The river basin management plan for the Scotland river basin district: 2015–2027

21 December 2015

Working together to protect and improve our water environment

Data and maps

The maps and charts shown in this document are produced by Water environment hub. In most cases, you can find more detail and view the mapping at a local scale using the online tool. Information is also available here for the whole of Scotland.

The maps are based on the following sources:

Ordnance Survey

The Centre for Ecology and Hydrology

Scottish Natural Heritage

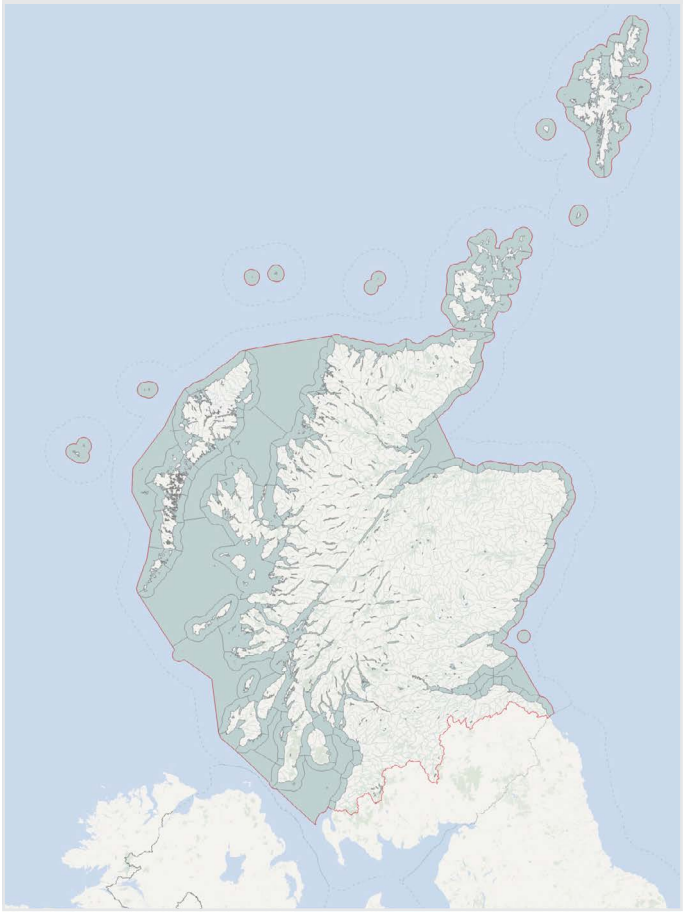
Contents

1 A plan for the water environment

Scotland is renowned worldwide for the environmental quality of its rivers, lochs, wetlands and seas. They are some of the country's greatest natural assets; attracting visitors, contributing to the health and well-being of its people, supporting a rich diversity of wildlife and providing for the sustainable growth of its economy[1]. Maintaining this enviable reputation is important for Scotland's continued economic success and well-being.

This plan is Scotland's route map for protecting and improving the water environment of the Scotland river basin district (Figure 1). A similar route map for the rest of southern Scotland is set out in the separate but parallel plan for the Solway Tweed river basin district[2].

Figure 1: The Scotland river basin district



Many waters in the Scotland river basin district are in a good or excellent condition. However, others are under significant pressure. The plan sets out what we – the Scottish Government, the Scottish Environment Protection Agency (SEPA), responsible authorities[3] and all Scotland's other public bodies - will do to tackle these pressures and improve the condition of the affected rivers, lochs, estuaries, coastal waters and groundwater.

This plan is also about the major contributions others will make to enable us to achieve our goals; we will work closely with businesses, land managers and voluntary groups and organisations, building and strengthening the partnership approach[4] we established over the period 2009 to 2015.

Working together to secure the sustainable use of the water environment will help maximise the benefits a healthy water environment can bring for people and businesses. It will also help identify, and make use of, opportunities to contribute to our wider goals, including those for improved resilience to climate change, biodiversity[5], forestry[6], flood risk management[7], fisheries[8] and sustainable land use[9].

The plan builds on the first river basin management plan for the Scotland river basin district[10], published in 2009. It sets revised objectives for the 12 year period from 2015 to the end of 2027 (Figure 2) and a strengthened programme of measures for achieving them.

1 More information at www.environment.scotland.gov.uk/get-informed/water/scotlands-water/

2 www.sepa.org.uk/environment/water/river-basin-management-planning/

3 The responsible authorities are British Waterways (Scottish Canals), local authorities and national park authorities, Forestry Commission Scotland, Scottish Natural Heritage, and Scottish Water. Further details can be found in Appendix 8

4 Appendix 8 provides further details on some of the national and local partnership groups helping to protect and improve the water environment.

5 www.gov.scot/Publications/2013/06/5538

6 http://scotland.forestry.gov.uk/supporting/strategy-policy-guidance/forestry-strategy

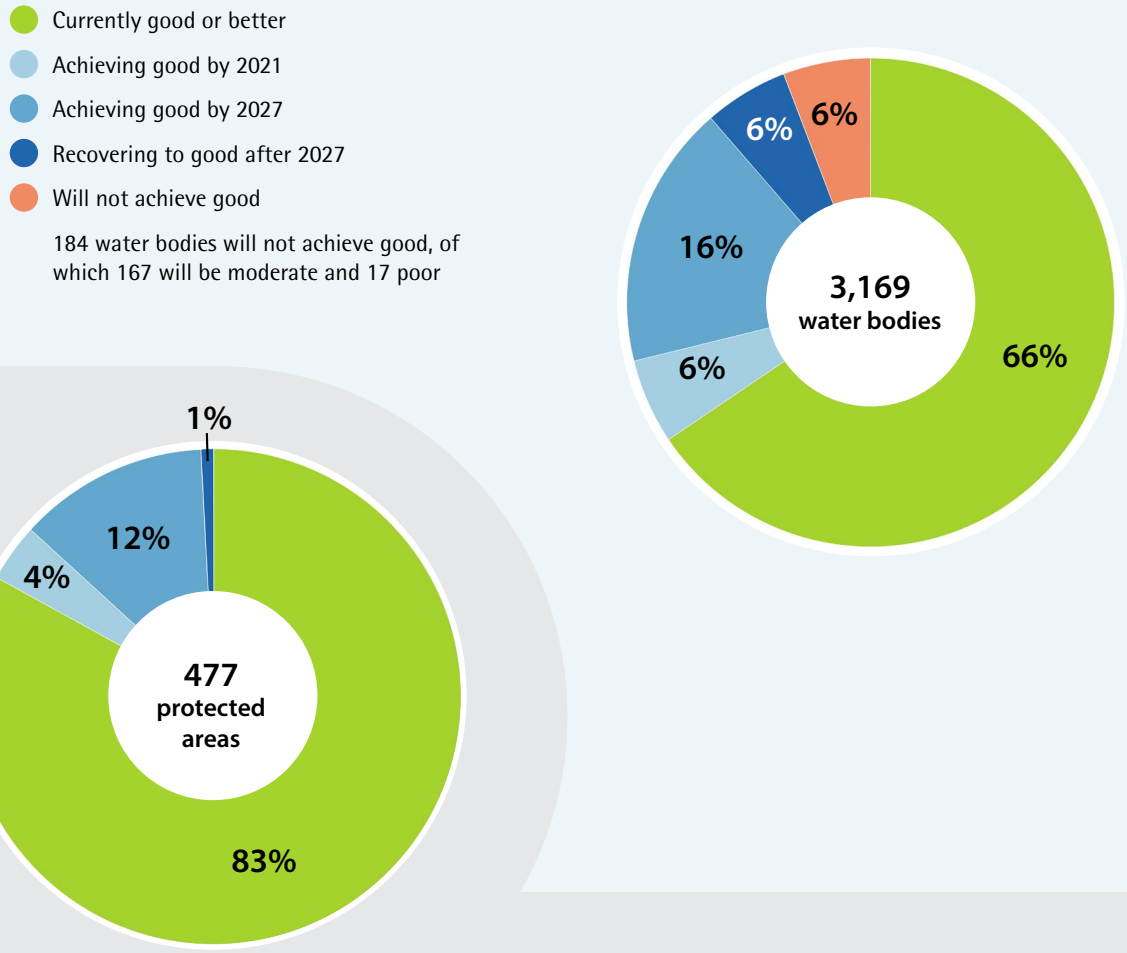
7 www.gov.scot/topics/environment/water/flooding/FRMACT

8 www.gov.scot/Topics/marine/Salmon-Trout-Coarse

9 www.gov.scot/Topics/Environment/Countryside/Landusestrategy

10 www.sepa.org.uk/environment/water/river-basin-management-planning/publications#RBMPplan

Figure 2: Expected improvements to the condition of the district's water bodies and protected areas as a result of the actions planned for the period 2015-2027



	Bathing waters	Shellfish waters	Wildlife conservation areas
Currently good or better	64	28	304
Achieving good by 2021	12	1	5
Achieving good by 2027	1	50	8
Recovering to good after 2027	0	0	4
Total	77	79	321

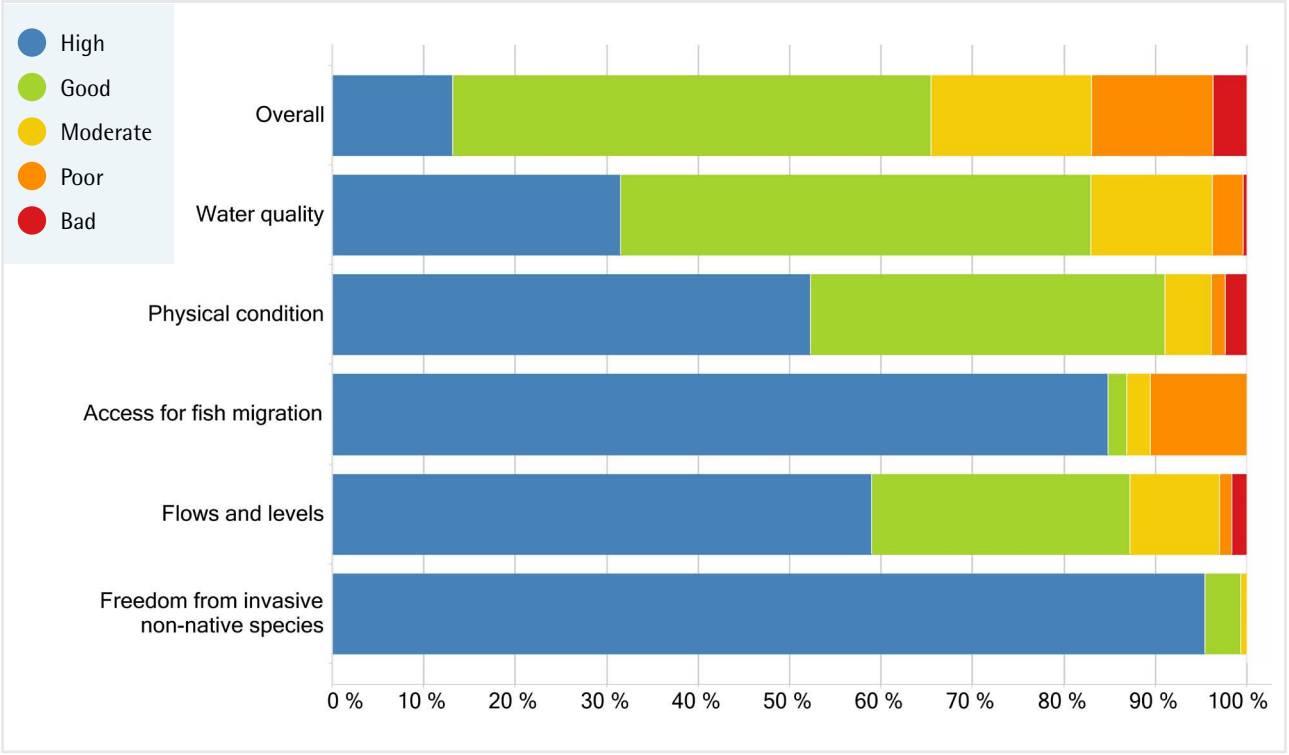
This document gives an overview of the programme of measures and the objectives. Full details, including for individual river, loch, estuary, coastal water and groundwater bodies, are contained in the Water environment hub.

2 Extent of pressure on the water environment

There are 3,169 river, loch, estuary, coastal water and groundwater bodies in the Scotland river basin district, and 1,488 protected areas that are associated with the water environment. Dividing surface waters and groundwater into water bodies allows us to show where the water environment is under pressure and where it is in a good or excellent condition. Protected areas are areas we have designated as needing special protection because of their importance for bathing, drinking water supply, growing and harvesting shellfish, the conservation of wildlife of Europe-wide interest or because they are particularly affected by excess inputs of plant nutrients (see Appendix 4 for further information).

In 2014, 66% of the district's water bodies and 83% of its protected areas were assessed[11] as being in a good or better condition (Figures 3 and 4).

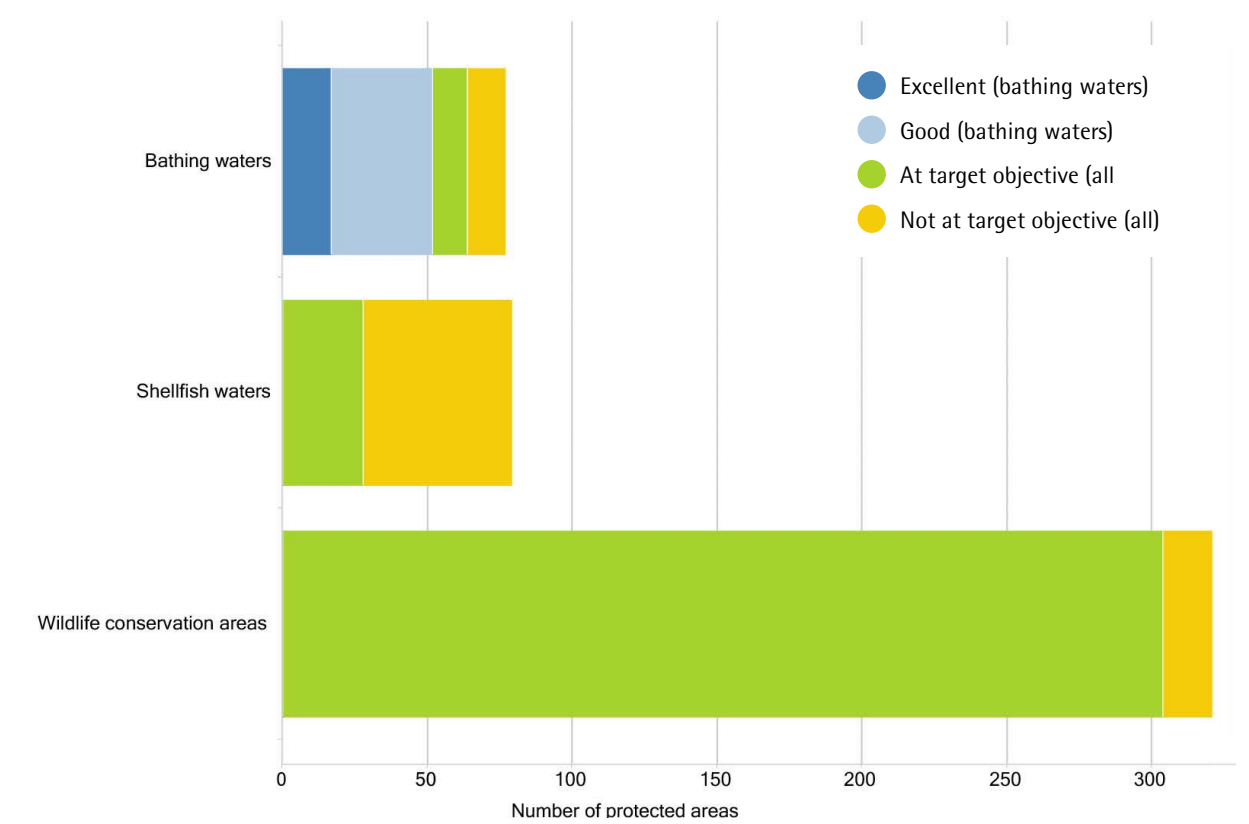
Figure 3: Condition of water bodies in the Scotland river basin district in 2014[12]



11 Information on how the condition of water bodies is assessed is provided in Appendix 2.

12 The information included on bodies of surface water combines assessment results for heavily modified; artificial and non-heavily modified surface water bodies. Further information on heavily modified and artificial water bodies can be found in Appendix 3.

Figure 4: Condition of protected areas for wildlife conservation, shellfish and bathing



Notes to Figure 4

The district's 858 protected drinking water sources are not included in the figure. Our objective for these areas is to prevent their deterioration. 22 of the areas are currently at risk. Areas designated as protected because of excess inputs of plant nutrients are also not shown. Our objective for these is to put in place certain actions to reduce inputs and this has been done. For wildlife conservation areas, 'at target' means that the characteristics of the water bodies on which an area's conservation goals depend are in at least a good condition. It does not indicate that the area's wildlife conservation goals are achieved: for a significant number of wildlife protected areas, the achievement of the latter is only partly dependent on the condition of the water environment. For some, the achievement of conservation objectives may require the condition of water bodies to be restored to a condition better than good. Where we find this is the case, we will review our targets for the areas concerned.

The 34% of water bodies and 17% of protected areas not in a good condition are as a result of a combination of impacts on:

- water quality;
- access for fish migration;
- physical condition;
- water flows or levels;
- direct impacts from invasive non-native species on aquatic plant and animal communities.

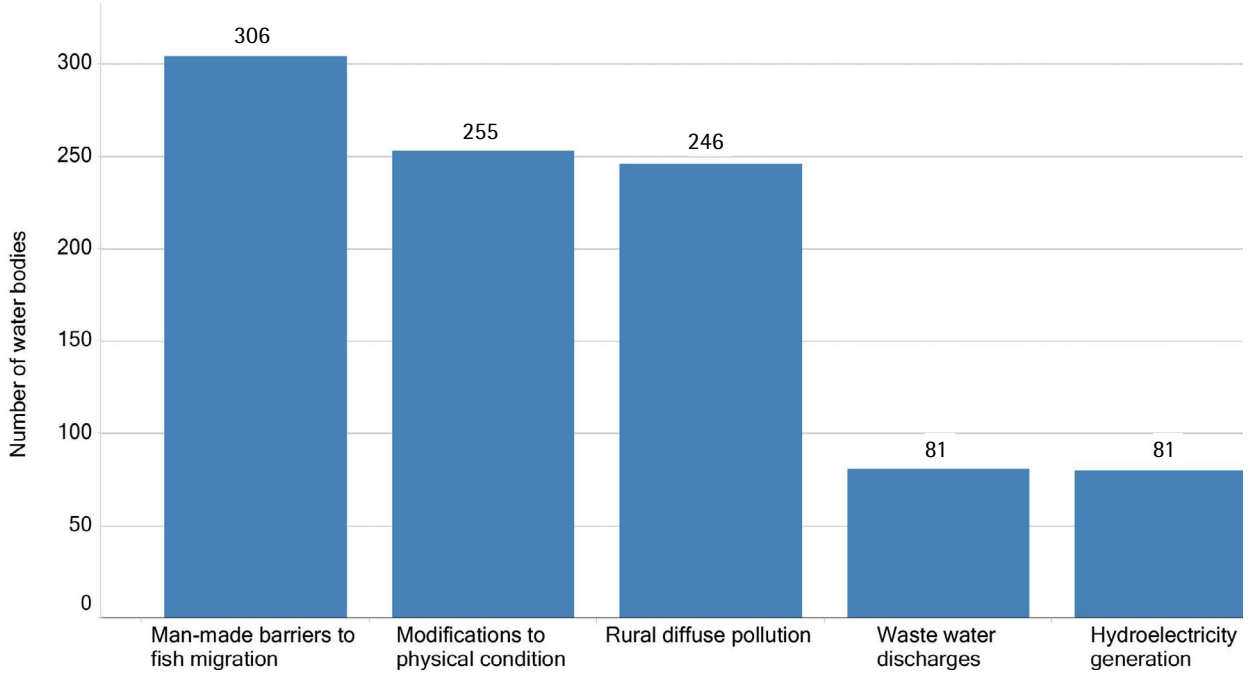
The sections that follow describe our plan for tackling the pressures responsible for each of these impacts and the improvements to the condition of water bodies and protected areas we are aiming to achieve as a result.

3 Tackling pressures on the water environment

Improving the condition of water bodies and protected areas

Since our first plan was published in 2009, the condition of over 200 water bodies has improved (see Appendix 6 for further details). However, a wide range of pressures are continuing to impact on the condition of other water bodies and protected areas. Most affect relatively small numbers of the water bodies and protected areas. However, a few affect very large numbers (Figure 5).

Figure 5: Most widespread pressures on the water environment (ranked by number of water bodies affected)



Note to Figure 5

A significant number of water bodies are affected by more than one pressure. These water bodies feature in more than one of the bars in the figure.

Some of these pressures pose significant management challenges[13] which we need to address if we are to achieve our goals for the water environment. Two of the biggest challenges are in tackling diffuse pollution and modifications to the physical condition of water bodies. Both these pressures are connected with various land uses. Reducing them requires very different approaches to those we use to tackle other pressures on the water environment, such as waste water discharges or water abstractions. Over the period 2009 to 2015, land managers, public bodies and voluntary organisations have worked together to develop and refine approaches to meeting these challenges. However, we now need to significantly expand this work if we are to achieve our objectives.

13 Further details on these challenges can be found in our consultation, *Current condition and challenges for the future: Scotland river basin district*, published in 2014.

www.sepa.org.uk/media/37219/current-condition_challenges-for-future_scotland-river-basin-district_public-consultation.pdf

For this second plan, we have strengthened our programme of measures, increasing focus and effort on reducing rural diffuse pollution and improving the physical condition of water bodies. The step changes we will be making to help tackle these, and the other major pressures on the water environment, are described in the sections below. They include:

- studies and investigations to help pin-point the sources of the problems;
- working with local communities and businesses to find solutions that maximise social and economic benefits;
- building action-focused partnerships, in particular with land managers, other businesses and voluntary organisations to lead and champion the work;
- communicating and sharing good practices, including among land managers;
- providing funding support for actions where appropriate.

Details of our full programme of measures for addressing all the pressures on the water environment can be found in Appendix 8 and, in relation to individual water bodies, in the accompanying **Water environment hub**. Appendix 8 also includes information about our assessment of the climate change-related implications of the main measures.
Our understanding of the condition of the water environment, the pressures on it and the benefits it provides have all improved since 2009. As well as strengthening our programme of measures, we have re-phased our objectives for 2021 and 2027 to take account of this - prioritising actions during 2015 to 2021 that we expect to deliver the greatest benefits without incurring disproportionate cost. If on-going improvements in our understanding of pressures and the costs and benefits of addressing them show it is appropriate to do so, we will further update our priorities for where and when action is taken.

Maintaining the quality of the water environment

Scotland has one of the best quality water environments in Europe and this deserved reputation contributes to the country's economic and social well-being. Alongside improving the condition of water bodies and protected areas that are not in a good or excellent condition, we need to maintain the quality of those that are. Preventing deterioration of the water environment, including drinking water sources, is a key purpose of this plan. It is a significant and constantly evolving challenge as pressures shift and change, and as more water bodies are restored to a good condition over the period 2015 to 2027.

Regulating water uses

Preventing deterioration requires an effective system for checking that water uses are sustainable and their risks effectively managed. We will continue to do this by:

- requiring the prior-authorisation of activities that can adversely affect the water environment;
- regulators, such as SEPA, carrying out programmes of monitoring and inspection to check and ensure the activities are carried out in accordance with the conditions of their authorisations.

Promoting sustainable use

We will also continue to promote and support sustainable water use by:

- providing information and advice on how to avoid causing pollution;
- ensuring that public-sector development plans as well as those of businesses are informed by information on where the water environment can accommodate additional pressure without adverse effects;
- rewarding and incentivising good practice;
- identifying risks posed from changing or expanding uses of the water environment and then working with the businesses concerned to find solutions and help them develop sustainably.

Minimising adverse impacts from important developments

Adverse impacts from development proposals are sometimes unavoidable. In these cases, we have to balance protecting the water environment with achieving other important goals, such as reducing flood risk, increasing renewable energy generation and securing adequate drinking water supplies. SEPA and other regulators will continue to ensure developments that would adversely affect the water environment only go ahead where:

- their benefits outweigh those of protecting the water environment;
- all practical steps are taken to minimise adverse impacts.

Based on the experience of the period 2009 to 2015, we expect a significant number of such developments over the period 2015 to 2027. Up to 2015, we have allowed significant modifications to 105 water bodies to facilitate sustainable development; the vast majority of these modifications were for new hydroelectricity generating schemes.

Maintaining good environmental practices

Good environmental practices play an important part in improving and then protecting the water environment, for example in agricultural land management and in managing industrial estates to prevent pollutants entering surface water drains. Public bodies, land managers and others will work to ensure that, once in place, good practices are maintained and that the next generation is ready and able to take them on.

Managing emerging risks

The condition of the water environment can be threatened by wider scale changes than those resulting from individual developments. These include:

- the spread of invasive non-native plants and animals;
- shifts in land uses or practices that increase diffuse pollution risks;
- changes in the use of chemicals and other materials;
- the introduction of diseases that can damage the health of aquatic wildlife.

The programme of measures we have established in this plan includes measures designed to manage a range of such potential risks. Managing risks posed by non-native invasive species present a particular challenge, and further details of how we are attempting to do so can be found in section 8 of this plan.

Spotting emerging risks early is the key to successfully avoiding damage to the water environment. This will be an important objective of the environmental monitoring and assessment programmes underpinning implementation of this plan. However, the scale of the task means that even when using state of the art environmental monitoring techniques, these programmes need to be supplemented with information from businesses, voluntary organisations and individuals. We will continue to promote and facilitate this important public role in helping protect the quality of the water environment[14].

Adapting to climate change

Periods of dry weather and periods of flooding already lead to increased risks to the water environment. Climate change will increasingly affect demands on water resources, the ability of the water environment to accommodate water uses, the pattern of land uses and the ability of non-native species to spread and become established[15]. Improving our understanding of when and where we need to act to manage these effects will be an important part of our river basin planning work over the period to 2027.

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14 Further information at www.environment.scotland.gov.uk/get-involved/ or www.sepa.org.uk/contact/

15 www.environment.scotland.gov.uk/get-informed/climate/climate/

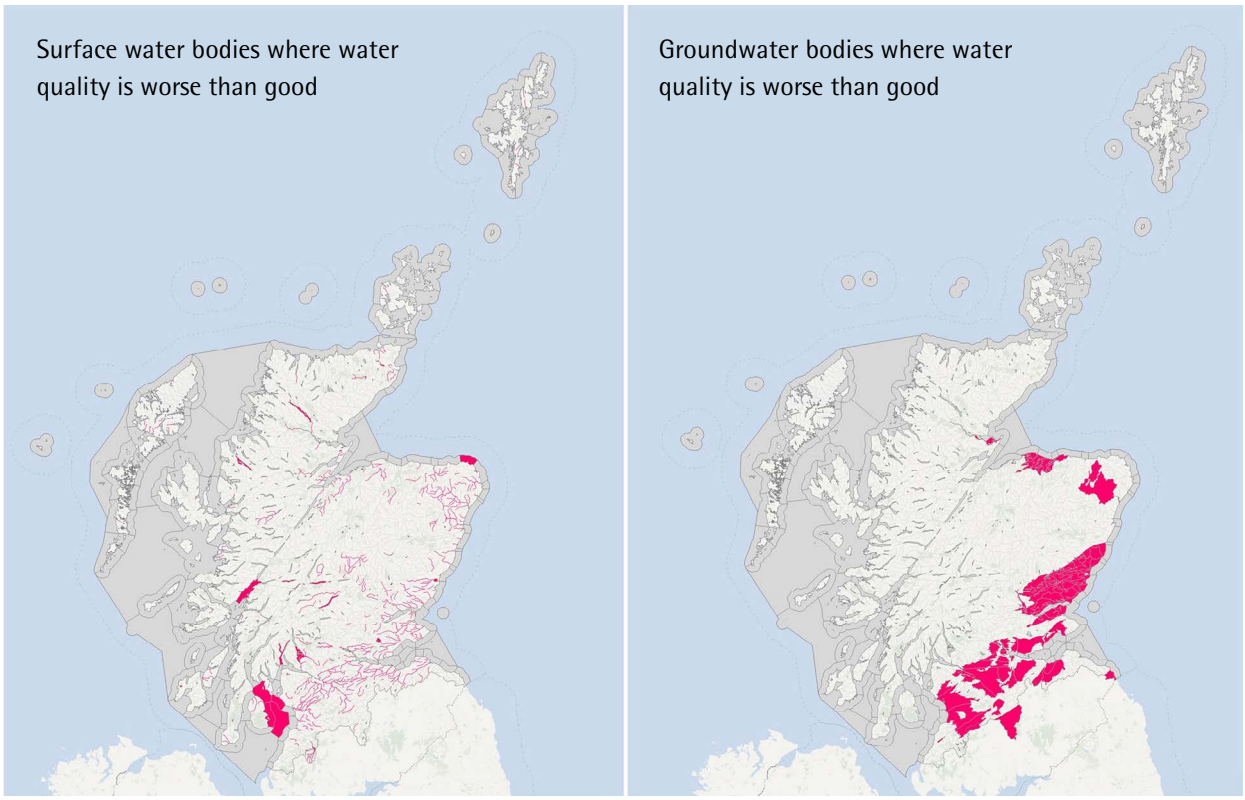
4 Pressures on water quality

Scale of pressures on water quality in the district

Across the district, water quality is worse than good in 504 (17%) water bodies and 73 protected areas (Figure 6). Improving water quality in these water bodies and protected areas will bring a range of benefits, including helping to:

- protect the health of private water supply users and reduce the costs of public drinking water production;
- improve the quality of bathing beaches;
- support the expansion of businesses that depend on a high quality water environment, such as tourism, fisheries and whisky production;
- contribute to the regeneration of urban areas by providing a high quality water environment;
- improve the health and range of populations of wild plants and animals, including rare and endangered species.

Figure 6: Water bodies where water quality is worse than good



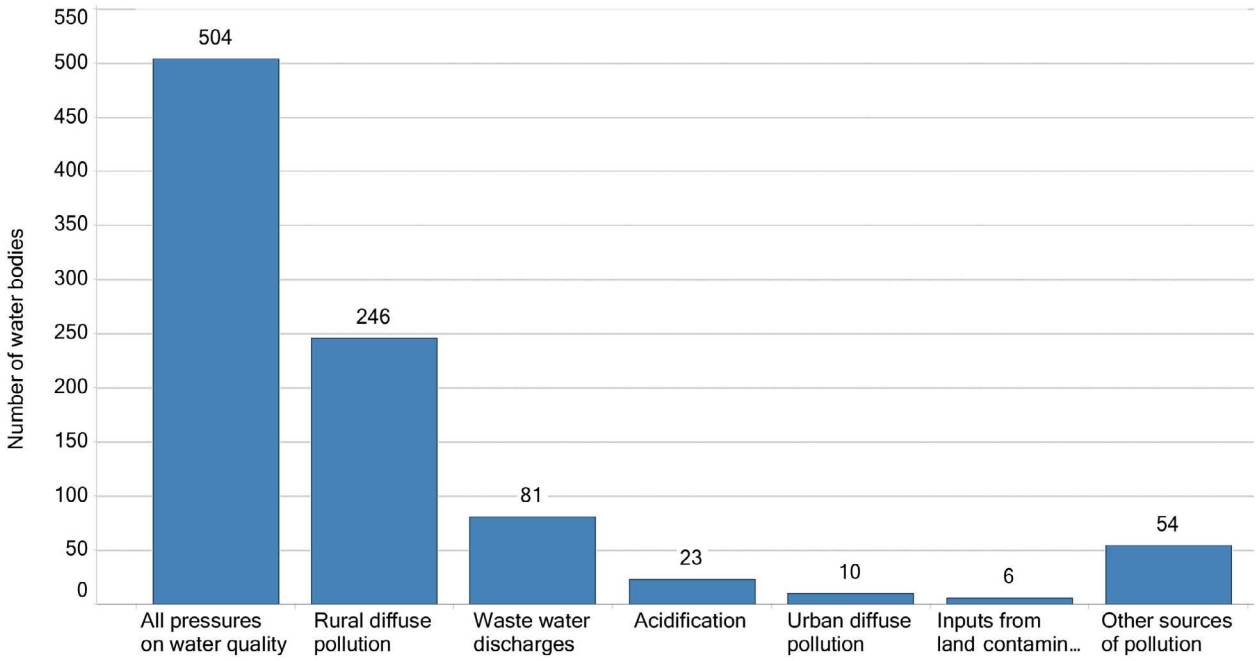
Note to Figure 6

Protected areas affected by poor water quality can be viewed on the Water environment hub.

Pressures on water quality

Rural diffuse pollution and discharges of urban waste water are the main pressures on water quality (see Figure 7). The following sections detail how we plan to address these and other pressures on water quality between 2021 and 2027.

Figure 7: Pressures on water quality



Note to Figure 7

Many water bodies are subject to multiple pressures and may feature in several of the bars in the figure.

Action on rural diffuse pollution

Summary of key step changes in our programme to reduce rural diffuse pollution

During the period 2015 to 2021, Scotland's land managers and public bodies will work together to drive improvements in land use management practices in 32 rural diffuse pollution priority catchments.

At the same time, land managers and public bodies will continue to work together in the 12 rural diffuse pollution priority catchments where they have been working since 2009 to ensure that good land use practices are strengthened and maintained.

During the period 2021 to 2027, land managers and public bodies will work to maintain and strengthen good land use management practices across all rural diffuse pollution priority catchments.

During the period 2015 to 2021, SEPA will investigate and confirm the sources of pollution in 64 smaller, rural diffuse pollution focus areas. Land managers and public bodies will work together to assess what can be done and then put in place the appropriate measures for completion before 2027.

What we have already done

A range of different sources can contribute to rural diffuse pollution. The main cause is typically when rainwater run-off from land picks up soil, bacteria and nutrients from livestock excreta, or fertilisers and pesticides used in agriculture. Inputs from other rural land uses such as forestry and discharges from septic tanks can also contribute.

Scotland is widely recognised as having one of the leading approaches in Europe for dealing with rural diffuse pollution. The approach, which was used during the period 2009 to 2015, included:

- The introduction of general binding rules (GBRs) on how a wide range of land management activities liable to cause pollution must be undertaken to help protect and improve water quality.
- Land managers and public bodies working together in 12 prioritised catchments to bring land management practices in line with the requirements of the GBRs. The approach, known as the **diffuse pollution priority catchment approach**[16], was designed for large areas of land where the dominant land uses are intensive arable or livestock farming. Almost 5,000km of rivers in 12 priority catchments were walked to assess diffuse pollution sources, and around 2,500 farms visited. Of the farms where non-compliance with the GBRs was found, 65% have subsequently taken steps to reduce pollution risks or are in the process of doing so. Public bodies are continuing to work with those farmers who have not yet started to improve their management practices to ensure they do. In some cases, land managers are doing more than is required by the GBRs with the assistance of funding available under the Scottish Rural Development Programme. The priority catchment approach is supported by the Diffuse Pollution Management Advisory Group,whose members represent a cross section of rural, environmental and wildlife conservation interests.
- Implementing targeted action programmes in three areas known as 'nitrate vulnerable zones' to reduce pollution of vulnerable groundwater and estuaries by agricultural nitrates.
- Running a 'sustainable land management incentive scheme' in eight catchments where drinking water sources are affected by diffuse pollution. This Scottish Water-led work included catchment visits, advice and an incentive scheme to fund additional action by land managers[17]. The incentive scheme has funded 98 projects since 2012.
- Forest managers and public bodies continuing and improving efforts to raise awareness of good practices for minimising pollution from forestry operations.

Improving farmland management practices – an example from the River South Esk, Angus

Before:
No buffer – cultivation on the bank top of the watercourse

After:
Management practice change – a 3m grass strip created as a buffer to reduce the risk of diffuse pollution

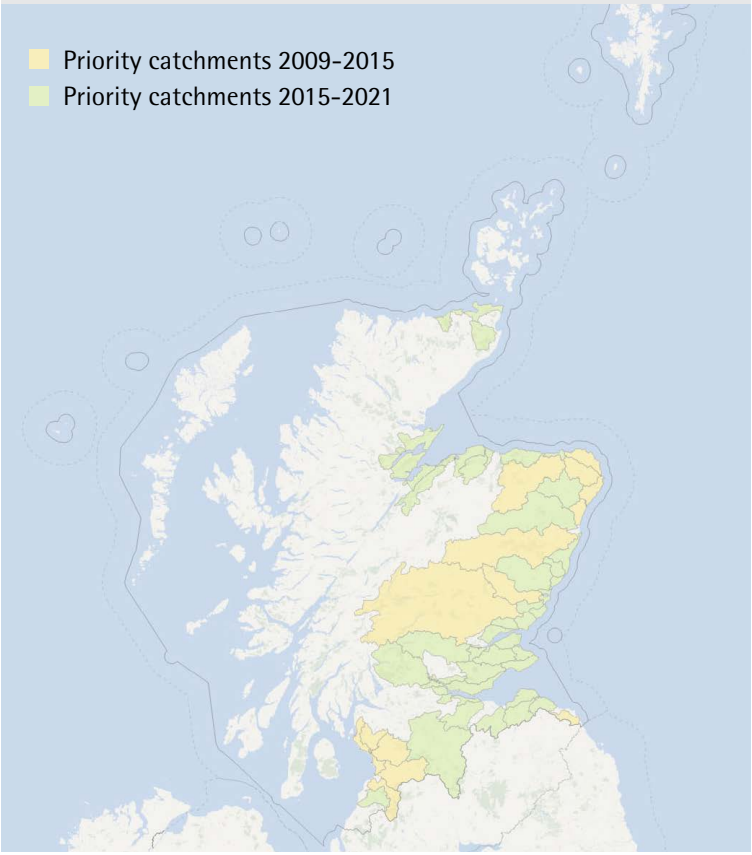
16 www.sepa.org.uk/regulations/water/diffuse-pollution/diffuse-pollution-in-the-rural-environment/
17 www.scottishwater.co.uk/about-us/corporate-responsibility/sustainable-land-management/slm-incentive-scheme

How we are going to build on what we have done

Our data show that, in 2015, rural diffuse pollution is contributing to adverse effects on water quality in 246 water bodies and 70 protected areas in the district.

Of these, 55 water bodies and six protected areas are in the 12 priority catchments in which land managers and public bodies have been working together during the period 2009 to 2015. We expect to see improvements in water quality in these water bodies and protected areas over the next few years. However, land managers and public bodies will continue to work together in the catchments over the period 2015 to 2027 to further improve compliance with the GBRs and ensure good land use practices are maintained and strengthened where necessary.

Figure 8: Diffuse pollution priority catchments



A further 140 water bodies and eight protected areas in 32 catchments are affected by agricultural land uses where the priority catchment approach is applicable. Over 2015 to 2021, land managers and public bodies will put in the concentrated effort required to help to drive and support the required improvements in land use management practices in these catchments. For the remaining 18 water bodies and 56 protected areas, the main sources of pollution typically include sources resulting from less intensive land uses, such as hill farming and sheep grazing, and septic tank discharges. The area over which concentrated action to reduce pollution is needed is also generally significantly smaller than for priority catchments. To differentiate these areas from priority catchments, we have identified them as **rural diffuse pollution focus areas**.

Over the period 2015 to 2021, SEPA will investigate and identify the main sources of pollution in the 64 focus areas concerned. Land managers in the focus areas and public bodies will then work to identify what can be done and start to put in place the appropriate measures with the aim of making as much progress as possible in improving water quality by 2021. This is a challenging programme of work because of:

- the large numbers of focus areas involved;
- the time and specialist expertise required in each focus area to work out the main sources of pollution and then develop practical solutions;
- the technical challenges of implementing those solutions in sometimes remote, rural areas where access can be difficult.

For these reasons, we do not think it will be feasible to complete all the actions required before the end of 2021. Land managers and public bodies will work together to complete the remaining actions in the period 2021 to 2027.

As well as significantly expanding our priority catchment work and initiating work in focus areas described above, we are:

- revising and strengthening the Scottish Rural Development Programme to help support land managers take action beyond the basic good practice required by the GBRs;
- increasing efforts on national awareness raising and education to help land managers across the district understand how they can reduce the risk of rural diffuse pollution.

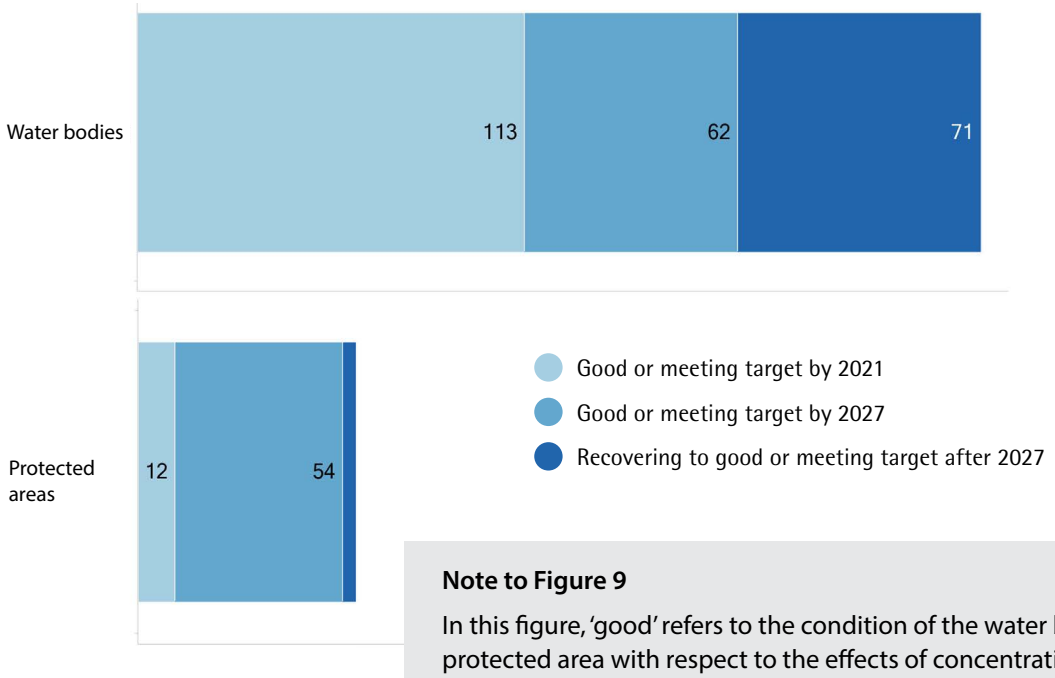
What we expect to achieve

It is not possible to predict precisely the effects of all these measures to reduce diffuse sources of pollution. However, our best estimate is that, in combination with the measures taken to address any other sources of the pollutants concerned, they will be sufficient to enable the achievement of good water quality in the affected water bodies in due course.

We will monitor progress towards this target. This will allow us to identify whether we are on track and to review and update our programme of measures if necessary.

Although the majority of the measures will be completed by 2021 (see Figure 9), the timescale for recovery from the effects of pollution will vary, typically being longer for lochs than rivers and longer still for groundwater. These delays are because it takes time for some pollutants already in the environment to flush out of the system and, in the case of surface waters, for healthy populations of water plants and animals to re-establish.

Figure 9: Expected improvements in water quality in water bodies and protected areas affected by rural diffuse pollution



Note to Figure 9

In this figure, 'good' refers to the condition of the water body or protected area with respect to the effects of concentrations in the water body or area of those pollutants that rural diffuse pollution is contributing to. It can take time for water plant and animal communities to recover from the effects of pollution, even after the required action to reduce pollutant concentrations has been taken. Water bodies where recovery is expected to lag in this way are shown in the figure as recovering to good after 2027.

Action on waste water discharges

Summary of our planned programme to reduce pollution from waste water discharges

Over the period 2015 to 2021, Scottish Water will carry out the works necessary to address those discharges of waste water currently contributing to worse than good water quality in four water bodies and five protected areas.

In the same period, Scottish Water will work with SEPA to complete a large study programme to:

i. confirm the extent that waste water discharges will need to be addressed to improve water quality in another 66 water bodies and 11 protected areas;

ii. where appropriate, design the necessary works to address those discharges.

Before the end of 2027, Scottish Water will carry out such works in relation to waste water discharges as the studies show are necessary to improve water quality in those 66 water bodies and 11 protected areas.

What we have already done

Addressing the impacts of waste water discharges on the water environment requires considerable investment in upgrading sewers and waste water treatment works.

To enable these investments to be made, Scottish Ministers have established a publicly-funded investment programme, known as the Quality and Standards (Q&S) programme. The objectives of the programme are set by Scottish Ministers following public consultation. Scottish Water is responsible for achieving the required environmental outcomes.

Over the period 2009 to 2015, Scottish Water has:

- made improvements to discharges from waste water treatment works and overflows from sewer networks affecting a total of 30 water bodies in the district;
- in discussion with SEPA, completed the studies necessary to help inform the Quality and Standards investment programme up to 2021.

Improving Scotland's waste water treatment works and sewer networks

Scottish Water has invested over £90m to improve and protect the environment in local coastal waters and rivers in the Ayrshire areas served by Meadowhead and Stevenston Waste Water Treatment Works.

How we are going to build on what we have done

Our current assessment is that discharges of waste water are contributing to adverse effects on water quality in 81 water bodies and 16 protected areas in the district. Over the period 2015 to 2027, Scottish Water will take such action in relation to these discharges as is necessary to enable the achievement of good water quality in the water bodies and protected areas concerned.

However, it is not feasible for Scottish Water to make all the investments needed by 2021 in the Scotland river basin district as well as those required in the Scottish part of the Solway Tweed river basin district. This is because of the scale and complexity of the work that would be required and the size of the necessary capital investment programme.

Over the last few decades, Scottish Water and its predecessor bodies have made very substantial investments in waste water treatment works and sewer networks to protect and improve the water environment. Most of the remaining impacts that waste water discharges are contributing to are difficult and complex to address. Resolving them requires considerable time and resources to plan and design infrastructure improvements, replace or upgrade the relevant infrastructure, and subsequently maintain the operation of the new or upgraded treatment works and sewers.
Scottish Water is already making capital investments at around the limit of what it can feasibly deliver efficiently and on-time. Its total capital investment programme across Scotland as a whole over the next six years will amount to around £500 million per year. About £70 million per year of this will be directed at protecting and improving the water environment.

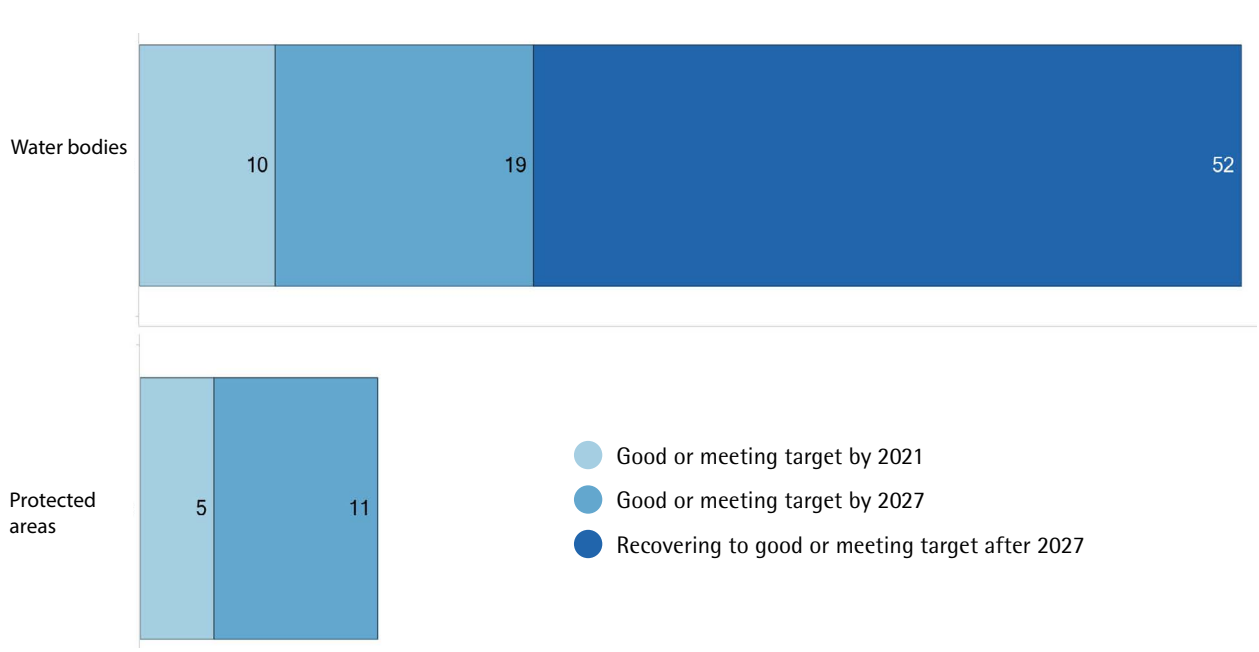
The Quality and Standards programme we have put in place for the period 2015-2021 will deliver the works necessary to address waste water discharges affecting four of these water bodies and five of the protected areas. The investments planned include a large investment in Glasgow's waste water treatment works and sewer network. This will benefit the River Clyde and its tributaries as well as reducing the risk of flooding in urban communities.

Any works needed to address discharges affecting the remaining 66 water bodies and 11 protected areas will be completed in the period 2021 to 2027. There is still some uncertainty about the scale of the contribution of waste water discharges to water quality impacts in some of this group of water bodies and protected areas. To resolve this, and enable the development of the investment programme for the period, Scottish Water will work with SEPA to carry out studies in respect of these water bodies and protected areas over the period 2015 to 2021.

What we expect to achieve

In combination with the measures we will take to address any other sources of the pollutants concerned, we expect the measures planned over the period 2015 to 2027 to be sufficient to achieve good water quality in due course in all 81 water bodies and 16 protected areas affected by waste water discharges (Figure 10).
The timescale for recovery from some of the effects of pollution will vary, typically being longer for lochs and estuaries than rivers. These delays are because it takes time in some cases for pollutants already in the environment to flush out of the system and for healthy populations of water plants and animals to re-establish. As a consequence, some water bodies and protected areas are not expected to recover until after the end of 2027.

Figure 10: Expected improvements in water quality in water bodies and protected areas affected by waste water discharges



Notes to Figure 10

In this figure, 'good' refers to the condition of the water body or protected area with respect to the effects of concentrations in the water body or area of those pollutants that waste water discharges are contributing to. Reductions in the concentrations of pollutants and, in surface water bodies, the recovery of water plant and animal communities from their effects can take time after the required action has been taken. Water bodies where recovery is expected to lag in this way are shown in the figure as recovering to good after 2027. These objectives include impacts of Scottish water measures delivered before 2015

Summary of action on other pressures on water quality

In addition to rural diffuse pollution and waste water disposal, a number of other sources of pollution affect smaller numbers of water bodies.

Point source discharges (other than waste water)		
		No. water bodies
Extent of pressures		9
Principal actions: SEPA and other regulators will work with operators of the discharges to ensure that they take the necessary steps to address the discharges.		
Expected improvements in water quality in the affected water bodies (combined effect of planned action on all sources contributing to the adverse impact)	Good by 2021	1
	Good by 2027	8

Diffuse source pollution

Acid deposition (acid rain)		No. water bodies
Extent of pressures		**23**
Principal actions: • The existing controls on emissions of acid gases across the UK will be maintained. • Forestry Commission Scotland will continue to promote UK Forestry Standard Guidelines[18] on felling, new planting and stocking in catchments at risk of acidification.		
Expected improvements in water quality in the affected water bodies (combined effect of planned action on all sources contributing to the adverse impact)	Good by 2027	3
	Extended recovery – good after 2027	20

Urban diffuse sources		No. water bodies
Extent of pressures		10
Principal actions: • Public bodies will maintain the existing controls on discharges into surface water drains and from those drains into the water environment. • Scottish Water will implement 11 new surface water action plans to address pollution from discharges of rainwater run-off. • Roads authorities will take appropriate action to address polluting runoff from roads.		
Expected improvements in water quality in the affected water bodies (combined effect of planned action on all sources contributing to the adverse impact)	Good by 2021	4
	Good by 2027	6

Legacy sources of pollution

Abandoned mine workings		No. water bodies
Extent of pressures		45
Principal actions: • The Coal Authority will secure the treatment of mine water to improve quality in the affected surface water bodies. • There are no feasible actions to speed up natural recovery of affected bodies of groundwater, so extended recovery objectives have been set for these water bodies. Recovery is expected to take several decades.		
Expected improvements in water quality in the affected water bodies (combined effect of planned action on all sources contributing to the adverse impact)	Good by 2021	1
	Good by 2027	15
	Extended recovery – good after 2027	29

18 www.forestry.gov.uk/ukfs/water

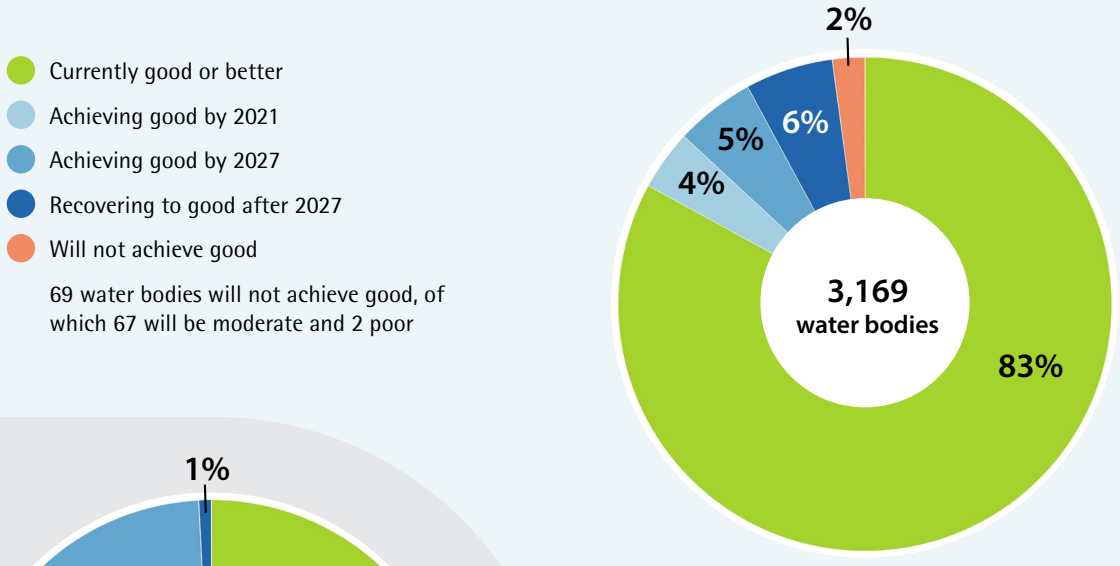
Land contamination		No. water bodies
Extent of pressures		6
Principal actions: • Public bodies will continue to work with developers and site owners to ensure measures are taken to remediate land and reduce pollution. • We will review the existing legislative and implementation framework, and strengthen it where necessary to achieve our objectives.		
Expected improvements in water quality in the affected water bodies (combined effect of planned action on all sources contributing to the adverse impact)	Good by 2027	5[19]

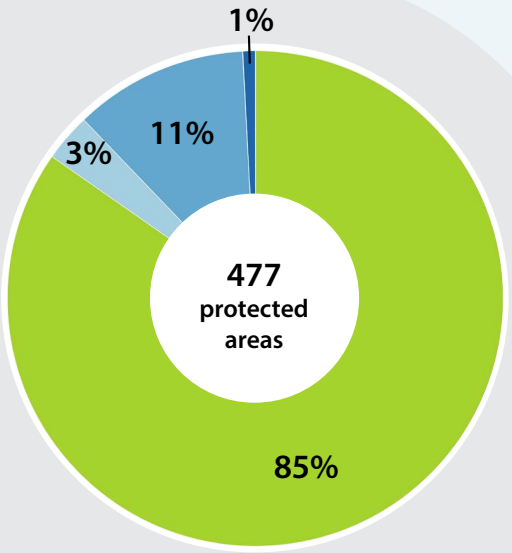
19 One water body has a less stringent objective

What we expect to achieve from the combined effects of all our actions to address pollution

In combination, we expect the measures we will take to address the pressures on water quality between 2015 and 2027 will, in due course, achieve good water quality in 472 water bodies and 73 protected areas (Figure 11).

Figure 11: Expected improvements in water quality in water bodies and protected areas as a result of the full programme of measures





Note to Figure 11

For 64 water bodies, our data indicate that, while concentrations of pollutants are higher than normally required for good, their water plant and animal communities do not appear to be adversely affected. In a further two water bodies, water quality is below the standard we have set for good but this appears to be for natural reasons – the water bodies are used by large numbers of wild birds whose faeces affect water quality.

Because it appears plant and animal communities are not impacted by human activities, taking further action would be disproportionate.

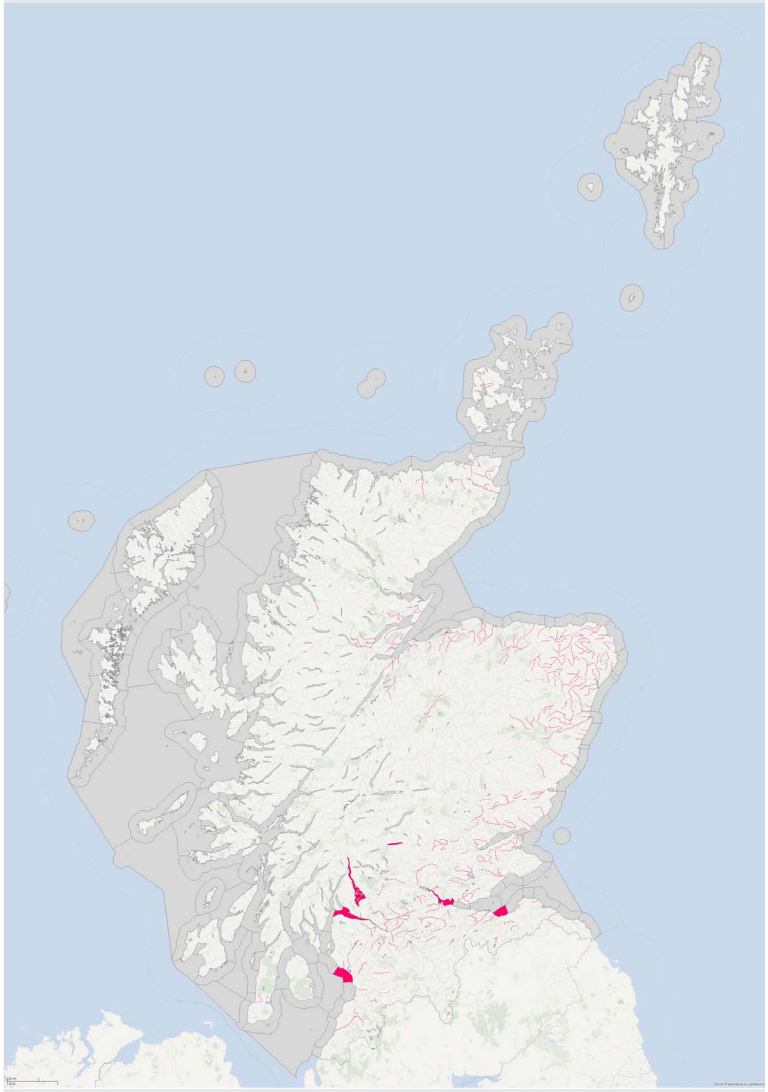
	Bathing waters	Shellfish waters	Wildlife conservation areas
Currently good or better	64	28	312
Achieving good by 2021	12	1	2
Achieving good by 2027	1	50	3
Recovering to good after 2027	0	0	4
Total	77	79	321

5 Pressures on the physical condition of the water environment

Scale of pressure on physical condition

Across the Scotland river basin district, 255 bodies of surface water and six protected areas for internationally important wildlife are adversely affected by modifications to their beds, banks or shores. These modifications have reduced the area, diversity and quality of habitats in the water bodies concerned with consequent impacts on the abundance, richness and health of their aquatic plant and animal communities (Figure 12).

Figure 12: Bodies of surface water with bed, bank or shore habitats not in a good condition



Note to Figure 12:

The physical condition of water bodies within six Special Areas of Conservation requires improvement to achieve our objectives for protected areas for wildlife conservation.

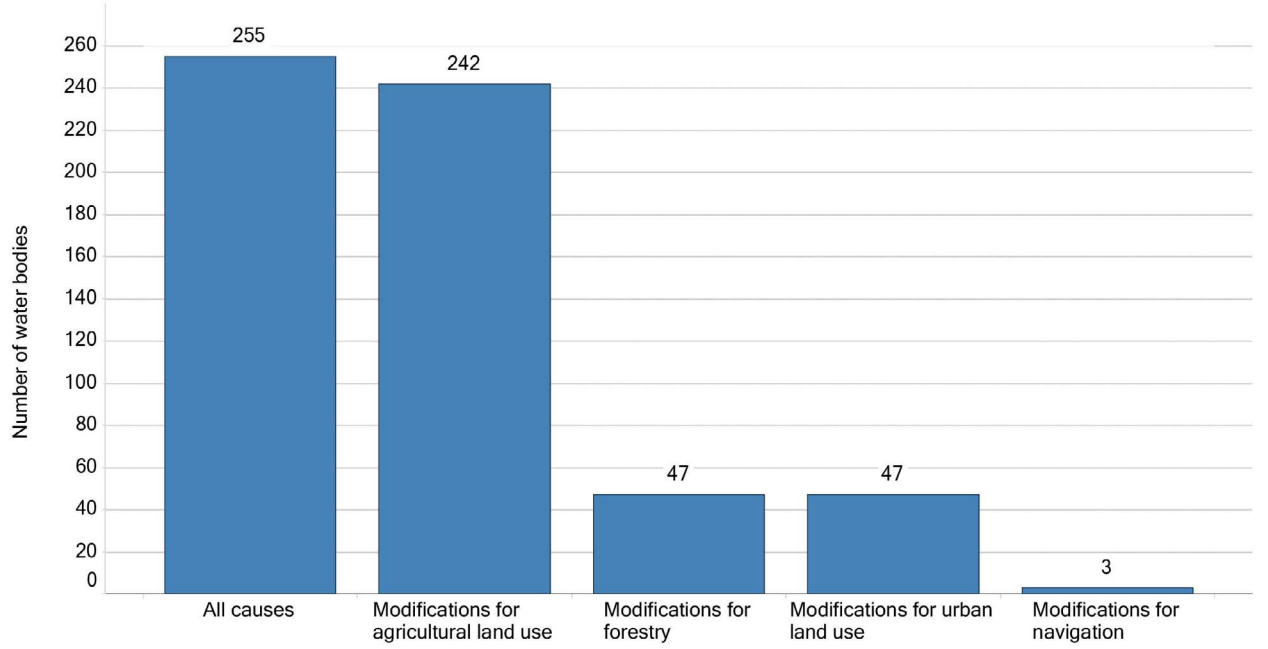
Improving the physical condition of these water bodies and protected areas will provide a range of wider benefits, including:

- access to better quality landscapes and amenity for communities and businesses, with associated benefits for health, wellbeing and the economy;
- improved health and range of populations of wild plants and animals;
- contributions to flood risk management, especially when integrated into natural flood risk management schemes;
- improved bank-side vegetation helping reduce the risk of diffuse pollution.

Pressures on physical condition

The physical condition of rivers, lochs, estuaries and coastal waters in the district has been modified at different times, with some modifications dating back centuries. The vast majority of the more substantial modifications were made to protect or facilitate land uses, but in some places significant modifications for navigation purposes have also been made (Figure 13).

Figure 13: Main causes of impacts on the physical condition of bodies of surface water



Note to Figure 13

Each bar in the figure shows the number of surface water bodies where the contribution of the modifications to the impact on the physical condition of the water bodies is substantial. Modification for the purposes listed also makes smaller contributions to impacts on other water bodies. A number of water bodies are affected by modifications serving different purposes. These water bodies feature in more than one of the bars in the figure.

The most common types of modifications responsible for impacts on the physical condition of the affected water bodies and protected areas are:

- straightening, deepening, narrowing and sometimes culverting of rivers and estuaries for land drainage, flood water conveyance, navigation, or to increase land area;
- reinforcement of, or the construction of walls and embankments on, banks and shores to help control erosion of adjacent land or contain flood waters;
- removal or degradation of natural bank-side vegetation due to over-grazing, urbanisation or conversion of land for agriculture or forestry uses.

Although some of the modifications no longer serve the purposes for which they were originally intended, many still provide important benefits, such as helping reduce the risk of flooding, helping drain farmland or enabling navigation. Achieving a good physical condition in these water bodies requires that their physical condition is improved to the extent possible without significant adverse impacts on those benefits. Where the best physical condition that can be achieved still means the water bodies are substantially modified, they will be identified as heavily modified water bodies (see Appendix 3 for further information). This is to indicate that their physical condition is as good as it can be given the constraints.

Action to improve physical condition

Summary of our planned programme to improve the physical condition of waters in the Scotland river basin district

During the period 2015 to 2027, we will significantly expand the effort and funding we put in to improving the physical condition of water bodies.

By the end of 2021, we will improve the physical condition of 41 water bodies.

Over the same period, we will complete the studies necessary to enable us to design and plan improvements to the remaining 214 water bodies and six protected areas that are adversely impacted by modifications to their physical condition.

During the period 2021 to 2027, we will improve the physical condition of the remaining 214 water bodies and six protected areas.

What we have already done

Between 2009 and 2015:

- public bodies, land managers and voluntary organisations worked together to make improvements to the physical condition of 36 water bodies;
- public bodies, land managers and voluntary organisations worked together to plan and design further improvement projects;
- Scottish Government established a dedicated fund (the Water Environment Fund) to support improvements to the physical condition of water bodies;
- SEPA set up a national team to administer the fund and to support and promote improvement projects;
- Scottish Government and SEPA initiated five catchment-scale pilot projects to identify and demonstrate how improving the physical condition of water bodies can be combined with reducing the risk of flooding;
- we outlined a set of principles that will underpin our work in the coming years through a supplementary plan, *Improving the physical condition of Scotland's water environment: A supplementary plan for the river basin management plans*[20].

20 www.sepa.org.uk/media/37336/improving-physical-condition-scotlands-water-environment.pdf

Improving physical condition in the South Esk catchment – increasing the area and diversity of natural habitats

Before:
Canalised river channel

After:
Restoration of more diverse habitats

How we are going to build on what we have done

During the period 2015 to 2027, we will improve the physical condition of all 255 water bodies and six protected areas for internationally important wildlife where physical condition is worse than good (Figure 14).

Making improvements to the physical condition of the water environment on this scale within this timeframe will be a significant challenge. To help meet it:

- the Scottish Government will increase the sums available through the Water Environment Fund for supporting improvements to the physical condition of water bodies;
- SEPA and local authorities will work together with voluntary organisations, land managers, local communities and businesses to deliver improvements and maximise associated social and economic benefits;
- public bodies will take action to reduce the impact of structures that they own or maintain, such as culverts;
- local authorities will encourage developers to incorporate action to improve the physical condition of the water environment in development proposals.

We have prioritised 41 water bodies for improvement by the end of 2021. In selecting these water bodies, we took into account the benefits their improvement could provide to their local communities as well as the feasibility of delivery, including how far we have got in building the necessary partnerships over the last six years.

We plan to improve the physical condition of the remaining 214 water bodies and six protected areas by the end of 2027.

We have phased improvements in this way because it is not feasible to improve all the affected water bodies and protected areas across the whole of Scotland by the end of 2021. This is due to:

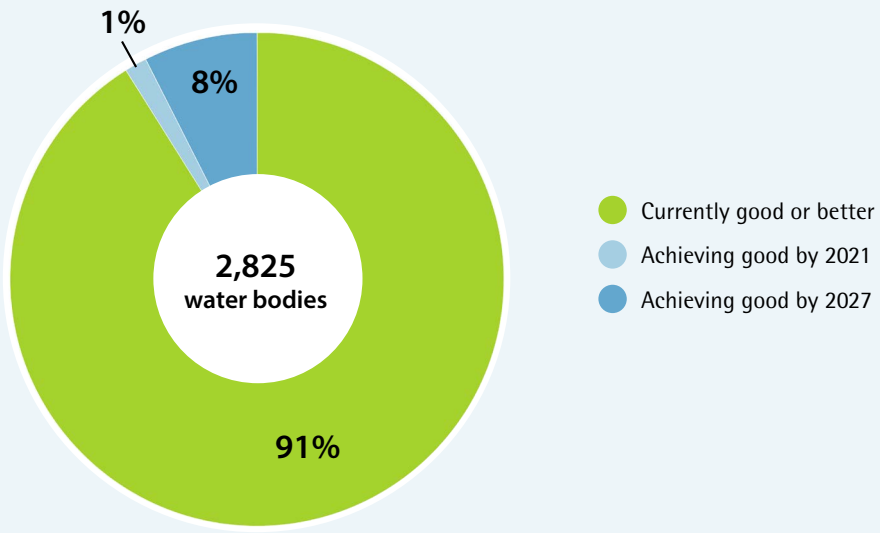
- the large number of water bodies involved and hence the scale of improvements required;
- the considerable length of time required to complete the complex process of designing an effective solution in discussion with local communities and land managers and then undertaking the necessary civil engineering work for each water body;
- the currently limited pool of necessary specialist expertise across Europe.

Over the period 2015 to 2021, we will carry out the necessary preparatory studies for the improvements phased for the period 2021 to 2027 so that we are ready to plan and deliver the required works. If progress on any of the water bodies we have prioritised for improvement by 2021 proves slower than anticipated, progressing with these studies will help us bring forward action on other water bodies if appropriate.

What we expect to achieve

The measures planned for the period 2015 to 2027 will enable the achievement of a good physical condition in all 255 water bodies and six protected areas identified as having physical condition at worse than good (Figure 14).

Figure 14: Expected improvements in the physical condition of water bodies

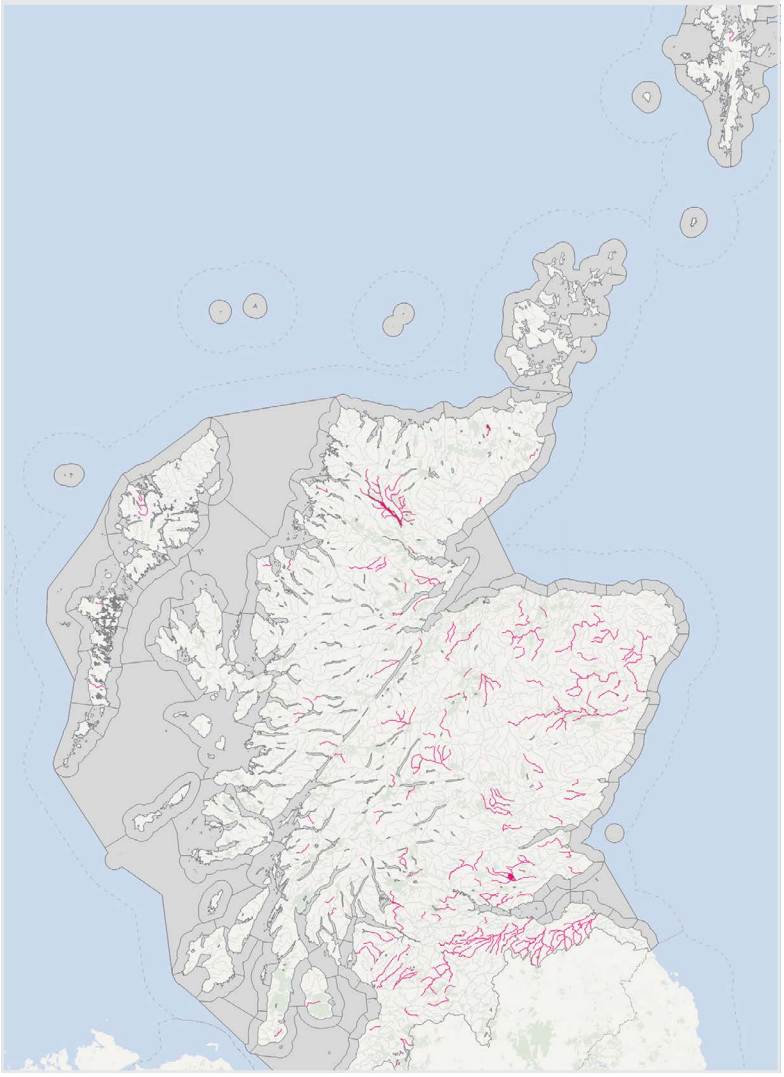


6 Pressures restricting fish migration

Scale of pressures restricting fish migration

Across the district, fish migration in 306 bodies of surface water and three associated protected areas for internationally important wildlife is prevented or restricted by barriers. These barriers are formed by structures such as weirs, dams, culverts and bridge reinforcements (Figure 15).

Figure 15:
Water bodies where fish migration is prevented or restricted



Barriers can affect the migrations of long distance migratory fish, such as salmon and eels, as well as the shorter distance movements of resident species, such as brown trout. Improving fish migration in the affected water bodies and protected areas will provide a range of wider benefits, including:

- restoring salmon runs to parts of rivers that have been inaccessible for generations;
- improving the quality and resilience of fisheries by restoring fish access to natural spawning and nursery habitats;
- helping conserve populations of the globally threatened freshwater pearl mussel, which depends for part of its lifecycle on salmon and trout populations.

Pressures responsible for restricting fish migration

We have identified 238 weirs and dams, and 56 other man-made structures that are acting as barriers preventing or restricting fish migration in the district's river systems. The other man-made structures include culverts under roads and railways, and bridge reinforcements.

Action to improve access for fish migration

Summary of our planned programme of work to improve access for fish migration in the Scotland river basin district

During the period 2015 to 2021, we will secure the removal of 145 barriers that are preventing or restricting fish migration in 167 water bodies and two protected areas for internationally important wildlife.

During the period 2021 to 2027, we will secure the removal of a further 149 barriers that are preventing or restricting fish migration in 126 water bodies and one protected area.

To achieve these goals:

- SEPA will work with businesses responsible for dams and weirs to ensure they take the actions needed to allow fish passage;
- SEPA and voluntary organisations, including the Rivers and Fisheries Trusts, will work with businesses and local communities to secure the removal of barriers created by other structures and abandoned weirs and dams;
- public bodies will take the action necessary to address barriers to fish migration created by structures that they own or maintain, such as culverts and bridges.

Barrier removal can be achieved in several ways. Fish passes can be constructed over or around the structures that created them or, where possible and appropriate, barriers created by abandoned weirs and dams can be demolished.

What we have already done

Between 2009 and 2015:

- we introduced regulatory controls enabling SEPA to work with operators of dams and weirs to ensure the operators take such steps as are necessary to provide for fish migration.
- Scottish Government established a dedicated fund (the Water Environment Fund) to help fund work to address barriers to fish migration caused by abandoned structures.
- SEPA set up a national team to administer the fund, and to support and promote barrier removal projects.
- SEPA, the Rivers and Fisheries Trusts of Scotland (RAFTS), individual fishery trusts and businesses worked together to restore fish access to 70 water bodies by securing the removal of barriers to fish migration.
- SEPA, RAFTS and its members worked together to significantly expand and improve the information Scotland holds on the number, location and ownership of barriers to fish migration.
- we outlined a set of principles that will underpin our work to remove barriers to fish migration in the coming years through a supplementary plan, I*mproving the physical condition of Scotland's water environment: A supplementary plan to the river basin management plan*[21].

21 www.sepa.org.uk/media/37336/improving-physical-condition-scotlands-water-environment.pdf

Removal of a barrier to fish migration, Pluscarden

Before:
Abandoned structure preventing fish migration

After:
Structure removed and, with it, the barrier to fish migration

How we are going to build on what we have done

During the period 2015 to 2027, we are aiming to secure removal of 294 barriers that are preventing or restricting fish migration in 293 water bodies and three protected areas for internationally important wildlife.
Removing barriers on this scale over the period 2015 and 2027 will be a significant challenge. To help meet it:

- the Scottish Government will increase the sums available through the Water Environment Fund for supporting action to secure the removal of barriers created by abandoned weirs and other structures;
- SEPA and voluntary organisations, such as the Rivers and Fisheries Trusts of Scotland, will work with land managers, local communities and businesses to remove barriers created by abandoned weirs and dams or by other structures;
- public bodies will take action to address barriers to fish migration created by structures that they own or maintain, such as culverts and bridges;
- SEPA will increase its work with businesses responsible for dams and weirs to ensure appropriate action is taken to provide for fish migration.

We have prioritised 145 barriers for removal by the end of 2021. This will improve fish migration in 167 water bodies and two protected areas.

In prioritising these barriers, we took account of the quantity of suitable habitat for fish that would become accessible when the barriers are removed, and the necessary sequencing of removal work in river and systems affected by multiple barriers.

During the period 2021 to 2027, we will secure the removal of another 149 barriers, which will improve fish migration in a further 126 water bodies and one protected area.

We have phased the work in this way because it is not feasible to remove all the barriers by the end of 2021 due to:

- the scale of the programme of civil engineering works that is required, taking account of the number of barriers requiring action in both the Scotland river basin district and the Scottish part of the Solway Tweed river basin district;
- the amount of time involved in designing effective solutions, commissioning the necessary civil engineering works, and then undertaking them;
- the limited number of existing specialists in the restoration of fish passage.

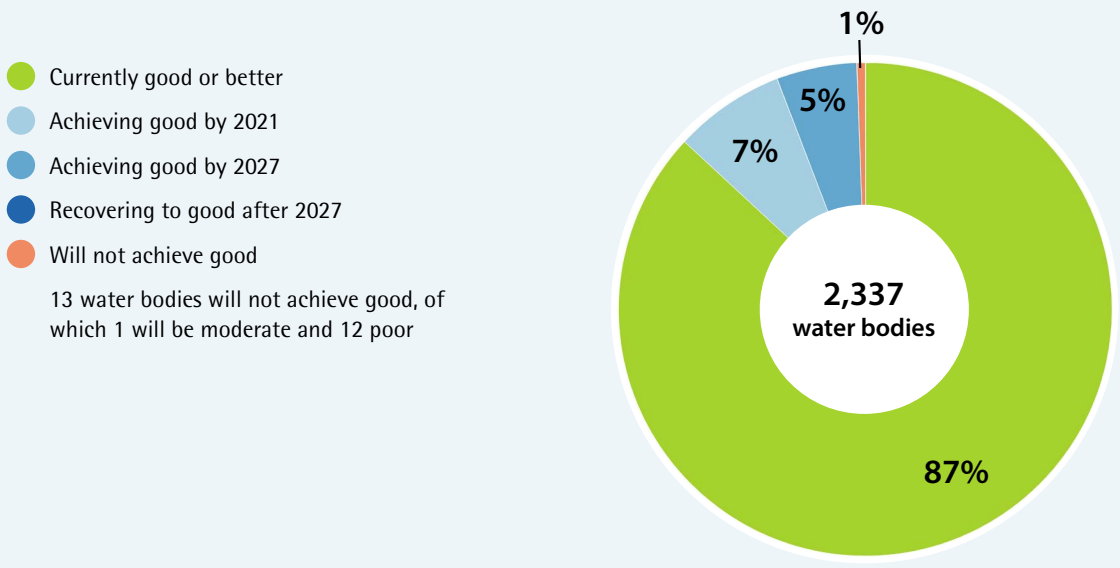
Over the period 2015 to 2021, we will carry out the necessary preparatory investigations with respect to the barriers phased for removal in the period 2021 to 2027. This will ensure we are ready to plan and deliver the required works. If progress on any of the barriers we have prioritised for action by 2021 proves slower than anticipated, progressing with these investigations will also help us bring forward action on other barriers if appropriate.

What we expect to achieve

The measures planned during the period 2015 to 2027 will achieve good access for fish in 293 water bodies and three protected areas and open up around 2,800 km of river to fish (Figure 16).

It will not be possible to restore good access for fish migration in 13 water bodies. These are surface water bodies upstream of water storage reservoirs that we have designated as heavily modified water bodies (See Appendix 3). The reservoirs have been designated because restoring them to a natural condition would result in the loss of the benefits they are providing, for example, to drinking water supply. The height of the dams on these reservoirs, means is not feasible to provide for fish passage or doing so would have a significant adverse impact on the benefits provided by the reservoirs.

Figure 16: Planned improvements in fish access to water bodies affected by barriers to fish migration

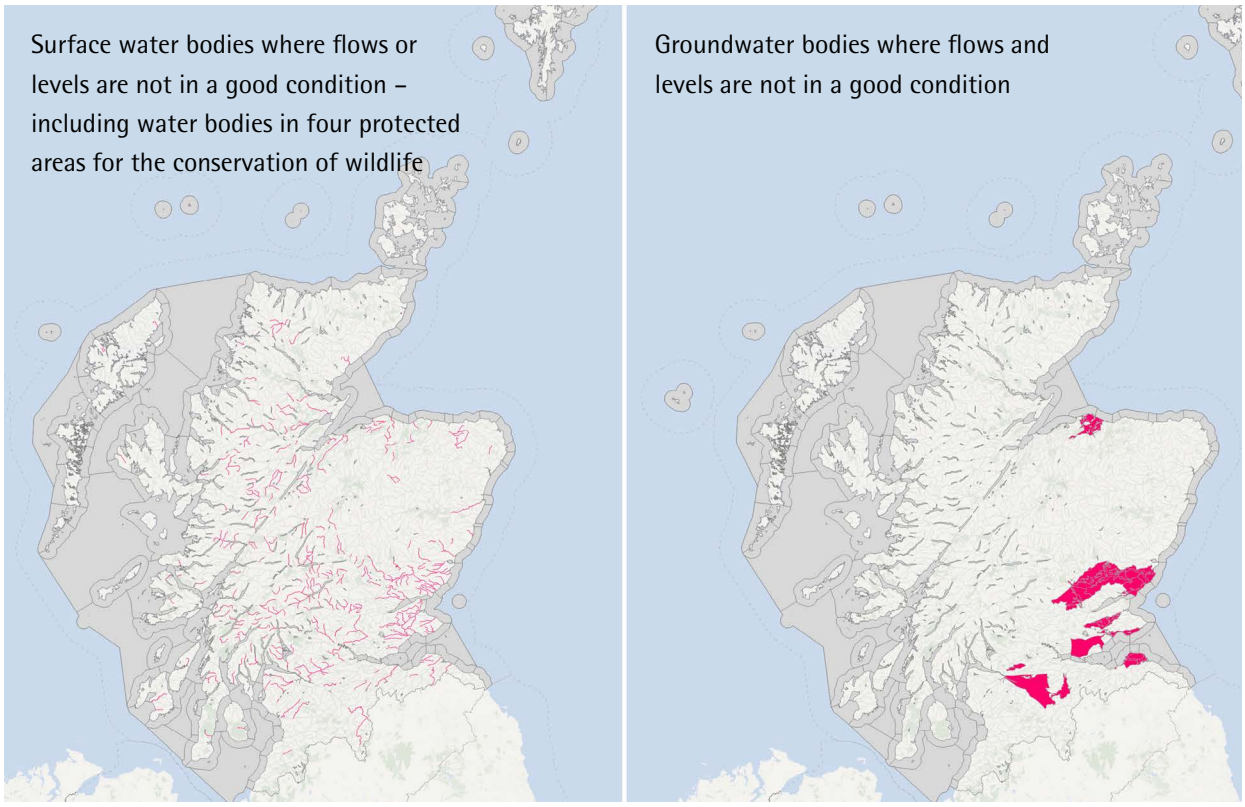


7 Pressures on water flows and levels

Scale of pressure on water flows and levels

Across the district, as many as 312 water bodies and four protected areas for internationally important wildlife can be adversely affected by pressures on water flows and levels (Figure 17). The scale of pressures and their impacts varies between wet and dry years.

Figure 17: Water bodies where water flows or levels are not in a good condition



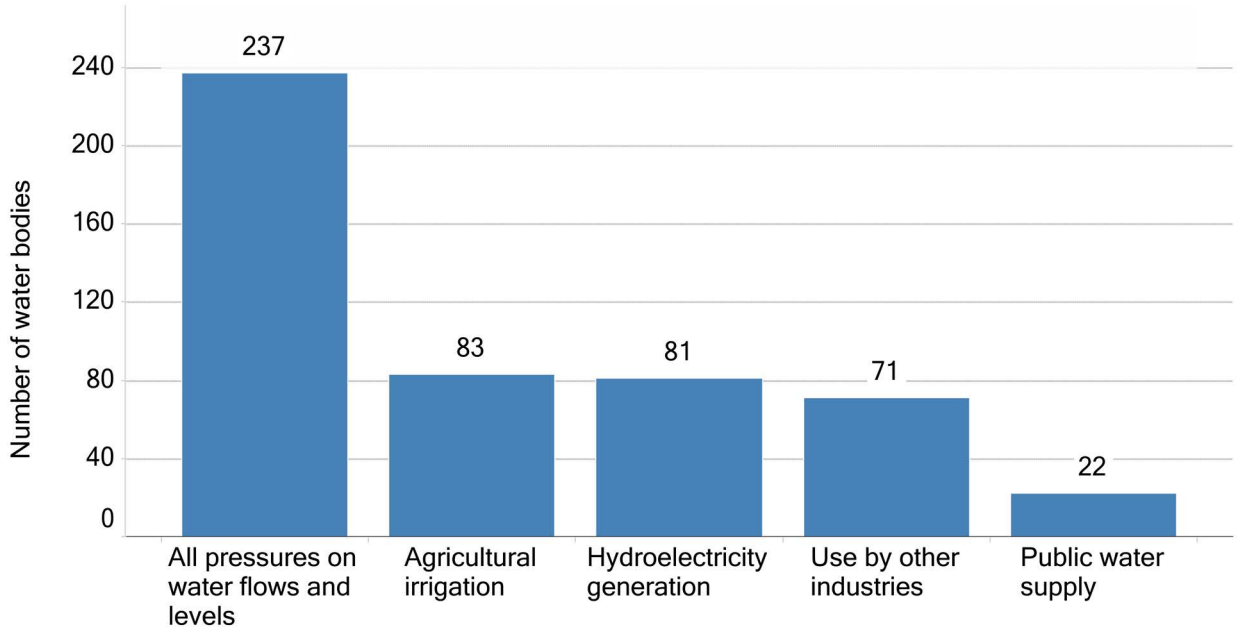
Where water flows and levels are not in a good condition, this can impact on the abundance and diversity of aquatic plants and animals by reducing the extent, quality, diversity and connectivity of aquatic habitats. As well as addressing these impacts, improving water flows and levels will provide a range of wider benefits, including:

- improving the quality of landscapes by, for example, restoring flows to dry, or nearly dry, rivers;
- helping restore and support runs of migratory fish, such as Atlantic salmon;
- improving the health and range of populations of wild plants and animals, including rare and endangered species;
- expanding opportunities for water-based recreation.

Pressures on water flows and levels

The main pressures on flows and levels are from water abstractions or reservoirs used for hydroelectricity generation, the irrigation of crops and the manufacture of food and drink (see Figure 18).

Figure 18: Main pressures responsible for impacts on water flows and levels



Note to Figure 18

Some water bodies are subject to multiple pressures and may feature in several of the bars in the figure.

Water bodies affected by the diversion of water to, storage in, or abstraction from, reservoirs for uses such as public water supply or hydroelectricity generation have been identified as heavily modified water bodies (see Appendix 3). This is to reflect the importance of the benefits those uses provide. Only those improvements that can be made without a significant impact on those benefits are required to achieve a good condition. Water bodies where flows and levels are already in this condition are not included in Figure 18.

There are a further 98 water bodies where flows and levels are adversely affected by hydroelectricity schemes that do not involve water storage in reservoirs. The authorisations for these schemes already require that their impacts on flows and levels are minimised as far as possible. Consequently, no further action is planned in relation to these schemes. These water bodies are not included in the totals given in Figure 18.

Action to improve water flows and levels

Summary of action to improve water flows and levels

During the period 2015 to 2021, SEPA will work with hydroelectricity producers, farmers and other businesses abstracting water or storing it in reservoirs, to ensure that they take the actions necessary to improve water flows and levels in 95 water bodies and one protected area.

During the same period, Scottish Water will improve flows and levels in 13 water bodies and one protected area affected by its abstractions or its reservoirs.

Over the period 2015 to 2021:

- we will increase our certainty about the impact of pressures on flows and levels in 141 water bodies and two protected areas. This will enable us confirm whether or not action is needed;
- Scottish Water will work with SEPA to complete a study programme to design measures to improve flows and levels in a further nine water bodies affected by Scottish Water's abstractions and reservoirs.

During the period 2021 to 2027, SEPA will work with hydroelectricity companies and other businesses responsible for the relevant abstractions and reservoirs to ensure those operators take such actions as are confirmed necessary to improve water flows or levels in 141 water bodies and two protected areas.

Over the same period, Scottish Water will carry out such works as studies show are necessary to improve flows and levels in the remaining eight water bodies thought to be adversely affected by its abstractions or reservoirs.

What we have already done

Over the period 2009 to 2015:

- we introduced regulatory controls enabling SEPA to require operators of reservoirs and abstractions to take such steps as are necessary to improve water flows or levels.
- Scottish Ministers established a publicly-funded investment programme, known as the Quality and Standards programme, to enable Scottish Water to make the investments needed to reduce pressures from its public water supply reservoirs and abstractions.
- Scottish Water improved flows and levels in 21 water bodies affected by its reservoirs and abstractions.
- SEPA worked with businesses, including hydroelectricity producers, farmers and drinks manufacturers, to ensure improvements to water flows were made, or will shortly be made, in 34 water bodies.
- Scottish Water worked with SEPA to complete the studies necessary to help inform its Quality and Standards investment programme for the period 2015 to 2021.
- with the help of information from operators of reservoirs and abstractions and from environmental monitoring programmes, we made significant improvements in our understanding of the extent of pressures on water flows and levels across the district.

How we are going to build on what we have done

We expect that the measures for securing improvements in water flows and levels established in the 2009 river basin management plan will continue to be sufficient to enable us achieve our objectives over the period 2015 to 2027. The main change we have made for this plan is to reprioritise improvements for the period 2015 to 2021. This primarily affects water bodies affected by hydroelectricity schemes.

Water bodies affected by abstractions or reservoirs used by businesses

During the period 2015 to 2027, SEPA will work with hydroelectricity producers, farmers, food and drinks manufacturers and other businesses abstracting water or storing it in reservoirs to ensure those businesses take the actions necessary to improve water flows and levels. This will affect 95 water bodies and one protected area.

Water bodies at risk only in unusually dry years

For 83 of the water bodies referred to above, the risk of water flows being worse than good is only high during unusually dry spells of weather. These water bodies are rivers used to supply water for irrigating agricultural land. In most years and for most of the time, the abstraction of water for irrigation does not have adverse impacts on aquatic plants and animals. To ensure the achievement of good flows in these water bodies, SEPA will work with the farmers concerned to ensure they take the necessary steps during these unusually dry spells to prevent their abstractions adversely affecting water flows and levels. These steps will also be designed to ensure that when water is scarce, its use is shared as equitably as possible.

Water bodies affected by abstractions or reservoirs used for public water supply

During the period 2015 to 2021, Scottish Water will improve flows and levels in 13 of the water bodies and one of the protected areas for wildlife affected by its abstractions and reservoirs. It will also work with SEPA to carry out the studies needed to design and plan improvements to the other eight water bodies thought to be affected by its abstractions or reservoirs.

Phased improvements

During the period 2021 to 2027, SEPA will work with the businesses responsible for the relevant abstractions and reservoirs to ensure that they take such actions as are necessary to improve flows and levels in 141 water bodies and two protected areas.

Over the same period, Scottish Water will take such actions as the studies referred to above show are necessary to improve flows and levels in the remaining eight water bodies affected by its abstractions and reservoirs.

We have phased improvements to the period 2021 to 2027 where:

(i) because of the scale and complexity of the programme of works required, it would not be feasible to improve flows and levels by 2021 in all the affected water bodies and protected areas;

(ii) we have insufficient evidence of impacts on water bodies that are close to the boundary between good and moderate conditions to be certain that improvement action is needed. Proceeding before we have sufficient certainty could incur unnecessary, and hence disproportionate, expense.

During the period 2015 to 2021, we will develop and apply new and improved assessment methods to increase our understanding of the impact of pressures on flows and levels. This will enable us to decide whether action is required to improve water flows or levels in the 59 water bodies that our data currently indicate are adversely affected but for which we do not yet have sufficient evidence to be certain that this is the case.

If our understanding of environmental priorities changes or if doing so would significantly reduce the costs of delivering improvements, we will reprioritise water bodies between the two periods, 2015 to 2021 and 2021 to 2027. We will ensure that the overall balance of effort between the two cycles remains similar.

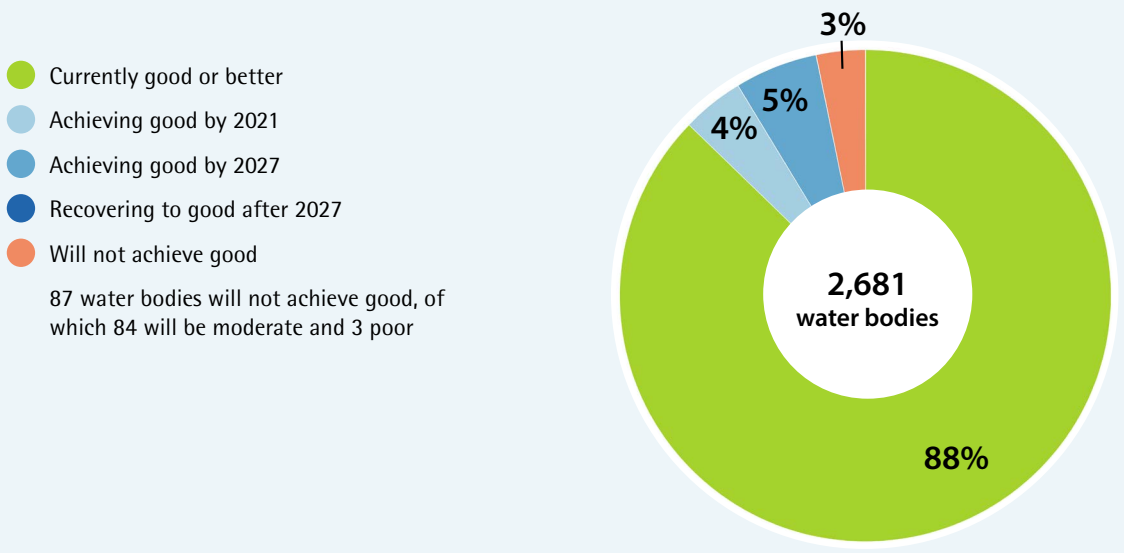
Climate change will alter the pattern of demand for water and the availability of water to meet it. As our understanding of when and where these impacts will be most significant improves, we will work with businesses to ensure that actions taken to improve flows and levels are as resilient as possible to these effects. We will also strengthen our work to ensure efficient water use in order to avoid unnecessary demands being placed on water resources.

What we expect to achieve

The measures planned for the period 2015 to 2027 are expected to achieve good water flows and levels in 236 water bodies and four protected areas (Figure 19).

Achieving good water flows and levels in the remaining 87 water bodies where flows and levels are currently worse than good is not possible without incurring disproportionate costs. For most of these water bodies, because of the benefits to sustainable development, we allowed water abstractions for new run-of-river hydroelectricity schemes or public water supply schemes to adversely affect their flows and levels. The authorisations for these schemes require that impacts on the water bodies are minimised as far as possible. This means that the flows in the water bodies concerned are not far below our normal target for good.

Figure 19: Expected improvements in water flows and levels

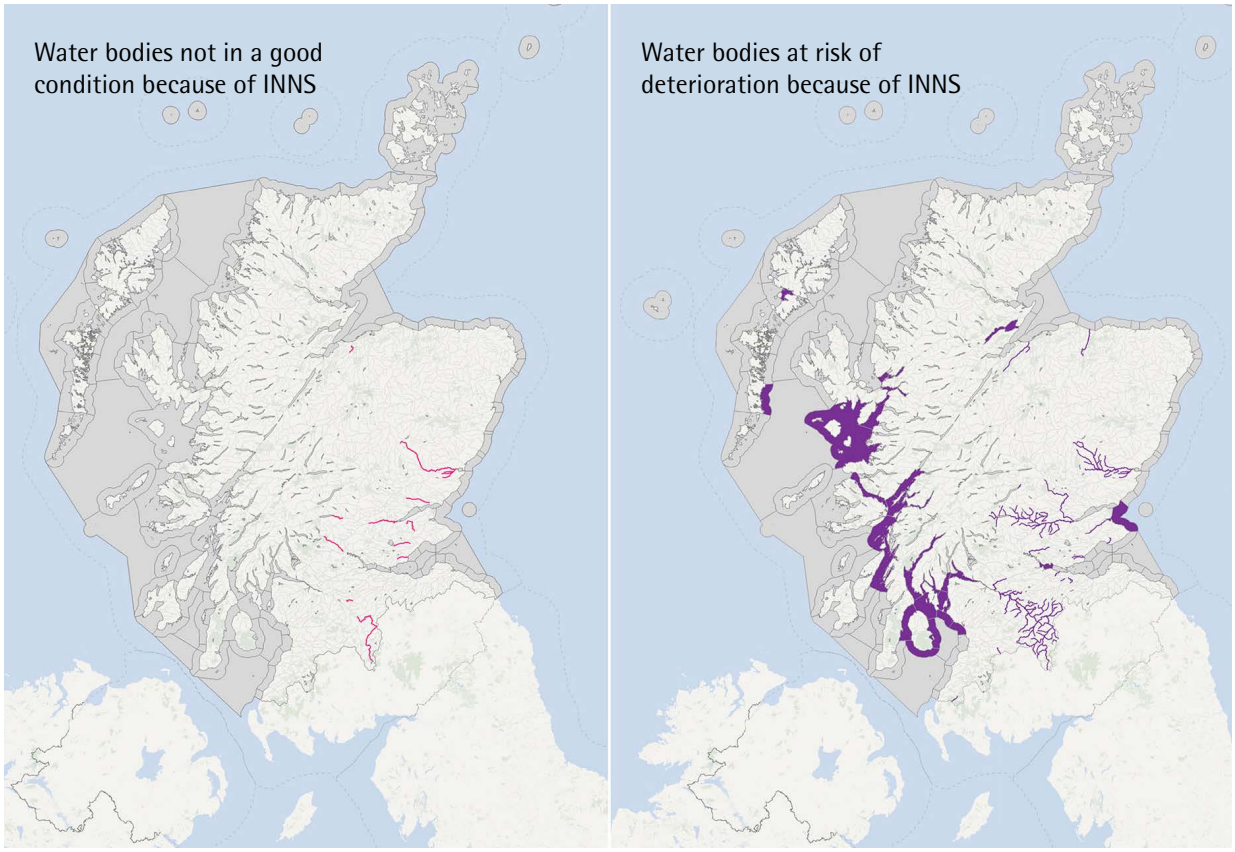


8 Pressures from the spread of invasive non-native species

Scale of pressure from invasive non-native species

In 2015, only 18 water bodies and one protected area were not in a good condition because of the impacts on their natural plant and animal communities of invasive non-native species. However, 150 water bodies are at risk of deterioration because of the potential for such species to spread to them from nearby water bodies (Figure 20).

Figure 20: Surface water bodies which are not in good condition, or at risk from the spread of invasive, non-native species (INNS).



Preventing the introduction and spread of invasive non-native species will provide a range of benefits, including:

- protecting Scotland's native wildlife, including species of national and international conservation importance;
- preventing impacts on economically important activities, such as angling and navigation.

Species currently posing the greatest risks

There are at least 30 invasive non-native species that have been found in rivers, lochs, estuaries or coastal waters somewhere in the UK. Around another 30 species have been identified that, although not yet present, could pose a significant risk to the condition of our natural aquatic plant and animal communities if they are introduced into the UK.[22]

Of the species already present in the UK, those posing a risk to the most water bodies in the district are the North American signal crayfish (90 rivers at risk) and the leathery sea squirt (40 coastal waters at risk).

Copyright Matt Brazier, Environment Agency

In rivers, the extensive burrows made by the North American signal crayfish can destabilise banks, causing erosion, and bank collapse. The animal also preys on young fish and their eggs, and competes with fish for food and habitat.

Copyright Chris Wood, Marine Conservation Society

The leathery sea squirt can compete for food with mussels or oysters and partially smother them. They also heavily foul ropes, buoys, moorings and boats.

22 www.wfduk.org/resources/alien-species-alarm-list

Actions to prevent the spread of invasive non-native species and diseases of wildlife

Our priority will continue to be minimising the risk of introduction and spread of invasive species. This is because, once established, it is currently not feasible to remove many of these species, including the North American signal crayfish and the leathery sea squirt. Even for species that can be removed, successful eradication is a significant challenge.

What we have already done

Between 2009 and 2015:

- we strengthened the legislative framework for controlling the introduction and release of non-native species, and set up a new statutory group to coordinate work under that framework;
- the Rivers and Fisheries Trusts of Scotland (RAFTS) and public bodies worked together to produce biosecurity plans for freshwaters;
- public bodies and other organisations worked together to produce marine biosecurity plans for the Firth of Clyde and the Shetland Islands;
- RAFTS, its members and public bodies worked to remove invasive plant species from the banks of rivers;
- public bodies and other organisations worked together to set up local Invasive Species Forums, to raise awareness of invasive non-native species and the steps that can be taken to prevent their spread;
- we produced a code of good practice explaining the risk posed by invasive non-native species and a specific code of practice on avoiding the introduction into Scotland of the fish parasite, *Gyrodactylus salaris*;
- we prepared a contingency plan for responding to the introduction of the fish parasite, *Gyrodactylus salaris*;
- we published a supplementary plan to guide river basin planning strategy and actions on invasive species over the coming years[23];
- public bodies supported work to investigate techniques for controlling the spread of North American signal crayfish, including trials in quarry ponds undertaken by Lochaber Fisheries Trust.

23 *Managing Invasive Non-Native Species in Scotland's Water Environment: A supplementary plan to the river basin management plan (2013)*, available at www.sepa.org.uk/media/37362/managing-invasive-non-native-species_plan.pdf

What we are going to do

During the period 2015 to 2027, we will continue the approach developed over the period 2009 to 2015:

We will take a zero tolerance approach to actions that could result in introductions of invasive species. Police Scotland will work with other public bodies to ensure legislation banning or restricting the possession, sale and release into the wild of invasive non-native species is rigorously enforced.

Public bodies and non-government organisations will continue to work together to raise awareness of how invasive species can spread and the steps businesses and the public need to take to minimise risks using biosecurity measures. This will include developing further biosecurity plans where appropriate.

Public bodies, voluntary organisations and other institutions will work together to carry out and coordinate the monitoring needed to give us early warning of the first appearance of new invasive species, including encouraging help from businesses and the public.

Where there are early warnings of the appearance of new species, we will take such rapid action as is feasible and proportionate to destroy or contain the species concerned before they can become established.

We will work with government administrations across the UK to ensure action is taken to reduce the risk of introductions via ship ballast water in line with protocols established by the International Maritime Organisation.

We will continue to support further research aimed at developing effective eradication methods.

What we expect to achieve

The programme of measures we have established will minimise the risk of introduction and spread of invasive non-native species and the risk of deterioration in the condition of surface waters.

9 Summary of our objectives for the Scotland river basin district

What we expect to achieve overall

We expect that, taken as a whole, the programme of measures we are planning over the period 2015 to 2027 will ultimately achieve a good condition in 908 of the 1,092 water bodies that are worse than good in 2015. It will also safeguard the quality of drinking water sources in drinking water protected area and achieve our improvement objectives for bathing waters, shellfish waters and the water bodies that protected areas for the conservation of internationally important wildlife depend on (Figure 21).

Figure 21: Expected improvements to the condition of the district's water bodies and protected areas as a result of the actions planned for the period 2015 to 2027

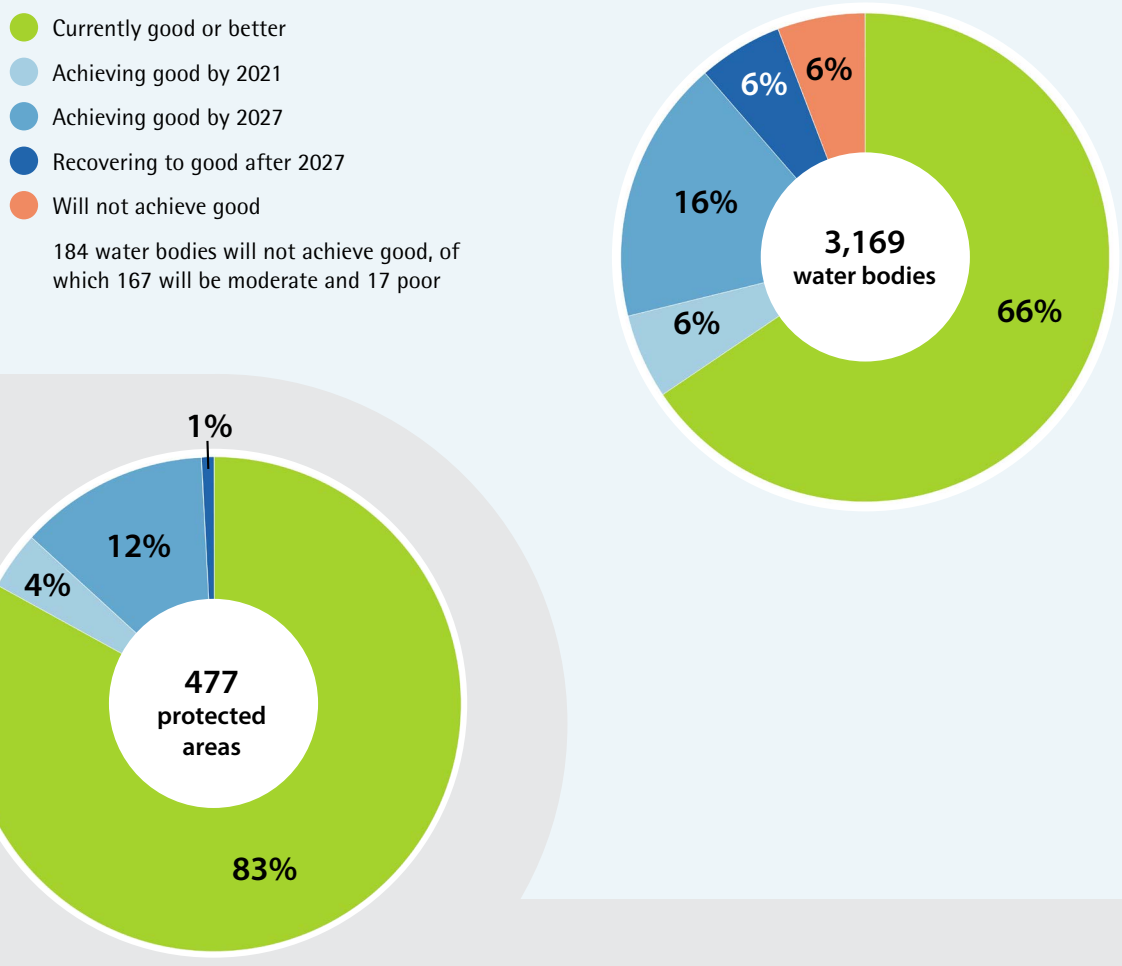


Figure 21 contd: Expected improvements to the condition of the district's water bodies and protected areas as a result of the actions planned for the period 2015 to 2027

	Bathing waters	Shellfish waters	Wildlife conservation areas
Currently good or better	64	28	304
Achieving good by 2021	12	1	5
Achieving good by 2027	1	50	8
Recovering to good after 2027	0	0	4
Total	77	79	321

Note to Figure 21

The information on protected areas for wildlife refers to the condition of the relevant aspects of the waterbodies that the area depends on. The achievement of an area's conservation goals may depend on factors other than the condition of the water environment or, in exceptional cases, may ultimately require the condition of the water environment to be better than good.

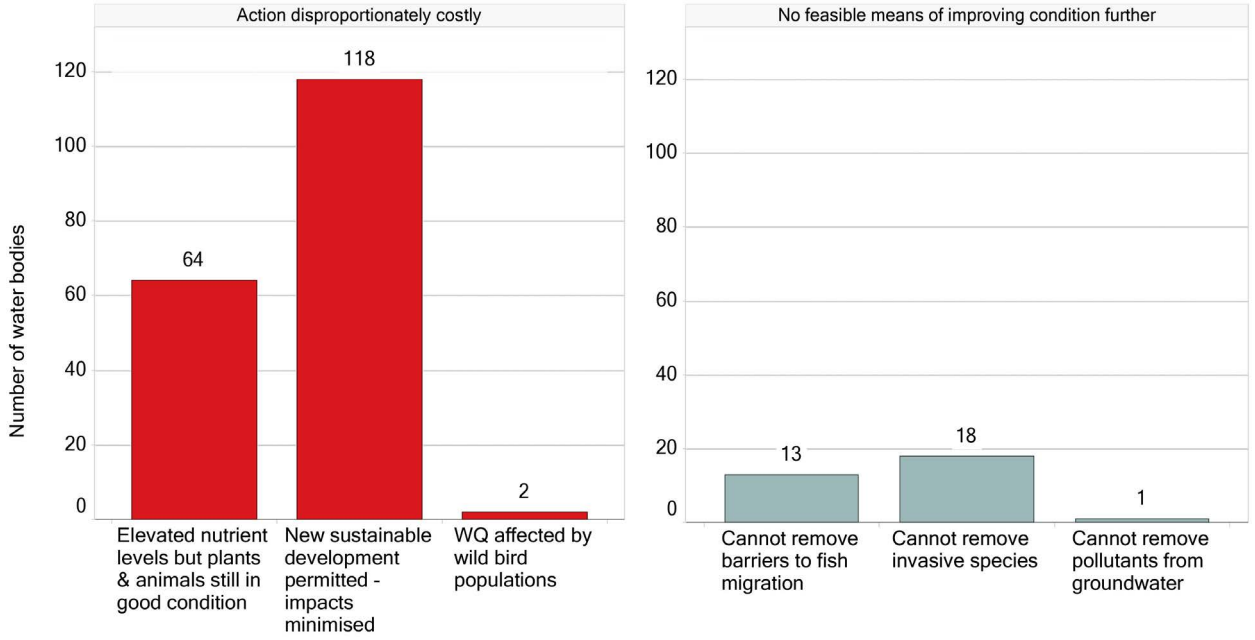
Where we cannot achieve a good condition

Achieving a good condition in some water bodies will not be possible. This is because it is not currently technically feasible to make all the improvements that would be necessary or because it would be disproportionately expensive to do so (Figure 22).

For 64 water bodies, further action would be disproportionately expensive because the condition of water plants and animals in the water bodies appears to be good even though concentrations of plant nutrients are elevated. We will undertake further investigations to confirm that this is the case and that action is unnecessary.

The vast majority of the remainder of the water bodies where we cannot achieve a good condition are affected by developments that we permitted between 2006 and 2015, principally for hydroelectricity generation. The authorisations for these developments required impacts on the water bodies concerned to be minimised, and we expect to still achieve a moderate condition.

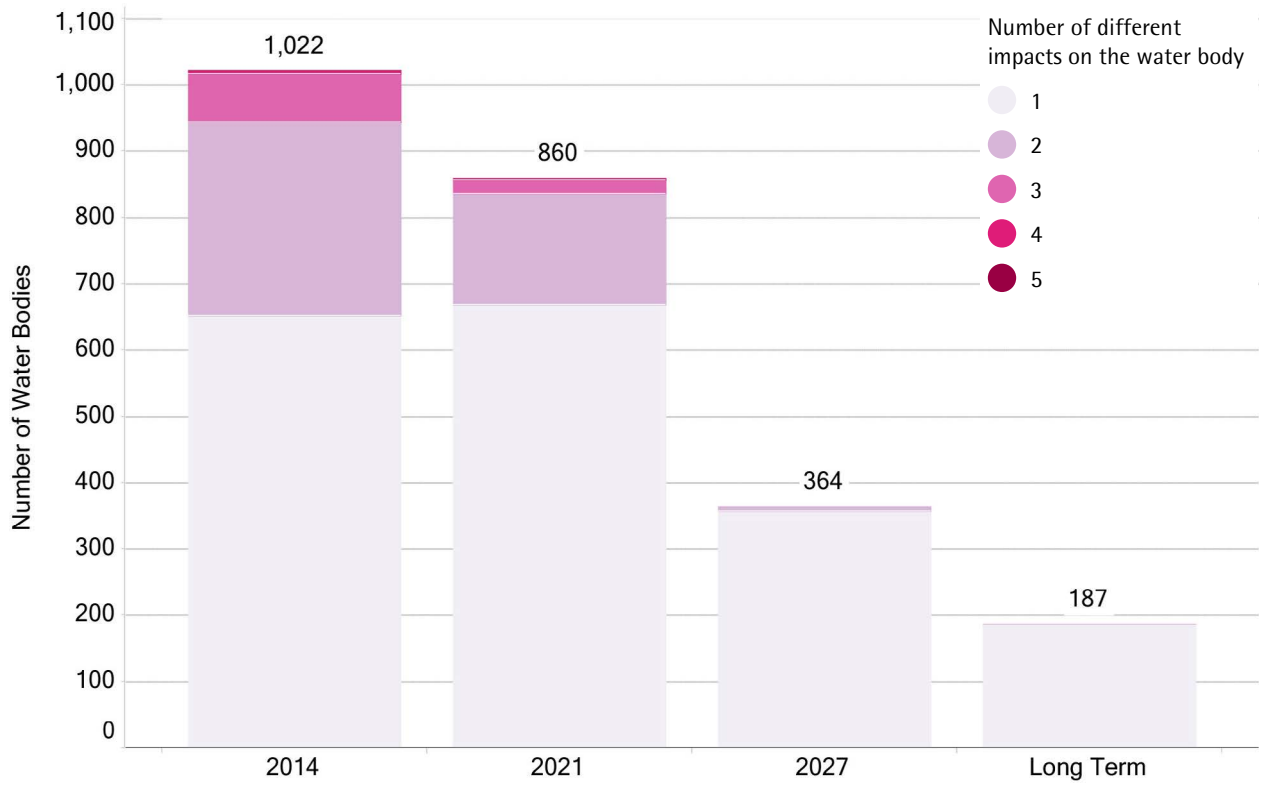
Figure 22: Summary of the reasons why we will not improve all water bodies to a good condition



Projected effect of the plan on the extent of pressures and the state of the water environment

As well as improving the overall condition of water bodies, the programme of measures will progressively reduce the number of water bodies that are subject to multiple impacts (Figure 23). This will ensure that even those water bodies that do not achieve a good condition will be under the least pressure possible.

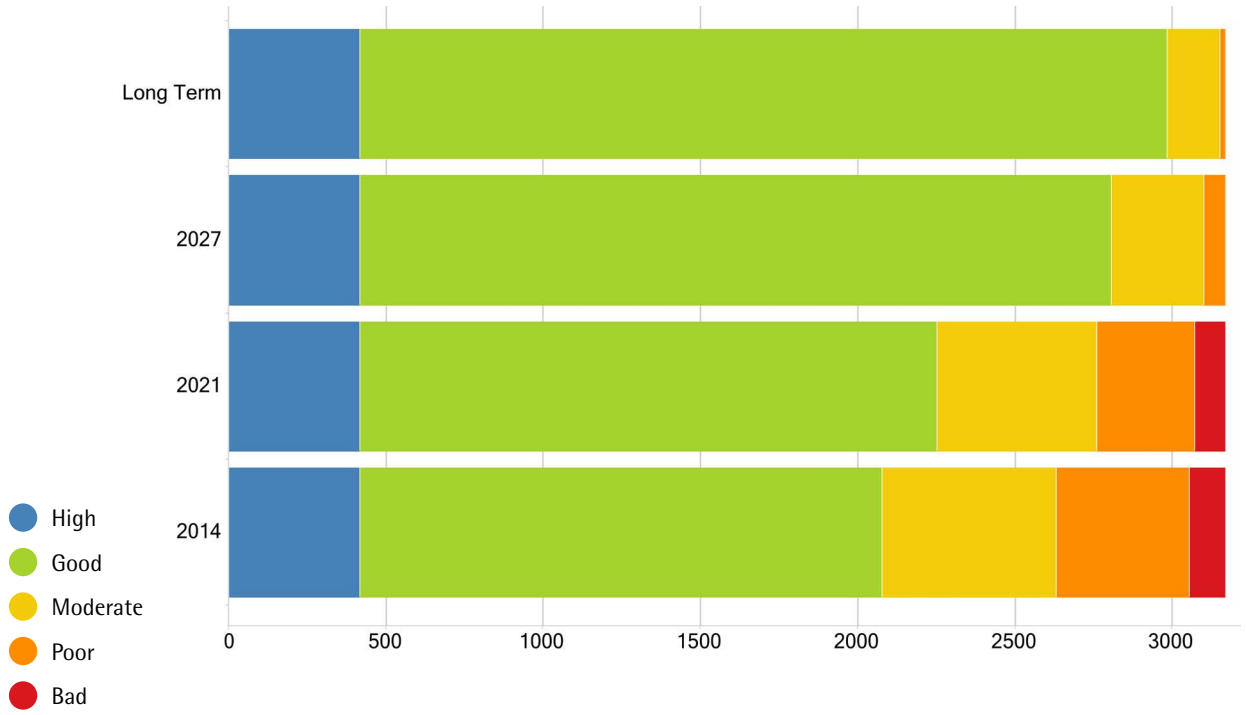
Figure 23: Expected progress in reducing the number of water bodies subject to multiple impacts



Our understanding of the condition of the water environment will improve and change over the period 2015 to 2027. It is also likely that over this period we will need to allow new modifications to some water bodies to facilitate sustainable development, reduce the risk of flooding or secure drinking water supplies. These factors make it difficult to make accurate projections about what assessments of the state of the water environment will look like in future years.

As an indicative guide based on our understanding of the state of the water environment in 2014, the measures we will implement over the period 2015 to 2027 would result in 88% of the water bodies in the district being in a good or better condition by 2027. Pressures on another 6% or so will have been addressed and they will be in the process of recovering to a good condition – although in some cases this may take several decades (Figure 24).

Figure 24: Projected condition of water bodies in 2021, 2027 and the longer term



Next steps

The main task now is to turn this plan into action, reversing the damage of the past and regenerating a healthy water environment teeming with wildlife and providing the high quality, high amenity waters that Scotland's businesses and communities need to thrive.

But it is also important we monitor progress towards achieving our objectives. As we implement the actions in this plan we will update and re-target our programmes of environmental monitoring and assessment to check that the actions taken have been effective and identify if and where we may need to do more.

We will publish a full report on progress in implementing measures at the end of 2018. In the meantime, SEPA will publish annual reports on the condition of the district's water environment.

We will need to continue to build our understanding of pressures on the water environment and how they are changing. This will enable us to respond early and prevent deterioration where pressures are increasing. It will also allow us to reprioritise where and when action is taken to improve the water environment so that our efforts are always targeted to best effect. Appendix 5 provides information on some of the further work we will be doing to improve our understanding of pressures between 2015 and 2021.