment services, flood

⁸ Scottish Executive (2005): Scottish Planning Policy SPP 15: Planning for Rural Development, February 2005

management and flood defence services, transport and navigation) and subsequently will define what pressure Scotland's population will be causing to water environment.

Key past demographic trends and future projections are presented below with additional supporting information in **Appendix A**.

- Scotland has experienced decline and ageing of the population as a result of a falling birth rate and out-migration as well steady decline in the urban population⁹. Regional changes however were not homogenous: while Eilean Siar has experienced significant decrease in its population in the last decade, substantial increase has occurred in West Lothian (GROS, 2007a).
- Scotland is seeing a projected gradual decline in population due to natural decrease and ageing of population. However, while falls in population are forecasted in Aberdeen, Dundee, parts of West Central Scotland and some of the remoter rural areas, continuing growth in population is expected in Eastern and Central Scotland (GROS, 2007b; Scottish Government, 2008b).
- Actions which are being taken by the Scottish Government to reverse the population decline through greater retention of people and in-migration seem to be successful: the slight increase in population between 2002 and 2006 was caused by net in-migration from Eastern Europe following enlargement of the European Union (GROS, 2007a; Scottish Government, 2008b).
- The population is expected to rise from 5.12 million in 2006 to 5.37 million in 2031 and then slowly fall below 5 million in around 2076 (GROS, 2007b). At the same time Scotland's population target is to match average European (EU-15) population growth over the period from 2007 to 2017 (Scottish Government, 2007b);
- There is a continued increase in the number of the households (due to second homes, smaller households and preference for living alone). This creates the demand for new urban area development, potentially in previously underdeveloped areas or adjacent to regional population centres (such as Stirling, Strathclyde, etc) (GROS, 2007a; Scottish Government, 2008b).

3.3.2 Implications for the provision of essential infrastructure

According to the draft National Planning Framework (2008b) investing in water supply and wastewater systems is a key priority for the Government and substantial resources are required. The primary focus and priority of the on-going and planned investment programmes is on provision of sufficient strategic infrastructure capacity to meet the needs of the (planned) development. Furthermore, the investment programme aims to bring existing infrastructure up to the standards required by environmental and public health legislation.

⁹ The population has been slowly declining since 1974 when it was 5.24 million till it reached its lowest point of 5.05 million inhabitants in 2002. Also the share of four main cities (Glasgow, Edinburgh, Aberdeen and Dundee) has been steadily falling from 39% in 1961 to 27% in 2006 (GROS, 2007a).

The draft Framework stresses the importance of ensuring that Scottish Water's long-term investment programme considers the Government's priorities for economic development, area regeneration and environmental improvement among other needs.

Furthermore, the draft Framework stresses that the projected increase in flood risk also needs to be taken into account in Scotland – both in relation to the siting of new development and the protection of existing development. Scottish Planning Policy 7: Planning and Flooding partially cover these issues.

In addition to the water and flood defence infrastructure, transport infrastructure will have to accommodate current and future demographic trends. While the draft National Planning Framework recognises the need to improve accessibility and links between cities, towns and rural communities as well as to tackle congestions and the lack of integration and connections in transport, the Scottish Government is committed to making best use of the existing rail and road networks. This means that development plans must take account of the availability of existing public transport infrastructure and the capacity of transport networks. Higher densities and mixed use development close to public transport nodes will therefore be promoted in urban areas. In rural areas, local service networks will be developed. The Framework does recognise however, that in some cases new transport infrastructure will be needed to support economic growth (Scottish Executive, 2008b).

3.3.3 Implications for the River Basin Management Plans and Impact Assessment

The changing population density in the regions may result in competition for space in terms of meeting housing needs and maintaining assets for environment, recreation and tourism. Therefore, the challenge under the WFD is to meet the requirement for no deterioration of the status of the water environment over the period up to 2027, whilst enabling the required development. The draft RBMP is anticipated to include actions to support this requirement whilst recognising the above trends.

3.4 Climate change

3.4.1 Overview

Climate change is undoubtedly a significant driver in recent and future changes to the water environment. Observed and predicted impacts as well as consequences of the climate change to water environment in Scotland are addressed in the reports on Significant Water Management Issues (SWMI) in the Scotland and Solway Tweed River Basin Districts.

SEPA in developing the draft RBMPs will need to consider where actions may be taken to address climate change as part of wider management of the water environment. It is recognised that this may see adjustments in the programme of measures over the three river basin management planning cycles, as the optimum course of actions are recognised. Additionally, emerging European policy on the links between WFD and climate change will need to be taken into account. Actions aimed at reducing emissions of greenhouse gases (GHGs) and adaptation measures will influence performance and development of different sectors and subsequently the pressures they cause on water environment. In terms of the IA for the draft RBMPs (as well as the SEA report), these will need to consider Scottish and UK strategic policy responses to the climate change challenge.

3.4.2 Climate Change Policies and Strategies

The UK Climate Change Programme¹⁰ and *Changing Our Ways: Scotland's Climate Change Programme* are the key documents which outline the domestic response to climate change through mitigation and adaptation. *Changing Our Ways* quantified for the first time Scotland's equitable contribution to UK climate change commitments in carbon terms and set a target to exceed this. In order to strengthen the domestic response to climate change, both the UK and Scottish Governments have proposed climate change bills which, amongst other things, will include statutory emissions reduction targets. The UK Bill would set a target for the UK as a whole to reduce carbon dioxide emissions by 60% by 2050, and the Scottish Government committed, through its *Government Economic Strategy*, to consult on a proposed Scottish Climate Change Bill which would set the ambitious target to reduce emissions by 80% by 2050. A new climate change programme will be required to deliver this more ambitious Scottish target.

Section 4 of the Scottish Government's *Consultation on proposals for a Scottish Climate Change Bill*¹¹ sets out the context for the Scottish Government's climate change response and background information. Details of **Scotland's Climate Change Programme (2006)** and the **UK Climate Change Programme (2006)** are presented in **Appendix B**. Key policy targets and commitments recognised in these policy documents include:

- UK domestic target to reduce CO₂ emissions to 20% below 1990 levels in 2010 with a long-term goal to reduce emissions to 60% below 1990 levels by 2050 and UK Kyoto target to reduce emissions by 12.5% over 2008-2012.
- Scotland's long-term vision of a low carbon economy and reduced vulnerability to the effects of climate change by 2050.
- Quantification of Scotland's equitable contribution to UK climate change commitments in carbon terms – the Scottish Share – and a target to exceed this contribution to climate change commitments by 1 million tonnes of carbon equivalent in 2010.
- Scotland's commitment to renewable electricity as well as support for low carbon energy sources, energy efficiency and energy savings through energy demand management.
- Actions planned across a vast range of different sectors, including waste, transport, agriculture, forestry, energy sector and planning. Measures include: promoting emissions reduction from land management practices; renewable energy and micro-generation; increasing forest cover as well as promoting sustainable flood management.

¹⁰ DEFRA (2006): Climate change. The UK Programme 2006, March 2006

¹¹ Scottish Government (2008): Climate change. Consultation on proposals for a Scottish Climate Change Bill, January 2008.

3.4.3 Consultation on proposals for a Scottish Climate Change Bill (2008)

It is proposed that the Scottish Climate Change Bill will provide a statutory framework, additional to the UK one, for a distinctive Scottish target and will introduce relevant measures.

A mandatory long-term target to achieve an 80% reduction in Scottish emissions by 2050 is the key policy commitment presented in the consultation paper. Continuous progress on reducing emissions is considered essential to reach an 80% reduction by 2050 and meeting the target will require emissions reductions equivalent to an average of more than 3% per year over the period. The Scottish Government believes that reporting an annual measure of progress within a multi-year budget process would be the best means of achieving the progress needed to meet the long-term target.

According to the consultation document there are four key reasons why the Scottish Government is bringing forward legislation to create mandatory climate change targets:

- To drive decisions in government and business;
- To create and enable new means of reducing emissions and adapting to climate change;
- To play a part in global action on climate change; and
- To provide a strong example to other countries showing what can be done.

A new Scottish Climate Change Programme will be required to deliver the ambitious target set in the Consultation.

Planned supporting measures

While stressing the importance of small changes and environmentally sustainable behaviour, the Scottish Government recognises the potential to enable more action in some areas. Potential measures discussed in the Scottish Climate Change Bill consultation cover a range of different sectors including: energy, building and construction, public sector, waste management and carbon storage. Generally this signals review of current actions with the plan to encourage more uptake of desired activities. For example, in waste management there is a planned review of the National Waste Plan and ongoing waste minimisation, including reuse of potentially waste materials, and increased recycling to reduce GHG emissions.

3.4.4 Carbon Sequestration Through Land Use

The Scottish Government recognises that, given Scotland's significant land resource, emissions reduction from land use will play a key role in the Scottish climate change strategy. While deforestation, conversion of grassland to arable, livestock breeding and use of fertilisers result in CO₂ emissions, woodland creation and conversion of arable to grassland create carbon sinks.

3.4.5 Climate Change Adaptation

The Scottish Government recognises the need for Scotland to adapt to the impacts of climate change which is likely to bring changes in seasonal rainfall patterns, with wetter winters and autumns, and warmer temperatures.

The Scottish Climate Change Bill Consultation stresses the challenge climate change presents to Scotland's land-use industries and highlights the need for agriculture and forestry to adapt and adjust land management practices to changing climate.

Areas such as planning, health, flood risk management, transport, forestry, building standards, agriculture and nature conservation will have a role in helping Scotland prepare for the impacts of climate change. The Scottish Government is currently developing a Scottish adaptation strategy to identify priority adaptation action and to clarify roles and responsibilities in achieving this action. A consultation on the Scottish Adaptation Strategy is expected during 2008.

3.4.6 Implications for Management of the Water Environment

Planned mitigation and adaptation measures across different sectors may potentially have an adverse impact on the water environment. Changes in land use practices and renewables obligations are the most important measures which might result in reduced or increased pressure to the Scottish water environment. However, mitigation measures in the agriculture and forestry sectors are unlikely to result in adverse effects on water quality, as they include options such as increases in forestry cover, conversion from arable to grassland, reduced use of fertilisers and reduced numbers of livestock. However, measures to mitigate flood risk and increase electricity generation from renewable sources may potentially result in extensive hydromorphological changes due to additional hydropower production and flood defence infrastructure.

3.5 Agriculture, Forestry and Aquaculture

3.5.1 Introduction

The impact of agriculture, forestry activities and aquaculture on Scottish waters is recognised and discussed in the SEPA's reports on Significant Water Management Issues in the Scotland and Solway Tweed River Basin Districts (2007).

While Chapter 2 addresses environmental regulatory framework for these activities, this section reviews key strategic policy and planning documents for agriculture (including rural development), forestry and aquaculture.

Section 3.5.2 reviews the characteristics of Scottish rural areas. Section 3.5.3 reviews the implications for the water environment resulting from current agricultural policy and trends. Forestry is reviewed in Section 3.5.4 and aquaculture in Section 3.5.5.

3.5.2 Overview of Scottish Rural Economy

An overview of the economy of Scottish rural areas is presented below. Additional detail is presented in **Appendix C.1**.

Around 54% of Scotland's territory is predominantly rural and in addition there are many areas which are remote (SRDP, 2007).

Scotland's rural areas are experiencing major structural changes with the continuing decline of farming and fishing accompanied by an expansion of the service sector, diversification into new activities and the growth of the leisure economy (NPFS, 2004). A significant part of the population lives in the central belt which, whilst it is densely populated, still retains extensive

areas of agriculture and forestry. Most of the remainder of rural Scotland is relatively unpopulated. It is estimated that about a million people, 19% of Scotland's total, live in rural areas (SPP 15, 2005).

There has been diversification in rural areas away from the primary industries of agriculture, forestry, fishing and energy, and growth in the contribution of other activities, particularly in the service sector. In 2005, nearly a quarter of farms engaged in some form of on-farm diversification activity. Of these, tourism accommodation and leisure, equine activities and shooting were the most common activities (6% each), and renewable energy was the least common activity (1%) (SRDP, 2007).

3.5.3 Agriculture

Overview

Agricultural land covers 6.12 million hectares or almost 80% of Scotland, however due to physical and climatic conditions most agricultural land is rough grazing, and 85% is classified as Less Favoured Areas. The area of land used for crops, fallow and set-aside represents only about 10% of the total agricultural area. The livestock sector is of particular significance to Scottish agriculture, including a significant area of dairying in south-west Scotland (SRDP, 2007).

In terms of the output, agricultural sector in Scotland accounts for 1.3% of Gross Value Added (GVA), although its importance is much greater in some regions of rural Scotland. The sector employs around 45,000 people, which represents 2.2% of the total workforce, or 5% of the rural workforce (A Forward Strategy for Scottish Agriculture, 2006).

Agricultural output forms a vital input to the wider food and drink industry, which represents one of the largest manufacturing sectors, accounting for about one-fifth of gross value added and one-fifth of employment in Scottish manufacturing (A Forward Strategy for Scottish Agriculture, 2006).

There have been some positive developments between 2000 and 2005 such as a 54% increase in Total Income from Farming, but the industry is undoubtedly still facing significant challenges through continuing pressure on output prices as well as increases in some critical input costs (A Forward Strategy for Scottish Agriculture, 2006).

In response to wider market drivers, projected changes across agricultural activities indicate that there are likely to be increases land area supporting wheat and oilseed rape, with decreasing land areas in barley, dairy, sheep, pigs and poultry (see **Appendix C.6** for information on these projections).

Common Agricultural Policy, National Strategy and Programmes

The European Common Agricultural Policy (CAP) reform along with the cross-compliance requirements has a significant effect on the changes in agriculture and subsequently pressure that agriculture causes on water environment in Scotland. CAP reform also underpins the rural development policy in Scotland and these together with the environmental regulations are the key policy drivers of the agriculture, forestry and aquaculture sectors.

The key policy documents and dates are:

- CAP Reform (2003), adopted in Scotland (2005);

- A Forward Strategy for Scottish Agriculture (2006);
- Scottish Rural Development Programme (2007-2013); and
- Rural Development Contracts (2007 onwards).

A summary of the key focuses for the CAP reform and the resulting Forward Strategy for Scottish Agriculture (2006) are presented in the box below. The following sections then discuss the impacts to the water environment from the CAP reform in Scotland and the resultant Scotland Rural Development Programme and the Rural Development Contracts.

Policy	Key Focus
CAP Reform	<p>Market orientation of sector.</p> <p>Decoupling of Farm subsidies from production.</p> <p>Cross-compliance requirements to promote environmentally sensitive farming.</p>
<p>Forward Strategy for Scottish Agriculture (2006)¹²</p> <p>(refer also Appendix C.2 for additional information)</p>	<p>Over-arching strategy document.</p> <p>Need for diversification away from traditional agriculture.</p> <p>Importance of agriculture in protection and enhancement of the environment.</p> <p>Importance of Scottish food and drink and tourism sectors and their links to agriculture.</p> <p>Reduced number of serious pollution incidents through better storage of slurry and silage effluent.</p> <p>Diffuse pollution from agriculture remains a threat to the achievement of a good water environment.</p> <p>Decoupling of farm subsidies from production and introduction of the cross-compliance requirements are seen as important contributors to the more environmentally sensitive farming (Scottish Executive, 2006a).</p>

CAP reform and management of the water environment

One of the key outcomes of the reform of CAP agreed in 2003 was the decoupling of farm payments from agricultural production, which allowed more farmers to make production decisions in response to the market rather than subsidy scheme rules. A new system (Single Farm Payment) was introduced in which payments are linked to economic, social and environmental objectives rather than agricultural production. Farmers need to meet standards (i.e. cross-compliance) in order to receive the full amount of payment. These standards include Statutory Management Requirements (SMRs) (i.e. EC requirements for public, animal and plant health and animal welfare); and Good Agricultural and Environmental Condition (GAEC) standards including protection and maintenance of soil, overgrazing, hedgerows, etc. This has reduced the incentive to maximise output and expected to result in less intensive farming and help to reduce pressure on environment.

¹² Scottish Executive (2006): A forward Strategy for Scottish Agriculture: Next Steps, March, 2006

The Reform of the Common Agricultural Policy (CAP), came into force in Scotland in 2005 (Scottish Executive Environment Group, 2005). The EU is currently undertaking a review of standards 'CAP Health Check' underpinning cross-compliance including European Statutory Management Requirements (SMRs) and GAEC standards. These are likely to align with EC Directives. Following the European 'Heath Check', Scottish Government will consider implications for review cross-compliance conditions under GAEC to better protect Scottish water environment. This will occur during 2008/09.

Scotland Rural Development Programme 2007-2013 (2007)¹³

Introduction

The Scotland Rural Development Programme (2007-13), which is in the process of approval, is the key document which defines measures and state aid support the achievement of the policy outcomes set out in the Strategic Rural Development Plan for Scotland. The programme addresses the following outcomes:

- Improved business viability;
- Enhanced biodiversity and landscape;
- Improved water quality;
- Tackling climate change; and
- Thriving rural communities.

The programme provides support under three Axes as presented in the headings of **Table 3.1** and the elements of each axes which are considered to contribute to the enhancement of the water environment are highlighted in the table¹⁴.

The underpinning Rural Development Regulations for the programme recognise CAR and therefore there are opportunities within the programme to link potential measures under the RBMPs with regional priorities under the SRDP; and to ensure that technical guidance underpinning SRDP options assist to meet WFD requirements. The options principally relate to biodiversity and water quality and there are no specific options identified for morphology or water resources management. However, it is considered that some biodiversity/diffuse pollution options will have multiple benefits. The national objectives under the SRDP recognise environmental management requirements and the options available to farmers under the Rural Development Contracts are presented in **Appendix C.3**.

Rural Development Contracts

The original SRDP programme provided support through Land Management Contracts (LMCs) (which was later substituted with Rural Development Contracts under the SRDP 2008 - 2014). The contracts are intended to have social and economic as well as environmental benefits.

¹³ Rural Development Regulation (RDR) (EC) No 1698/2005 (2007): Scotland Rural Development Programme 2007-2013, June 2007

¹⁴ The italicised actions in the table are new requirements under the SRDP programme (2007-13) to support management of the water environment, linked to CAR, and are therefore not considered part of the baseline.

The LMC Regulations provided for payments of aid to be made by Member States to farmers who enter into Land Management Contracts. In addition to adhering to the principles of each contract, the farmers must also comply with the general environmental requirements set out in Schedule 2 of the Regulations which was amended in 2006 to include an explicit reference to the Controlled Activity Regulations (CAR). This means that a fundamental condition of the contract is that the recipients of funding must comply with the provisions of CAR, and should help to ensure that the WFD is further implemented through the threat of termination of the contract in the event of breach. These conditions are to be carried across under requirements for new regulation associated with RDCs and SRDP 2007-2013 (due early 2008).

Table 3.1 Measures in the SRDP contributing to the enhancement of water environment and rural diversification

Axis 1 Improving the competitiveness of the agricultural and forestry sector	Axis 2 Improving the countryside and the environment	Axis 3 Quality of Life and diversification of economic activity
<u>Modernisation of farm holdings</u> <ul style="list-style-type: none"> • Crofting Counties Agricultural Grants Scheme • Restructuring of agricultural businesses • Modernisation through electronic data management <u>Improving and developing infrastructure related to the development and adaptation of agriculture and forestry</u> <ul style="list-style-type: none"> • Support for renewable energy • Provision and upgrading of infrastructure related to access to farm and forest land, energy supplies and water management • Access creation for sustainable forest management • Treatment of run-off of nutrients and other pollutants • Manure/slurry storage and treatment <u>Adding value to agricultural and forestry products</u> <ul style="list-style-type: none"> • Processing and marketing grants <u>Improving the economic value of forests</u> <ul style="list-style-type: none"> • Improving the economic value of forests • Management of genetically appropriate tree stocks for seed production 	<u>Payments to farmers in areas with handicaps, other than mountain areas</u> <ul style="list-style-type: none"> • Less Favoured Area Support Scheme <u>Agri-environment payments</u> <ul style="list-style-type: none"> • Support for the conversion to and maintenance of organic farming <u>Wetland features:</u> <ul style="list-style-type: none"> • Improvement of rush pasture for wildlife • Creation, restoration and management of wetlands (<i>constructed farm wetlands</i>) • Management/restoration of lowland raised bogs • Creation and management of water margins and <i>enhanced riparian buffer areas</i> • Management of flood plains <u>Water quality</u> <ul style="list-style-type: none"> • <i>Nutrient management plan</i> • Soil and water management programme • Arable reversion to grassland/ unfertilised grassland <u>First afforestation of agricultural and non-agricultural land</u> <ul style="list-style-type: none"> • Woodland creation <u>Forest-environment payments</u> <ul style="list-style-type: none"> • Sustainable management of forests and woodlands 	<u>Diversification into non-agricultural activities</u> <ul style="list-style-type: none"> • Support for diversification outwith agriculture • Support for renewable energy (non land-based) <u>Encouragement of tourism activities</u> <ul style="list-style-type: none"> • Provision, development or upgrading of small scale tourist facilities by land managers • Information and awareness raising • Farm and forest visits and talks

Future amendment of SRDP: statutory elements

To date, only land managers receiving Single Farm Payments (SFPs) must meet GAEC standards/statutory requirements (also known as Tier 1). Under SRDP (2007-2013), any funding under Tier 2 and 3 options (Appendix C.4) means applicants who may not received SFPs must also meet cross-compliance. This for the first time captures forestry and sporting estates.

For achievement of WFD environmental objectives, the SRDP statutory elements can be used to include new requirements e.g. restoration regulations. At this point there are limited measures to address groundwater/drinking water protection or morphology and water resources.

3.5.4 Implications for management of the Water Environment

Under the Rural Development Contracts: rural priorities, there will be a set of guidance on 'regional priorities'. This will advise Regional Priority Area Committees (RPACs) on prioritisation of projects to be funded aligned with National Objectives/Regional priorities. RPACs have identified their regional priorities for funding and SEPA have identified areas at risk into the RPACs process. These have been picked up differently across the RPACs (e.g. nutrient management is more important in NVZ areas).

There is a shared opinion that the reform, agri-environment schemes and other policy initiatives will help to protect water quality. In some cases improvements are already being made through good practice, developed and promoted by farmers, such as the PEPFAA Code and the 4 Point Plan. Moreover, it is anticipated that actions under the SRDP could result in additional improvements in water quality (SRDP, 2007).

However, it is difficult to assess what scale of improvement may be expected (e.g. what reduction in diffuse pollution is likely) (RDP, 2007). According to the review of the previous Rural Development Programme, funding was skewed heavily towards measures aimed at improving access, which indicates that farmers have focused on measures that they consider more likely to give economic return by improving technical efficiency (animal health & welfare measures) (Scottish Executive Environment Group, 2005).

In some catchments it is possible that current measures may go some way towards delivering the water quality targets but it is anticipated that significantly more action is required for the control of diffuse pollution (Scottish Executive Environment Group, 2005). There may be a need to encourage uptake of water quality related options under the SRDP 2008-2014 and the process as described above for regional priorities will support this.

Improved soil management will constitute the main impact for cropping systems, which would lead to reduced run-off and erosion which in turn would mean less detachment of soil and Phosphorous (P). The reduction in run-off would however have little impact on the level of nitrogen except in extreme conditions. In the livestock sector, the main impact of GAEC is seen to be reduced poaching of land (University of Cambridge, SAC, 2006).

The study highlights the role of enforcement in how effective the policies are in mitigating environmental impacts of farming (University of Cambridge, SAC, 2006).

3.5.5 Forestry

Characteristics of Scottish forestry, trends and forecasts

Forestry and wood processing

Forecasts indicate the potential for a continued rise in timber production from the current level of almost 7 Mm³/a, to a peak availability of about 10 Mm³/a in the mid-2020s. Forestry and wood processing industries employ around 10,800 people and forestry industries contribute £650 million/a to the Scottish economy or about 1% of Gross Domestic Product (GDP) (RDR, 2007; Scottish Executive, 2006b). Most of the timber resource is in Dumfries and Galloway, the Borders, the Highlands and Islands, Argyll, Aberdeenshire, Tayside, and the Forth Valley. Given the existing drivers for the biomass production to reach the renewables targets, new markets are emerging (Scottish Government, 2008b; Scottish Executive, 2006d).

Trends in the woodland area

The woodland area in Scotland comprises about 1.3 million ha or 17.2 per cent of the total area. In the last 25 years it has increased by more than 5 per cent (see Figure 3.1) (Forestry Commission Scotland, 2008).

Planting of new areas

There is a target to increase the area of forest by 2050. There will be a required an increase in the annual plantings from the current 4–5,000 Ha/a to approximately 10,000 Ha/a. It is likely that the majority of this new planting will be in the central belt and southern Scotland, concentrating on creating woodlands near centres of population to meet other Forestry Commission Scotland objectives e.g. woodlands in and around towns¹⁵.

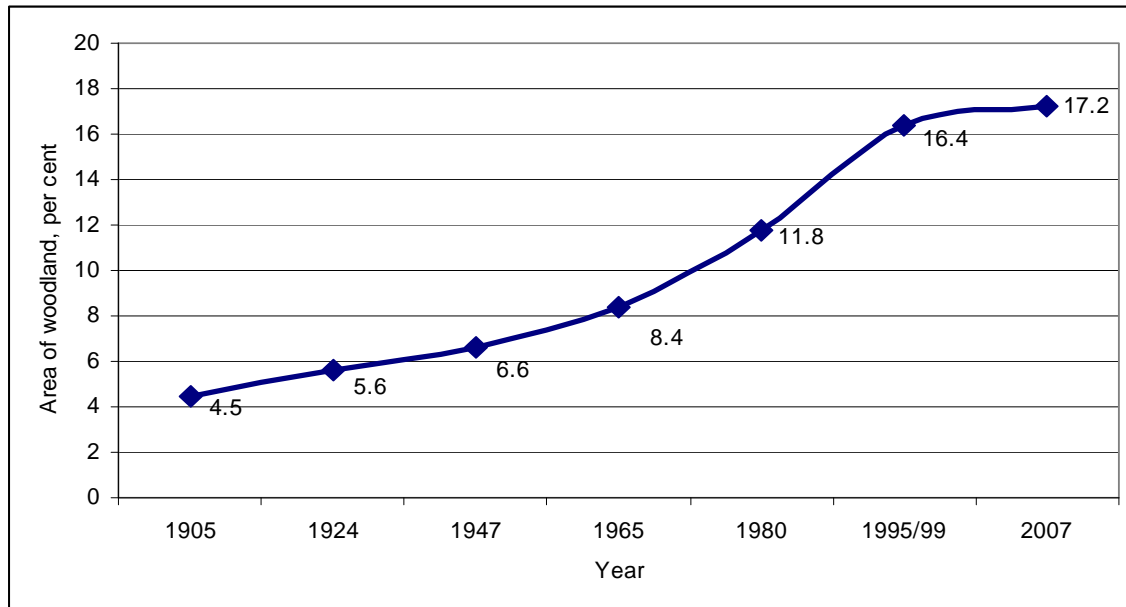
Felling

Many forestry plantations were established in the 1960s with many being harvested in the next 20-30 years. Looking forward, Scotland will need to manage the felling pattern. There is the potential, if not managed in line with sustainable forest management, to see the localised affect of increased diffuse pollution concentrated in particular regions in Scotland and the Solway Tweed RBDs from concentrated felling practices.

Trends in the ownership of the woodland areas

About 65 per cent or 884,000 Ha of the woodland areas in Scotland were owned and managed privately in 2007. The remaining 457,000 Ha or about 35 per cent were managed by Forestry Commission/Forest Service (Forestry Commission Scotland, 2008). The split in the ownership of the Scottish woodland has remained almost constant in the last 5 years.

¹⁵ Communication with Catherine MacCulloch, Forestry Commission Scotland (2008)

Figure 3.1 Trends in the woodland area in Scotland (1905-2007)

Source: Forestry Commission Scotland (2008)

The current situation in the woodland ownership in Scotland reflects the long-term vision stated in the Scottish Forestry Strategy of 70% of the total forest area being non-state woodland with majority of it covered by the forest plans. In 2006 about 28% of the woodlands were covered by approved, long-term forest plans (Scottish Executive, 2006b).

The state forest estate is predominantly comprised of spruce and other non-native conifers (94% in 2007), while the native species comprise just 17% of the forest area (Scottish Executive, 2006b; Forestry Commission, 2008).

Trends in the timber production

In the time period from 2000 till 2004 wood production in Scotland increased from 5.2 Mm³ to 6.9 Mm³ (about 60% of the UK total). The Scottish forestry sector is characterised by large-scale operators. While there is a substantial number of small-scale grower and processor businesses, their contribution in terms of processing volumes is not significant (RDR, 2007). Details on the timber production and employment is presented in **Appendix C.6**.

The Scottish Forestry Strategy (2006)

The Scottish Forestry Strategy¹⁶ is the key strategic policy document which sets a long-term vision (up to the second half of the 21st century) and priorities in the next decade for the forestry sector in Scotland.

According to the Strategy, climate change and renewable energy have become major drivers for extending Scotland's woodland cover, as increased area of appropriate new woodland will help to achieve climate change programme targets. The forestry sector aims to deliver annual carbon

¹⁶ Scottish Executive (2006b): The Scottish Forestry Strategy, October 2006

savings of 0.6 million tonnes of carbon (MtC) by 2010, 0.8 MtC by 2015 and 1.0 MtC by 2020 by afforestation, biomass as a renewable energy source, wood as a substitute for energy intensive building materials and timber miles, i.e. reduction of road transport of roundwood (Scottish Executive, 2006a; Scottish Executive, 2006b).

The Strategy highlights:

- The importance of strengthening forestry through business development to underpin sustainable forest management and support economic growth and employment across Scotland;
- Promotion of predictable and stable timber supplies;
- Encouragement of more use of timber;
- Increase of timber supply chain efficiency; and
- Development of the hardwood sector.

Having regard to the climate change, as well as timber resource and business development related targets the long-term vision is to expand woodlands from 17.1% in 2006 to about 25% (Scottish Executive, 2006b). This aspiration is reiterated in the consultation on proposal for a Scottish Climate Change Bill (Scottish Government, 2008a).

Implications for management of the water environment

The Scottish Forestry Strategy recognises the importance of protecting the environmental quality of Scotland. One of the objectives stated in the Strategy is to contribute positively to soil, water and air quality by:

- Helping to improve the quality of surface water and groundwater bodies through implementation of the relevant Forest Guidelines to avoid point source and diffuse pollution and through recovery of acidified rivers and lochs;
- Integrating forestry planning and practice in River Basin Management Plans;
- Encouraging the restoration of forest wetlands;
- Endorsing sustainable soil management through promotion of low impact management systems in areas with highly fragile soils; and
- Using “green” technology to minimise emissions from forestry operations among other measures.

The Strategy highlights that where woodlands occupy a significant proportion of vulnerable water catchments, the canopies capture a lot of pollutants which can exacerbate acidification of water bodies. Furthermore, in the past, many woodlands were planted too close to watercourses and with ploughing techniques that accelerated run-off and sedimentation¹⁷. The Strategy

¹⁷ Two different silvicultural approaches are used in Scotland: clear felling and the alternative which is called ‘low impact silviculture’. Low impact systems are particularly variable and range from single tree selection systems to small coupe felling (Scottish Executive, 2006b)

stresses however, that provided good forest design and practice are implemented, well planned and well managed woodlands can protect and enhance water quality in a number of ways by:

- Reducing the potential for watercourse acidification and soil erosion;
- Stabilising riverbanks;
- Reducing pollution in run-off which can have a positive role in Nitrate Vulnerable Zones; and
- Examining the potential for forestry in sustainable flood management (in terms of riparian and flood plain woodlands).

While the decline in pollutant emissions has been observed over the past 20 years, any new planting or replanting proposals in catchments at, or likely to exceed, their 'critical load' require detailed discussions with the responsible authority (SEPA) to determine whether to proceed with the proposal.

According to the Scottish Forestry Strategy: Implementation Plan 2007-2008¹⁸ a number of activities are planned to help to protect Scotland's water which include among others:

- Workshops to support implementation of the Water Environment (Controlled Activities) Regulations 2005, including action to tackle diffuse pollution;
- Research on avoiding acidification from tree planting and harvesting; and
- Establishing baseline data and monitoring processes for forestry and water quality indicators (Forestry Commission Scotland, 2007).

3.5.6 Aquaculture

Introduction

The development of aquaculture offers another opportunity for diversification of economic activity in the rural areas of Scotland and it is considered that there are positive prospects for local inshore fisheries based on shellfish and the farming of white-fish species.

Characteristics of Scottish Aquaculture

Aquaculture is fundamentally about providing high quality, healthy food through the rearing of aquatic animals. In Scotland it is dominated by salmon with other important sectors including trout, shellfish and a small but increasing marine fin-fish sector, supplying cod and halibut. Salmon farming takes place in cages in both fresh and salt water while trout production mainly takes place in fresh water. Fish processing takes place at a number of locations across Scotland. Marine cage aquaculture is centred on the northern and Western Isles and along the west coast of Scotland. Trout farming, by contrast takes place mainly in central Scotland and the Borders with some marine farm sites on the west coast¹⁹.

¹⁸ Forestry Commission Scotland (2007): The Scottish Forestry Strategy. Implementation Plan 2007-2008, March 2007

¹⁹ Sangster, M. (?): Developing a framework for sustainable fish waste management infrastructure

Since the 1970s, the industry has developed into a major employer in rural Scotland and it has been the fastest growing industry in Scotland over the past 20 years. In many instances, it supports communities in fragile rural areas. Aquaculture supports about 1,500 direct jobs in primary production, with a further 4,500 full-time equivalents in processing. Around 75% of these jobs are in the Highlands and Islands.

The value of the aquaculture industry in Scotland is estimated to have a 'farm gate' value of some £290M. This is broadly similar to landed value of sea fisheries, but with superior prospects of growth. This is made up of £270M for farmed salmon, about £10M for trout, about £4M for halibut and cod, and about £6M for shellfish. Value of fish exports (including aquaculture products) in the order of £450M. This accounts for around two thirds of all food exports.

Scotland is the largest producer of farmed salmon in the EU. It is the third largest producer in the world, behind Norway (700,000 t) and Chile (600,000 t) and above Canada (100,000t).

In 2006, around 130,000 tonnes of salmon, 7,000 tonnes of rainbow trout, 5,000 tonnes of cultivated shellfish (mussels, Pacific and native oysters, scallops (including queen scallops) were produced.²⁰ While much of its production arises from activities in marine waters, the trout sector and early stages of salmon rearing occur in the Scotland's fresh waters. In addition, the industry exports from its hatcheries for example, turbot to Wales and salmon eggs and smolts to Chile.

A Strategic Framework for Scottish Aquaculture (2003)

This strategic document which is currently being renewed sets a vision, guiding principles and priority actions for the aquaculture industry in Scotland. The Framework states that aquaculture should:

- Make a positive contribution to the Scottish economy through being internationally competitive in the marketplace and economically viable at a national level; and
- Manage and minimise environmental impacts, and avoid significant, cumulative, long-term or irreversible changes to ecological systems.

The Framework addresses environmental issues with regard to the aquaculture including pressure it causes on the aquatic environment as well as discussing its dependence on water quality. The Framework draws particular attention to the issue of wastes arising from the fish farms, chemical residues and nutrient pollution. It further discusses possible options and techniques to resolve these problems²¹.

²⁰ Fisheries Research Services, 2007. Scottish Fish Farms Annual Production Survey 2006.

²¹ Scottish Executive (2003): A Strategic Framework for Scottish Aquaculture, 2003

3.6 Energy and hydropower

3.6.1 Introduction

The energy sector, in particular hydropower production, has a significant impact on the Scottish water environment through hydro-morphological alteration, abstraction and changes to the natural river flow. The impact of hydropower production on Scottish waters is addressed and discussed in the SEPA's reports on Significant Water Management Issues in the Scotland and Solway Tweed River Basin Districts (2007).

Climate change commitments pose a challenge of 80% reduction in carbon emissions by 2050. A shift to a low carbon economy including low or zero carbon energy sources and generation technologies is placed at the heart of the energy policy in the UK. Obligations on renewables, issues of clean energy supplies, energy efficiency and security of supply constitute the key elements of the energy policy and are reviewed further²².

Key policy targets and commitments include:

- Renewable energy sources and energy savings are highly promoted and supported in light of the Scotland's and UK commitments towards climate change mitigation.
- Proposals within the draft Scottish Climate Change Bill to reduce carbon emissions by 80% by 2050, much of which will come from the changes in the way Scotland generates and consumes energy.
- The Scottish Government has set a target of 50% of electricity generation to come from renewables, as a proportion of Scottish consumption, by 2020. An interim target of 31% by 2011 has also been introduced.
- Present hydrocapacity is 1.4GW. The Forum for Renewable Energy in Scotland (FREDS) Hydro Sub-Group have commissioned a study examining the potential for further development and how to overcome any environmental and regulatory constraints to maximising this potential.

3.6.2 Scotland's renewables targets

Objectives and targets

Aiming to take the full advantage of Scotland's massive renewables potential, the Scottish Government in November 2007 increased their renewables target to 50% of electricity generation, as a proportion of consumption, by 2020, with an interim target of 31% by 2011²³. The interim target will largely comprise of existing hydro and the continued development of the more commercial renewables, such as onshore wind. In setting the 2020 target, Scotland has

²² DTI (2007): Meeting the Energy Challenge. A White Paper on Energy, May 2007; The policy document is reviewed and summarised in the Appendix D.

²³ The previous target (set in the "Securing a Renewable Future: Scotland's Renewable Energy" (2003)) was to ensure that 18% of electricity generated in Scotland is coming from renewable sources (including existing hydro-electric output). It also provided a new long-term aspiration to generate 40% of electricity from renewable sources by 2020.

taken into account the potential for emerging new technologies such as off-shore wind and marine energy. Other technologies will be supported, such as biomass, hydrogen and fuel cells and micro-generation, to help develop a diverse clean energy mix and contribute to security of energy supply.

The Renewables Obligation Scotland (ROS), introduced in 2002, is Scotland's main policy measure to encourage the development of renewable forms of energy. It does so by obliging electricity suppliers to provide an increasing proportion of their electricity generated from eligible renewable sources (Scottish Executive, 2003). Following reviews and consultations on ROS less commercial technologies, such as wave and tidal, will have greater incentives whereas more established technologies such as landfill gas will receive less support than they previously did²⁴.

The Government also recognises the role of electricity demand management measures and their potential contribution to the achievement of 2011 and 2020 targets. Thus similarly to the position of the UK White Paper on Energy, the role of improved energy efficiency is seen as vital to cutting carbon emissions in Scotland.

Scotland's commitment to renewable energy is driven not solely by environmental imperatives. Scottish strategy is to encourage the development of renewable energy both as a response to the climate change commitments and as a measure to promote sustainable economic growth²⁵.

Challenges to the renewable energy sector in Scotland

Challenges to the development of the renewable energy in Scotland are in line with those in UK:

Infrastructure: The importance of grid upgrading if the renewables sector is to reach its full potential is recognised. It is also stressed that the lack of spare grid capacity in renewables rich areas and the need for significant and timely upgrades to both the transmission and distribution systems might constitute a significant obstacle to development of renewables. It is clear that substantial upgrades will be required to Scotland's electricity transmission system depending on the level of renewable development to be accommodated.

Planning: the planning regime is crucial to the intelligent deployment of renewable energy. While the Scottish Government is strongly committed to further renewable energy development, it recognises that particular types of development can give rise to public concerns due to adverse environmental impact (see planning policy SPP6L below).

3.6.3 Scottish Planning Policy SPP 6L Renewable Energy (2007)

This policy²⁶ sets out the national planning policies for renewable energy developments that planning authorities should consider when preparing development plans and when determining

²⁴ Communication with James Simpson, Scottish Government (2008).

²⁵ Communication with James Simpson, Scottish Government (2008); Scottish Executive (2003): Securing a Renewable Future: Scotland's Renewable Energy, 2003.

²⁶ Scottish Executive (2007): Scottish Planning Policy SPP 6L: Renewable Energy, March 2007

planning applications. The intention of the SPP is to facilitate successful achievement of the 2020 target on generation of electricity from renewable sources. It is expected that sufficient developments should be consented, to enable achievement of a much higher rate of renewables than is currently installed.

The document sets out how the planning system should manage the process of encouraging, approving and implementing renewable energy proposals when preparing development plans and determining planning applications. Planning authorities should use the development plan process to support and encourage the continued growth of all renewable technologies and should not restrict development on sites where the technology can operate efficiently and environmental and other impacts can be addressed (ensuring however, significant protection of the areas designated for their national or international natural heritage value etc.) (Scottish Executive, 2007).

3.6.4 Studies on renewable resources in Scotland

A total of around 8GW renewable installed capacity²⁷ is required to meet the target by 2020, while the potential renewable energy resource in Scotland is estimated at about 60 GW. The renewable capacity currently installed in Scotland amounts to around 2.5 GW, therefore around a further 5.5GW installed capacity needs to be built²⁸.

Previous studies²⁹ suggested that Scotland has the potential for exploitation of a range of renewables to meet both Scottish and UK targets. Clearly onshore wind will play the greatest short term role, but, assuming a range of technical and economic issues can be overcome, other technologies should also be capable of playing an important part by 2020. Biomass for example is a proven technology and could be making a substantial contribution. As **Table 3.2** illustrates, offshore renewable once proven to be technically and economically viable, have the potential to play the most significant part of Scotland's renewable energy make up (University of Edinburgh, 2006; Garrad Hassan, 2001; Scottish Executive, 2005c).

Table 3.2 Installed and Forecasted Capacity

Technology	Installed (existing) capacity (GW)*	Technology Exploitable capacity (GW)*	Potential electricity generation (GW)**
On-shore wind	0.4	11.5	11.5
Off-shore wind		25.0	25.0
Hydro	1.3	1.5	

²⁷ Communication with James Simpson, Scottish Government (2008)

²⁸ Communication with James Simpson, Scottish Government (2008); University of Edinburgh (2006); Garrad Hassan and Partners Limited (2001); Scottish Executive (2005c)

²⁹ University of Edinburgh (2006): Matching Renewable Electricity Generation With Demand, February 2006.; Garrad Hassan and Partners Limited (2001): Scotland's renewable resource 2001, December 2001; Scottish Executive (2005c): Scotland's renewable energy potential, June 2005. These studies are reviewed and summarised in the Appendix E

Technology	Installed (existing) capacity (GW)*	Technology Exploitable capacity (GW)*	Potential electricity generation (GW)**
Small hydro			0.3
Waves		14.0	14.0
Tidal-currents		7.5	7.5
Biomass		0.6	
Landfill Gas			0.07
Forestry Residues			0.09
Energy Crops			0.14
Organic Materials from Agriculture			0.4
Municipal Solid Waste (MSW)			0.1
Consented (on and off shore wind, hydro, biomass)	1.1		
Total	2.8	60.1	59.1

* University of Edinburgh (2006): Matching Renewable Electricity Generation With Demand, February 2006

**Garrad Hassan and Partners Limited (2001): Scotland's renewable resource 2001, December 2001

3.6.5 Role and potential of hydropower generation in Scotland

At present hydro and on-shore wind are the major renewable-energy sources in Scotland. There is about 1.4 GW of installed hydro-electric plant capacity in Scotland, however the scope for new hydro-electric schemes is unknown.

Previous studies³⁰ quote a range of the estimates of potential remaining hydro capacity: 200MW in the "Scotland's renewable energy potential" (2005), 224 MW in the "Scotland's renewable resource 2001", which in turn references some older studies providing another two estimates: 400 MW and between 300-550 MW.

To try and establish a more authoritative figure, the FREDs Hydro Sub-Group commissioned a Scottish Hydro Resource Study³¹ in early 2008, which will examine not only the theoretical potential but also how much of that can practically be developed, given the existing regulatory and environmental constraints. The study will largely focus on small scale run-of river projects. Development of further such schemes together with the continuing refurbishment of existing large schemes, should ensure that hydro continues to play an important part in Scotland's renewable energy mix. Development plans should confirm that issues such as impacts on the natural and cultural heritage, water regimes, fisheries, aquatic habitats and species and cumulative impacts must be adequately addressed by applicants³².

³⁰ Review of the studies on potential of hydropower generation in Scotland is presented in the Appendix E

³¹ The group will report on the findings of the study in summer 2008

³² Scottish Executive, 2007; Communication with James Simpson, Scottish Government (2008)

As part of the IA for draft RBMP for the Scotland RBD, the implications for the hydro-schemes industry will need to consider the balance of ensuring a continued supply and meeting the requirements of the WFD.

3.7 Water Industry (public water supply and sewerage)

3.7.1 Introduction

Scottish Water is responsible for providing water supply and sewerage services in Scotland and operates within a regulatory framework established by the Scottish Parliament in which Scottish Ministers, acting on behalf of the people of Scotland, set the objectives for the industry to be delivered at least cost to customers.

Scottish Water was established to bring significant improvements to the quality and efficiency of Scotland's water industry in meeting environmental and public health standards. Delivery of substantial infrastructural investment as well as maintenance is a key aspect of the strategy to transform the industry.

3.7.2 Current Investment Programme

Investing in Water Services: Objectives for 2006 – 2014, Statement by the Scottish Executive, and The Scottish Water Directions 2005

The current investment programme was announced by Scottish Ministers in February 2005 and confirmed in a Direction to Scottish Water in September 2005³³ and covered improvements to:

- Drinking water quality;
- The environment; and
- Customer service.

In setting these objectives, Ministers intended to:

- achieve the maximum affordable improvement in public health and standards of environmental protection;
- support housing and economic growth in communities across Scotland through investment in new water and sewage capacity; and
- achieve these outcomes while ensuring that water charges remain stable and Scottish Water's capital programme is of a scale that can be delivered efficiently in the interests of all water customers (Scottish Executive, 2005a, b).

Covering an eight year horizon, the Ministerial Objectives seek to facilitate better business planning and secure more cost effective compliance with longer term legislative requirements,

³³ In February 2005 the Scottish Executive published a statement, setting out confirmed objectives for Scottish Water in managing water services in the period 2006-2014. These were stated in the Scottish Water (Objectives For 1st April 2006 to 31st March 2010) Directions 2005 published in September 2005.

including environmental. The activities of the water industry have a significant impact on the water environment.

In the period 2006-2010 these objectives will deliver the following outcomes through a combination of improved operating practices and £2.45bn of investment (Scottish Government website, 2007):

- Improve the quality of drinking water for 1.5m people and provide better disinfection control for 4m people;
- Contribute to improving water quality for over 200km of water bodies;
- Provide new strategic capacity to enable new development;
- Address odour nuisance at 14 waste water treatment works;
- Remove 456 properties currently at risk from internal sewer flooding;
- Remove 2250 properties currently subject to low water pressure (less than 1 bar pressure);
- Deliver a net reduction of 425 properties affected by unplanned interruptions in water supply (non trunk mains);
- Improved customer services from 177 (2006) to 250 (2010) as measures by the Overall Performance Assessment (OPA) methodology; and
- Reduce leakage in line with Water Industry Commission's targets.

The key requirements in relation to management of the water environment are identified and are summarised from the following documents:

- The Scottish Water (Objectives For 1st April 2006 to 31st March 2010) Directions 2005³⁴ published by the Scottish Executive, September 2005;
- Scottish Water Delivery Plan 2006-2010³⁵, published in May 2006; and
- Factors to be considered when determining the appropriate size of the next capital programme for Scottish Water, published in December 2007³⁶.

3.7.3 Scottish Water Delivery Plan 2006-2010

In May 2006 Scottish Water published their Delivery Plan for 2006-2010, setting out annual forecasts and milestones for meeting, and outperforming the objectives set by the Scottish Executive and regulators (the Water Industry Commissioner, SEPA, the Drinking Water Quality Regulator, Waterwatch and the Health & Safety Executive).

³⁴ Scottish Executive (2005b): The Scottish Water (Objectives For 1st April 2006 to 31st March 2010) Directions 2005, September 2005

³⁵ Scottish Water (2006): Scottish Water Delivery Plan 2006-2010, May 2006

³⁶ LECG Ltd (2007): Factors to be considered when determining the appropriate size of the next capital programme for Scottish Water, December 2007

Table 3.3 summarises the key activities and the elements where action may be attributed to WFD as a key driver and these activities are expanded on in the following paragraphs.

Table 3.3 Key Activities where WFD is the Principal Driver

Activity	Driver
Development constraints and growth	Customer service
Service improvements: Malodour abatement, Sewer flooding reductions, Reduced interruptions to supply, Water pressure improvements	
Business metering	
Drinking water quality and resource enhancements	Public health and environmental legislation. (Note: some elements transferred to WFD)
Environmental quality enhancements	Environmental legislation, with sub-set of actions related to WFD.
Maintaining current water and waste water services	Customer service
Introduction of competition	Business requirement/customer service

The following activities have been identified within the investment programme:

- **Removing Development Constraints and Providing for Growth:** Scottish Water are required to deliver new strategic capacity for up to 40,000 population equivalents (PE) at water treatment works and up to 16,500 PE at waste water treatment works, in support of new housing development and the domestic requirements of commercial and industrial developments. This ongoing development will need to meet the requirements of environmental and public health legislation.
- **Water Resources:** Scottish Water are required to reduce the effect on the environment of water abstracted in 78 water resource zones. The required outcomes have been converted by SEPA into specific outputs in accordance with the Birds and Habitats Directives and the Water Framework Directive (WFD). Outside drinking water protected areas, this is viewed as WFD being the significant driver. Measures may include reducing abstraction, increasing compensation flows (flow in a water course downstream of an impounding structure), development of new sources of water and re-zoning networks. Any studies and investigation would be identified as contributing to the identification of actions to be included in the programme of measures in the draft RBMPs.
- **Flow metering:** Flow metering and recording will be introduced at 574 drinking water sources.
- **Management of point source and diffuse source pollution:**
 - **Overflows** Reduce the quantity and improve the aesthetic quality of these intermittent discharges by providing additional sewer system capacity in the

form of storm detention tanks or enlarged sewers, together with screening equipment. New or extended sea outfalls will be provided where required. Additionally, and as agreed with SEPA, work is included to meet the requirements of SEPA's monitoring matrix which defines in detail the level of permanent or periodic monitoring of spills and sewer flows, and their reporting required by SEPA as a part of consents to discharge conditions.

- **Surface Water Outfalls** Improve the quality of storm water run-off from industrial sites and estates by providing 'end of pipe' Sustainable Urban Drainage Systems (SUDS) to treat the storm water before discharge into the receiving water.
- **Dual Manhole Systems** Prevent the occurrence of foul effluent discharges polluting water bodies due to inadequate separation of systems, by isolating the foul and surface systems from one another by the construction of separating manholes.
- **Wastewater treatment works** will be enhanced to meet required standards. At other treatment works that currently do not meet their consent standard, compliance will be improved in the short term by operational interventions.

3.7.4 Considerations on the Scottish Water Investment Programme 2010-2014 and beyond

Scottish Water is presently preparing its first draft business plan setting out how much it will cost to deliver Ministers objectives for the 2010-2014 period. Any actions taken to improve the water environment will be recognised as part of the programme of measures in the draft RBMP.

The process to determine the level of resources Scottish Water requires is called the Strategic Review of Charges. The process concludes with publication of the Water Industry Commission for Scotland (WICs) final determination of charges for a given regulatory period. The aim of the process is to determine the charges that must be paid by customers to fund at the lowest reasonable overall cost to fund the operation of Scottish Water and the delivery of the objectives set by Ministers want and determine price levels that are consistent with Minister's principles of charges. The process determines the level of charges customers must pay.

The period for which prices are set is called the regulatory period and the current regulatory period ends in March 2010. The process of setting future prices takes approximately 3 years from start to finish and was initiated in 2007 for the next regulatory period. Ministers are responsible for setting the framework for the Strategic Review of Charges. They initiate the Review process by setting out the principles that the review must observe and determine the length of the next regulatory period.

Alongside this, the Water Industry Commission is considering the optimal size of the investment programme, recognising external and internal constraints (availability of engineering services, time required for investigations and studies, etc). According to the report (LECG, 2007) the factors which influence the size of the capital programme Scottish Water can effectively deliver between 2010 and 2014 indicate that a mid-sized programme is to be preferred. The report suggests that the investment programme should average at £400-£450 million per year, compared to the current capital programme which averages over £600 million per year. This will influence the investment programme up to 2014 in the next and successive

regulatory periods. The process for the development of the period beyond 2014 will commence in 2008.

The above factors will influence the form and commitments made in the draft RBMPs for the second and third river basin management planning cycles. As part of this, there may need to consider external factors that may drive up costs of provision of water services (e.g. diffuse pollution in catchments may cause the need for additional treatment of water supplies, ongoing development of rural areas). This will be considered as part of the Impact Assessments for the draft RBMPs.

3.7.5 Challenges for the Water Industry Sector

Environmental related legislation including the Urban Waste Water Treatment Directive, Bathing Waters Directive, Shellfish Waters Directive, Shellfish Hygiene Directive, Freshwater Fish Directive, the Wild Birds and Habitats Directives and SSSI along with WFD forms significant challenges for the sector, which have resulted in the activities and investment programmes presented above.

Future baseline challenges for the sector will result from the revised Bathing Water Directive, particularly if there are new Bathing Waters declared. Increased consumption of water, both through additional households and increased number of water appliances in each household will place additional pressures on both abstraction and discharges. There will also be pressure on SEPA to balance the net contribution of sectors to managing pollution under the draft RBMPs.

3.8 Manufacturing and Industry

3.8.1 Introduction

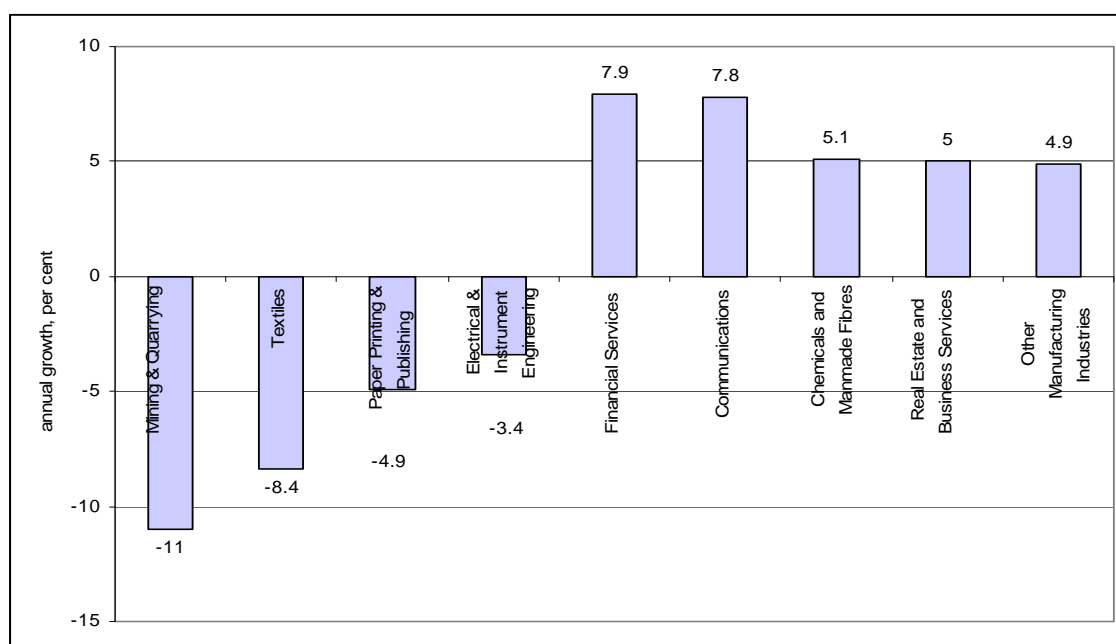
Industries have a significant impact on the Scottish water environment, particularly in terms of the point source pollution and water abstraction. The impact of manufacturing on Scottish waters is addressed and discussed in the SEPA's reports on Significant Water Management Issues in the Scotland and Solway Tweed River Basin Districts (2007).

This section reviews and discusses economic policies in Scotland with regard to the sectoral development and trends in the key industrial sectors.

3.8.2 Key Industrial Sector Trends

Growth of the Scottish Gross Domestic Product (GDP) between 2000 and 2005 was 1.8% on average, with 2.2% growth in 2006. Annual growth by sector for the period 2005-2006 is presented in **Figure 3.3**. The service sector (which is the largest sector in the Scottish economy accounting for 72% of the total GDP) was largely responsible for the overall growth, demonstrating an annual growth of 2.9% (Scottish Economic Statistics, 2006).

The production sector which accounts for 19% of the Scottish GDP has declined since the end of 2000 (by 1.1% in 2006) largely due to the contraction of the electronics sector. Within production, the manufacturing sector declined by 0.2%. Mining & quarrying and electricity, gas & water supply also declined by of 11.0% and 2.4% respectively. The construction sector, which accounts for 7.1% of the GDP has grown by 4.6% (Scottish Economic Statistics, 2006).

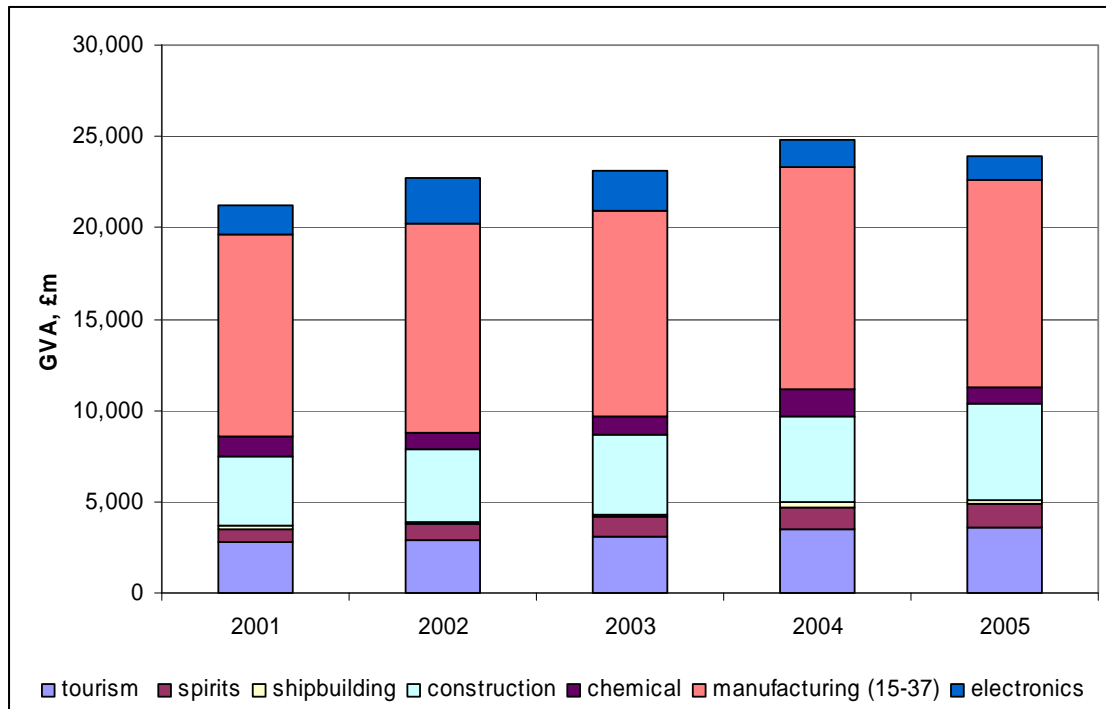
Figure 3.2 Annual growth of Sectors (2005-2006)

The relative importance of industries to the economy as a whole has changed over time, with the service sector growing in importance and production, construction and agriculture, forestry & fishing reducing (Scottish Economic Statistics, 2006). Past trends in the growth rates in selected manufacturing sectors are presented in **Table 3.4** and their Gross Value Added contribution to the Scottish economy is presented in **Figure 3.4**.

Table 3.4 Trends in the sector GVA in per cent

Industrial sectors	2001/2002	2002/2003	2003/2004	2004/2005
Textiles, clothing and footwear	-6.9	-2.0	1.4	0.5
Paper, printing & publishing	-9.1	-3.3	0.9	3.3
Chemicals & fibres	-7.4	-1.6	1.3	0.6
Metals & Metal Products	-5.9	-0.7	-1.4	3.3
Electrical & Instrument Engineering	-24.6	0.5	1.2	2.3
Other manufacturing	-1.6	-0.3	1.1	1.1

Source: Scottish Economic Statistics, 2006

Figure 3.3 Trends in the Gross Value Added of different sectors (2001-2005)

3.8.3 Food and Drink (including Whisky)

The food and drinks sector employs over 47,000 people, generating sales of £7.3 billion (£3 billion for whisky alone) (Scottish Government, 2008b; Scottish Executive, 2006d).

The food and drink industry is also identified as a key beneficiary of the improvements to the water environment and Scotland's green image. The largest sectors are fish and fruit processing (£400m); meat processing (£399m); and dairy products (£223m). All other sub-sectors processed less than £35m of primary produce each, with the soft drink sector processing only around £30,000 worth of Scottish primary produce.

Whisky

Whisky production in Scotland contributed about £1.3 billion to the Gross Value Added in 2005. The sector supports around 41,000 jobs of which 9.5 thousand people are directly employed in production.

There are 87 working malt distilleries in Scotland and 7 grain distilleries, which are mainly concentrated in the area of the River Spey and on the island of Islay. The whisky distilling sector is named to be the best known manufactured export item amounting up to £2.3 billion per year. The estimated sales of whisky are £3 billion³⁷.

³⁷ Sources: Scottish Economic Statistics, 2006; Reports on Significant Water Management Issues, 2007 and Article 5 report on Economic Analysis of Water uses, 2005

Fish Processing

The fisheries sector is a very small component of the Scottish economy. It can be defined in a number of ways and the three core components are the fish catching sector, fish farming, and fish processing. Employment in fish processing, at 10,400 employees, is larger than in the fish primary sector and accounts for 0.5 per cent of employment..

However, this figure does not reveal the importance of the fisheries sector to some local areas. This is because the fishing sector is highly concentrated in a few coastal regions. In these areas, the contribution of the fishing industry is significantly greater than for Scotland as a whole.

3.8.4 Trends in the water use

According to the business-as-usual scenario for the water use developed for Scotland by SAC, electrical and instrument engineering was the most significant water user in 2004. The expected changes in the water use are diverse, while 26% increase is predicted for the chemical industry, only 7% increase is expected in the food and drink sector. However, the study suggests that future work is required to address the data gap on distilleries.

Table 3.5 Forecasted changes in the water use by major sectors

Sectors	2004 MI/year	2015 MI/year
Electrical and instrument engineering	519,620	604,095
Chemical Industry	315,917	397,217
Food and Drink	260,179	279,451
Paper	87,692	105,256
Other industry	917,282	1,053,814

3.8.5 Policies affecting development of industrial sectors

The Government Economic Strategy (2007)

The Strategy identifies key sectors which play a significant role in the Scottish economy at present, have the potential to make a significant contribution to the future economic growth and where government's intervention can make a difference.

Having regard to the Scotland's commitment to build a knowledge-based economy, sectors which generate high added value and which are not resource intensive have the biggest potential for growth. Furthermore, areas where Scotland has an established comparative advantage, such as financial services and energy are seen as promising. The potential that Scotland has in the renewable energy sector provides a solid basis for the further development of the sector and even for becoming an international lead.

The Scottish Government will give particular attention to the following key manufacturing sectors by creating the right environment for their competitiveness and growth:

- Creative Industries (including digital content and technologies);
- Food and Drink (including agriculture & fisheries); and

- Life Sciences (including biotechnology and translational medicine).

The support for these priority industries will be delivered with the help of both Scottish and Highlands& Islands Enterprise.

3.9 Tourism and water related recreation

3.9.1 Introduction

While most of the sectors of Scotland's economy cause pressure on water resources, there are sectors and activities which benefit from Scotland's high quality water environment. This section reviews and discusses tourism and water related recreation in Scotland in terms of current situation and forecasts.

Tourism is a significant contributor to employment, employing about 9% of the Scottish workforce (around 210,000 people). This number however relates to employment in tourism-related industries, including hotels, travel agencies etc. About 99,000 jobs are due to overnight tourism.³⁸ Moreover, tourists spend around £4.2 billion a year. The Highlands, Edinburgh and Glasgow are Scotland's most popular destinations and more than 83% of visitors originate in other parts of the UK or Ireland. The sector significantly contributes to the rural development as it provides means for diversification of traditional rural activities, such as farming, fishing and forestry (Scottish Government, 2008b; Scottish Executive, 2006d).

Key projections include:

- The number of visitors to Scotland will increase from 17.3 million visitors in 2005 to 21.8 million in 2015 and 27.3 million by 2025 with the average growth at 2.3% per year.
- The number of overseas visitors will increase more rapidly than domestic ones.
- Water related recreation in Scotland include following types of activities:
 - Recreational bathing;
 - Water sports (kayaking, sailing, canal use etc.); and
 - Angling.

These are discussed in the sections below.

3.9.2 Recreational Bathing

There are sixty-one designated bathing sites under the Council Directive 76/160/EEC in Scotland. Estimation of the total number of the recreational bathing trips to Scotland was derived from the VisitScotland statistics (see Table 3.6).

³⁸ Scottish Executive (2007): Scottish Economic Statistics, July, 2007

Table 3.6 Estimated number of recreational bathing trips to Scotland

Tourist Trips	Total number of trips (millions)	Percentage of the recreational bathing trips (%)	Calculated number of the recreational bathing trips in Scotland (millions)
UK tourists 2005 (holiday trips)	9.45	21 ³⁹	1.98
Overseas tourists 2005 (holiday trips)	1.10	5 ⁴⁰	0.06
Total	10.55		2.04

The majority of the recreational bathing is attributed to holiday trips by UK residents (97% of total).

3.9.3 Water Sports (including Canals)

Number of the trips related to the water sport activities has been derived from the VisitScotland data and research. According to the VisitScotland (2007a, 2008) 18% of all holiday trips are devoted to the water sports, thus amounting to 1.9 million trips per year.

It is necessary to stress that different information sources have provided significantly varying estimates on the water sport activities. The range of the estimates varied from 762,000 trips up to 7.4 million trips (see Table 8) (Glasgow Caledonian University and University of Edinburgh, 2003⁴¹). However, VisitScotland (2007a, 2008) estimate is the only one explicitly related to Scotland.

Table 3.7 Estimates of the water sport activities in Scotland

Source of estimate	Number of water sport related trips per year
VisitScotland (2007a, 2008)	1.9 million trips in Scotland (18% of the total holiday trips i.e. 10.55 million).
AXA Insurance Survey (2003) cited in VisitScotland (2007a)	7.4 million people in the UK looking for water sports planning an adventure-based holiday.
Mintel (1998) cited in Glasgow Caledonian University and University of Edinburgh (2003)	1.85 to 2.37 million participation rate in water sports in the UK.
Church et al. (2001) cited in Glasgow Caledonian University and University of Edinburgh (2003)	0.762 million people engaged in the water sports (Scotland) (12% use water for recreation and 3% of the population)

³⁹ Data from year 2003

⁴⁰ Data from year 1996. It is assumed that the proportion of the bathing trips in the overall number of trips stayed constant (Source: calculation based on the VisitScotland data (2008))

⁴¹ Glasgow Caledonian University and University of Edinburgh (2003): An assessment of the Economic Impact of Water-Related Recreation and Tourism in the Spey Catchment in 2003. Summary report

Source of estimate	Number of water sport related trips per year
	regularly participating in the water based sport and recreation in England and Wales; assuming the same degree of involvement).
UK Visitor Survey (2001) cited in Glasgow Caledonian University and University of Edinburgh (2003)	1 million water-sport trips by UK residents in UK.

The most popular water sport sites are the River Tay, Loch Tay, River Spey and Loch Earn.

About 3 million people live within one hour of a canal for use as a place of leisure, recreation and sport and there are over 25 million visits to the towpaths each year. The Scottish canals attract significant number of boaters from foreign countries, for example, about 60% of boaters on the Caledonian canal are from Sweden. The Falkirk Wheel is a top tourist attraction drawing in almost 450,000 visits per year. Significant private sector investments (British Waterways have levered in over £100m of private sector investment over the past 5 years) contribute to the development of Scottish canals and regeneration⁴².

3.9.4 Angling and freshwater fisheries

Freshwater fisheries are a major contributor to the recreational enjoyment of Scotland's countryside. They encourage social inclusion through the activity of owners, managers, and volunteers engaged in the management and use of the fisheries.

Scotland has over 50,000km of rivers and over 31,000 lochs, lochans and ponds of 1 ha or greater in area, almost all supporting populations of fish. There are over 380 declared salmon rivers in Scotland.

The Scottish Government's *Strategic Framework for Scottish Freshwater Fisheries* was issued for consultation in August last year, and closed on 4 Jan 2008. It identifies the vision for the management of freshwater fisheries, describes the context in which freshwater fisheries in Scotland is operating, and lists the recent policy developments and other initiatives which bear on its operation.

Scotland is divided into 54 salmon fishery districts, of which 42 have district salmon fishery boards (DSFB) in place. The powers and duties of these boards, as well as their composition, is defined in the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003. The Scotland Act 1998 makes special provision for the management of salmon and freshwater fisheries in the Border Rivers, the Esk and the Tweed. Historically, fisheries management in the Esk has been subject to English Law and in the Tweed subject to Scots Law. Since 1969, the River Tweed Commission has had statutory responsibility for the protection and management of salmon and all freshwater fish species.⁴³

Management is largely in the hands of the owners of the fishing rights. All fishing rights in Scotland are privately owned as heritable titles - freshwater fishing rights are a pertinent of the land adjacent to the water; salmon fishing rights may held with or separate from any land as a

⁴² Communication with Margaret Horn, Scottish Government (2008)

⁴³ Scottish Government's *Strategic Framework for Scottish Freshwater Fisheries*. Consultation (2007)

separate heritable title. Salmon fishing rights in the sea are privately owned, with the rights extending to 12 miles.

Many of the fisheries issues for water quality, physical habitats and other users are being addressed through the implementation of the WFD and supporting RBMPs, and through regulation and incentive. Fisheries managers will contribute to the production and delivery of the RBMPs. The RBMPs will need to be linked to the production of the Fisheries Management Plans by the Trusts. Fisheries Trusts have received recent additional funding from Scottish Government to develop and implement sound, sustainable and scientifically-based fisheries management plans for the monitoring and assessment of salmon and other freshwater fish.

Angling contribution to Economy

The most detailed and most up-to-date estimates on angling in Scotland are provided in the study by the Glasgow Caledonian University and Cogentsi Research International (2004)⁴⁴. According to this study, remote areas, such as Highlands contribute the most to angling.

The report identifies that there are over 1.3 million angler days per annum. In terms of the fish species salmon and sea trout constitute the most significant share in the Scottish angling - 39% or 545 thousand angler days per year, especially at put-and-take rainbow trout fisheries in Central Scotland. The total angler annual spend is over £112.5 million - with the biggest single contributor (or angler spend) being salmon and sea trout angling in Highland Region. Angling in Scotland supports around 2,800 full-time job equivalents, mostly in rural Scotland.

Local anglers dominate in the Scottish angling comprising more than half of angler days – 56% or 773 thousand angler days. Foreign anglers account for about a quarter of the total angler days – 27% or about 370 thousands, while the remaining days are attributed to the non-local UK residents (Glasgow Caledonian University, 2004).

3.10 Sea, Coastal and Inland Navigation

3.10.1 Introduction

Navigation and sea and coastal water transport are identified as significant water management issues contributing to diffuse pollution in the reports on Significant Water Management Issues in the Scotland and Solway Tweed River Basin Districts (2007). Use of canals for transport and recreation has also been considered within this report.

3.10.2 Characteristics of sea and coastal and inland navigation⁴⁵

In 2006 the Scottish ports handled about 102 million tones of cargo with crude oil, oil products and coal accounting for the greatest portion. The total trade value of port traffic is around £65 billion.

⁴⁴ Glasgow Caledonian University and Cogentsi Research International (2004) The Economic Impact of Game and Coarse Fishing in Scotland. Report for the Scottish Executive

⁴⁵ Sources: National Transport Strategy, 2006; Reports on Significant Water Management Issues, 2007; National Planning Framework for Scotland 2, 2008; communication with Margaret Horn (2008)

There are ten major ports in Scotland (handling over 1 million tonne of cargo per year). The ports of Sullom Voe, Forth and Aberdeen handle bulk oil and oil products, Hunterston handles most of Scotland's coal imports and large tonnages of granite are shipped from Glensanda. Grangemouth is Scotland's largest container port, with important European, Baltic and global connections and approximately 9 million tonnes of cargo are handled through its dock facilities each year.

The ferry services in Scotland service about 10 million passengers per annum (2005).

3.10.3 Sea and coastal water transport

The promotion of more sustainable transport in order to minimise climate change and protect the global environment is a key commitment made by the Scottish Government. The link between economic growth, increased traffic and increased emissions as well as the challenge to break it is recognised.

Reduction of emissions to tackle the issues of climate change is, therefore, one of the strategic outcomes set out in the National Transport Strategy⁴⁶.

In terms of the water environment, this commitment translates for freight in a shift from road to rail and water. The draft National Planning Framework (Scottish Government, 2008b) highlights that while the trunk road network will remain the predominant means of moving freight for the foreseeable future, there is scope for moving a higher proportion by rail and water⁴⁷. The Government is therefore committed to developing incentives such as the Freight Facilities Grant and Waterborne Freight Grants to encourage the movement of a higher proportion by rail and water.

There is potential for Scottish ports to handle both international traffic and coastal services from English ports offering opportunities to transport a higher proportion of containerised freight by sea rather than road. It is observed that a growing proportion of freight is containerised and the number of containers handled by Scottish ports is increasing steadily. However, it is estimated that Scotland's existing container port capacity will be exceeded sometime between 2011 and 2013. The Framework therefore highlights that container handling capacity will need to be expanded to accommodate the projected growth in this traffic over the next 25 years and there are opportunities for this. For example, it is proposed that a new international container terminal on the East Coast will be created (Scottish Government, 2008b).

In terms of the ferry transport the Government is committed to support Scotland's island communities recognising the vital importance of ferry services as well as to expand direct ferry links from Scotland (Scottish Government, 2008b).

⁴⁶ Scottish Executive (2006): Scotland's National Transport Strategy, December 2006

⁴⁷ Please note, that given that the Planning Framework is a draft in consultation, changes are possible before its adoption

3.10.4 Canals: artificial water bodies⁴⁸

While underused to an extent, a network of Scottish canals offers significant potential in terms of regeneration, sustainable development and leisure. There is substantial scope for increasing tourism, providing further maritime links and development of freight traffic⁴⁹.

In a response to periods of decline that canals have suffered, a policy document “Scotland’s Canals: an asset for the future” was adopted in 2002. The paper set the policy framework for the British Waterways’ work and aims to encourage development of the inland waterways. British Waterways have been renovating, developing and transforming canals into important national assets and made considerable investments to bring canals back to life.

The policy aim is to encourage the full potential and sustainable development of the Scottish canals for the benefit of the widest possible range of people. Canals contribute across the range of economic functions and to all five strategic objectives⁵⁰.

The policy document recognises a role for canals in regeneration initiatives, along with navigation and recreation. It addresses five principal areas in which policy decisions can have a significant impact on the sustainable development of canals, including: regeneration, planning and development, public access, integrated transport, environment and tourism.

The following aspirations, goals and trends are most relevant to IA as they will have an impact on Scottish water environment:

- Recognition that development may comprise potential new works, extensions to the network and restoration of degraded canal-side land;
- Commitment to develop aquatic and wildlife habitats, cultivate the biodiversity along the canals, improve water quality in line with the WFD requirements for artificial water bodies; and
- Aims to increase utilization of canals for recreation, public transport and freight traffic.

While the Scottish Government aims to stimulate freight movements on canals, it recognises that for low-bulk or time-critical goods, canal traffic will never be able to compete with other transport modes. However, having regard to the canals’ links to some of Scotland’s major ports

⁴⁸ Sources: communication with Margaret Horn (2008); Transport Act 1968; National Transport Strategy, 2006;

⁴⁹ The Transport Act 1968 (as amended) requires BW to classify canals into three types:

- commercial canals – those principally available for the commercial carriage of freight (Caledonian and Crinan canals)
- cruising waterways – those principally available for cruising, fishing and other recreational purposes
- remainder canals – i.e. those which are not commercial or cruising canals (Forth & Clyde, Union and Monklands. However, the restoration of the Forth & Clyde and Union canals means the need to designate them as cruising waterways)

⁵⁰ Set in the Scottish Government Economic Strategy, 2007

the network could be used to remove large bulk goods and non time-critical freight from the road and rail networks. Short-haul movements on stretches of canal where speed is not slowed by locks may also be possible on the Lowland canals. To address this issue British Waterways Scotland is taking forward plans designed to stimulate greater use of the canal network (Scottish Government, 2008b). In addition to increased freight traffic, the Scottish Government and BWS aim to see more leisure boats on the lowland canals in particular.

3.10.5 Implications for management of the water environment

The canal network will be recognised in the RBMP as Artificial Water Bodies with the requirements to meet good ecological potential. Mitigation measures for water bodies designated as heavily modified (or AWBs) as a result of Inland Navigation (including canals) have been agreed at UK level and will be used by SEPA to classify and set objectives for canals with British Waterways Scotland.

Overall, the increase use of canals should see greater investment in management which will be beneficial. There are possible additional pressures from e.g. maintenance of the canals⁵¹, i.e. dredging may have impacts on hydromorphology of Scottish canals or the risk of introduction of invasive alien species through boat movements.

3.11 Mining and quarrying

Mining and quarrying is named as one of the significant water management issues contributing to the point source pollution in the reports on Significant Water Management Issues in the Scotland and Solway Tweed River Basin Districts (2007). Overall SEPA's SWMI reports for Scotland did not identify significant issues for the water environment.

3.11.1 Trends in the Scottish mining and quarrying sector⁵²

Mining activities in Scotland have historically been associated with coal, shale, fireclay and ironstone mining but are presently largely restricted to areas of coal and oil shale extraction. The nature of coal exploitation has changed significantly in recent years. Deep mined coal is no longer produced in Scotland and coal production is now from opencast, often extensive, sites producing, nationally, over 7 million tons of coal per annum.

Although coal accounts for only 15% of Scottish minerals by weight, it accounts for half the value of all minerals produced in Scotland. There remains large extractable reserves of coal in southern and central Scotland although it is becoming increasingly difficult for the industry to bring forward proposals for large sites due to difficulties of ownership, planning and environmental issues. Within Scotland, future demand for coal will be strongly influenced by the remaining life of the coal-fired power stations at Cogenzie and Longannet. However, the movement of coal outwith Scotland and the availability of coal from abroad means that the

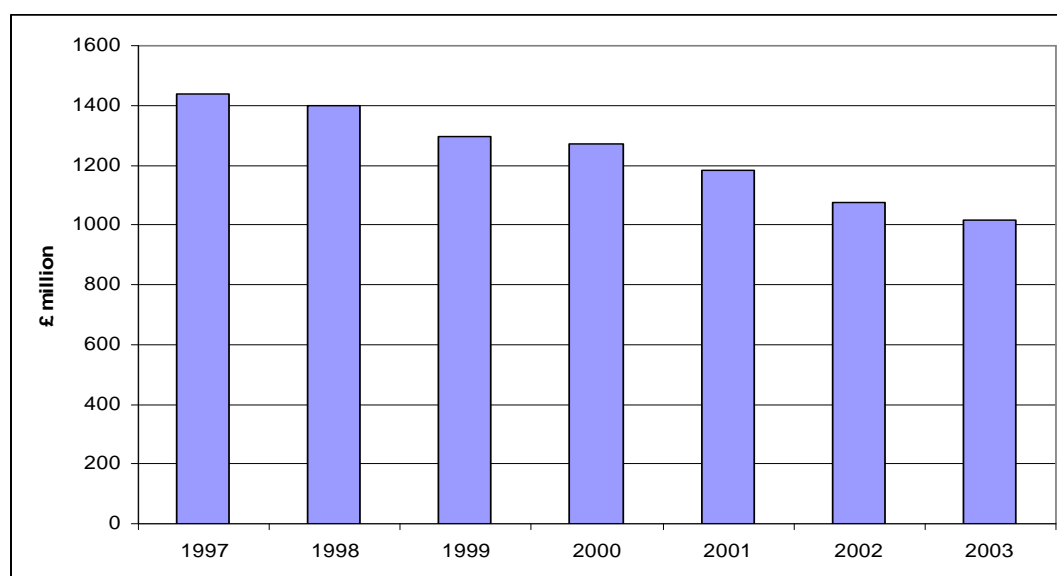
⁵¹ The Transport Act (S105) places a duty on BW to maintain the canals in a suitable condition for navigation taking account of its given classification and the dimensions of vessels that used it in 1967. Thus BW have to dredge the canals so as to maintain navigation for certain sizes of vessel

⁵² Sources: Scottish Economic Statistics, 2006; Reports on Significant Water Management Issues, 2007

industry now operates in a highly open and competitive market. As a result, Scottish opencast production now plays a significant role in total UK supply. This is expected to continue.

In 2006, mining and quarrying showed an 11% decline becoming an industrial sector with the largest negative annual growth. The sector employed about 40 thousand people in 2004 accounting for 2.1% of the total employment and contributed 1.3% (about £1billion) of the gross value added to the Scottish Economy. However, the Gross value added of mining and quarrying has decreased by around 30% between 1997 and 2004. The sector accounts for 2.5% of the total export, which has increased from £335 million in 2002 up to £440 million in 2004. The trend in gross value added production by year is presented in **Figure 3.5**.

Figure 3.4 Trends in the Gross Value Added of the Mining & Quarrying Sector between 1997-2004



3.11.2 Issues for the Water Environment

There will be a continuing need to ensure that minerals are extracted in a way that minimises impacts on local communities and the environment. This is achieved primarily through planning and environmental regulation although the activities of the sector continue to be tightly regulated by European Directives. The new EC Mining Waste Directive will ensure that operators handle waste in a way that prevents or reduces as far as possible any adverse effects of the environment and in accordance with the objectives of the WFD.

SEPA licenses the abstraction and discharges associated with current mining through the CAR regime. SEPA has prioritised point source pollution resulting from historic mine discharges and the Coal Authority through its statutory role has powers and funds to provide remedial solutions to these discharges. However, it is considered that these funds may be limited in future years.

4. Pressure and Sector Specific Drivers and Trends

4.1 Introduction

The sections below attempt to integrate the impacts of the drivers, policies and sectoral trends identified in Sections 2 and 3 and assess their likelihood of resulting in the achievement of the WFD Environmental Objectives within the identified pressure areas.

4.2 Diffuse Pollution

Principal sectors influencing the diffuse pollution are Agriculture, Forestry Urban Development, and Sea and Coastal Transport. The trends are to diversification in agriculture and forestry but with wholesale prices driving a move to quality over quantity. Urban trends are to increasing numbers of households, particularly in suburban, rural areas surrounding towns and cities and coastal areas. The legislation and trends are summarised in **Table 4.1**.

Table 4.1 Assessment of the Effects of Baseline Drivers in Achieving WFD Environmental Objectives for Diffuse Pollution

Sector	Baseline Driver/ Effect (R – regulation, E – economics, A – advice, T – Trend)	Effect +ve; -ve or neutral
Agriculture	NVZ Action Programmes (<2007 and revised 2007). (R)	+ve
	Scottish Rural Development Programme and Rural Development Contracts (E)	
	CAP Reform and Single Farm Payment resulting in decline in intensive farming. Numbers of livestock are predicted to decrease but limited intensification will occur in some areas. Market will override CAP when prices are strong (e.g. recent increase in wheat production and predicted increase in oil seed production) (T)	neutral
	Pressure on output prices from manufacturers and retailers (T)	-ve
	On-farm diversification (e.g. recreation, organic, direct sales)	+ve
	Cross-compliance measures (farm assurance, Rural Stewardship Schemes). (R)	+ve
	Revised cross-compliance and further development of GAEC (2008). (R)	neutral
	Revised PEPFAA guidance (2008). (A)	+ve
	Codes of Practice and other guidance (e.g. 4 Point Plan, Farm Soils Plan). (A)	+ve
	Farm advice from NGOs	+ve
	The Voluntary Initiative (A)	+ve
	Additional controls to manage at risk areas. (R)	+ve

Sector	Baseline Driver/ Effect (R – regulation, E – economics, A – advice, T – Trend)	Effect +ve; -ve or neutral
Forestry	Rural services extension programme. (A)	+ve
	Diffuse Pollution Implementation Strategy (A)	+ve
	Diversification of species. Management of forest areas for recreation. (T)	+ve
	Effective controls over felling through felling licensing or forest plans. (R)	+ve
	Where appropriate, consideration through the Environmental Impact Assessment (Forestry) (Scotland) Regulations 1999. (R)	+ve
	UK Forestry Standards and associated guidelines as mandatory requirement of forestry incentives and felling controls. (E)	+ve
	Forests and Water guidelines. (A)	+ve
	Phasing of land-use change in the catchment of sensitive lochs. (A)	+ve
	Rural Development Contracts: ensuring UK Forestry Standard part of cross-compliance requirements. (E)	+ve
Urban Development	Use of RDCs to support forest planting to protect water quality e.g. riparian and shelter belts. (E)	+ve
	Decline in city populations but increase in number of households (T)	-ve
	Local authority development plans require SUDS. (R)	+ve
	Local authority development control enforces the requirements for SUDS. (R)	+ve
	Quality and Standards investment programme supports retrofitting of SUDS to surface water systems in industrial areas. (E)	+ve
	Scottish Water's technical manual - design requirements for SUDS (A)	+ve
	Promote source control of polluted road drainage before discharging into the public drainage system. (A)	+ve
	Promote the development of integrated surface water management planning in major urban areas. (A)	+ve
Acidification	PPC Regulations (R)	+ve
	Local Authority Air Pollution Control (R)	+ve
	Planning Regulations (R)	+ve
	Emissions Trading Schemes (E)	+ve
	Forest and Water Guidelines (A)	+ve
Sea and coastal transport	Replacement of older vessels, overall reduction in number of vessels through move to larger vessels. Use of container transport. (T)	+ve
	Increase in use of containerised transport through ports.	-ve
	Promotion of the use of canals by British Waterways for freight transport.	-ve
	IMO ban on use of TBT on vessels > 25m (2003)(R) IMO ban on use of TBT on vessels < 25m (1989)(R)	+ve
	IMO ban on TBT treated vessels in European ports (2008) (R)	+ve
	The Merchant Shipping and Fishing Vessels (Port Waste Reception Facilities) Regulations 2003 (R)	+ve

Sector	Baseline Driver/ Effect (R – regulation, E – economics, A – advice, T – Trend)	Effect +ve; -ve or neutral
	IMP 'International Convention for the Control and Management of Ships' Ballast water and Sediments (R)	+ve

4.3 Point Source Pollution

The principal sectors are sewage disposal, aquaculture, manufacturing, refuse disposal and mining and quarrying. Existing controls on discharge driven by the Dangerous Substances Directive, PPC legislation and Groundwater Directive; waste management licensing; the contaminated land regime and the development of sewage treatment by Scottish Water are resulting in significant decline in point source pollution. A summary of the review of these pressures is presented in **Table 4.2**.

Table 4.2 Assessment of the Effects of Baseline Drivers in Achieving WFD Environmental Objectives for Point Source Pollution

Sector	Baseline Driver/ Effect (R – regulation, E – economics, A – advice, T – Trend)	Effect +ve; -ve or neutral
Sewage disposal	Habitats Directive Review of Consents (R)	+ve
	First time rural sewerage programmes resulting from Bathing Water or Shellfish Directive implementation (R)	
	SEPA controls on wastewater discharges to rivers, lochs, etc. (R)	+ve
	Scottish Water controls on trade effluent discharges to sewer. (R)	+ve
	Statutory controls over use of polluting substances in products. (R)	+ve
	Scottish Water charging scheme provides incentives for industry to reduce the amount of trade effluent they discharged to sewer. (E)	+ve
	Pollution reduction campaigns (Scottish Water). (A)	+ve
	Environmental best practice campaigns for industry. (A)	+ve
Aquaculture /fish farming	To protect the local environment, a SEPA licensing regime places limits on the rate or scale of discharges arising from fish farms. (R)	+ve
	To protect the wider waterbody, SEPA applies an assimilative capacity approach under Scottish Government the Locational Guidelines following advice from FRS.	+ve
	Industry quality assurance schemes. (E)	+ve
	Area management agreements have been developed leading to loch wide treatment plans for sea-lice. (A)	+ve
	Code of good practice for Scottish FinFish Aquaculture. (A)	+ve
	The Aquaculture and Fisheries Act 2007 includes powers for the FishHealth Inspectorate to monitor fish farms ensuring adequate sea lice control and prevention of escapes. (R)	+ve

Sector	Baseline Driver/ Effect (R – regulation, E – economics, A – advice, T – Trend)	Effect +ve; -ve or neutral
	The Tripartite Working Group is to develop environmental risk assessment of sites so that economic support and regulatory action are directed to relocating a prioritised list of sites. (E/R)	+ve
	Initiative to conduct strategic development planning for freshwater along similar lines to the marine sector location/relocation programme. (E/R)	+ve
Manufacturing	Continued decline in manufacturing and move to tertiary sector industry (T)	+ve
	Waste management and PPC regimes regulate industrial processes to minimise pollution. (R)	+ve
	Local authority development control ensures that industrial developments are sited in appropriate locations. (R)	+ve
	Local authority contaminated land regime (prioritisation of sites may require review to reflect river basin planning targets). (R)	+ve
	Environmental Management Systems promoted as means to improve environmental performance. (A)	+ve
	NetRegs offers advice on best practice. (A)	+ve
	SEPA offer advice on minimising water pollution (A)	+ve
	SEPA is a partner in HAZREFD which provides guidance to business on reducing the use of hazardous raw materials along with case-studies. (A)	+ve
	Environwise provides guidance on minimising use of hazardous raw material and reducing water pollution (A)	+ve
Refuse disposal activities	SEPA has powers under PPC to prevent new land fills sites from causing pollution of groundwater. (R)	+ve
	SEPA can require mitigation measures to address historic pollution at sites which are still operating under a Waste Management Licence. (R)	+ve
	Local authorities – Impacts caused by closed landfill sites which are now longer subject to licensing can be addressed by the contaminated land regime. (R)	+ve
	Scotland's Waste Strategy will progressively reduce the volume of waste which passes to landfill. (T&R)	+ve
Mining and quarrying	Limited economic deposits of coal reserves available, these are focussed in Lanarkshire and Fife. Decline in volume mined and limited opportunity for new development. (T)	+ve
	Opencast reworking of historically mined areas enabling treatment of point source discharges (T).	+ve
	SEPA risk minimisation of mine water drainage (R)	+ve
	SEPA can control mine dewatering and its discharge from existing mines and quarries. (R)	+ve
	SEPA can require treatment of discharges from mines where a responsible person can be identified. (R)	+ve
	The Coal Authority imposes conditions on the management and restoration of coal mines and quarries to minimise their environmental impact. (R)	+ve
	Planning conditions imposed in local authority planning permissions minimises wider environmental impacts. (R)	+ve

4.4 Abstraction and Flow Regulation

Limited drivers were present in Scotland prior to the WFD to limit abstraction and flow regulation. These related principally to controls promoted by recreation (i.e. angling, canoeing, boating) and promotion by Scottish Water and through public awareness campaigns for the efficient use of water. The concern about climate change is resulting in increased pressure for renewable power generation and the hydropower sector views this as an opportunity. A summary of the review of pressures by sector is presented in **Table 4.3**.

Table 4.3 Assessment of the Effects of Baseline Drivers in Achieving WFD Environmental Objectives for Abstraction and Flow Regulation

Sector	Baseline Driver/ Effect (R – regulation, E – economics, A – advice, T – Trend)	Effect +ve; -ve or neutral
Electricity generation	Fishery (Electricity) Committee advice on measures to protect fisheries imposed via SEPA licences. (R)	+ve
	Climate change goals resulting in new hydro-power schemes (T)	Potential -ve
	Local authority development and planning control. (R)	+ve
	Voluntary agreements between hydropower companies and interest groups such as anglers. (A)	+ve
Water supply activities	Charging incentives encourage efficient use of water by industry. (E)	+ve
	Publicity campaigns promoting efficient water use by domestic customers. (A)	+ve
Agriculture irrigation	Publicity campaigns promoting efficient water use by farmers. (A)	+ve
	Organise workshops with farmers on water efficiency. (A)	+ve
	Promote management agreements between farmers. (A)	+ve

4.5

4.6 Changes to Morphology

Historical engineering works have resulted in significant changes to the morphology of a number of river systems in Scotland (e.g. the lower Clyde, Waters of Leith). These have principally resulted from ports and shipping, urban development, agriculture (land drainage) and electricity generation. Limited regulatory powers currently exist for the redevelopment of these engineering structures. The pressure for additional housing in suburban and semi-rural areas is creating pressure for the development on flood plains. The forthcoming Floods Directive could implement additional legislation to control activities. These pressures are summarised by sector in **Table 4.4**.

Table 4.4 Assessment of the Effects of Baseline Drivers in Achieving WFD Environmental Objectives for Morphology

Sector	Baseline Driver/ Effect (R – regulation, E – economics, A – advice, T – Trend)	Effect +ve; -ve or neutral
Historical engineering activities & urban development	Additional requirement for containerised handling areas at ports (T)	-ve
	Housing development on flood plain areas. (T)	+ve
	Planning and Development Control used to identify restrictions on urban development and opportunities for restoration of brownfield sites with historical structures. (R)	-ve
	Planning Advice Notes warn against development on flood plains. (A)	+ve
	Development of Flood risk management plans under the Floods Directive. (R)	+ve
	New funding frameworks for taking forward restoration work. (E)	+ve
Agriculture	Single Farm Payments promote good agricultural practice.	+ve
	Forestry Committee's woodland grant schemes promote riparian woodland. (E)	+ve
	Best practice advice from NGO/SEPA/SNH/Forestry Commission on river management. (A)	+ve
	Habitat enhancement schemes led by voluntary initiatives.	+ve
Land reclamation	Local authority development controls on new areas of land claim. (R)	+ve
	Use of EIA regulations by local authorities. (R)	+ve

4.7 Alien Species

The introduction of alien species in the environment principally results from the domestic sector (garden plants, recreation, boating) and historical release has often been a non-deliberate activity. Controls on the release of alien species in the environment have aimed to limit the introduction. A summary of the trends and drivers is presented in **Table 4.5**.

Table 4.5 Assessment of the Effects of Baseline Drivers in Achieving WFD Environmental Objectives for Alien Species

Sector	Baseline Driver/ Effect (R – regulation, E – economics, A – advice, T – Trend)	Effect +ve; -ve or neutral
All Sectors	Use of non-native (exotic) plant species in gardening (T)	-ve
	Control of Pesticides Regulations (use of herbicides to control invasive plants in or near water. (R)	+ve

Sector	Baseline Driver/ Effect (R – regulation, E – economics, A – advice, T – Trend)	Effect +ve; -ve or neutral
	The Prohibition of Keeping or Release of Live Fish (Specified Species) (Scotland) Order 2003 (T)	+ve
	Species Action Framework (Scottish Government/SNH). (A)	+ve
	NetRegs advice on best practice for control of certain alien plant species	+ve
	Local Authority and local voluntary projects to address problem species. (A)	+ve
	Strategic Framework for Scottish Freshwater Fisheries (A)	+ve
	Scotland's Canals: an asset for the future (A)	-ve/+ve

4.8 Summary

Changes to pressures on diffuse pollution have principally resulted from trends driven by market demand resulting in the overall decline in agricultural production, localised intensification in agriculture and growth in urban areas. Economic drivers (i.e. SRDP and CAP reform programme) have had an important influence in addition to legislation through the Nitrates and Sludge Use Directives resulting in important national and catchment based Regulation.

The overall improvement of point source pollution pressures to the water environment in many sectors has principally been driven by existing legislation such as the Dangerous Substances, PPC Regulations and Groundwater Directive.

Abstraction and flow regulation has had limited legislative control in Scotland to present. The principal drivers for improvement have been through promotion of efficient water usage (domestic and agriculture) and from interest groups (e.g. angling) on the regulation of river systems (principally from water abstraction and hydropower generation).

Historic engineering works have resulted in significant changes to river channel morphology particularly in the downstream areas close to urban development, ports and harbours. The canal system managed by British Waterways and hydropower generation has also been important in this regard. No regulatory mechanisms have been available to date to promote restoration works in these areas. Expansion of housing into suburban and semi-rural areas has increased the pressure on development in flood plains and for land reclamation, principally in estuarine and coastal areas.

The release of alien species is controlled through some legislation, principally for fish. The principal driver is through domestic use of non-native plants and through recreation.

Appendix A

Demographic Trends

4 pages

Past Trends and National Demographic Situation

In 2006, 5.12 million people were living in Scotland (GROS, 2007b⁵³). Whilst the population size has been relatively stable over the last 50 years, the population has been slowly declining since 1974 when it was 5.24 million till it reached its lowest point of 5.05 million inhabitants in 2002 (GROS, 2007a⁵⁴).

According to the Scotland's Annual Population Review Scotland's population since 1974 is both falling and ageing (GROS, 2007a). The main cause of the decline is a falling birth rate, though out-migration is still a concern in some rural areas (Scottish Executive, 2004a). The low birth rate and rising life expectancy are changing the age profile of the population. Since 1996, there has been a 10% decrease in the number of children under 16 and a 13% increase in over-75s. The working population is becoming more middle-aged, with a pronounced shift towards the over 45s. These trends are set to continue as the 1960's baby boom reaches retirement age after 2020 (GROS, 2007a).

Given that in 2006 (for the first time since 1994) there were more births than deaths, the observed slight increase in population (by 61 thousand people) between 2002 and 2006 was caused by net in- migration from Eastern Europe following enlargement of the European Union (GROS, 2007a; Scottish Government, 2008b).

Past Trends and Demographic Situation in Urban Areas

Over 60% of the population lives in the Central Belt and 27% in the four main cities – Glasgow, Edinburgh, Aberdeen and Dundee (GROS, 2007a). However, the distribution of population has been changing. The biggest increase in the population since 1996 occurred in West Lothian, while Eilean Siar accounted for the most significant decrease.

Table A.6 **Changes in the regional population 1996-2006**

Area	Change in per cent
West Lothian	+10.4%
East Lothian	+6.7%
Stirling	+5.7
Eilean Siar	-7.9%
Dundee city	-6.6%
Inverclyde	-6.3%

Source: GROS, 2007a

⁵³ General Register Office for Scotland (2007b): Projected population of Scotland (2006-based), October 2007

⁵⁴ General Register Office for Scotland (2007a): Scotland's Population 2006. The Registrar General's Annual Review of Demographic Trends, July 2007

The period 1981 to 2006 saw a significant change in city population trends. While the city of Edinburgh has experienced growth in its population, cities of Aberdeen, Glasgow and Dundee saw a dramatic decline in the number of inhabitants (see **Table A.7**)

Table A.7 **Changes in city population (1981-2006)**

City	Change in per cent
Edinburgh	+3.9%
Glasgow	-18.5%
Dundee	-16.2%
Aberdeen	-2.6%

Source: GROS, 2007a

As a result, the “four city” share of population has continued to fall from 30% to 27% of the Scottish total (GROS, 2007a).

While the number of inhabitants is falling, the trend towards smaller households means that the number of households is still growing. This is mainly due to the ageing of population and more people living alone (GROS, 2007a). These trends in turn have important implications for the development in the period to 2025 as increases in the number of households will translate into a requirement for additional houses (Scottish Government, 2008b).

Demographic Projections

The Office for National Statistics (ONS) on behalf of the General Register Office for Scotland (GROS) regularly prepares, publishes and updates long-term population projections for Scotland. On the policy side, recognising the link between the demographic situation and the potential for economic growth, the Government Economic Strategy (2007) and the draft National Planning Framework 2 for Scotland (2008) discuss expected demographic trends and Scotland’s response to these by putting in place a number of policy measures.

According to the latest GROS long-term demographic projections the population in Scotland is expected to rise from 5.12 million in 2006 to 5.37 million in 2031 before slowly declining and falling below 5 million in around 2076 (GROS, 2007b).

The key principal projections include:

1. the number of children aged under 16 is projected to decrease by 7%;
2. the number of people at the working age is projected to increase slightly by 0.4%;
3. the number of people of pensionable age is projected to rise by around 31%; and
4. the number of people aged 75 and over is projected to increase by around 81% (GROS, 2007b).

There is also a number of variant projections developed. One of them forecasts decline in population between 2006 and 2031 by 0.06 million if the natural change only is assumed (i.e. zero migration) (GROS, 2007b).

Table A.8 Population projections 2006-2031 in Scotland

Area	2006	2011	2016	2021	2026	2031	change 2006-31 %	change 2006-31
Scotland	5,116,900	5,205,613	5,270,249	5,326,398	5,362,774	5,373,569	5.02	256,669

Source: General Register Office for Scotland (2007): Projected Population of Scotland (2006-based).

The previous national projections expected the population to increase till 5.13 million by 2019 and then fall below 5 million before 2036 reaching 4.86 million in 2044 (GROS, 2007a). The latest forecasts, however, are more optimistic due to the fact that number of births is predicted to be higher, number of deaths lower and net migration is predicted to increase (based on the observed trends in the last 5 years) (GROS, 2007b).

Three important demographic trends, which will also have an impact on the future economic development of Scotland include (GROS, 2007b):

1. Projected gradual decline in the population.

Slowing population growth is a phenomenon found in all developed economies and is primarily linked to falling birth rates. The natural decrease is projected to be the main cause for future population decline in Scotland (GROS, 2007b).

The draft Framework document highlights that there is a scope for reversing the population decline which might pose a risk for economic growth. The observed increase in the population due to in-migration in the last years demonstrates that (Scottish Government, 2008b)⁵⁵.

2. Ageing of Scottish society.

The draft Framework highlights that while there is a risk that an ageing population could lead to lower activity rates, a less entrepreneurial society and skill shortages, more people are now able to lead an active life after the traditional career span (Scottish Government, 2008b).

3. Changing population density in the regions.

The draft Framework stresses that there are likely to be significant differences in population change between different parts of the country. According to the sub-national population projections to 2024 continuing growth in population is expected in Eastern and Central Scotland (West Lothian) while falls in population are forecasted in

⁵⁵ In Scotland, a Fresh Talent initiative has been set up in 2003 with the aim to reverse the population decline and continue to maintain the necessary skills within the Scottish labour force. In particular, the Initiative is aimed at boosting the working age population and alleviating demographic pressures on the economy through greater retention of people and in-migration. The initiative effectively encourages more Scots to remain in Scotland and promotes Scotland abroad as an attractive place in which to live and work (Scottish Executive, 2004a; GROS, 2007a).

Aberdeen and Dundee, parts of West Central Scotland and some of the remoter rural areas (Scottish Government, 2008b).

Table A.9 Regional population forecasts till 2024

Area	
West Lothian	+21%
Scottish Borders	+15%
East Lothian	+13%
Edinburgh	+10%
Aberdeen	-18%
Eilean Siar	-15%
Dundee and Inverclyde	-14%
East Dunbartonshire and the Shetland Islands	-11%

Source: Scottish Government, 2008b

Appendix B

Climate Change

3 Pages

Scotland's Climate Change Programme (2006)

Scotland's Climate Change Programme published in 2006 by the then Scottish Executive is under review to deliver the more ambitious target proposed by the Scottish Climate Change Bill in reducing emissions and adapting to climate change. The underlying principles of this Programme will continue - to tackle climate change in a sustainable way, to report annually on progress, to mainstream climate thinking across Government, to better understand the carbon impact of policies, to raise the profile of adaptation, and to communicate the importance of the issue much more widely.

Commitments

The Programme quantifies the Scottish Share - Scotland's equitable contribution to UK climate change commitments - at 1.7 MtC. However, Scotland is committed to deliver more than its fair share and sets more ambitious over-arching target for Scotland, which is to exceed the Scottish Share by 1 MtC. However, the Programme stresses that meeting the target is not the only challenge, as it has to be met in a sustainable way, protecting the environment whilst building a strong, sustainable economy.

In addition to the quantified Scottish Share and over-arching Scottish target, Scotland has also set a target to produce 31% of electricity generated from renewable sources by 2010, rising to 50% by 2020. (To achieve 40% by 2020 about 6GW of installed capacity will be required).

In the long-term perspective, a low carbon economy and reduced vulnerability to the effects of climate change are part of the vision of Scotland in 2050 (Scottish Executive, 2006b).

Planned actions

The programme seeks to achieve a balance between the two strands of Scotland's climate change response, i.e. mitigation and adaptation, focusing on where the Scottish Government has policy levers (devolved policies) to influence outcomes. The actions address the same sectors as the UK Climate Change Programme: energy; transport; agriculture, forestry and land use; business, residential sector and public sectors; and waste management.

Sector	Planned Actions
Energy Sector	<p>Increase energy savings and improve energy efficiency, for example:</p> <ul style="list-style-type: none">• development of the Scottish Energy Efficiency Strategy which will set out contribution to the overarching Scottish Target in terms of the total carbon savings from all energy saving measures• development of the range of measures to help cut energy related emissions arising from the heating and lighting of buildings• development of additional measures to support inclusion of energy efficiency and renewables in public sector investments• development and adoption of new energy standards for new buildings <p>Shift towards cleaner sources of energy:</p> <ul style="list-style-type: none">• promotion of renewable electricity: Renewables Obligation (Scotland) creates a strong financial incentive for the building of new renewables capacity to meet the resulting demand• promotion of renewable heat and biomass: e.g. through <i>Development of a Scotland's Renewable Heat Strategy</i> supporting market development; provision of support for biomass sector in Scotland (including forestry products); production of a Biomass Action Plan• promotion of small scale renewables and micro-generation: e.g. through: Scottish Community and Household Renewables Initiative (SCHRI) providing grants and expert advice on small scale renewable projects
Transport	<ul style="list-style-type: none">• along with UK and European counterparts, support efforts to include aviation in the EU Emissions Trading Scheme.;• support to the UK development work on the implementation of a Renewable Transport Obligation (RTFO) to ensure that 5% of all UK fuel sold on UK forecourts are biofuels by 2010;• support to promotion of new and cleaner vehicle technologies and fuels; and• promotion of the travel behaviour change and modal shift to more sustainable travel modes
Other sectors : agriculture, forestry, land use sector, public, business	<ul style="list-style-type: none">• promotion of carbon savings from forestry• promotion and support to the increases in the energy efficiency as well as revision of energy standards in Scottish building regulations are among actions to be taken in business, public and residential sectors.• targeted support to renewable micro-generation in the residential and public sectors• inclusion of the business sector in the second phase of the EU Emissions Trading Scheme• planning and flood risk management in the adaptation to the climate change meeting sustainable flood management principles

Source: Scottish Executive, 2006b

UK Climate Change Programme (2006)

UK Climate Change Programme defines policies and priorities for action in UK with regard to the climate change including:

- Meeting the commitment made under the Kyoto Protocol to reduce emissions of greenhouse gases (GHG).
- Setting a domestic target as part of its Climate Change Programme which aims to reduce carbon dioxide emissions by 20% below 1990 levels in 2010. It is estimated that existing and new policy measures in the Programme are projected to reduce carbon dioxide emissions to 15-18% below 1990 levels by 2010.
- Highlights the long-term perspective of the UK climate change policy whose long-term goal is to reduce carbon dioxide emissions by some 60% by about 2050 (DEFRA, 2006).

Appendix C

Agriculture, Forestry and Aquaculture

12 Pages

C.1 Overview of Scottish Rural Areas

Around 54% of Scotland's territory is predominantly rural and in addition there are many areas which are remote (SRDP, 2007).

Scotland's rural areas are experiencing major structural changes with the continuing decline of farming and fishing accompanied by an expansion of the service sector, diversification into new activities and the growth of the leisure economy (NPFS, 2004). A significant part of the population lives in the central belt which, whilst it is densely populated, still retains extensive areas of agriculture and forestry. Most of the remainder of rural Scotland is relatively unpopulated. It is estimated that about a million people, 19% of Scotland's total, live in rural areas (SPP 15, 2005).

Agricultural land covers 6.12 million hectares or almost 80% of Scotland, however due to physical and climatic conditions most agricultural land is rough grazing, and 85% is classified as Less Favoured Areas. The area of land used for crops, fallow and set-aside represents only about 10% of the total agricultural area. The livestock sector is of particular significance to Scottish agriculture, including a significant area of dairying in south-west Scotland (SRDP, 2007).

In terms of the output, agricultural sector in Scotland accounts for 1.3% of Gross Value Added (GVA), although its importance is much greater in some regions of rural Scotland. The sector employs around 45,000 people, which represents 2.2% of the total workforce, or 5% of the rural workforce (A Forward Strategy for Scottish Agriculture, 2006). Since 1998, the number of full-time employees has fallen significantly and employment of part-time and casual/seasonal employees has increased. Furthermore, the workforce in agricultural sector is ageing, with 51% of working occupiers aged over 55 years (of which 24% are over 65 years) in 2005 (SRDP, 2007).

Agricultural output forms a vital input to the wider food and drink industry, which represents one of the largest manufacturing sectors, accounting for about one-fifth of gross value added and one-fifth of employment in Scottish manufacturing (A Forward Strategy for Scottish Agriculture, 2006).

Small firms are characteristic of rural Scotland, particularly in remote rural areas where they support 84% of employment (2004 figures) (SRDP, 2007).

There have been some positive developments between 2000 and 2005 such as a 54% increase in Total Income from Farming, but the industry is undoubtedly still facing significant challenges through continuing pressure on output prices as well as increases in some critical input costs (A Forward Strategy for Scottish Agriculture, 2006).

Agriculture is a key contributor to the wider rural economy in Scotland which comprises a broad range of activities. There has been diversification away from the primary industries of agriculture, forestry, fishing and energy, and growth in the contribution of other activities, particularly in the service sector (A Forward Strategy for Scottish Agriculture, 2006; SRDP, 2007).

In terms of income, 69% of GVA in rural areas is derived from the tertiary sector and 4% is derived from the primary sector. The tertiary sector also accounts for a substantial proportion of rural employment, supporting 43% of jobs compared to 11% in the primary sector and 30% in the secondary sector.

However, levels of on-farm diversification are relatively low in Scotland. In 2005, nearly a quarter of farms engaged in some form of on-farm diversification activity. Of these, tourism accommodation and leisure, equine activities and shooting were the most common activities (6% each), and renewable energy was the least common activity (1%) (SRDP, 2007).

There are over 200,000 tourism-related jobs in Scotland (almost 9% of total employment), and many of these are in rural areas. Moreover, the Rural Development Programme suggests that further opportunities exist to develop the tourism sector and bring added value to the rural economy (SRDP, 2007).

C.2 A Forward Strategy for Scottish Agriculture (2006)⁵⁶

The Strategy highlights such major themes as sustainable development, market orientation of the sector, climate change, health and well-being, environmental protection and rural development. It builds on the principles identified in the Scotland's Sustainable Development Strategy and defines the following vision for the Scottish Agriculture:

“It should be:

- Focused on producing food and other products for the market;
- A major driver in sustaining rural development, helping rural communities prosper;
- A leading player in the protection and enhancement of the environment;
- A major contributor to key objectives on animal health and welfare and human health and well-being;
- Keen to embrace change and market opportunities”.

Furthermore, the Strategy sets out actions which will help to ensure that the Scottish farming industry is: competitive in markets; a driver of rural development; and renowned for its high environmental standards.

The Strategy aims to build on the achievements in animal health and welfare, diversification and environment. Furthermore it highlights the importance of key Scottish industry sectors, such as food and drink and tourism.

The Strategy addresses business opportunities for the Scottish agriculture. While stressing that global competition will always be a challenge for Scottish producers, the Strategy recognises that Scotland can build on its tradition and quality of agricultural products, as well as on its good record on livestock health and welfare. Re-opening of the beef export markets and production of energy crops offer market opportunities as well.

The Strategy stresses that agriculture is a part of wider rural development and suggests that the farming industry should be a major driver in sustaining rural development. It does however recognise and highlight the need and importance of diversification. While the choice of an activity for diversification depends on local circumstances, tourism, commercial recreation, forestry and energy crops are seen as key priority industries. Furthermore, referring to the permanent disadvantage of some of the rural areas, the Strategy highlights the critical role of the Less Favoured Area support scheme in maintaining farming's role in rural communities.

⁵⁶ Scottish Executive (2006): A forward Strategy for Scottish Agriculture: Next Steps, March, 2006

Given, that agricultural land accounts for almost 80% of the land area of Scotland, the way this land is farmed has a significant effect on Scotland's (water) environment. The Strategy recognises that while farmers have reduced the number of serious pollution incidents through better storage of slurry and silage effluent, diffuse pollution from agriculture remains a threat to the achievement of a good water environment. Decoupling of farm subsidies from production and introduction of the cross-compliance requirements are seen as important contributors to the more environmentally sensitive farming (Scottish Executive, 2006a).

Land-use planning policy

The draft National Planning Framework (2008) highlights the role of Planning in the rural development, which is to enhance the value of rural resources and help create development opportunities at sustainable locations. Scottish Planning Policy on Rural Development (SPP 15) further sets the approach to the planning and defines objectives for development of rural areas.

The aim of the Framework is to reverse the declining trend in the population in rural areas, recognising that many rural areas in Scotland can absorb more people without losing their environmental quality. High quality natural surroundings offer opportunities for a wide range of activities while modern communications technologies make dispersed economic activity feasible. It highlights the potential for the development of creative and knowledge-based businesses as opposed to the traditional primary industries. According to the Framework document, the future of rural areas in Scotland lies in economic diversification and environmental stewardship.

The Scottish Government has developed a number of national strategies for agriculture, forestry and aquaculture to promote rural development and sustainable resource management.

In the most peripheral rural areas of Scotland cultural and environmental resources are the assets with enormous potential as there are large markets for Celtic culture, built heritage and environmental tourism.

C.3 SRDP Agri- environment scheme options related to the water environment

SUMMARY - SPECIFIC WATER QUALITY RELATED OPTIONS

- Livestock tracks gates and river crossings (Tier 3) ***
- Manure/slurry storage and treatment (Tier 3)***
- Treatment of run-off of nutrients and other pollutants (Tier 3):***
- a) (Tier 3) Construction of biobeds (Tier 3) ***
- b) Constructed farm wetlands (CFWs)***
 - Arable reversion to grassland/unfertilised grassland (Tier 3)
 - Nutrient Management Plan (Tier 2)
 - Provision and upgrading of infrastructure related to access to farm and forest land, energy supplies and water management (investment can include water storage reservoirs) (Axis 1, tier 3)***
 - Rural infrastructure, which can include reducing bacterial contamination (Axis 3, tier 3)***

Notes: those identified *** are new under the SRDP 2007 programme and can be identified as contributing to delivering diffuse pollution targets under WFD.

Full List of Options related to Agri-environment Payments (Articles 36(A)(iv))

WILDLIFE ON FARMLAND AND OTHER TYPES OF LAND

- (a) Wild Bird Seed Mix/Unharvested Crop (Tier 2 and Tier 3)
- (b) Management of Mown Grassland for Wildlife (Tier 3)
- (c) Management of Mown Grassland for Corn Buntings (Tier 3)
- (d) Management of Mown Grassland for Corncrakes (Tier 3)
- (e) Management of Grazed Grassland for Corncrakes (Tier 3)
- (t) Creation and Management of Early and Late Cover for Corncrakes (Tier 3)
- (g) Management of Early and Late Cover for Corncrakes (Tier 3)
- (h) Management of Open Grazed or Wet Grassland for Wildlife (Tier 3)
- (i) Mammal and Bird Control (Tier 3)
 - Predator control
 - Crow control.

-
- Predator control for black grouse and capercaillie
 - (j) Supplementary Food Provision for Raptors (Tier 3)
 - (k) Wardening for Golden Eagles (Tier 3)
 - (l) Control of invasive non-native species

MANAGEMENT OF SPECIES RICH AREAS

- (a) Management of Species Rich Grassland (Tier 3)
- (b) Bracken Management Programme for Habitat Enhancement (Tier 3)
- (c) Creation and Management of Species Rich Grassland (Tier 3)
- (d) Management of Habitat Mosaics (Tier 3)

WETLAND FEATURES

- (a) Improvement of Rush Pasture for Wildlife (Tier 2)
- (b) Management of Wetland (Tier 3)
- (c) Creation, Restoration and Management of Wetland (Tier 3)
- (d) Management and Restoration of Lowland Raised Bogs (Tier 3)
- (e) Creation and Management of Water Margins and Enhanced Riparian Buffer Areas (Tier 3)
- (f) Management of Flood Plains (Tier 3)
- (g) Management of Buffer Areas for Fens and Lowland Raised Bogs (Tier 3)

MOORLANDS

- (a) Summer cattle grazing (Tier 2)
- (b) Management of Coastal or Serpentine Heath (Tier 3)
- (c) Management of Lowland Heath (Tier 3)
- (d) Wildlife Management on Upland and Peatland Sites (Tier 3)
- (e) Management of Moorland Grazing (Tier 2 and Tier 3)
- (f) Management of Moorland Grazings on Sites Designated for Their Uplands and Peatlands (Tier 3)
- (g) Moorland - Stock Disposal (Tier 3)
- (h) Away-Wintering of Sheep (Tier 3)
- (i) Off-Wintering of Sheep (Tier 3)
- (j) Muirburn and Heather Swiping (Tier 3)

FIELD MARGINS AND BOUNDARIES

- (a) Management of Linear Features (Tier 2)

-
- Hedgerows and hedgerow trees

- Dykes

(b) Management of Hedgerows (Tier 3)

(c) Management of extended hedges (Tier 3)

(d) Management of Grass Margins and Beetlebanks in Arable Fields (Tier 2 and Tier 3)

ARABLE FIELDS

(a) Biodiversity Cropping on In-Bye (Tier 2 and Tier 3)

(b) Management of Cropped Machair (Tier 3)

(c) Management of Conservation Headlands (Tier 2)

(d) Retention of Winter Stubbles (Tier 2)

WOODLAND AND SCRUB

(a) Management of Ancient Wood Pasture (Tier 3)

(b) Management of Scrub and Tall Herb Communities (Tier 3)

WATER QUALITY

(a) Nutrient Management Plan (Tier 2)

(b) Soil and Water Management Programme (Tier 3)

(c) Arable reversion to grassland unfertilised grassland (Tier 3)

Livestock tracks gates and river crossings (Tier 3)

Manure/slurry storage and treatment (Tier 3)

Treatment of run-off of nutrients and other pollutants (Tier 3):

(Tier 3) Construction of biobeds (Tier 3)

Constructed farm wetlands (CFWs)

Provision and upgrading of infrastructure related to access to farm and forest land, energy supplies and water management (investment can include water storage reservoirs) (Axis 1, tier 3)

Rural infrastructure, which can include reducing bacterial contamination (Axis 3, tier 3)

SMALL UNITS

(a) Conservation Management Plan with Special Measures for Small Units (Tier 3)

(b) Retention or introduction of cattle of native or traditional breeds (Tier 3)

C4 Projections of Agricultural Activities

A number of forecasts of agricultural activities have been elaborated so far. While Business as Usual projections (BAU III) developed jointly by the University of Cambridge and Scottish Agricultural College are the most relevant as they were elaborated purposefully for the WFD, they did not take into account implications of the trade liberalisation. This issue has been addressed in the FAPRI-UK project while developing projections for agricultural activities taking into account elimination of export subsidies and reduction of import tariffs. **Table D.1** summarises BAU III projections and alternative projections which take into account trade liberalisation.

Table C.10 **BAU III and alternative projections of agricultural activities**

BAU III Projections	Alternative Projections
Wheat area to increase by 9%	Wheat area to increase by 9%
Barley area to fall by around 3%	Barley area to fall by around 3%
Oilseed Rape to increase by 30%	Oilseed Rape to increase by 30%
Dairy numbers to fall by 7%	Dairy numbers to fall by 12%
Beef cow numbers to fall by 3%	Beef cow numbers to fall by 11%
Sheep numbers to fall by 8%	Sheep numbers to fall by 26%
Pig numbers to fall by 1%	Pig numbers to fall by 1%
Poultry number to fall by 2%	Poultry number to fall by 2%

Inclusion of the trade liberalisation considerations in the projections result in greater reduction in the livestock numbers. Number of sheep, beef cows and dairy cows are projected to fall significantly⁵⁷.

⁵⁷ Sources: University of Cambridge, SAC (2006): Business as usual projections of agricultural activities for the Water Framework Directive, April, 2006; SG note (2008): Review of likely Impacts on Land-use Change

C.5 Details on Timber Production and Employment

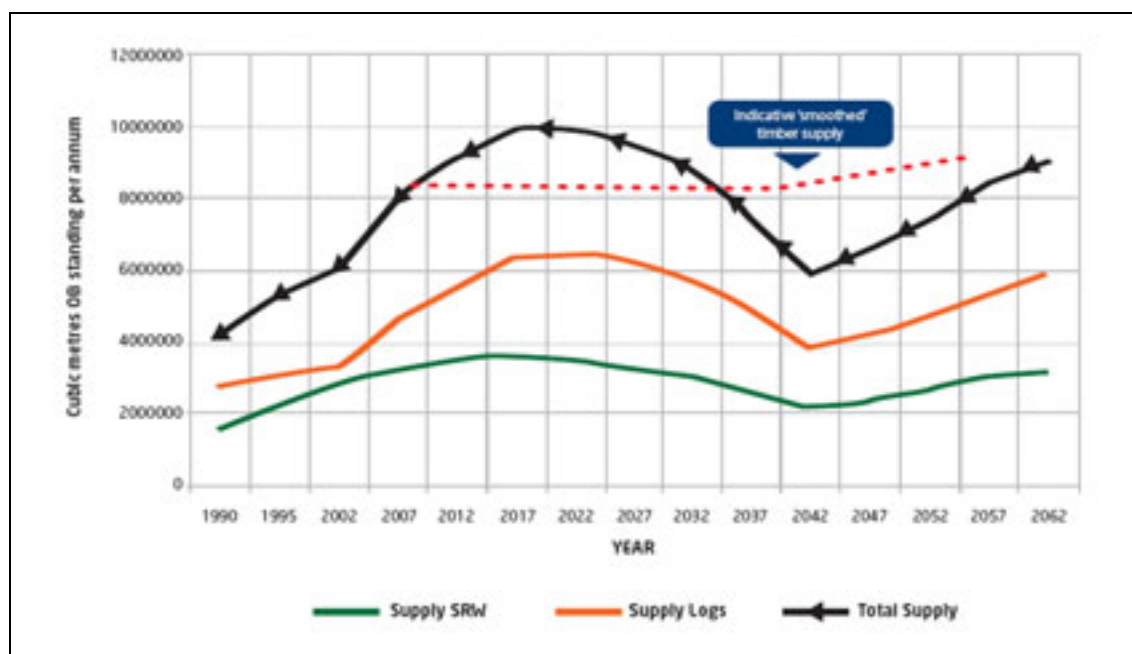
Private sector investment in the forestry industry has continued at about £60 million each year over the last 15 years. However, according to the Scotland Rural Development Programme many woodland owners struggle to obtain sufficient direct returns from their woodlands which in turn affect their ability to undertake desirable silvicultural operations, such as thinning. Management of the state woodland is primarily based on a clear felling (RDR, 2007, Scottish Executive, 2006b).

Currently over 70% of the timber is processed in Scotland, with the resultant sawn wood and wood products finding ready markets within the UK and abroad (Forestry commission Scotland, 2007). This is in line with the long-term vision set in the Scottish Forestry Strategy which is a local timber processing based on softwoods and hardwoods and new value-adding enterprises. However limited information exists on levels of diversification in forestry (RDR, 2007; Scottish Executive, 2006b).

Despite the growth in the timber production, the Forestry Commission stresses that UK will continue to import a very large proportion of its timber and timber product needs, intensifying the challenge for Scottish forestry industry to minimise costs and to maximise efficiency (Forestry Commission Scotland, 2007).

The vision set in the Scottish Forestry Strategy is a competitive timber production of about 8.5 million m³ per year with further growth potential. Forecasts indicate the potential for a continued rise in timber production from the current level of almost 7 million m³, to a peak availability of about 10 million m³ in the mid-2020s (see **Figure C.1**).

Figure C.1 Long-term forecasts of the timber production in Scotland⁵⁸



⁵⁸ Source: adopted from Scottish Executive, 2006b

Employment in the forestry and wood processing

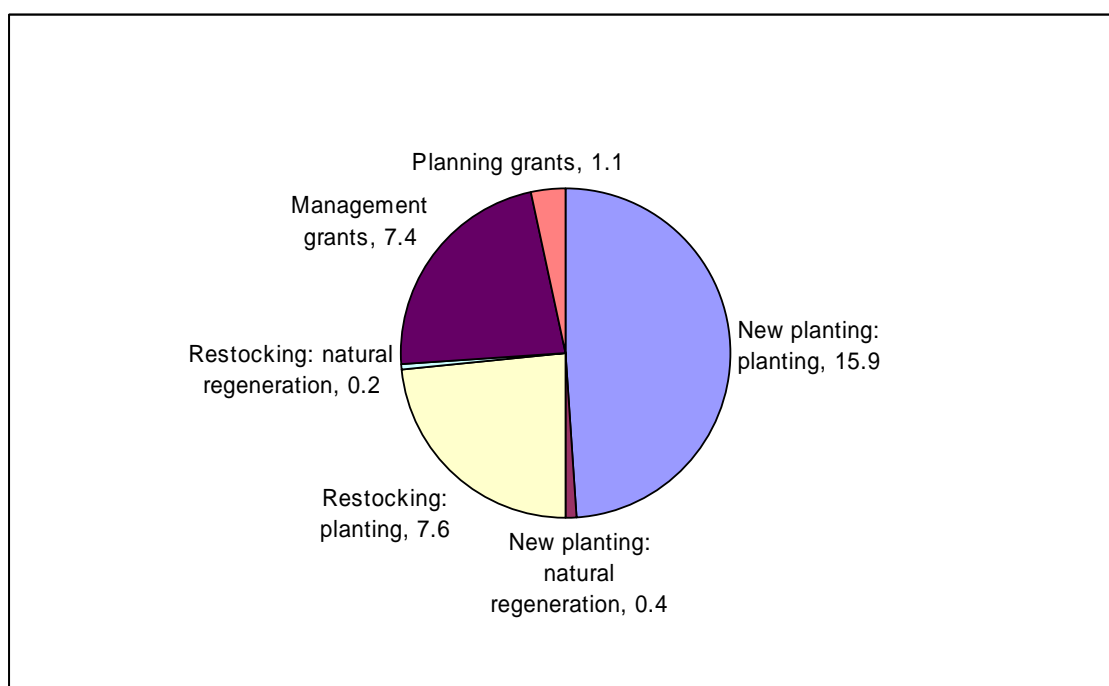
More than 10,000 people directly employed in forestry, wood processing and allied businesses in Scotland. About 7,600 jobs are provided directly by forestry and another 3,100 in the primary wood processing industry (Forestry Commission Scotland, 2007; Scottish Executive, 2006b).

There were 19,000 employees in the manufacturing in the forestry sector in Scotland in 2003. This figure becomes twice as high if employment associated with the manufacturing of wood products and of pulp/paper products are taken into account (RDR, 2007).

Forestry schemes

Creation of the new non-state woodland and management of the existing woodland is supported by a range of grants. The Woodland Grant Scheme (WGS) introduced in 1988 was the main support mechanism for forestry, which has been later replaced. The new mechanism - Scottish Forestry Grants Scheme (SFGS) was introduced in 2003 (Forestry Commission Scotland, 2008; RDR, 2007) (see **Figure C.2**).

Figure C.2 Grant money paid in 2006-2007 (£ million) per grant scheme⁵⁹



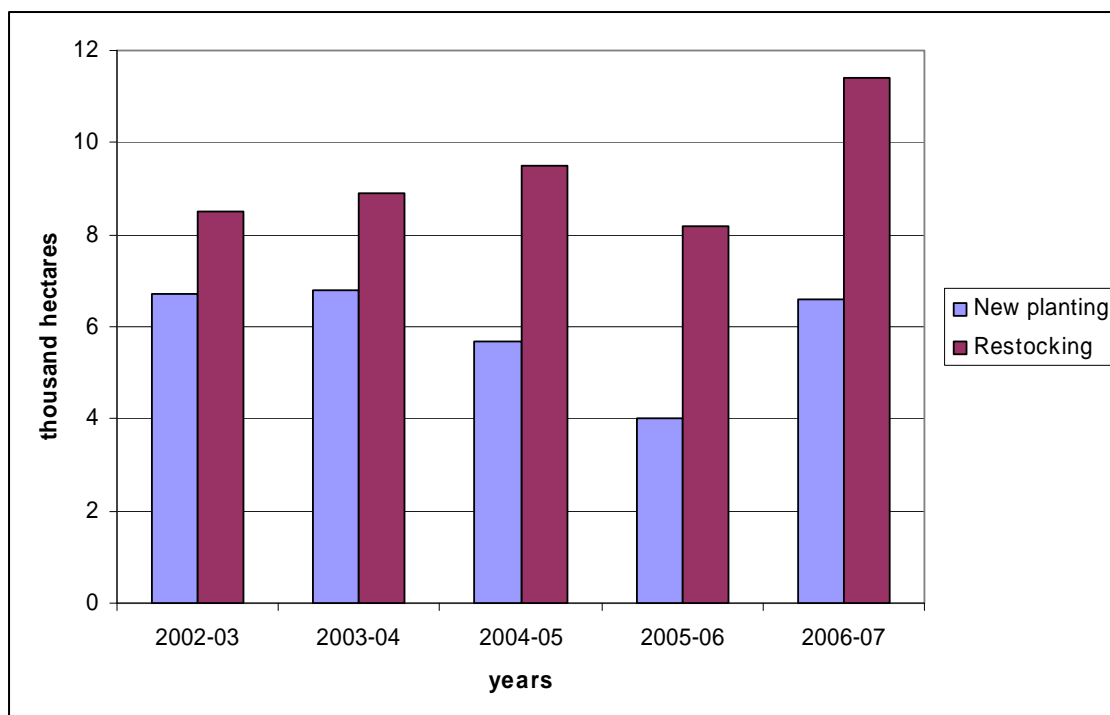
Support (the Farmland Premium) is also available to encourage the creation of new woodlands on agricultural land by offering annual payments for a period of up to 15 years from the time trees are planted to compensate for agricultural income foregone (RDR, 2007).

Overall, forestry schemes have led to an increase in wooded area and wood production, and have retained employment in rural areas (see

Figure C.3).

⁵⁹ Source: Forestry Commission Scotland (2008): Forestry Statistics 2007

Figure C.3 Past trends in new planting and restocking in Scotland⁶⁰



However, according to the Scottish Rural Development Programme targeted support for processing would further improve the benefits that are generated by forestry schemes (RDR, 2007).

⁶⁰ Source: Forestry Commission Scotland (2008): Forestry Statistics 2007

Appendix D

Energy and Hydropower

4 Pages

D.1 UK White Paper on Energy (2007)

Commitments and targets

UK White Paper on Energy is the key document which defines policies and priorities for action in UK with regard to the energy generation having regard to the international, EU and domestic commitments and targets.

EU energy policy

Renewables constitute an important part of Europe's climate change and energy policy. Subsequently the UK Government has set a target of 10% of electricity generated in UK coming from renewable sources of energy by 2010, with an aspiration for this level to double by 2020.

Tackling climate change and ensuring secure, clean and affordable energy are the main drivers and long-term challenges stated in the White Paper. The way these challenges are and will be addressed will shape the energy sector in UK and Scotland (DTI, 2007).

The key elements and actions supporting meeting energy generation targets are identified in the table below.

	Response
Energy saving	UK Government supports EC proposal to save 20% of the EU's energy consumption through improved energy efficiency by 2020 The White Paper identifies a number of measures in place or planned to promote energy savings in business, transport, public sectors as well as in households
Clean energy supplies (move towards cleaner energy supplies of heat, electricity and transport fuels and reduce emissions from the use of the fossil fuels)	Promotion of heat and electricity production at local level and assistance to deployment of decentralised energy in the UK (e.g. micro-generation, district heating schemes, combined heat and power and biomass fuelled heating at community and industry scale). Cleaner large scale electricity generation through supporting low carbon technologies Cleaner generation where use of fossil fuel electricity generation and carbon capture and storage
Renewable Electricity	<u>Renewable Obligation (RO)</u> : promote electricity production <u>Planning</u> : future reform of the planning system in relation to large scale energy infrastructure, including large scale offshore and onshore renewable electricity projects <u>Grid access</u> : remove key barriers to connecting renewables projects to the transmission grid
Security of supply	UK Government plans actions aimed at improving electricity security of supply

Source: DTI, 2007

D.2 Renewable Obligation Scotland (ROS)

The Renewables Obligation (Scotland) is Scotland's main policy measure to encourage the development of renewable forms of energy. It is the Scottish version of the Renewables Obligation in the UK. The ROS which was put in place in 2002 obliges electricity suppliers to provide an increasing proportion of their electricity generated from eligible renewable sources constituting a powerful incentive for generators to supply progressively higher levels of renewable energy. Eligible renewables generators receive Renewables Obligation Certificates (ROCs) for each MWh of electricity generated. These certificates can then be sold to suppliers. In order to fulfil their obligation, suppliers can either present enough certificates to cover the required percentage of their output, or they can pay a 'buyout' price for any shortfall. By 2010 the ROS will increase to 10.4% (Scottish Executive, 2003).

Renewable Obligation Scotland (ROS): reviews and consultations

In 2008, the UK Government will be consulting on proposed changes to the RO which will see the banding of ROCs. Less commercial technologies, such as wave and tidal, will have greater incentives (e.g. double ROCs for every MWh of generation) whereas more established technologies such as landfill gas will receive less support than they previously did. The Scottish Government will consult on similar changes to the ROS in spring 2008, though may offer greater support for emerging technologies, especially marine energy, should they believe the UK proposals are inadequate. It is intended that any changes will be introduced in April 2009⁶¹.

Small-scale renewables developments

The Scottish Community Renewables Initiative (SCRI) provides a tremendous incentive for communities and householders to develop small-scale renewables projects. The SCHRI supports a wide range of renewable technologies, including micro hydro, micro wind, heat pumps and solar, and has provided funding support to over 2,000 projects since its launch in 2003⁶².

D.3 Matching renewable electricity generation with demand (2006)

The study determined whether Scotland could meet the targets set by forecasting future demand for electricity in Scotland and comparing it with the existing and exploitable renewable resources.

Scotland's future demand for electricity

Demand for electricity was forecasted to increase slowly reaching 41 TWh by 2020. Supplying forty-percent of this demand from existing hydro-generation, consented and new renewable sources would require an annual production of over 16.4 TWh. Given existing and consented hydro, wind and biomass capacities (about 3 GW) another 3 GW of new renewable energy-generating capacity would need to be identified, consented and constructed.

The study suggests that after application of constraints it could be possible to develop renewable resources to capacities reaching or exceeding 6 GW for onshore wind, 3 GW for offshore wind, 3 GW for wave and 1 GW for tidal current, or any combination of these technologies. The

⁶¹ Communication with James Simpson, Scottish Government (2008)

⁶² Communication with James Simpson, Scottish Government (2008)

study has concluded that Scotland could, in 2020, meet on average 40% of its demand for electricity from renewable resources with a total renewable capacity of around 6GW (University of Edinburgh, 2006).

Studies on renewable resources in Scotland: potential of hydropower generation

In order to support formulation of the energy policies in Scotland several studies⁶³ were carried out. The estimated potential renewable energy resource in Scotland is about 60 GW. A total of around 6GW renewable installed capacity is required to ensure that 40% of electricity comes from renewable sources by 2020.

The renewable capacity currently installed and consented in Scotland amounts up to 2.8 GW, thus around a further 3.4GW installed capacity needs to be built. Given the amount of wind and hydro capacity already consented and in the planning system, the studies suggest that Scotland should be well placed to meet the target even perhaps before 2020.

Studies however suggested that a range of renewable technologies could be deployed to meet the Scottish and UK targets. Clearly onshore wind will play the greatest short term role, but, assuming a range of technical and economic issues can be overcome, other technologies should also be capable of playing an important part by 2020. Biomass for example is a proven technology and could be making a substantial contribution. Similarly, marine technologies, once proven to be technically and economically viable, could play an important part in the overall generation mix (University of Edinburgh, 2006; Garrad Hassan, 2001; Scottish Executive, 2005c).

Role and potential of hydropower generation in Scotland

There is about 1.3 GW of installed hydro-electric plant capacity in Scotland with a possible extension to 1.5 GW by 2020.

While the studies quote a range of the estimates of potential capacity, they all agree that the scope for new hydro-electric schemes in Scotland is limited and is unlikely to be more than 200 MW. Availability of the resource is named as a key limiting factor.

The study on the Scotland's renewable potential suggests that this is a tribute to the work done in the 1940s, 1950s and 1960s, which was almost totally successful in fulfilling the potential for hydro-electricity in Scotland. However, environmental and regulatory constraints are more significant at present than they were in the past. According to the Scotland's renewable resource 2001 study the application of environmental constraints does more than halve the resource.

Given that hydro resources constitute only 2.5% of the total renewable exploitable capacity and little scope for the new hydropower built, onshore- and offshore-wind, waves and tidal-currents are considered key for ensuring compliance with 2020 target as they have significant potential for growth.

Nevertheless, the role of new hydro built is recognised across all the studies:

⁶³ University of Edinburgh (2006): Matching Renewable Electricity Generation With Demand, February 2006; Garrad Hassan and Partners Limited (2001): Scotland's renewable resource 2001, December 2001; Scottish Executive (2005c): Scotland's renewable energy potential, June 2005

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- While limited in potential capacity new hydro has an important part to play in helping to realise Scotland's renewable energy ambitions. It will broaden the mix of energy sources used and reduce the amount of capacity that would need to be installed from the on-shore, off-shore wind, wave and tidal energy sources. A series of small-scale hydro-electric schemes have been developed in recent years, and others are under development, including a large-scale hydro-electric scheme at Glendoe, near Loch Ness. There is also a considerable scope for micro-generation. Furthermore, the refurbishment of the hydro power stations will improve their efficiency by around 5% and enable them to produce more electricity.
 - Small hydropower schemes have a valuable role in the economic development and diversification of rural areas. Eligibility and support from ROS is essential for small hydro in securing a market for the generated electricity. The studies suggest that while not cost competitive with onshore wind, schemes may still be developed – and grant-supported – on the strength of rural development benefits (University of Edinburgh, 2006; Garrad Hassan, 2001; Scottish Executive, 2005c).

Appendix E

Reference Documents

8 Pages

Document	Comments
LEGISLATION	
EC Directives	
Water Framework Directive	
WFD daughter directive on groundwater	Part of the baseline after the first cycle.
WFD daughter directive on priority substances	
Bathing Water Directive (76/160/EEC)	Baseline
Revised Bathing Water Directive	Part of baseline after first cycle
Nitrates (91/676/EEC)	
Urban Waste Water Treatment Directive (91/271/EEC)	
Drinking Water Directive (80/778/EEC as amended by 98/83/EC)	Requirements under Private Water Supplies (Scotland) Regulations 2006. Elements linked to DWPAs and management. Promotion of Water Safety Plans by regulators.
Surface Water for Drinking Directive (75/440/EEC)	Repealed 2007. Requirements with consent conditions
Dangerous Substances Directive (76/464/EEC)	Repealed 2007, with parts repealed from 2013
Shellfish Waters Directive (79/923/EEC)	Repealed 2013 Requirements covered under existing consent conditions
Water for freshwater fish Directive (78/659/EEC)	WFD implementation has picked up freshwater Fish requirements
Groundwater (80/68/EEC)	Repealed 2012 Requirements covered under existing consent conditions CAR has picked up requirements for GWDD
Dangerous substances related directives in Annex IX of WFD	Mercury discharges, cadmium discharges, mercury, hexachlorocyclohexane discharges and DS discharges directives.
Birds Directive (79/409/EEC)	
Habitats Directive (92/43/EEC)	
Integrated Pollution Prevention & Control Directive (96/61/EC)	
Sludge Use in Agriculture Directive (86/278/EEC) (also known as Sewage Sludge)	
OSPAR Convention 1992	
Major Accidents (Seveso) (96/82/EC)	
Landfill Directive (99/31/EC)	
Plant Protection Products (91/414/EEC)	
Waste Incineration Directive (2000/76/EC)	
National Emissions Ceiling Directive (2001/81/EC)	

Document	Comments
EU Marine Strategy (proposed – COM/2002/539)	Part of the baseline after the first cycle
Sludge Directive (proposed) & EC Soils Strategy	
Flood Directive (proposed)	
Scotland and UK legislation	
Controlled Activities Regulations (Scot) 2005	Part of the baseline after the first cycle
WEWS - Sustainable Flood Management	As above
WEWS – Wetlands	First cycle – focus will be those GWDTEs linked to Protected Areas/SSSIs, requirements will come into play second cycle
Environment Act 1995, Section 34	
Environmental Protection Act 1990, Part IIA (Contaminated Land)	
Control of Pollution Act 1974, s34	Requirements transferred to CAR – continued compliance with existing consent conditions
Great Britain (GB) Framework Strategy on Invasive Non-native Species	
Economic growth/ development	
Building a better Scotland: Infrastructure Investment Plan : Investing in the Future of Scotland	
DEFRA (2005): One Future-Different Paths. The UK's shared framework for sustainable development, 2005	Goals, principles and priorities for SD
Future European Structural Funds Programmes in Lowlands & Uplands Scotland 2007 - 2013	
Future European Structural Funds Programmes in Highlands & Islands 2007 - 2013	
General Register Office for Scotland (2007a): Scotland's Population 2006. The Registrar General's Annual Review of Demographic Trends, July 2007	
General Register Office for Scotland (2007b): Projected population of Scotland (2006-based), October 2007	
Regulatory Impact Assessment (RIA) UK SD Strategy	
Scottish Executive (2005e): Choosing Our Future. Scotland's Sustainable Development Strategy, December 2005	
Scottish Executive (2006d): Scottish Economic Statistics, November 2006	
Scottish Executive (2006e): Scottish Economic Report, December 2006	
Scottish Government (2007b): The Government Economic Strategy, November 2007	
Scottish Government (2008b): The National Planning Framework for Scotland 2. Discussion draft, January 2008	
Securing the Future – UK Government Sustainable Development	Priority areas including sustainable consumption and production, climate

Document	Comments
Strategy	change, natural resource protection and sustainable communities
Demography/urban development	
Local Authorities: Town and Country Planning (Scotland) Act 1997	
Civic Government (Scotland) Act 1982	
Regional and Local Structure Plans	Provide strategic framework for land use planning on a regional council wide basis
Local Plans	Detailed policies and specific proposals for the development and use of land
Scottish Executive (2004a): The National Planning Framework for Scotland, 2004	Analysis of the trends in Scotland's territorial development, key drivers and priorities for investments
Scottish Executive (2005b): Scottish Planning Policy SPP 15: Planning for Rural Development, February 2005	
Scottish Government (2008a): note: Review of likely Impacts on Land-use Change	
Scottish Government (2008b): The National Planning Framework for Scotland 2. Discussion draft, January 2008	
Climate change	
DEFRA (2006): Climate change. The UK Programme 2006, March 2006.	
Tomorrow's Climate, Today's Challenge: UK Climate Change Programme	
Scottish Executive (2006b): Changing our ways: Scotland's Climate Change Programme, March 2006	
Scottish Government (2008a): Climate change. Consultation on proposals for a Scottish Climate Change Bill, January 2008	
Changing Our Ways, Scotland's Climate Change Programme - www.scotland.gov.uk/Publications/2006/03/30091039/0	
Coastal development and flooding	
Local Authorities: Flood Prevention Act 1961;	
Scottish Planning Policy 7 – Planning and Flooding	Guidance to prevent further development which would have a significant probability of being affected by flooding or which would increase the probability of flooding elsewhere
National Planning Policy Guideline 13 – Coastal Planning	Outlines policy guidance for developments which may require a coastal location
Shoreline Management Plans	eight exist in Scotland
Flooding bill and sustainable flood management (SFM) consultation paper	
Agriculture/ Land use	
A Forward Strategy for Scottish Agriculture – Next Steps?	Updates the general direction for the farming and food industry
Diffuse pollution screening tool: Stage 3	SNIFFER

Document	Comments
Diffuse Water Pollution from Rural Land Use (2005)	Scottish Executive Environmental Group
Implementing the Water Environment and Water Services (Scotland) Act 2003: Diffuse water pollution from rural land use (Consultation on proposed Regulations relating to General Binding Rules)	
Rural Development Regulation (RDR) (EC) No 1698/2005 (2007): Scotland Rural Development Programme 2007-2013, June 2007	
Scottish Executive (2006a): A forward Strategy for Scottish Agriculture: Next Steps, March, 2006	
Scottish Planning Policy 15 – Rural Development	Sets out the approach, key messages and objectives that should underpin planning policies and decisions affecting rural areas
University of Cambridge, SAC (2006): Business as usual projections of agricultural activities for the Water Framework Directive, April, 2006	
NVZ Action programme	
Diffuse Pollution Strategy	
4 point plan	
PEPFAA code	
Farm soils plan	
Control of pollution (Silage, Slurry and Agricultural Fuel) Regs 2003	
Forestry	
Forestry Commission Scotland (2003): Forests&Water Guidelines, 2003	
Forestry Commission Scotland (2007): The Scottish Forestry Strategy. Implementation Plan 2007-2008, March 2007	
Forestry Commission Scotland (2008): Forestry Statistics 2007, 2008	
Forestry Commission Forestry Act 1967	
Indicative Forestry Strategies	Produced by Local Authorities to guide where most suitable locations for woodland planting and expansion would be most likely to be acceptable
Nature Conservation (Scotland) Act 2004	
The Scottish Forestry Strategy: implementation plan 2007-2008	
Scottish Executive (2006c): The Scottish Forestry Strategy, October 2006	
Aquaculture/Fisheries	
Aquaculture & Fisheries (Scotland) Act 2007	
Nature Conservation (Scotland) Act 2004	
Scottish Executive (2003a): A Strategic Framework for Scottish Aquaculture, 2003	
Scottish Executive (2003): A Strategic Framework for Scottish Freshwater Fisheries: A Consultation Document	

Document	Comments
A Strategic Framework for Scottish Aquaculture: Second review of appendix 3	
Developing a framework for a sustainable fish waste management infrastructure	
District Salmon Fisheries Boards Salmon and Freshwater Fisheries (Consolidation)(Scotland) Act 2003	
Fisheries Committee Electricity Act 1989	Fisheries committees will be change in 2009. there will not be a requirement for legislative involvement
Fisheries Management Plans	Produced by 11 Inshore Fisheries Groups. Include the setting out of the local objectives, actions and tools for the inshore fisheries in the area
Managing River Habitats for Fisheries	
Protecting and Promoting Scotland's Freshwater Fish and Fisheries a review	
Protecting and promoting Scotland's freshwater fish and fisheries: Summary of Responses	
Review and synthesis of the environmental impacts of aquaculture	
Sangster, M. (?): Developing a framework for sustainable fish waste management infrastructure, ?	
Scottish Environment Protection Agency (2003): Waste Arising from fishing and fish relating industry in Scotland, 2003	
Scottish Executive Review of the Aquaculture Industry in Scotland	
Scotland's freshwater fish and fisheries: Securing their future	
Energy and hydropower	
Copestake, P. Hydropower and environmental regulation – A Scottish Perspective, British Ornithologists' Union, Ibis, 148, p. 169-179, 2006	
DTI (2007): Meeting the Energy Challenge. A White Paper on Energy, May 2007	
ENERGY WHITE PAPER: Our energy future - creating a low carbon economy	
Garrad Hassan and Partners Limited (2001): Scotland's renewable resource 2001, December 2001	
Renewables trends in Scotland. Statistics & Analysis. Scottish Natural Heritage, December 2004, 2006 & 2007.	
Matching Renewable Electricity Generation With Demand (with appendices)	
Scottish Executive - 2005 – 06 Review of the Renewables Obligation (Scotland) Order: Preliminary Consultation January, 2005	
Scottish Executive response to UK energy review, June 2006	

Document	Comments
Scottish Executive. Response to the proposed policy framework for new nuclear build, 2006	
Scottish Executive (2003b): Securing a Renewable Future: Scotland's Renewable Energy, 2003	
Scottish Executive (2005d): Scotland's renewable energy potential: realising the 2020 target, June 2005	
Scotland's Renewable Energy potential – Beyond 2010: A CONSULTATION PAPER, 2002 and review of the responses (2003)	
Scottish Executive (2007a): Scottish Planning Policy SPP 6L: Renewable Energy, March 2007	
SG. UK Government Consultation On The Future OF Nuclear Power. The Scottish Government Response, 2007, October	
Securing a Renewable Future: Scotland's Renewable Energy	
Scottish Planning Policy SPP 6L: Renewable Energy	
The Renewables Obligation (Scotland) 2005/2006:	
The Renewables Obligation (Scotland) Review 2005/6: Statutory Consultation, September, 2005	
The Renewables Obligation (Scotland) Technical Review (August 2003): Statutory Consultation	
University of Edinburgh (2006): Matching Renewable Electricity Generation With Demand, February 2006	
Water industry (public water supply and sewerage)	
Dynamics of water use in Scotland	Moran, D et al. (2004) Report to the Scottish Executive
LECG Ltd (2007): Factors to be considered when determining the appropriate size of the next capital programme for Scottish Water, December 2007	
Scottish Executive (2004b): Investing in Water Services 2006-2014. A consultation paper, July 2004	
Scottish Executive (2005a): Investing in Water Services: objectives for 2006-2014, February 2005	
Scottish Executive (2005c): The Scottish Water Directions, February 2005	
Scottish Water –Strategic Asset Capacity and Development Plan	
Scottish Water (2006): Scottish Water Delivery Plan 2006-2010, May 2006	
Scottish Water Sewerage (Scotland) Act 1968	
Water (Scotland) Act 1980	
Water Industry (Scotland) Act 2002	

Document	Comments
Manufacturing	
Measuring Progress Towards A Smart, Successful Scotland: 2006	
Annual Survey of Small Businesses: Scotland 2005	
Research on options for the development of better measures of Scottish productivity	
Natura 2000	
Conservation (Natural Habitats & c.) Regulations 1994	
Local Biodiversity Action Plans (LBAP)	Identifies environmental objectives and targets which must be secured and around which development can be planned
Nature Conservation (Scotland) Act 2004	
National Parks (Scotland) Act 2000	
Natura 2000 relevant plans and Programmes – eg site monitoring and management plans	
National Planning Policy Guideline 14 – Planning and Natural Heritage	Sets out national planning policy considerations in relation to Scotland's natural heritage
Scottish Natural Heritage: Natural Heritage (Scotland) Act 1991	
Tourism and recreation	
Glasgow Caledonian University and University of Edinburgh (2003): An assessment of the Economic Impact of Water-Related Recreation and Tourism in the Spey Catchment in 2003. Summary report	
Glasgow Caledonian University and Cogentsi Research International (2004) The Economic Impact of Game and Coarse Fishing in Scotland. Report for the Scottish Executive	
Scottish Tourism: The Next Decade - A Tourism Framework for Change	
VisitScotland (2008). URL: www.visitscotland.com	
VisitScotland (2007a): From Bugging to Sphereing: The Prospects for Scotland's Adventure Tourism Product. Tomorrow's World Consumer and Tourist Volume 3, Number 1	
VisitScotland (2007b): Visitor forecast to Scotland 2005-2025, March 2007	
Transport	
British Waterways Board Transport Act 1962	
British Waterways Act 1995	
Scottish Executive (2006f): Scotland's National Transport Strategy, December 2006	
Alien species	
Conclusion to the consultation on the draft Invasive Non-Native Species Framework Strategy for Great Britain	
Great Britain (GB) Framework Strategy on Invasive Non-native	

Document	Comments
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Species

Great Britain Invasive Non-Native Species Framework Strategy
Initial Regulatory Impact Assessment

Review of non-native species policy

ISBN 978 0 7559 1925 3 (web only publication)

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