

Improving the quality of Scotland's water environment

Forth area management plan 2010–2015

Supplementary to the river basin management plan for the Scotland river basin district



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The Forth Area Advisory Group

This plan has been produced in partnership with the Forth Area Advisory Group, which is made up of representatives from the following organisations.

- British Waterways
- Chemical Industries Association
- City of Edinburgh Council
- Clackmannanshire Council
- East Lothian Council
- Falkirk Council
- Fife Council
- Forestry Commission Scotland
- Forth District Salmon Fisheries Board (also representing River Forth Fisheries Trust)
- Forth Estuary Forum
- Forth Ports
- Loch Lomond and The Trossachs National Park
- Midlothian Council
- National Farmers Union Scotland
- Perth and Kinross Council
- Royal Society for the Protection of Birds
- Scottish Borders Council
- Scottish Environment Protection Agency
- Scottish Government Rural Payments and Inspections Directorate
- Scottish Natural Heritage
- Scottish Rural Property and Business Association
- Scottish Water
- Stirling Council
- The Coal Authority
- The Leven Trust
- West Lothian Council

SEPA would like to thank these group members and the other organisations who have worked to prepare the first Forth area management plan.

Information about the work of the Forth advisory group can be found on SEPA's website at:

www.sepa.org.uk/water/river_basin_planning/area_advisory_groups/forth.aspx

Introduction

Purpose

The purpose of the Forth area management plan is to maintain and improve the ecological status of the rivers, lochs, estuaries, coastal waters and groundwaters in the Forth advisory group area (Map 1). This plan supplements the river basin management plan for the Scotland river basin district and will help to deliver Water Framework Directive requirements. It focuses on local actions for the Forth advisory group area and highlights the opportunities for partnership working to ensure that we all benefit from improvements to the water environment.

The plan has been produced in partnership with members of the Forth Area Advisory Group. The advisory group expects river basin planning to maintain and improve water quality and water habitats within the area, to contribute to flood management and to help us adapt to the effects of climate change. This plan will run from 2010 to 2015, when it will be reviewed and the next six year cycle of planning will begin.

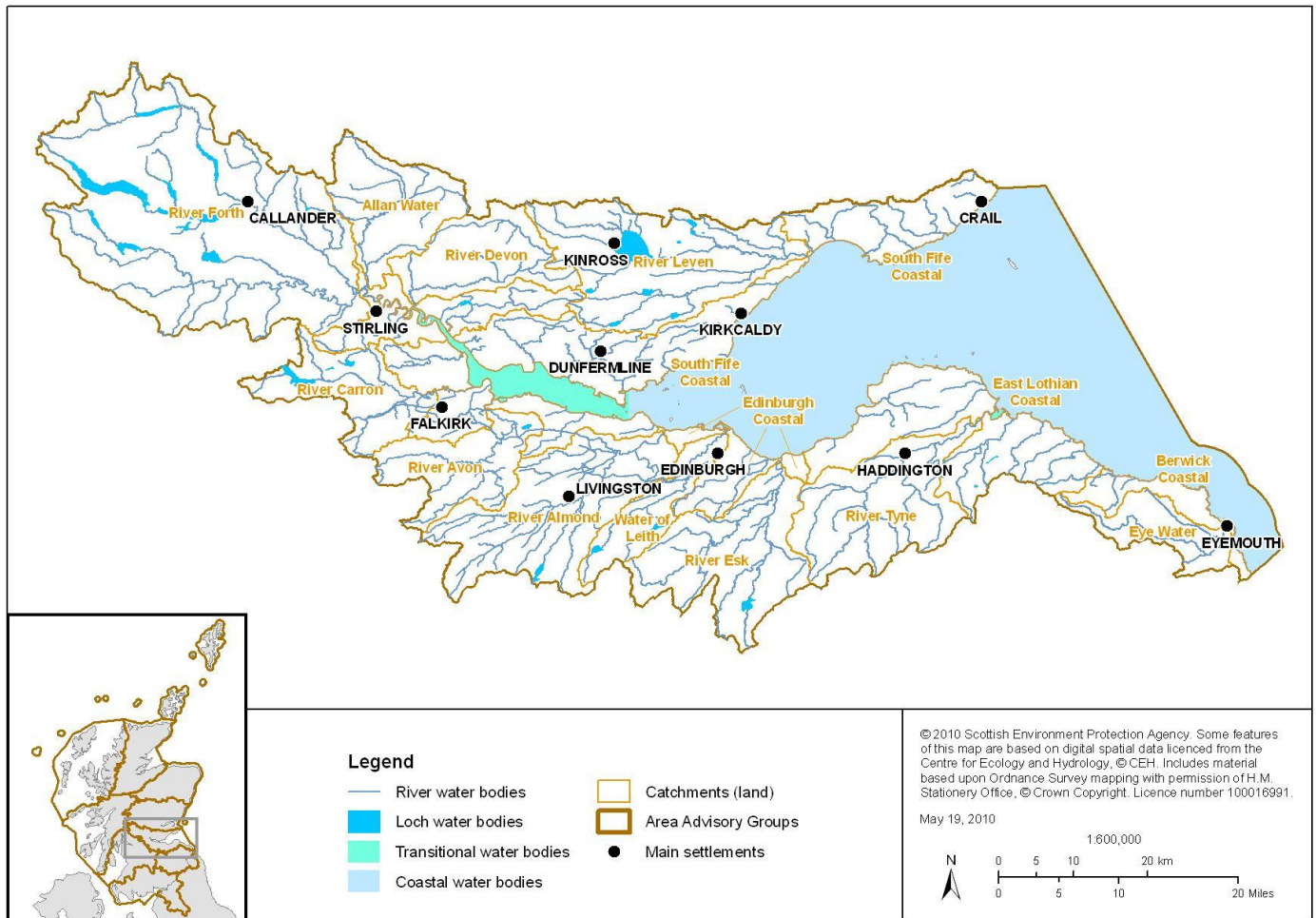
In 2008, only 26% of water bodies in the Forth advisory group area were classified as being at good or high ecological status or potential. In general, the classification of surface water bodies describes by how much their condition ("status") differs from near-natural conditions. Water bodies in a near-natural condition are at high ecological status while those whose ecological quality has been severely damaged are at bad ecological status. The classification of heavily modified and artificial water bodies, such as canals, describes their ecological potential. This is a measure of the extent to which the ecological quality of the water body has been maximised given the limits imposed by the physical and hydrological modifications necessary for its uses.

This plan aims to prevent a deterioration in ecological status and, more ambitiously, to improve those currently at less than good ecological status, so that by 2027 96% of water bodies will achieve good or high ecological status or potential. The planned improvement targets until 2027 are set out in Table 1.

Table 1: Overview of planned improvements in the Forth advisory group area, 2010–2027				
	2008	2015	2021	2027
% of surface water bodies at good (or high) ecological status/potential	22%	32%	45%	98%
% of groundwaters at good status	59%	69%	72%	83%
% of all water bodies at good (or high) ecological status/potential	26%	36%	48%	96%

What area does this plan cover?

The Forth advisory group area includes all the land that drains into the rivers Leven, Devon, Forth, Carron, Avon, Almond, Esk, Tyne and the Allan Water, Water of Leith and Eye Water, plus the adjacent estuarine and coastal waters out to three nautical miles (Map 1). It is an extensive and varied area, extending from Loch Lomond and the Trossachs National Park through Stirling, Falkirk, Clackmannanshire, Fife, the Lothians, and down into the Borders. In addition to surface waters, the Water Framework Directive also requires us to consider groundwater, which lies beneath the ground surface and provides part of the flow in many rivers.



Map 1: Forth advisory group area (showing main catchments)

Who is this plan for?

This plan is for the Forth area advisory group and:

- anyone who manages or uses the water environment;
- anyone who manages activities on land that interacts with the water environment;
- anyone who wants to know more about how our water environment is being protected.

This plan is designed to provide a co-ordinated approach to the delivery of the [River basin management plan for the Scotland river basin district](#) within the Forth advisory group area.

You may find it helpful to see how the aims and objectives of this area management plan will contribute to what we are trying to achieve on a larger, national scale. The plan for the Scotland river basin district also includes a number of chapters that explain the different parts of the river basin planning process – see www.sepa.org.uk/water/river_basin_planning.aspx for more information.

The organisations that are part of the Forth area advisory group have a responsibility to share the information contained in the plan with a wider range of stakeholders, in order to encourage them to implement the actions that are required in the Forth advisory group area. SEPA's role in the development of the plan has been to provide information, particularly with

regard to classification, and to co-ordinate information and input from others. In this document 'we' refers to all those involved in the production of this report, not just SEPA.

A wider forum has also been established. The forum is open to the public and provides an opportunity for a wider group of stakeholders to be involved in river basin planning.

How to use the Forth area management plan

This plan has three key components:

1. **Area management plan summary** (this document) provides an overview of the Forth advisory group area including classification, pressures, objectives, key measures and an outline of the key areas of work for the Forth area advisory group.
2. **Catchment profiles** provide information on classification, pressures, measures and objectives for each catchment. They also highlight gaps where we need to develop measures. The catchment profiles will be produced by December 2010, updated regularly and kept as live documents during this first river basin planning cycle.

The following catchments are in the Forth advisory group area.

Allan Water
Berwick coastal
East Lothian Coastal
Edinburgh coastal
Eye Water
Forth Estuary (South) Coastal
River Avon
River Almond
River Carron
River Devon
River Esk
River Forth
River Leven
River Tyne
Forth Estuary and Firth of Forth
South Fife coastal
Stirling coastal
Water of Leith

In the catchment profiles, coastal and transitional water bodies are discussed together with their neighbouring land catchments.

3. **Action plan** with information about how the Forth Area Advisory Group will work together to deliver the objectives outlined in the district plan and provide a record of where new actions are being developed. This will be a live document and regularly updated during the first river basin planning cycle.

The catchment profiles and action plan will be published on SEPA's website when they are complete: www.sepa.org.uk/water/river_basin_planning/area_advisory_groups/forth.aspx

The water environment and achieving the environmental improvements

This section summarises the condition of the water environment in the Forth advisory group area, the improvements we plan to achieve and the key pressures and impacts that we need to address.

The environmental quality and natural characteristics of surface waters and groundwater vary widely. To reflect this variation SEPA has divided the water environment into water bodies. Detailed information for individual water bodies is held in the interactive map on the SEPA website at: www.sepa.org.uk/water/river_basin_planning.aspx

Information on the classification, objectives and measures for the Scotland river basin district, as well as detailed supplementary information on how we classify and how objectives have been set, can be found in the district plan at: www.sepa.org.uk/water/river_basin_planning.aspx

The current condition of the water environment

The water environment includes all rivers, lochs, estuaries, coastal waters, artificial waters (such as canals and reservoirs) and groundwater. It also includes all the wetlands that depend on surface waters or groundwater for their water needs.

Classifying the condition of each water body over a certain size threshold - rivers with a catchment area of more than 10km² and lochs which have a surface area greater than 0.5km², and all estuaries and coastal water bodies regardless of size - provides a picture of where the water environment is in good condition and where improvements need to be made.

In general, the classification of surface water bodies describes by how much their condition ("status") differs from near-natural conditions. Water bodies in a near-natural condition are at high ecological status while those whose ecological quality has been severely damaged are at bad ecological status. The overall status depends on the condition of the different elements of the classification (eg the plant community, fish populations, water quality etc).

SEPA has divided waters in the Forth advisory group area into 268 water bodies. Currently only 70 (26%) of these water bodies are at good or high ecological status and 198 (74%) are classified as being at moderate, poor or bad ecological status. A significant amount of work is therefore required to restore these water bodies to good ecological status (see Table 2 and Maps 2a and 2b below).

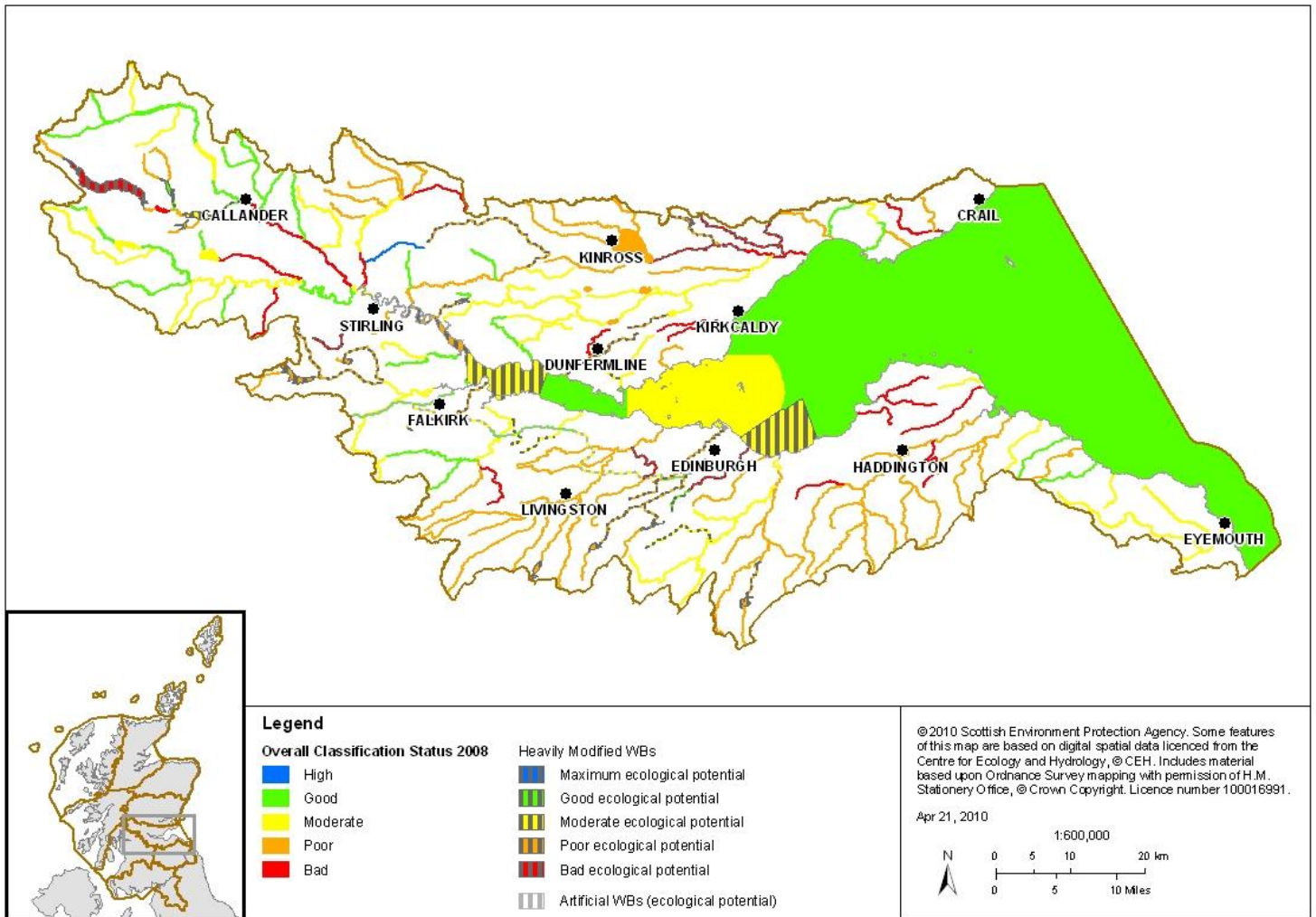
Of the surface water bodies in the Forth advisory group area, 43 (around 18%) have been substantially changed in character for important social and economic purposes such as flood protection, hydropower generation, navigation, land drainage or water storage for drinking water supply. These are known as heavily modified water bodies. A further 10 (around 4%) of surface water bodies are artificial, including the Forth and Clyde Canal, the Union Canal and Pond Lagoon (Culross). The classification of heavily modified and artificial water bodies describes their ecological potential. This is a measure of the extent to which the ecological quality of the water body has been maximised given the limits imposed by the physical and hydrological modifications necessary for its uses. For more information on heavily modified and artificial water bodies see Chapter 4 of the *River basin management plan for the Scotland river basin district* at: <http://www.sepa.org.uk/water/idoc.ashx?docid=b10ee280-15b9-40b9-a608-bc8187c335f8&version=-1>

The classification of bodies of groundwater describes whether or not they are polluted and whether or not the volume of any water being abstracted from them is sustainable without significant impacts on rivers or wetlands that depend on that groundwater. Unlike the five status classes applying to surface waters, two classes are used to describe the status of groundwater: good and poor.

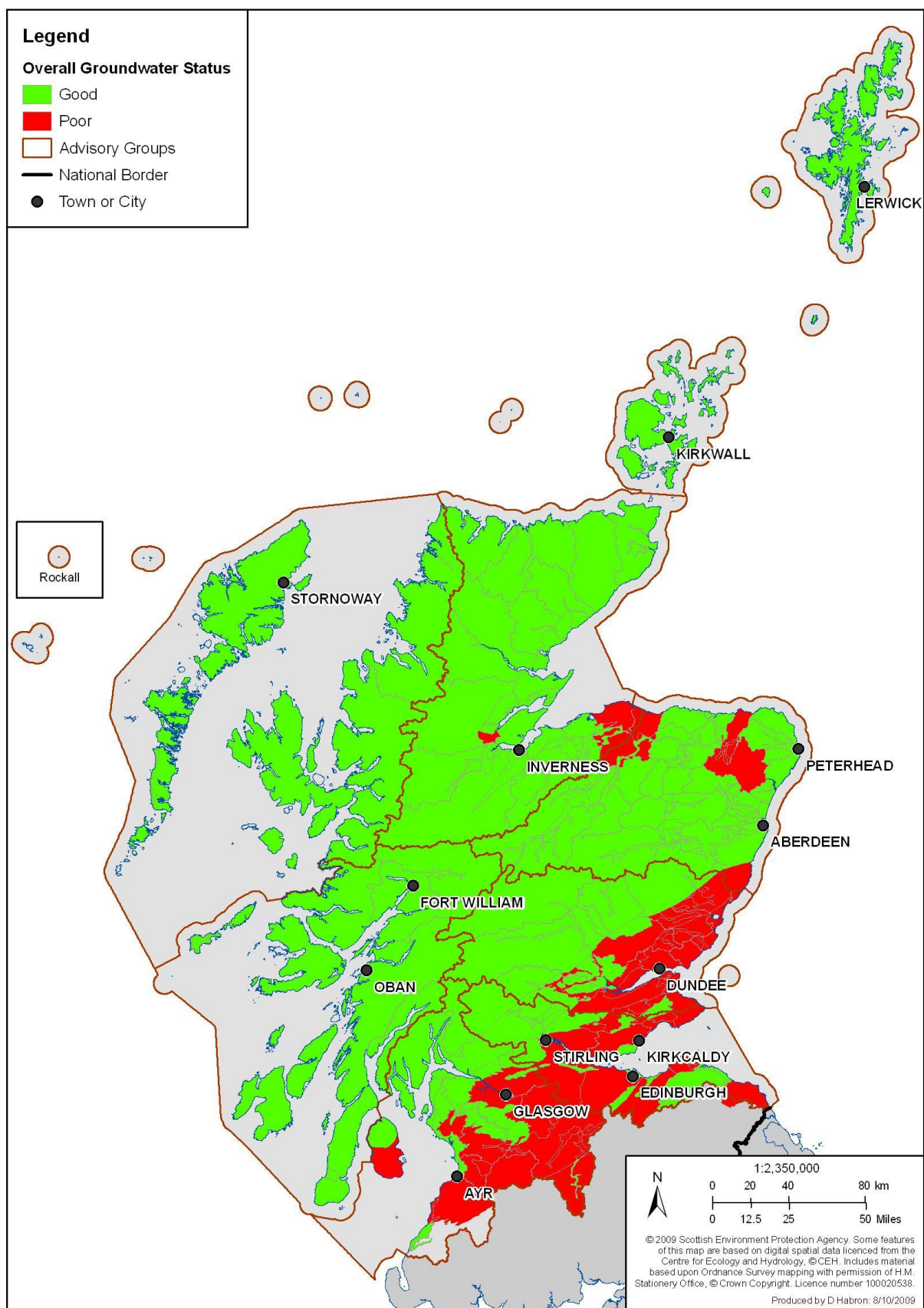
Table 2: Status of surface waters and groundwater in the Forth advisory group area

2008 status	Number of water bodies				
	All water bodies	Surface waters			Groundwater ¹
		Natural	Heavily modified	Artificial	
High/Maximum	1	1			
Good	69	41	4	7	17
Moderate	64	54	7	3	
Poor	111	73	26		12
Bad	23	17	6		
Totals	268	186	43	10	29
Number and proportion good or better (%)	70 26%	42 23%	4 9%	7 70%	17 59%

¹ Bodies of groundwater are classed at either good status or poor status.



Map 2a: Current surface water classification for Forth advisory group area



Map 2b: Current groundwater classification for Scotland river basin district

Pressures and risks

A wide variety of pressures and impacts on the water environment have been identified within the Forth advisory group area, reflecting the mixture of urban and rural land use. The following key pressures are found within the Forth advisory group area.

Physical (morphological) changes to water bodies

A large number of water bodies have been physically altered from their natural state and there are often multiple physical pressures within each water body, particularly in our urban areas. Every water body in the Almond catchment has morphological pressures and it is a key issue within the Esk, Allan Water, Tyne, Water of Leith and Leven catchments.

Barriers to fish passage

Obstructions which prevent fish moving through a catchment affect a high proportion of water bodies within the Forth advisory group area. An impassable barrier low down in the catchment will cause a failure for each upstream water body within that catchment. This is currently an issue within the Tyne and Almond catchments.

Point source pollution from sewage disposal

This, and to a lesser extent diffuse source pollution from sewage disposal, is a significant pressure within the Forth area affecting the majority of catchments. It is a particular issue within the Avon, Almond, Esk and Tyne catchments.

Diffuse pollution from agriculture

Such pollution affects the majority of catchments, but is a particular issue in the Eye Water, Tyne, Leven, Stirling coastal, South Fife coastal and East Lothian coastal catchments.

Point and diffuse source pollution from mining and quarrying of coal and oil shale

This legacy impact from our industrial past is causing pressures in the Almond, Avon, Esk, Leven and South Fife coastal catchments and groundwaters of the Forth area.

Other pressures

Although not a key pressure throughout the Forth advisory group area, agricultural abstraction is causing a pressure within the East Lothian coastal and Tyne catchments, and in the River Leven catchment there are numerous abstraction pressures reflecting the diversity industries operating within this area.

Invasive non-native species

Our water environment is also at risk of deterioration due to the presence of invasive non-native species. In the Forth advisory group area, the Tiel Burn in the South Fife coastal catchment is at less than good ecological status due to an established population of the invasive non-native North American signal crayfish.

As further information is gathered on invasive non-native species within the Forth advisory group area it is likely that further pressures will be identified. Indeed we would expect more morphological pressures to be highlighted within the area once riparian invasive non native species such as Japanese knotweed, giant hogweed and Himalayan balsam are included within the morphological classification.

The above list does not include all impacts and there are other issues that will also need to be addressed through river basin management planning. Appendix 1 provides an overview of the number of water bodies affected by the different pressures within each catchment. More detailed information on the pressures and impacts in each catchment, including the specific water bodies affected, measures and objectives, is included in the catchment profiles and in the water body information files, both available on SEPA's website at: www.sepa.org.uk/water/river_basin_planning.aspx.

Objectives for the water environment

As the classification results and analysis of pressures show, the water environment in the Forth advisory group area is under significant pressure and there is a challenge to restore water bodies to good ecological status. However, it is important to remember that there have been significant improvements over the past 40 or so years, primarily to water quality. The task now is to build on that achievement. In the Forth area we aim to improve our water bodies so that by 2027 96% of them are at good or high ecological status. This will help to deliver the overall goal of the Scotland river basin district, which is for 97% of water bodies to be in good or better condition by 2027.

To achieve this, water bodies will be protected from deterioration and action will be taken to enhance and restore those which are below good ecological status. Restoring waters to good ecological status will take time, so improvements have been prioritised over the river basin planning cycles until 2027. For the small proportion of waters for which achieving good ecological status by 2027 is not feasible, all reasonably achievable improvements will be made. Comprehensive reviews of progress will be undertaken during each period and will be reported in updates of this plan

Table 3 shows how the water environment in the Forth area is projected to improve in the period to 2027 (illustrated in Maps 3a and 3b). This gradual improvement reflects the time needed to develop and implement the necessary technical solutions and to make the required investments and adjustments without creating disproportionate burdens. However, these are still ambitious objectives and only through working together can we deliver the required improvements.

Table 3: Projected improvements in the status of water bodies in the Forth advisory group area

Category	All water bodies	Number of water bodies at good or high ecological status/potential				Number of water bodies <good in 2027
		2008	2015	2021	2027	
Rivers	189	28	48	77	184	5
Lochs	23	2	6	7	22	1
Estuaries	6	4	4	4	6	0
Coastal waters	11	9	9	9	11	0
Groundwater	29	17	20	21	24	5
Artificial	10	7	8	8	10	0
Totals	268	70	97	128	258	11
Proportion good or better (%)		26%	36%	48%	96%	

Lower (less stringent) objectives than good status

For 11 water bodies in the Forth advisory group area, we believe that good ecological status cannot be achieved by 2027. For these water bodies, we have set a lower (less stringent) objective than good ecological status.

The Tiel Burn in the South Fife Coastal catchment is projected to be at moderate ecological status by 2027 due to difficulties in tackling the invasive North American signal crayfish population. There is currently no known means of eradicating this species from rivers.

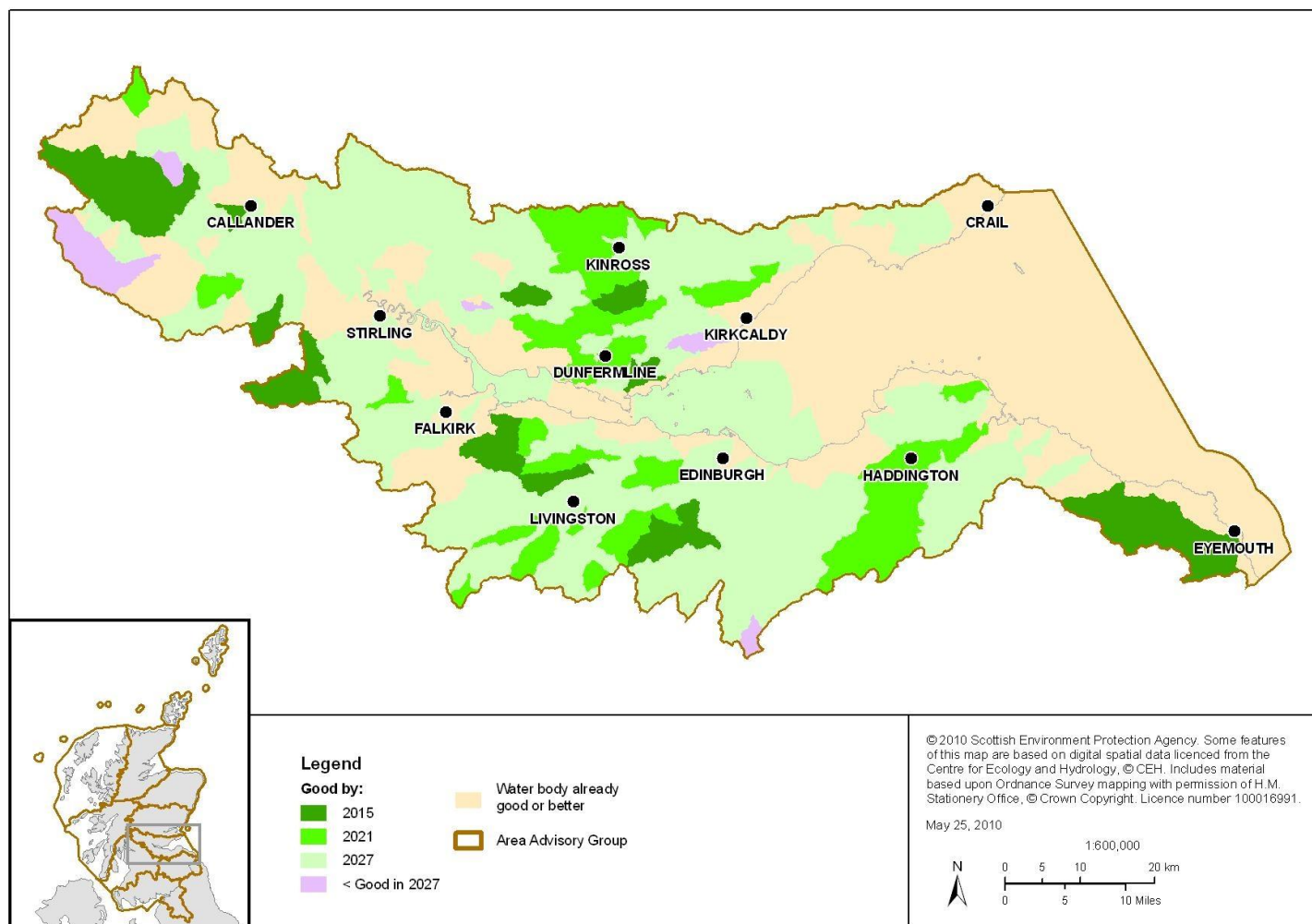
In the River Forth catchment, the Duchray Water is likely to continue to suffer from acidification associated with forestry. The time needed for recovery is difficult to predict, but it is likely to be beyond 2027. Also within the River Forth catchment, Allt Gleann nam Meann and the Finglas Water² will continue to be at poor ecological status because of a barrier to fish passage at the downstream Glen Finglas Reservoir. This barrier will not be addressed because the environmental benefits of installing fish passage are low compared with the costs involved.

In the River Esk catchment, the River South Esk (source to Gladhouse Reservoir) water body will continue to be classed at poor ecological status. This is because Gladhouse Reservoir is causing a barrier to fish passage and will not be addressed because the environmental benefits of installing fish passage are low compared with the costs involved.

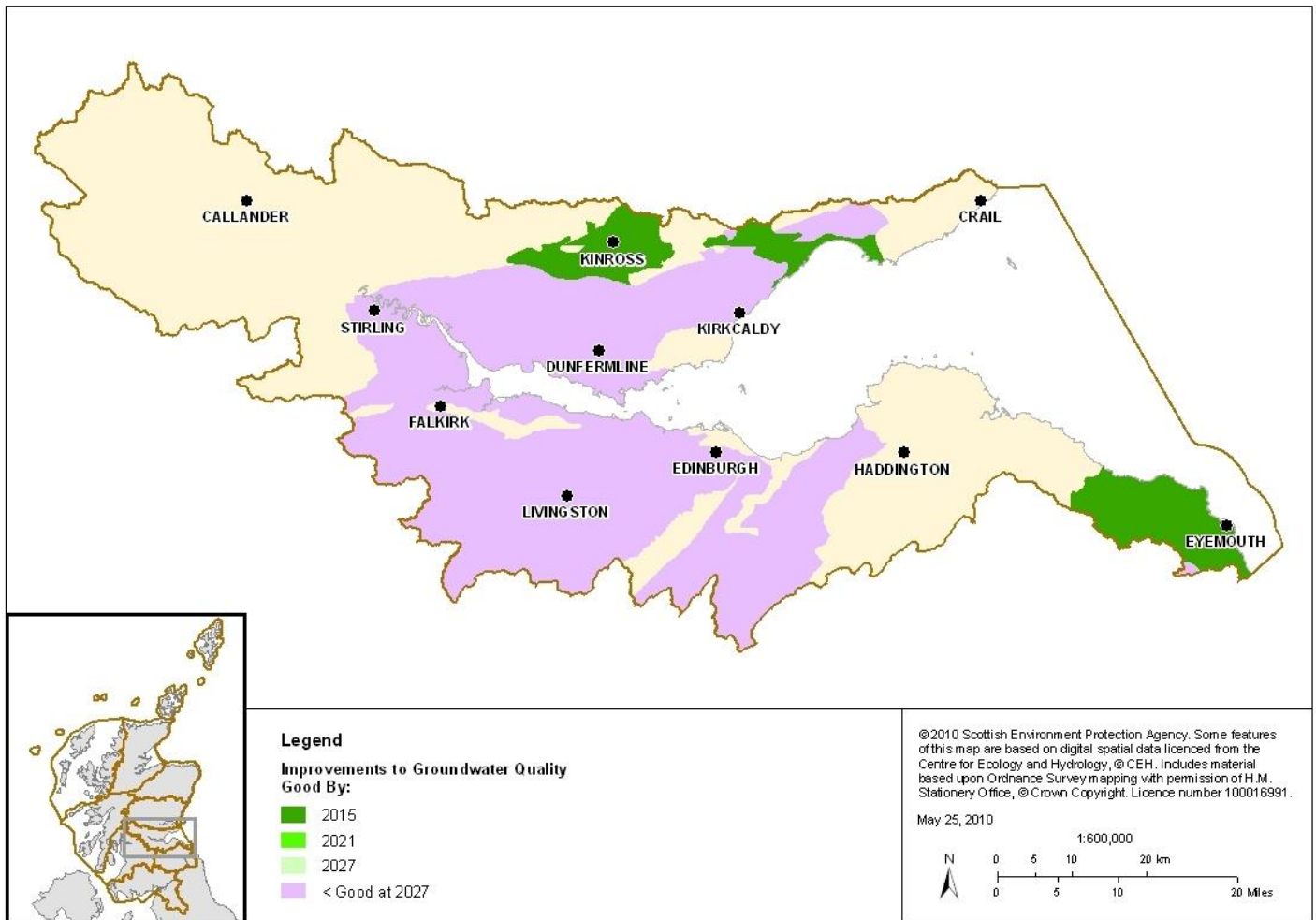
Gartmorn Dam, a heavily modified water body in the Stirling coastal catchment, is projected to remain at poor ecological potential because of the ecological recovery time associated with impacts from diffuse phosphorous inputs.

² The water body information sheet for the Finglas Water, which can be found on the SEPA website, currently states that it will reach good status by 2015. This is an error which will be amended when the water body information sheets are updated.

Five groundwater bodies also have lower (less stringent) objectives. The water quality of the Dalkeith, Stirling and Falkirk, Alloa and South Fife bedrock and localised sand and gravel aquifers has been adversely affected by pollution arising from past coal mining activities. The water quality of the Edinburgh and Livingston bedrock and localised sand and gravel aquifers has been adversely affected by pollution arising from past oil-shale mining activities. The groundwater status recovery time within these five areas is currently projected to be beyond 2027.



Map 3a: Projected improvements in surface water status over the three cycles



Map 3b: Projected improvements in groundwater quality over the three cycles

Protected area objectives

Many water bodies are also part of water-dependant protected areas. As well as being required to meet good ecological status/potential, these water bodies must also achieve the objectives for which the protected area was established. Protected areas include waters that:

- support economically important shellfish;
- have been designated as bathing waters;
- provide water for human consumption;
- support species or habitats identified as requiring special protection under European legislation (Natura 2000 sites).

Many protected areas are already achieving the goals for which they were established. The objective for these areas is to protect them from deterioration. Further environmental improvements are needed for other areas that are currently not meeting their objectives. Information on the protected areas within the Forth advisory group area together with any planned improvements are summarised below.

Natura 2000 sites

There are five water-dependant Special Areas of Conservation within the Forth advisory group area:

- Berwickshire and North Northumberland Coast;
- Isle of May;
- River Teith;
- St Abb's Head to Fast Castle;
- Kippenrait Glen.

Three of these are currently achieving their objectives and two, the Berwickshire and North Northumberland Coast and Kippenrait Glen, are currently failing to achieve their objectives - Berwickshire and North Northumberland Coast on account of diffuse pollution from agriculture and Kippenrait Glen due to the presence of rhododendron, an invasive non-native species, and the presence of other non-native tree species such as beech, sycamore and spruce. Both are forecast to be achieving their objectives by 2015.

There are six water-dependant Special Protection Areas within the Forth advisory group area which are all achieving their objectives:

- Loch Leven;
- Forth Islands
- Gladhouse Reservoir
- St Abbs Head to Fast Castle;
- South Tayside Goose Roosts;
- Firth of Forth.

Bathing waters

There are 26 bathing waters within the Forth advisory group area: five classified as poor; three as sufficient; six as good and 12 as excellent. The five currently classed as failing (ie less than sufficient) are Kinghorn (Harbour Beach); Portobello (Central); Portobello (West); Eyemouth; and Kirkcaldy (Seafield).

Under the revised Bathing Waters Directive the aim is to ensure that all designated bathing waters are classified as 'sufficient' by 2015. Bathing waters also have an overall aim to increase the proportion attaining a good or excellent classification rather than sufficient.

Shellfish waters

There is only one area designated under the Shellfish Waters Directive within the Forth advisory group area: Fife Ness to Elie. This area achieved the mandatory values set out in the Shellfish Waters Directive as all the water quality conditions required to support shellfish life and growth are being achieved. However, like many other areas in Scotland, this area failed to achieve the Shellfish Waters Directive's more stringent guide value for faecal coliforms in 2008. Our objective is to achieve the guide value in this area by 2027.

Drinking water protected areas

There are 60 drinking water protected areas in the Forth advisory group area. One, the Loch Leven bedrock and extensive sand and gravel aquifers, is at risk of deterioration due to nitrate inputs from arable farming. This area is within an area designated as a Nitrate Vulnerable Zone under the Nitrates Directive and action programmes have been established

with the aim of restoring the quality of water in this Drinking Water Protected Area so that abstraction for human consumption can be resumed. This action is expected to take some time to be effective because of the lag time for groundwater recovery.

Drinking Water Protected Areas are currently under review and any changes to designations will be reflected in updates of this plan.

Nutrient sensitive areas: nitrate vulnerable zones

Two nitrate vulnerable zones (NVZs) are either within or partially within the Forth advisory group area:

- Edinburgh, East Lothian and the Borders NVZ;
- Strathmore and Fife NVZ.

Action programmes for these NVZs have been established. The programmes aim to reduce water pollution caused by nitrates from agricultural sources and to prevent further such pollution. The action programme will be reviewed and, where necessary, revised every four years based on assessment of its effectiveness.

Nutrient sensitive areas: Urban Waste Water Treatment Directive (UWWTD) sensitive areas

There are 25 Urban Waste Water Treatment Directive sensitive areas within the Forth advisory group area. These are not assessed against an environmental standard. Instead, compliance is measured in terms of measures taken, such as improvements to sewage treatment works. All relevant wastewater treatment plants in the Scotland river basin district have tertiary treatment and so no further action is required at these.

Freshwater fish

There are 16 protected areas for economically important freshwater fish, 14 for salmonids³ and 2 for cyprinids⁴ (the Forth & Clyde and Union Canals). All areas are currently achieving the mandatory standards required by the Freshwater Fish Directive.

³ Salmonid waters are waters that support or become capable of supporting fish belonging to species such as salmon, trout, grayling and whitefish.

⁴ Cyprinid waters are waters that support or become capable of supporting fish belonging to the cyprinids (family of fish including carp, tench, roach, rudd and dace) or other species such as pike, perch and eel.

Actions planned to achieve our objectives

River basin management planning requires us to establish a programme of measures to protect water bodies from deterioration and restore water bodies that are below good ecological status. Chapter 3 of the *River basin management plan for the Scotland river basin district* provides information on the programme of measures for Scotland. The measures include regulatory tools, the latest investment planning work for Scottish Water, partnership working with landowners to reduce pollution and to tackle pressures from physical changes, awareness raising and guidance provision.

Specific information on the key measures that the Forth advisory group members will take forward is included in the catchment profiles, and on the water body sheets on the online interactive map. The catchment profiles will be kept as live documents during the planning cycle and will be updated as more measures are developed and implemented.

Some of the measures carried out locally will contribute to protecting or improving water body status in a less direct way, for example through awareness raising and education, while others involve long-term projects and multiple partners. For the Forth advisory group area, some key measures to alleviate the pressures outlined in Table 3a-e are described below.

Point source pollution

Sewage discharges

Targeted investment in sewerage infrastructure through Scottish Water's planned programme of investment has been developed in partnership with SEPA and others in order to address pressures on water bodies. This programme will deliver specified improvements in sewerage provision, sewage treatment and water supply. In the Forth, a catchment-wide drainage study has just started for the River Almond catchment, where sewage is a key pressure. The results of this study are likely to direct future investment in the Almond catchment in the next river basin planning cycle.

As part of SEPA's regulatory function, private sewerage disposal (including septic tanks, soakaways and small package plants) will be authorised through The Water Environment (Controlled Activities) (Scotland) Regulations 2005.

SEPA, Scottish Water and developers will also work closely with local planning authorities to ensure that the impacts of future developments are considered in an integrated way.

Other point source discharges

SEPA regulates discharges through The Water Environment (Controlled Activities) (Scotland) Regulations 2005 and, if a discharge is causing a pressure within a water body, SEPA will review the licence and work closely with licensed operators to reduce the impact of the discharge.

Mining and quarrying

The Coal Authority and some local authorities operate minewater treatment schemes throughout the Forth advisory group area to improve the condition of minewater from point and diffuse sources prior to it entering watercourses. Further work to tackle discharges which are currently untreated will commence throughout the river basin planning cycles.

Rural diffuse pollution

A focused work programme to address rural diffuse pollution using voluntary, economic and regulatory measures started in March 2010. This work is steered by a national partnership, the Diffuse Pollution Management Advisory Group, and includes a campaign to promote the uptake of the diffuse pollution General Binding Rules, coupled with a targeted catchment approach where SEPA staff will work directly with land managers in 'priority' catchments. In the Forth, the Eye Water has been designated a priority catchment between 2010 and 2015. More information is available at:

www.sepa.org.uk/water/river_basin_planning/dp_priority_catchments.aspx

In addition, we have the following candidate priority catchments for rural diffuse pollution in subsequent river basin planning cycles:

2015–2021

East Lothian coastal
Edinburgh coastal
River Almond
River Forth
River Leven
River Tyne
South Fife coastal

2021–2027

Forth Estuary (South) coastal
River Avon
River Carron
River Esk
Water of Leith

To help tackle the rural diffuse pollution pressures and to ensure no deterioration within the Forth advisory group area, the Forth Area Advisory Group will help to promote the national diffuse pollution awareness raising campaign locally. This will help ensure that diffuse pollution General Binding Rules and other general best practice is being adhered to in forestry and farming operations.

Whilst focusing on these catchments for diffuse pollution, the Area Advisory Group will also consider how to mitigate of other impacts on the water environment, such as changes to beds and banks, abstractions, flooding and invasive non-native species.

Urban diffuse pollution

Forth advisory group members have suggested areas where retrofit sustainable urban drainage systems could be installed to help alleviate urban diffuse pollution. The potential to install these in areas where urban diffuse pollution is causing a problem will be investigated throughout the Forth advisory group area. In addition, local authority development planning guidance and policy on topics such as sustainable urban drainage systems, soakaways and buffer strips will help prevent deterioration in water bodies and reduce the impacts from new development.

Physical changes

The Forth Area Advisory Group has a key role to play in reviewing the local actions required to fix physical pressures. This will involve working with local authorities and landowners to establish what measures can be implemented and the timescales for them. We will also work together to identify funding for these measures such as the SEPA administered Restoration Fund or the Scottish Rural Development Program (SRDP).

The Restoration Fund can contribute towards the removal of fish barriers from watercourses, while regulation can be used to ensure that the impacts of barriers are mitigated through the

use of good design and fish passes. A catchment-scale partnership project with West Lothian Council, the Forth District Salmon Fisheries Board and SEPA has started in the River Almond to scope nine fish barriers for removal or mitigation. It is hoped that work to prioritise and remove or mitigate barriers will continue through the actions of area advisory group stakeholders.

The Restoration Fund can also be used to tackle other morphological impacts and we hope to address other legacy impacts in our urban and rural areas through partners developing and delivering projects. In the Eye Water rural diffuse pollution priority catchment landowners will be encouraged to apply for restoration funding to address physical pressures to beds, banks and shores.

Invasive non-native riparian species such as Japanese knotweed and giant hogweed have the potential to seriously affect the physical environment of our water bodies by undermining bank stability and causing erosion. These are not currently included in the classification. However, it is expected that they will be included before the end of the first river basin planning cycle and therefore it is important that steps are taken within the Forth advisory group area to identify locations where these species are established, and that a programme of eradication is undertaken by working in partnership.

Abstraction and flow regulation

Measures to tackle pressures associated with abstraction and flow regulation include:

- **Investment**
Scottish Water actions will aim to minimise the amount of water required for supplying customers through efficient management of their water supply systems.
- **Planning**
SEPA and Scottish Water will work with local planning authorities through the development planning process to highlight areas where abstraction for drinking water is putting pressure on water bodies, and where future development must be constrained or the development impacts mitigated.
- **Regulation**
SEPA will work in partnership with those who abstract water (including Scottish Water, hydropower generation companies, whisky producers and farmers) to review licenses under The Water Environment (Controlled Activities) (Scotland) Regulations 2005.

More widely, the members of the area advisory group have identified a broad range of ongoing and future projects which can secure additional improvements in water body status. Examples include research, development of guidance, sharing best practice and awareness raising, catchment management planning, habitat management and restoration.

Putting the plan into action

The Forth Area Advisory Group will have an important role in taking forward the actions required to deliver river basin planning at an area level. The group will help to identify actions needed in the area and to translate nationally agreed actions into work on the ground. They will co-ordinate action, identify gaps where key pressures have been identified but no action yet agreed, and consider how best to tackle these gaps. The group will review the status of water bodies and the progress of measures delivery in the Forth on an annual basis, and will amend existing measures and develop new measures as required.

There are five key areas of work for the Forth Area Advisory Group to take forward during the first river basin planning cycle.

1. Develop and facilitate the implementation of local actions required in the area. This will be done on a catchment basis, linking to existing catchment management groups where possible, or potentially by creating specific sub-groups.
2. Increase the number of water bodies accessible to migratory fish, and tackle alterations to beds and banks. This could potentially be done by forming a small sub-group to review knowledge on fish barriers and other morphological pressures, prioritise actions and seek funding to remove or provide appropriate mitigation.
3. Reduce the effects of nutrient enrichment from rural diffuse pollution. The area advisory group will work with farming and land user representatives and will also help to advise on the 'priority catchment' approach on diffuse pollution.
4. Raise awareness of the importance of the water environment within the Forth advisory group area, and let people know how their actions can protect and enhance it. This will require communication, events and projects across the whole area and the area advisory group will investigate setting up a sub-group to co-ordinate this work.
5. Recording the presence of invasive non-native species and implementing the national work, outlined in the invasive non-native species implementation plan, at a local level will be a key focus of the group to prevent deterioration due to presence of such species.

The Area Advisory Group will receive updates from the sub-groups and annual updates on classification, which will enable them to monitor progress. They will produce a short briefing each year which will outline progress in delivering river basin planning in the Forth advisory group area, and which will highlight significant areas of achievement and issues of concern. Short action plans will be produced by sub-groups to tackle any issues of concern.

Appendix 1

The following tables provide an overview of the pressures within each catchment. Adjacent non-catchment coastal water bodies have been grouped into the nearest land catchment. Please note that, as one water body may be affected by more than one pressure, some water bodies may be counted twice in these tables.

Number of water bodies affected by point source pollution pressures in each catchment																		
Industry sector	Allan Water	Berwick coastal	East Lothian coastal	Edinburgh coastal	Eye Water	Forth Estuary (South) coastal	River Almond	River Avon	River Carron	River Devon	River Esk	River Forth	River Leven	River Tyne	South Fife coastal	Stirling coastal	Water of Leith	Forth Estuary and Firth of Forth
Total number of water bodies in catchment	9	3	15	5	4	11	20	8	14	5	17	46	23	13	21	8	10	6
Agriculture													1		1			
Aquaculture			2				1					1						
Sewage disposal			3	1		2	11	6	3	1	7	4	5	5	7	3	2	2
Landfill															1			1
Mining and quarrying of coal							1				5		3		2	1		
Air transport							1											
Other manufacturing and food and whisky production						1	1		1				1	1	1			2
Recreational activities													1*					

* Knockhill Racing Circuit

Number of water bodies affected by diffuse pressures in each catchment																	
Industry sector	Allan Water	Berwick coastal	East Lothian coastal	Edinburgh coastal	Eye Water	River Almond	River Avon	River Carron	River Devon	River Esk	River Forth	River Leven	River Tyne	South Fife coastal	Stirling coastal	Water of Leith	Forth Estuary (South) coastal
Total number of water bodies in catchment	9	3	15	5	4	20	8	14	5	17	46	23	13	21	8	10	11
Forestry											1	1					
Agriculture		1	6	1	4	6	1			3	5	12	9	10	4	1	3
Transport				1		2		1						1			
Sewage disposal				2		3	1					2		4		1	
Mining and quarrying of coal/oil shale						7	2					2		1			
Urban development				1		3	2					1				1***	
Unknown origin								1*			1**						

* Failing total iron so could be linked to mining and quarrying.

** Fish downgrade – missing year class for salmon and low trout numbers. Will require investigative monitoring.

*** Phosphorous – so could be sewage.

Number of water bodies affected by morphological pressures in each catchment																		
Industry sector	Allan Water	Berwick coastal	East Lothian coastal	Edinburgh coastal	Eye Water	Forth Estuary (South) coastal	River Almond	River Avon	River Carron	River Devon	River Esk	River Forth	River Leven	River Tyne	South Fife coastal	Stirling coastal	Water of Leith	Forth Estuary and Firth of Forth
Total number of water bodies in catchment	9	3	15	5	4	11	20	8	14	5	17	46	23	13	21	8	10	6
Forestry												6					1	
Agriculture			5		1	1			1			1	2					
Aquaculture			4						1									
Water collection, purification and distribution									3		4	6	1	1			1	
Road/rail transport	3											1						
Other* (includes urban development)	8			2		3	21	2	8	2	16	5	16	11	7	3	8	2
Coastal transport/land reclamation/ sea defence				2														

* The majority of these pressures are associated with barriers to fish passage (eg in the River Tyne catchment, 11 of the 12 water bodies within the catchment are downgraded from good ecological status due to the presence of a fish barrier low down in the catchment), or from are water bodies affected by multiple pressures such as straightening/bank reinforcement.

Number of water bodies affected by abstraction pressures in each catchment																		
Industry sector	Allan Water	Berwick coastal	East Lothian coastal	Edinburgh coastal	Eye Water	Forth Estuary (South) coastal	River Almond	River Avon	River Carron	River Devon	River Esk	River Forth	River Leven	River Tyne	South Fife coastal	Stirling Coastal	Water of Leith	Forth Estuary and Firth of Forth
Total number of water bodies in catchment	9	3	15	5	4	11	20	8	14	5	17	46	23	13	21	8	10	6
Agriculture			5		1		1			1			2	3	4			
Aquaculture	1												1					
Mining and quarrying of coal							1						2					
Production of renewable energy*	1									1		1	1					2
Water collection, purification and distribution			2				1		2	1		2	1	1		2	1	
Mineral water /food/whisky production	1												2					
Other manufacturing	1						1		1				2		2			

* Nuclear and pumped hydro are not renewable forms of electricity generation.

Number of water bodies affected by flow regulation pressures in each catchment																	
Industry sector	Allan Water	Berwick coastal	East Lothian coastal	Edinburgh coastal	Eye Water	River Almond	River Avon	River Carron	River Devon	River Esk	River Forth	River Leven	River Tyne	South Fife coastal	Stirling Coastal	Water of Leith	Forth Estuary (South) coastal
Total number of water bodies in catchment	9	3	15	5	4	20	8	14	5	17	46	23	13	21	8	10	11
Water collection, purification and distribution			1					2	1		6	5	1		1		