Delivering river basin planning in the Clyde catchment

May 2017

Contents

1. Introduction

This information pack was produced for Rosanna Cunningham, Cabinet Secretary for the Environment, Climate Change and Land Reform to provide additional information to supplement a visit to the Clyde catchment on 22nd May 2017. The visit was at the request of Scottish Government to highlight the improvements in water quality within the Clyde catchment, which have been delivered during the first cycle of river basin planning.

Ms Cunningham said:

"The Clyde flows through the very heart of Glasgow and for centuries the river has provided our largest city with a gateway to the world and a source of prosperity.

"However, since industrialisation in the early 1800s, we've abused this river, tipping our waste into it without a second thought for the impact it has on the communities living along the banks, water quality or the wider environment.

"That's why I am delighted to see further evidence that we have secured a lasting change in the Clyde's fortunes.

"These improvements are down to the hard work of SEPA and its partners and are the result of Scottish Water's investment of more than £600 million, much of which has already been delivered or is being delivered as we speak.

"That hard work and investment has seen water quality improve, aquatic species return to the waters, and an end to the stench which once made residents' lives a misery.

Ms Cunningham at Stane Garden, Shotts

Ms Cunningham at Dalmarnock WWTW

2. River basin planning in the Clyde catchment

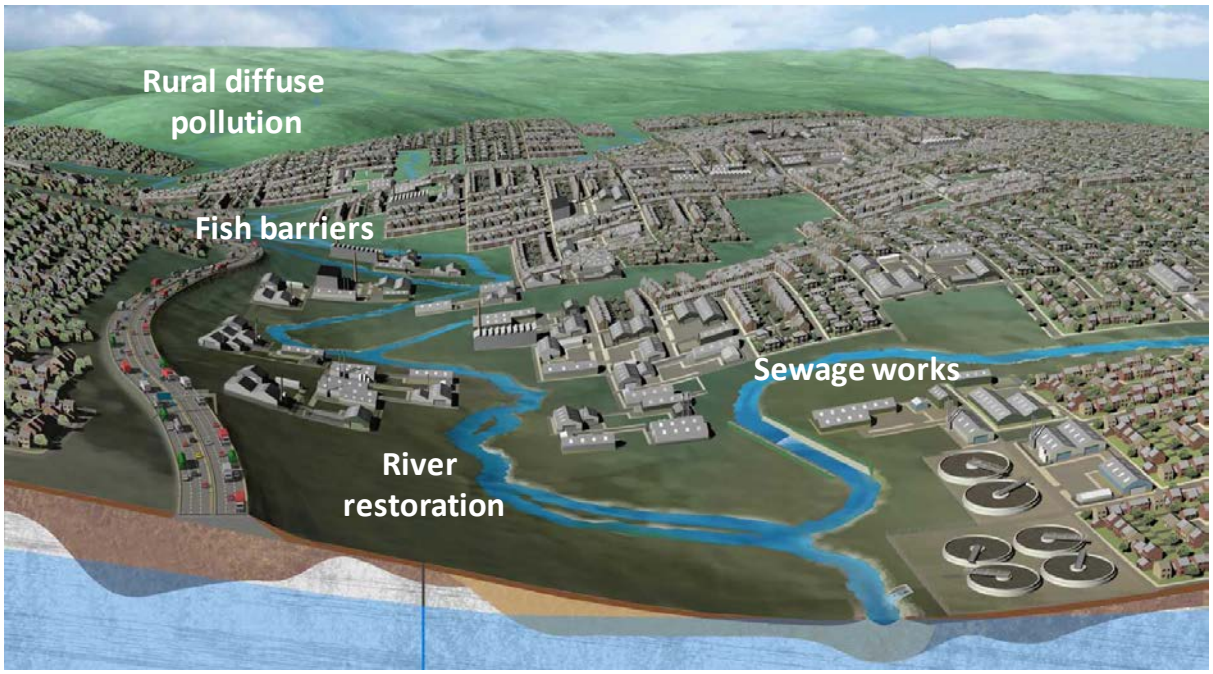
Scotland's River Basin Management Plans set out key objectives for improvement of Scotland water environment. At present 63% of water bodies in Scotland are at 'good' or better status. The work set out in the second plan(published December 2015) aims to ensure that 87% of water bodies are at 'good' status by 2027.

Using examples from across the Clyde catchment, this summary provides an insight into some of the ways SEPA are working with partners to get the balance right in a complex catchment.

The Clyde is a busy urban catchment, which we use in many different ways; for wastewater disposal, manufacturing, recreation, navigation, water supply and agriculture.

There are many pressures that result from our need to use the Clyde and which result in changes to the ecology and chemical water quality of the river, changes in the amount of water available and physical changes to the form of the river. These different pressures on the water environment can have a negative impact alone and in combination.

The challenge for river basin planning in the Clyde (and across Scotland) is to find the balance that allows us to manage the pressures in a way that protects the water environment, whilst still meeting the needs of a healthy and growing Glasgow.



River basin planning in a busy urban catchment

Figure 1 catchment illustration

3. Pressures on the water environment

Rivers are essential for people's health and well-being as well as supporting a sustainable economy. We must work together in partnership to deliver improvements and get the balance right for sustainable development. The Clyde catchment is home to approximately 34% of Scotland's population. The River Clyde is 170km long, Scotland's third longest river.

Individual pressures are recorded so that we can map out where the pressures are within a catchment and better target our approach to addressing them. The pressures in the water environment have been split into five categories: water quality, physical condition, access for fish migration, flows and levels and freedom from invasive non-native species. All of these pressures are present in the Clyde catchment.

In delivering the River Basin Management Plans, SEPA is moving from traditional environmental regulation to a complex integrated approach, based on partnerships. Three types of measures are delivering river basin planning, we will spend the day looking at examples of them in the Clyde:

- Traditional regulatory measures – wastewater and land remediation
- Diffuse pollution measures – rural diffuse pollution
- River restoration – fish barriers and urban restoration project

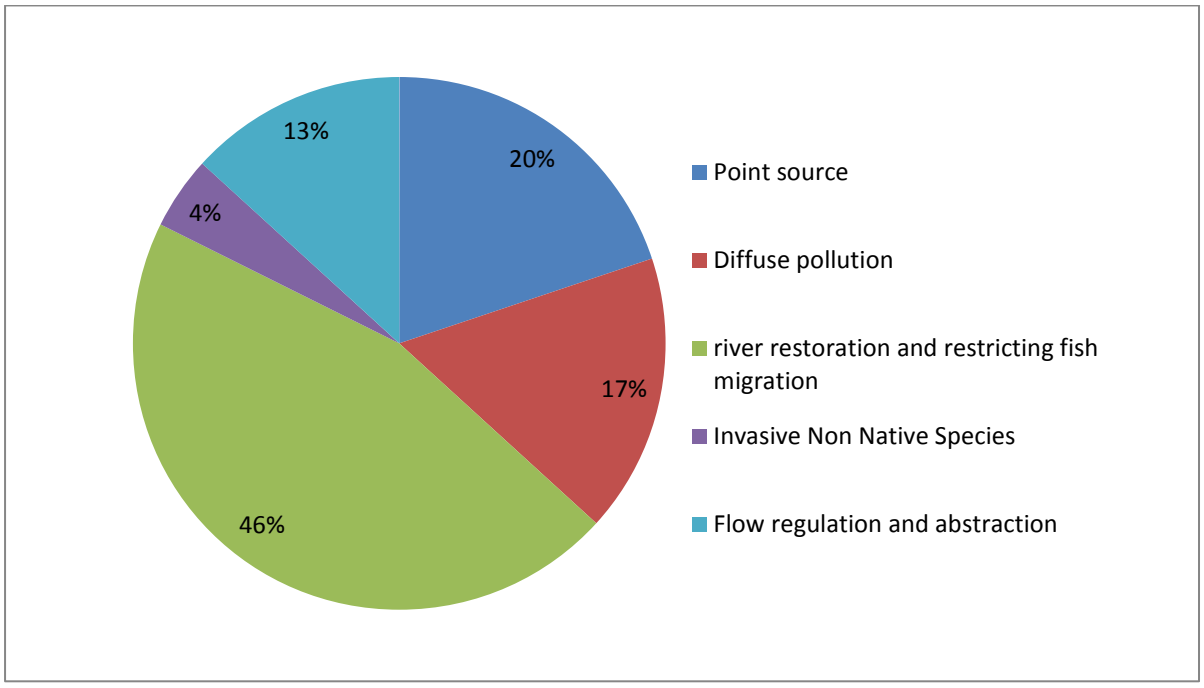


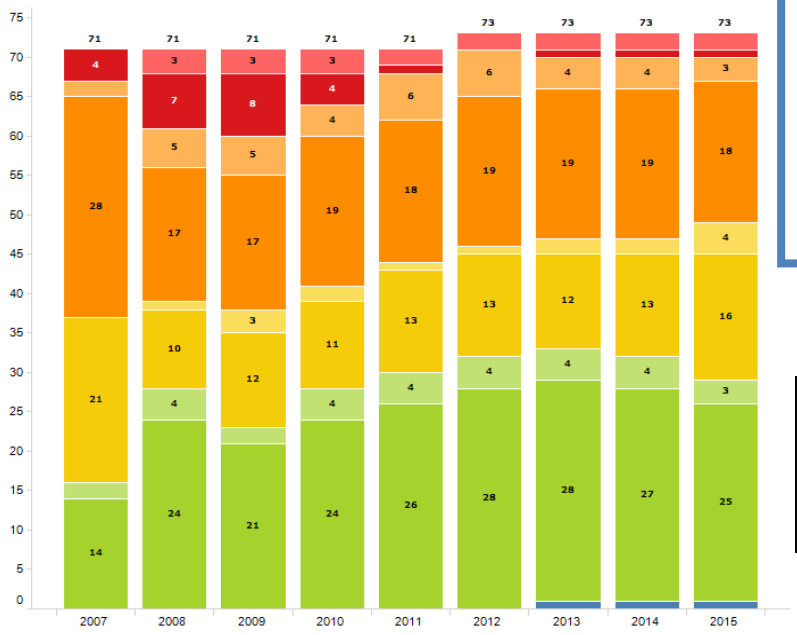
Figure 2 pressure types in the Clyde catchment

4. Water Quality in the Clyde

Figure 3 River Clyde catchment current classification (2015)

- There are 73 water bodies in the Clyde catchment of which 29 were at Good status or better in 2015.
- The River Basin Management Plan has set a target to improve the remainder to Good status by 2027.
- The Lower River Clyde which flows through Dalmarnock and Glasgow Green was classified as Moderate status by SEPA in 2015.
- The classification is made up of a large number of monitored parameters, many of which are now at Good (Oxygen, Ammonia). Phosphorus is at Moderate in 2015.
- Invertebrates, which are a key indicator of water quality, have improved from Bad in 2013 to Moderate in 2015.
- There are three water bodies classified as having Bad status in 2015, a reduction from 10 in 2008.
- The Westruther Burn improved from Good to Excellent in 2013 and has remained Excellent.

Figure 4 River Clyde catchment classification improvements 2007 – 2015 **(number of water bodies)**



	Excellent
	Good
	Moderate
	Poor
	Bad

5. Salmon in the Clyde

The industrial revolution created a legacy of water quality and physical barriers which meant that salmon became extinct from the Clyde by the early 1900s.

Environmental improvements, particularly to water quality, saw the return of salmon to the lower reaches of the Clyde in the early 1980s.

SEPA has used a combination of monitoring data and numerical modelling to investigate the improvements to water quality. We have found that positive changes within the Clyde, like oxygen levels have increased dramatically over the past few decades, primarily due to:

- Improvements in sewage treatment
- Reductions in industrial inputs
- Less dredging, which results in faster flushing of pollutants

Oxygen levels in the Clyde can however still drop and cause fish kills under certain conditions around the Tidal Weir. A combination of factors such as warm temperatures, low river flows and high intensity rainfall can result in low oxygen concentrations which can produce a significant fish kill. SEPA operates a continuous water quality monitoring station at the Tidal Weir and further actions are being considered to reduce the risk of future fish kills.

Fish barriers continue to limit the migration of salmon within the Clyde. The installation of fish passes on the River Avon weirs in 2016 is a major step forward, opening up important spawning grounds upstream. The Clyde is now ranked 14th in Scotland for the number of salmon caught in 2015 (992 Atlantic salmon).

Further barrier removals and river restoration projects have been identified for delivery in coming years.

6. Point source pollution: wastewater treatment within the Clyde catchment

Key messages:

- The River Clyde has improved from Bad water quality in 2007 to Moderate water quality in 2015 as a result of investment by Scottish Water to date across the catchment and in particular, improved licence compliance and discharge quality at key sewage works.
- Further improvements to the sewerage network are ongoing to improve the water quality and reduce sewage litter in the Clyde's tributaries.
- SEPA and Scottish Water are continuing joint work to determine whether any further upgrades will be required to achieve Good water quality in the Clyde.

6.1 Wastewater improvements in the River Clyde

Significant improvements in the water quality of the River Clyde over the past 9 years are a direct result of capital investment and improved operations at Scottish Water's wastewater treatment works (WWTW).

Advanced treatment was installed at large Daldowie Wastewater Treatment Works (WWTW) in 1999. Further upgrades have been specified by SEPA for wastewater treatment works at many towns in the catchment and delivered by Scottish Water through the Quality & Standards programme during 2010-2015.

During the same period, changes in Scottish Water's operations at Daldowie WWTW and Dalmarnock WWTW have contributed to better river water quality, due to a better quality of effluent being produced than required by the licence.

In 2015, SEPA took regulatory action to require Scottish Water to improve sewage storm tank operations at Dalmarnock WWTW, which has also had a positive impact on water quality.

The net result of this investment has been a steady improvement in water quality in the main stem of the River Clyde, which was classified as having Bad water quality in 2007 but now has Moderate water quality.

Further improvements are being carried out during 2017-18 at Dalmarnock and Daldowie WWTW to the meet the minimum water quality standards required under the Urban Wastewater Treatment Directive.

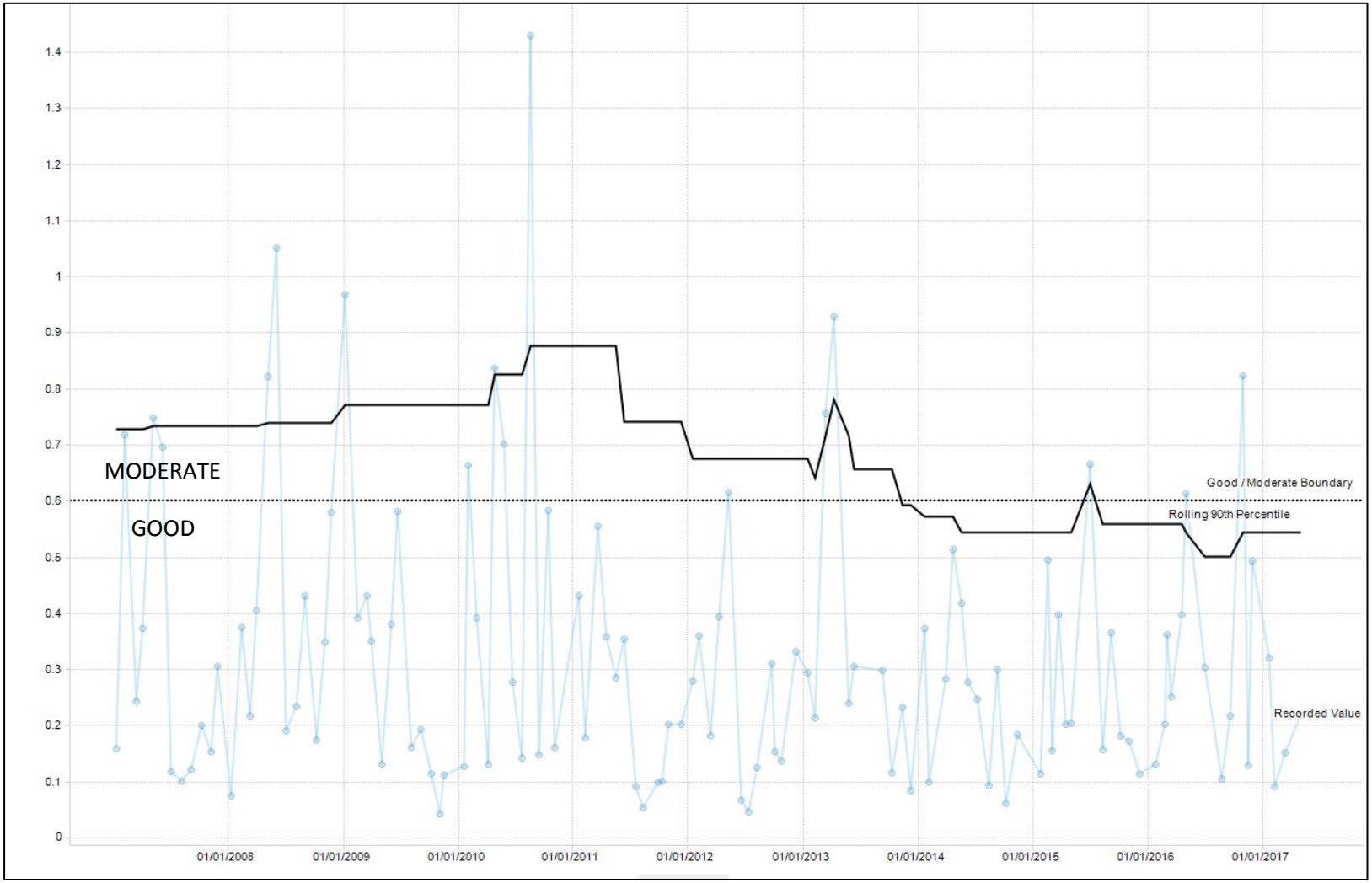
SEPA and Scottish Water are continuing joint work to determine whether any further upgrades will be required to achieve Good water quality in the River Clyde.

Figure 5 Wastewater improvements and the Clyde catchment

River *(and some communities through which the river flows)*	**Number of Wastewater Treatment Works (WWTW)**	**Number of sewer overflows to be improved**	**SEPA Water Environment Monitoring**		**Water Environment Objective (in River Basin Management Plan)**		
			2007	**2015**	**2021**	**2027**	**2033**
River Clyde (North Calder to Tidal Weir) *in Carmyle, Rutherglen, Dalmarnock*	2	37	Bad	Moderate	Moderate	Good	Good
River Clyde (Strathclyde Loch outflow to North Calder) *in Bothwell Uddingston*	4	17	Moderate	Moderate	Moderate	Moderate	Good
River Clyde (Mouse Water to Strathclyde Loch outflow) *in Carluke, Wishaw, Larkhall*	3	4	Poor	Moderate	Moderate	Moderate	Good
South Burn *in Airdrie-Coatbridge*		16	Bad	Bad	Good	Good	Good
North Calder Water (Hillend reservoir to Shotts Burn) *in Caldercruix, Plains, Dunrobin*	1	14	Poor	Poor	Good	Good	Good
South Calder Water (Tillan Burn to Strathclyde Park) *in Motherwell*	2	14	Poor	Poor	Good	Good	Good
Shirrel Burn, Thankerton Burn and Legbranock Burn *in Holytown and Bellshill*		5	Bad	Bad	Poor	Good	Good
Shotts Burn *in Salsburgh, Chapelhall*		1	Poor	Poor	Moderate	Moderate	Good
Malls Mire Burn, Polmadie Burn and Cityford Burn *in Spittal, Rutherglen, Shawfield*		5	No data	Bad	Bad	Moderate	Good
Inner Clyde Estuary *Through Glasgow city centre, Renfrew, Clydebank*	4	72	Bad	Moderate	Moderate	Good	Good
Other rivers in Greater Glasgow catchments (Kelvin, White Cart etc)	2	173					
Total wastewater improvements	**18**	**445**					

Figure 6 Ammonia concentrations in the River Clyde (tidal weir monitoring point) 2007-2017

Ammonia can be toxic to aquatic life.The water quality classification is based on the rolling 90th percentile, which improved to Good for the first time in 2013.



6.2 Urban Wastewater Treatment Directive

This European Directive requires treatment to be installed at large wastewater treatment works, shown on this map by purple dots. The Clyde is designated as a Sensitive Area due to the risk of it becoming “eutrophic” (caused by pollution-derived nutrients which disturb the river’s ecosystem). This designation means that the WWTW were required to have nutrient removal treatment installed by 2013. Treatment was installed at many upstream works during the period 2010-2013, however it was agreed to delay installation at Dalmarnock and Daldowie WWTW to find the most cost-effective solution, which is currently being trialled at these works.

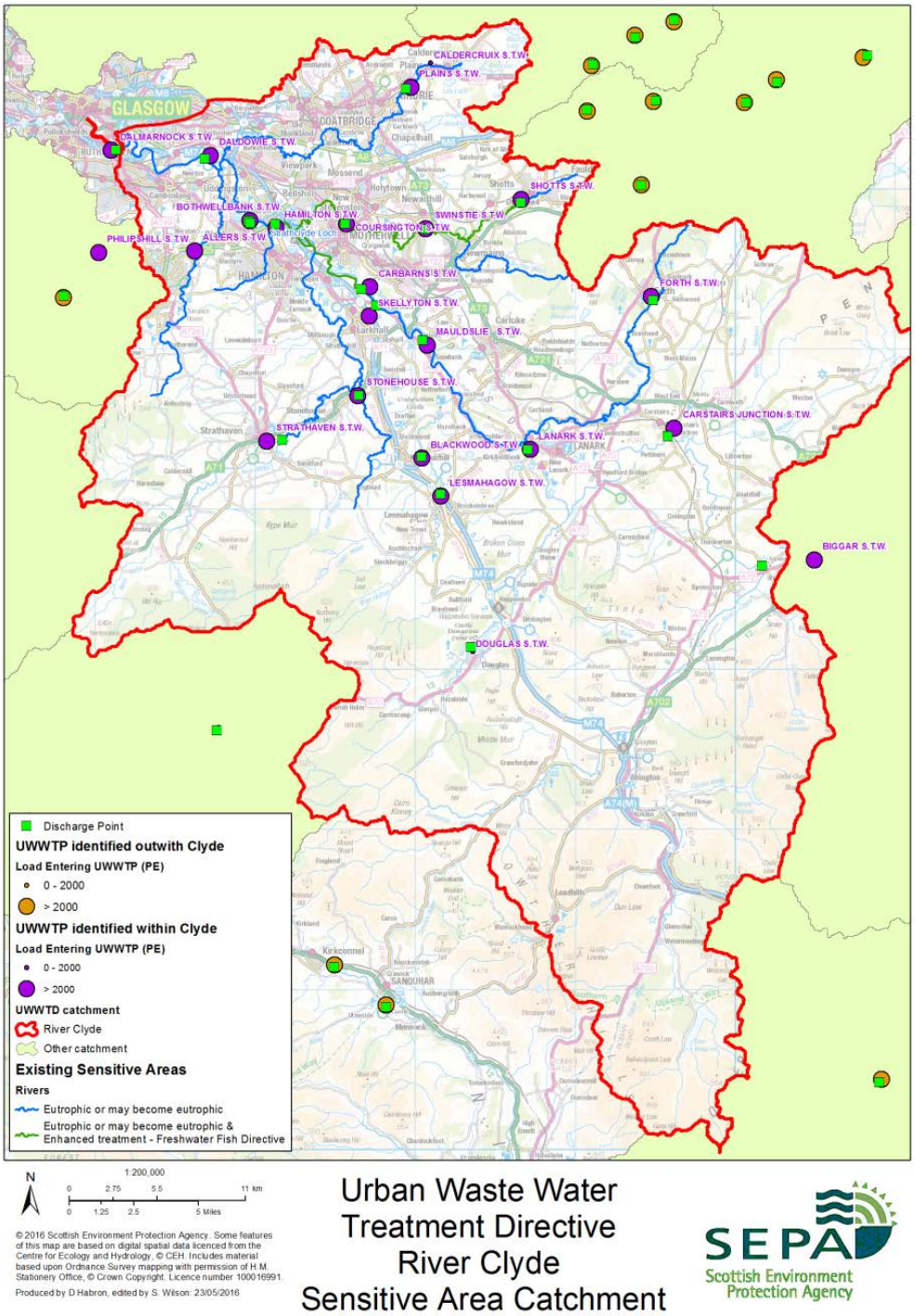


Figure 7 Urban WWTD Sensitive catchment area

6.3 Upgrades at Wastewater Treatment Works in the Clyde 2002-2017

Wastewater Treatment Works	Population Equivalent (2015)	Treatment Upgrade Date
Philipshill (East Kilbride)	60,996	2009
Mauldslie	15,302	2012
Hamilton	63,174	2012
Lanark	13,224	2012
Carbarns	46,610	2012
Swinstie	11,458	2012
Shotts	9684	2012
Blackwood	4600	2012
Strathaven	7,765	2014
Allers (East Kilbride)	42,247	2014
Plains	5365	2014
Caldercruix	3500	2014
Lesmahagow	7713	2014
Carstairs	2945	2014
Bothwellbank	25,055	2015
Coursington (Motherwell)	7,662	2015
Stonehouse	5289	2015
Skellyton (Larkhall)	15,111	2016
Daldowie	269,679	2017 (ongoing)
Dalmarnock	231,125	2017 (ongoing)

River Clyde at Dalmarnock wastewater treatment works 2017

6.4 Sewer overflows in the Clyde and its tributaries

- There are over 600 sewer overflows in Greater Glasgow, which should only spill during heavy rainfall so as to avoid sewer flooding in houses and gardens.
- Many overflows in Glasgow are not designed correctly for modern drainage systems and are polluting smaller tributaries in the Clyde catchment with sewage and litter.
- Scottish Water and SEPA identified over 400 overflows across Glasgow which are in an unsatisfactory condition and Scottish Water is delivering a phased programme of improvement over the period 2010-2027.
- This programme will address the issues associated with these overflows, such as pollution and sewage-related debris.
- This work is being undertaken in collaboration with the Metropolitan Glasgow Strategic Drainage Partnership (MGSDP)

Figure 8 Typical pollution caused by unsatisfactory sewer overflows

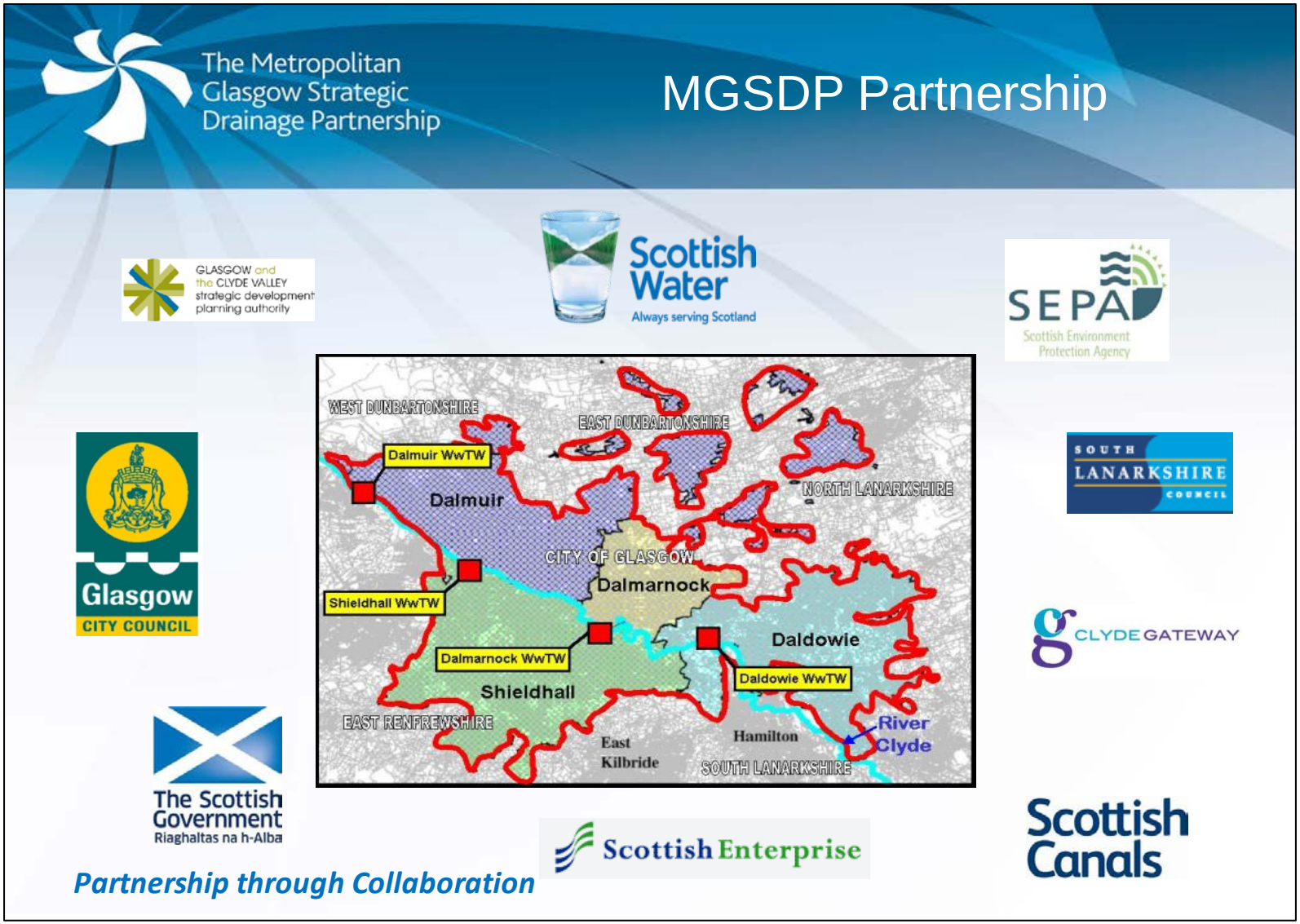


Figure 8 MGSDP partners

7. Wastewater Management in Glasgow

Key messages:

- Significant investment in WWTW and sewer overflows has been made across the city to date as part of the Scottish Water Glasgow Environment Programme, launched in 2013 by Nicola Sturgeon.
- Recent maintenance expenditure and state of the art operational control has achieved better discharge quality. Further works are planned at Daldowie and Dalmarnock WWTW in the next 2 years to modernise the site.
- A new treatment process is being successfully trialled at both works to achieve minimum EU standards.

Glasgow's wastewater system has evolved over many decades to support the growth and development of the city. With the imperative to provide safe drainage and sanitation the focus in recent decades, particularly since the creation of Scottish Water, has been to address the environmental legacy in the Clyde and deliver a drainage system fit for the 21st century.

Serving a quarter of the population of Scotland, Glasgow's wastewater is drained through over 10,000km of sewers across 5 sewer network catchments, each draining to a treatment works and subsequently to the Clyde:

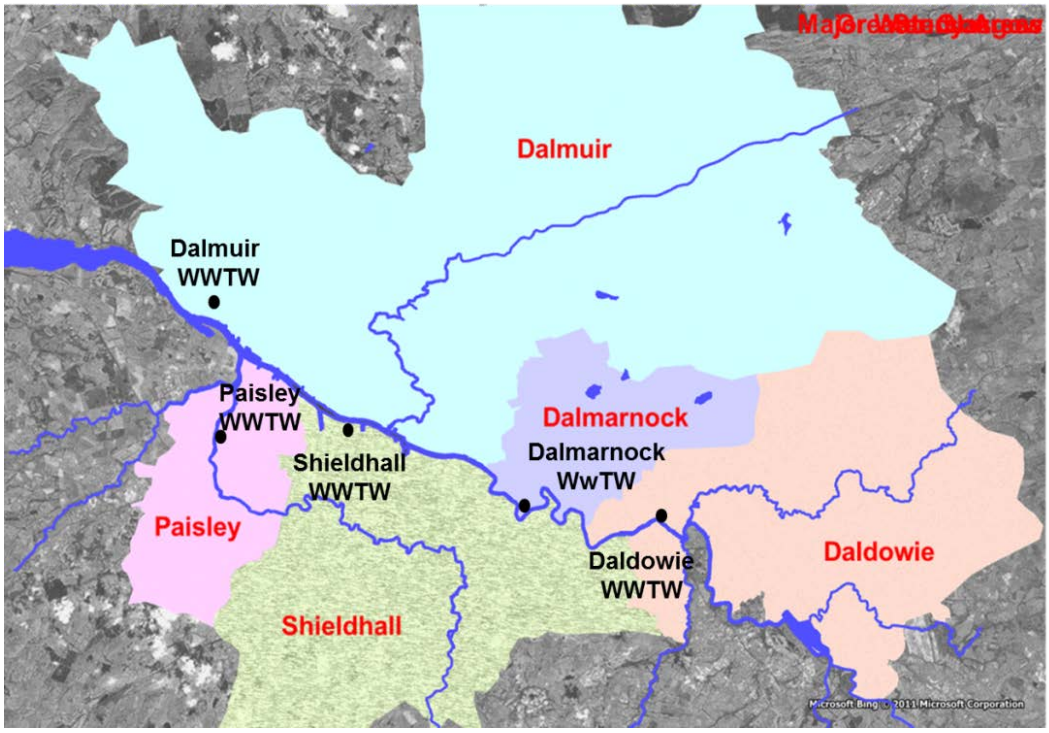


Figure 9 WWTW catchment map

The 5 treatment works and sewer catchment serve around a quarter of the population of Scotland:

Works	Population Equivalent	Licensed flow
Daldowie	184,000	2,400 litres per second
Dalmarnock	260,000	5,200 litres per second
Dalmuir	435,000	4,300 litres per second
Paisley	250,000	2,470 litres per second
Shieldhall	570,000	7,600 litres per second

As well as drainage from homes and businesses, in keeping with much of the country the system combines both sewage and surface water (rainfall) drainage. With a typical rainfall of 1200-1400mm per annum in the Glasgow areas Scottish Water manages around **400 million cubic metres** of wastewater per annum.

Flows that exceed the hydraulic capacity of the system are spilled to watercourses through circa 600 Combined Sewer Overflows (CSOs) across the city. CSOs are a means to relieve pressure and prevent flooding of homes and businesses. Well designed, these should not be detrimental to the environment, but this is a major area of enhancement identified for the city.

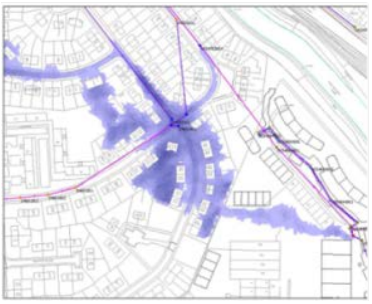
7.1 Enhancing Glasgow's Wastewater System: evidence based decisions

Key to enhancing Glasgow's wastewater network is good decision making. The scale and complexity of the system and its interaction with the environment required extensive study to determine the flooding and environmental needs, and the solutions to be delivered.

In collaboration with SEPA, Scottish Water delivered the £10m Glasgow Strategic Study across Glasgow's catchments to identify all flooding and environmental needs, the causes and the options to deliver improvements. This identified major challenges for delivery:

350
Improvements to overflows

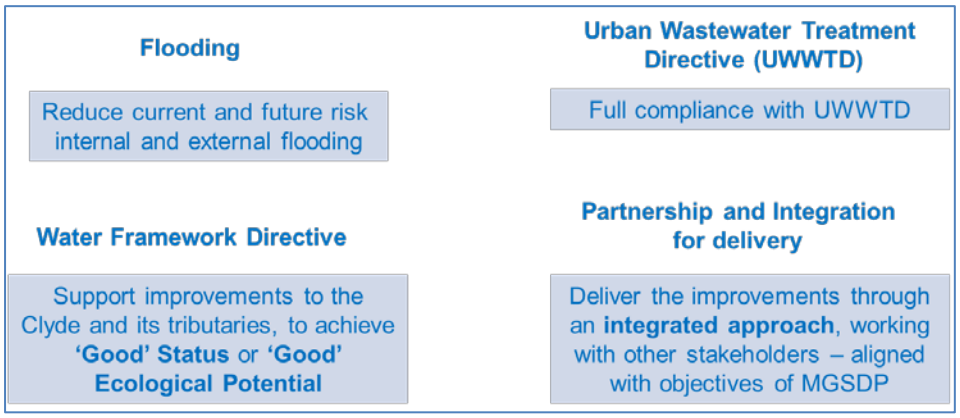
60
Hydraulic schemes



150
flooding locations

Of 600 CSOs, more than half required enhancement to provide screening (remove debris), reduce spills to meet environmental needs, or increase capacity to address flooding. In addition, significant enhancement was identified for two of Glasgow's wastewater treatment works, Daldowie and Dalmarnock to remove phosphorus.

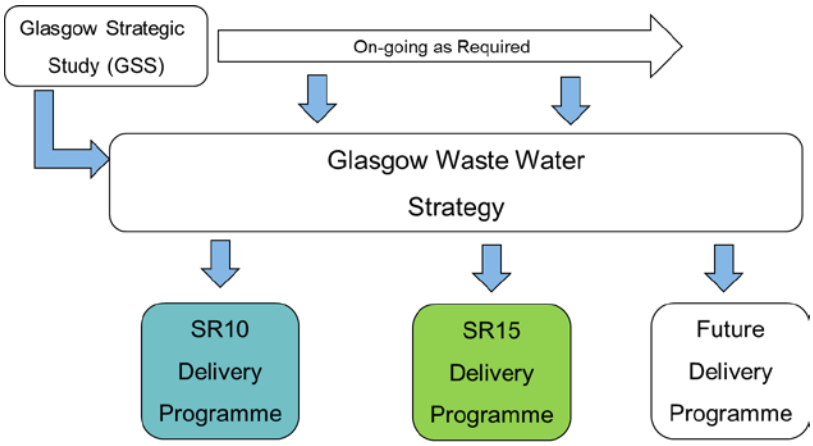
The Glasgow Strategic Study supported the development of the Glasgow Wastewater Strategy, which in turn informs the environmental and flooding programmes for delivery. The Glasgow Wastewater Strategy sets the following 4 objectives:



Partnerships to support delivery

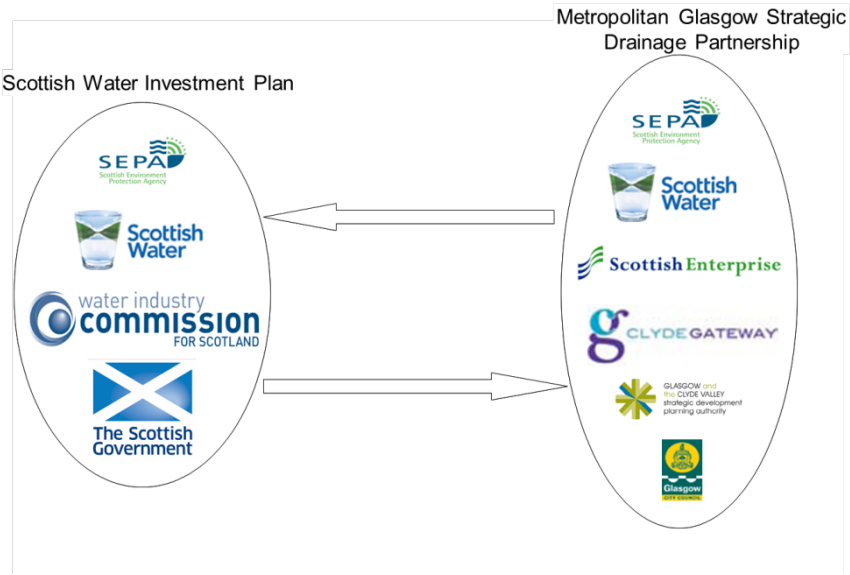
The scale of enhancement required meant that this needs to be programmed over long periods to enable work to be affordable and delivered in a way that minimises disruption.

This required partnership working with SEPA, Scottish Government and the Water Industry Commission to secure agreement over the work to be delivered and financing the delivery. A key principle is that we will study to understand the needs and programme delivery within the Quality and Standards process. This has enabled the Glasgow Environmental and Flooding Programme to be studied, planned and programmed, with periodic updates as new information becomes available:



Wider partnership working is vital, reflecting the range of stakeholders and parties responsible for managing water and drainage across the Clyde catchment. The Glasgow Programme needs to integrate with other initiatives for example local authority projects to manage surface water and flooding across the city.

The **Metropolitan Glasgow Strategic Drainage Partnership (MGSDP)** is a model for how this may work, bringing together key stakeholders to promote integrated and strategic action to support economic development, reduce flood risk and improve the environment.



Delivery to date

Scottish Water has invested substantially to enhance Glasgow's wastewater system in the SR10 and SR15 regulatory periods, with more planned for SR21. To date Scottish Water has:

- Enhanced 180 unsatisfactory discharges to remove environmental impacts
- Addressed flooding at 137 properties
- Delivered work to secure compliance at Daldowie and Dalmarnock WWTWs

Scottish Water expects to invest around £260m in Glasgow during the current investment programme, and the scale of this is shown in the following projects:

Elmvale Row Flood Alleviation Scheme

Objective – to relieve significant flooding in the local catchment impacting 34 properties.

Two major tanks of 25m diameter x 20m deep were created to provide 13,500m^3 storage capacity which will provide flood protection up to a 1 in 30 year storm event. The work was delivered in close proximity to residents and the local primary school, which adds to the complexity of delivery.

7.2 Shieldhall Tunnel

Objective – to provide a relief sewer to convey flows and provide capacity in the wider catchment to reduce flood risk and support environmental enhancement.

Currently located beneath Pollock Park, the tunnel boring machine “Daisy the Driller” has now reached the halfway point of the 5km tunnel. At 4.7m in diameter this will be the largest sewer in Glasgow when completed, and has presented major engineering challenges at the launch site in Jura Street to seek to minimise the impact on the community.

Launching “Daisy the Driller” – Shieldhall Tunnel Boring Machine

Future investment

The Glasgow environmental and Flooding Programme will continue to form a key part of Scottish Water’s investment in the coming years to address customer flooding and support Good Status in the Clyde under the Water Framework Directive. The outline programme is complex and will be revised as new information becomes available to ensure we continue to adhere to the principle of evidence based decision making.

8. Shawfield regeneration

Key messages

- The key challenge for Shawfield is the legacy of the chromium contamination from the former Whites Chemical Works which is impacting on the quality of the River Clyde and is carcinogenic and therefor a threat to human health.
- A partnership approach was needed with Clyde gateway, SEPA, Scottish Water and South Lanarkshire Council working together.

Clyde Gateway are tackling large areas of vacant and derelict land to create new employment opportunities, new homes and an improved environment for existing residents and those new to the area.

One of the first steps during phase 1 was to build the bridge spanning the Clyde at Shawfield to provide quick access to the new transport hub at Dalmarnock Station.

Remediation of Phase 1 is complete at a cost of £16m with the first commercial building being delivered on site by Clyde Gateway (funded by CG, Scottish Government and South Lanarkshire Council).

Chromium levels in Phase 2 are significantly higher than those in phase 1. A Remediation Strategy is being prepared with product trials currently taking place on site. Funding for the project remains challenging.

Samples contaminated with dissolved chromium from Shawfield

9. Rural Diffuse pollution

Key messages:

- Scotland is recognised across the world as leading the way in tackling rural diffuse pollution
- Our diffuse pollution regulations allow us to ensure good practice. We have worked closely with NFU to make sure land managers know their environmental responsibilities.
- Working with partners under Farming and Water Scotland, a joint initiative promoting awareness of GBRs and rural diffuse pollution.

SEPA is tackling diffuse pollution as a key part of our work to improve the quality of Scotland's water environments, in line with the objectives set out in the River Basin Management Plans.

Diffuse pollution can be tackled by improving farmland practices, engaging with land managers and encouraging behavioural change on the ground to achieve compliance with regulations. Typical changes include increasing buffer strips to reduce agricultural run-off into watercourses.

One-to-one farm visits by SEPA staff have been very effective in encouraging landowners and land managers to tackle rural diffuse pollution. Our initial visits during 2010-2015 found that 35% of farms were compliant with regulations. Over the last two years we have revisited 1,602 farms. 86% of these farms are now either compliant or have started remedial work.

Pollution from farm slurry run-off

Buffer strips significantly reduce diffuse pollution from fields into burns

9.1 Raising awareness of diffuse pollution

SEPA is working in partnership with Scotland's Rural College to launch an awareness raising campaign under the brand of "Farming and Water Scotland". The brand encompasses both regulatory messages and advice for farming business on diffuse pollution and the General Binding Rules. Farming and Water Scotland were at 40 agricultural shows across Scotland during the year.

Scotland's Rural College website hosts a range of information packs on how diffuse pollution can arise and how to avoid it. Diffuse pollution commonly results from careless application of slurry, manure or artificial fertilisers onto fields, or from poor drainage around farm buildings. Simple precautions are discussed, such as keeping a 10m buffer zone around

watercourses, avoiding periods when heavy rain is predicted or spreading on frozen or waterlogged land.

Poor drainage around farm buildings is also a common cause of diffuse pollution. "Steading Drainage – know the rules" discusses how to collect run-off polluted by slurry and silage effluent, and avoid polluting drainage ditches and local watercourses. The website lists the possible benefits of reducing diffused pollution, beyond simply keeping on the right of the regulations. These include improving livestock health by reducing the risk of transferring disease downstream and using nutrients more efficiently through reduced fertiliser or slurry run-off.

9.2 Priority catchments for diffuse pollution

SEPA has identified 57 "priority" catchments where diffuse pollution is causing impacts on water quality. During the first River Basin Management Plan period (2009-2015), SEPA worked through a programme of farm visits in 14 priority catchments.

During the second River Basin Management Plan period, we have set an aspiration to complete rural diffuse pollution work in 43 newly identified priority catchments by 2021. We have made good progress with 821 initial one-to-one visits to land managers being completed so far in the following catchments: Whiteadder, Dighty (Dundee area), Dundee coastal, Tweed, Stonehaven, Nairn, Ken/Dee, Urr, Water of Girvan, Dumfries coastal and Annan catchments

Farm visits are scheduled to begin in the Clyde catchment from 2019.

- SEPA will be working closely with land managers in the Clyde catchment from 2019 to address diffuse pollution.
- Current work is focusing on other Scottish catchments where SEPA has improved compliance by famers from 35% to 86%.
- SEPA continues to respond to environmental pollution events caused by agricultural practices when these are identified.

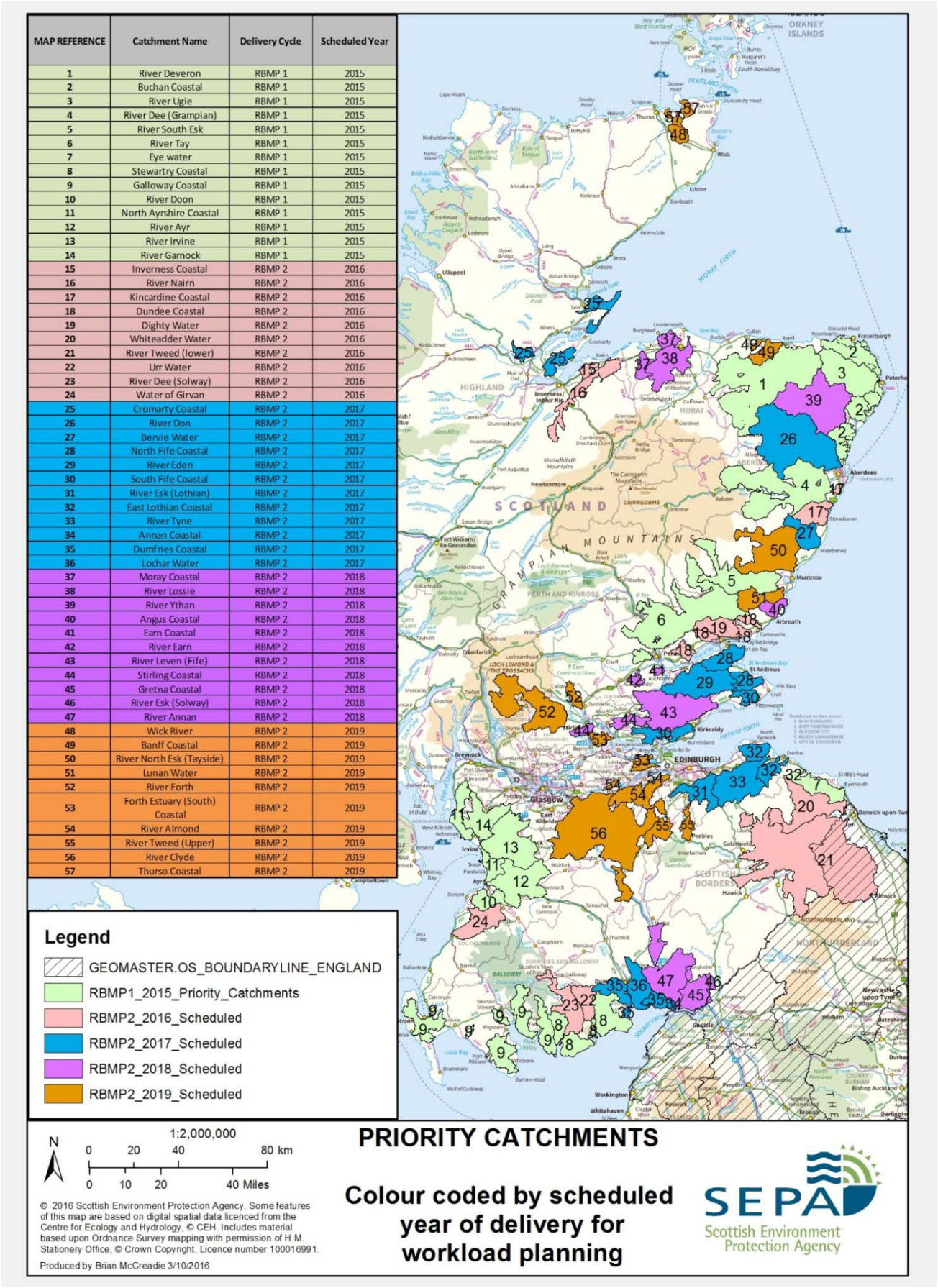


Figure 10 Priority catchments

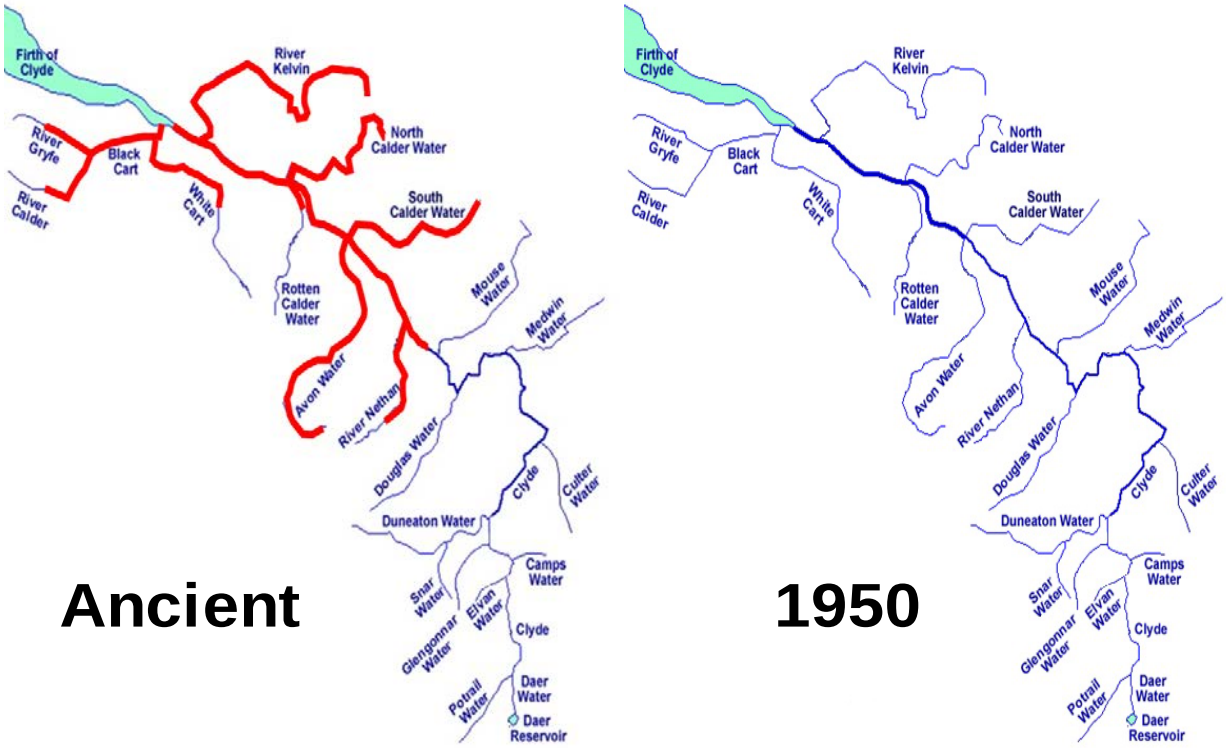
10 Restoring fish passage

Key messages:

- Salmon have successfully returned to the Clyde, but many kilometres of spawning grounds are still blocked by old dams.
- In the Clyde catchment 14 barriers have been identified; 12 have been prioritised for action by 2021. There are 373 barriers across Scotland which require improvements.
- Because of these fish barriers, 21 of the 78 water bodies in the River Clyde catchment have been classified as being at Poor for fish access in Scotland's RBMPs. The actions planned by 2021 will restore 19 of these water bodies to Good for fish access.
- With partners, and using Water Environment Fund (WEF) funding, we have opened up 150 km of river so that they are accessible to fish. People have already reported seeing fish running the pass.

Figure 11 Fish access in the Clyde (Colin Bean SNH, after Doughty & Gardiner 2003)

The red line shows the extent to which fish used to be able to access the Clyde and its tributaries. By the 1950s, salmon were no longer seen upstream of Glasgow due to a combination of pollution and fish barriers.



Slide acknowledgement, Colin Bean, SNH
After Doughty & Gardiner (2003)

University of Glasgow

10.1 Avon Water Barriers – Removing barriers to fish migration

Work was completed in November 2016 to install fish passes at two redundant weirs which obstructed migrating fish on the Avon Water in South Lanarkshire. The visit will be to one of these weirs at Ferniegair.

- **Project scope:** To ease passage to migratory fish at two weirs on the Avon Water. The weirs involved obstruct fish access to approximately 100 km of excellent quality upstream habitat. The installation of fish passes at both weirs will allow salmon, sea trout, eel and lamprey to access this habitat.
- **Progress:** Work to install fish passes at two redundant weirs (Millheugh and Ferniegair Weirs) was completed in November 2016. The fish pass at Ferniegair is now fully functional, the fish pass at Millheugh requires some aftercare due to post construction damage and work is ongoing to progress this.
- **Benefit:** Six water bodies will have improved as a result of this project. Of the six, five will be at High status for fish passage and a further one will achieve Moderate, meeting five of Scotland's River Basin Management Plan objectives outright.
- **Wider benefit:** Fish populations, both marine and freshwater, will be improved, angling opportunities will be increased and there are educational opportunities for local communities by project engagement and media interest in the work.
- **Partnership**: the work is funded by WEF and is a partnership between SEPA, the River and Fisheries Trusts of Scotland, Clyde River Foundation, Avon Angling Club and the landowners.
- **Public engagement:** Communities and landowners were engaged during the design of the project including local public meetings. BBC Radio Scotland broadcast an item on 7th March 2016 and articles on the project have appeared in national newspapers and social media.
- **Price:** £1,300,000 (fish pass construction at two weirs, and design supervision)

Before: Ferniegair weir obstructed fish access to upstream habitat

After: Fish passage installed in November 2016

David Harley, Head of Ecology SEPA, shows Cabinet Secretary Rosanna Cunningham a Stone Fly, which is a biological indicator of good water quality.

11 River Restoration

Key messages:

- As well as wildlife value, restoration of our urban rivers can have significant benefits for communities by creating new green-blue spaces with health and wellbeing benefits, and which are more likely to create the conditions for successful economic development.
- River habitat restoration is a major challenge for delivering the RBMP as there is often a requirement to secure additional land either side of the river to achieve the level of environmental benefits required. We work hard to properly engage landowners and through this we've already delivered improvements to Stane Garden in the Clyde. In Scotland we already have improved four rivers and plan to improve a further 14 stretches of river by 2021.
- For WEF, projects delivered in partnership are key to securing environmental, social and economic success

Typical pressures impacting on the physical condition of rivers

Canalisation:

Engineering of river banks

11.1 Morphology restoration: Stane Gardens, Shotts

Stane Gardens is an urban river restoration project set within the Shotts community in North Lanarkshire. The area has been blighted by historic industrial processes that have significantly altered the shape of the South Calder River and contaminated a large area of land.

Before: River channel at Stane Gardens

During (Sept 2016): New River channel beside old concrete channel.

After (May 2017 – New river Channel

Stane Gardens: Key facts

Project scope: Remediation of contaminated land and the restoration of the river channel, along with the creation of new parkland for local residents.

Progress: Project has now successfully completed (2017).

Benefit: One water body will have improved status for physical condition as a result of this project.

Wider benefit: The remediation of contaminated land represents a significant boost to public safety. Combined with the restoration of the river and the creation of the parkland the local

community will have access to good quality greenspace bringing further benefits to health & wellbeing.

Partnership: the work is funded by WEF and North Lanarkshire Council and is a partnership between SEPA and the local authority.

Public engagement: Communities were engaged during the design of the project including local public meetings. In 2014 the project was nominated for a SURF award (Sustainable Urban Regeneration Forum). Articles on the project have appeared in national press and social media.

Price: £2,800,000 (design and construction works for river restoration and parkland creation, does not include costs of contaminated land remediation).

The river starting to take a more natural pathway through the site, Stane Garden May 2017.

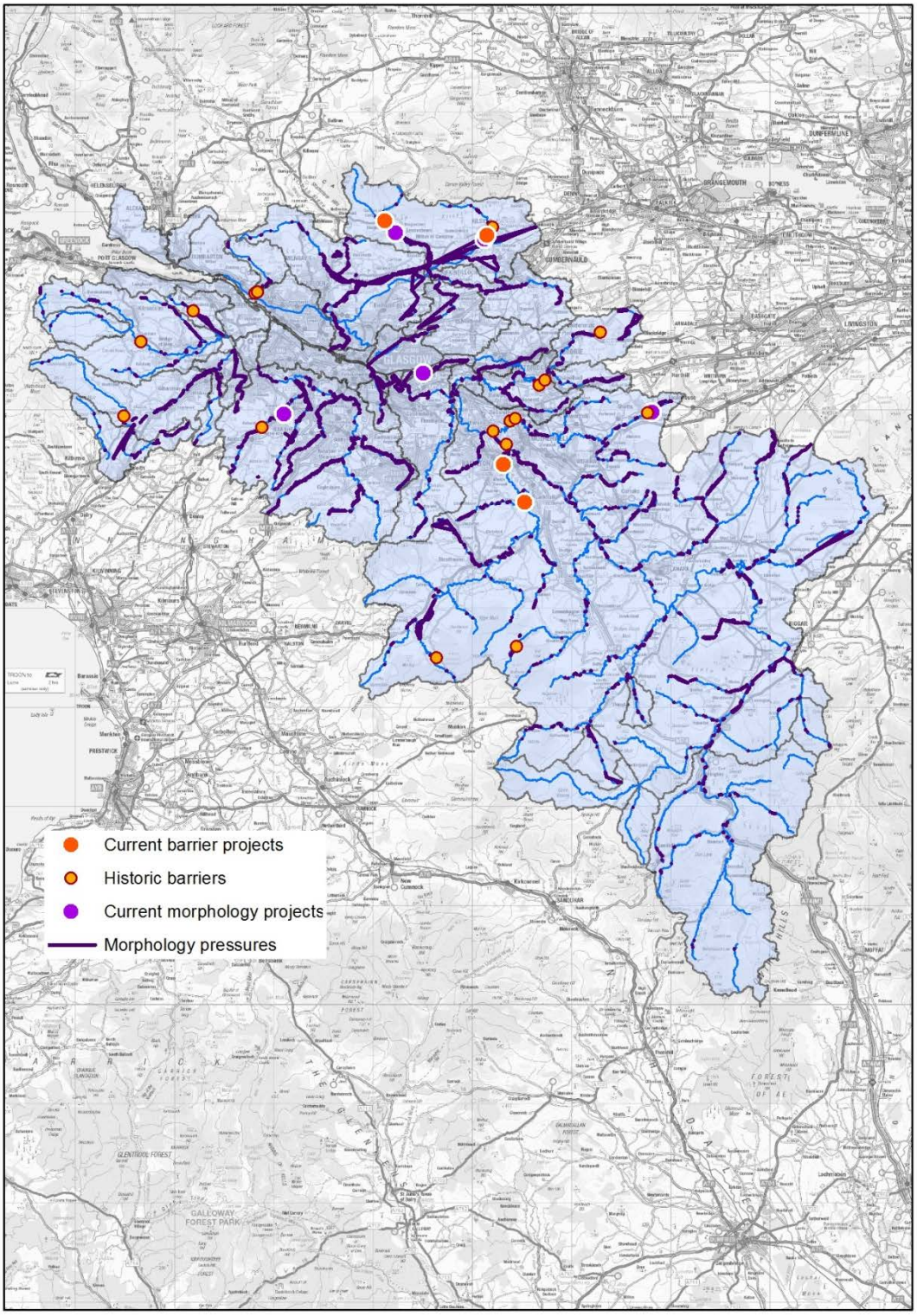
Stane Garden Community opening event 2016

Rosanna Cunningham Cabinet Secretary for the Environment visits Stane Garden, Shotts May 2017

12 Future work on fish passage and river restoration

Work continues to tackle morphology and fish barrier pressures within the Clyde catchment. SEPA and partners will deliver this during second and third cycles of river basin planning. The map below illustrates current projects and where further action is required.

River restoration in the Clyde catchment



For further information on any of the topics after today please contact:

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