

Drainage and Wastewater Management Plan (DWMP)

Overview of the New Forest River Basin Catchment

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Version 2

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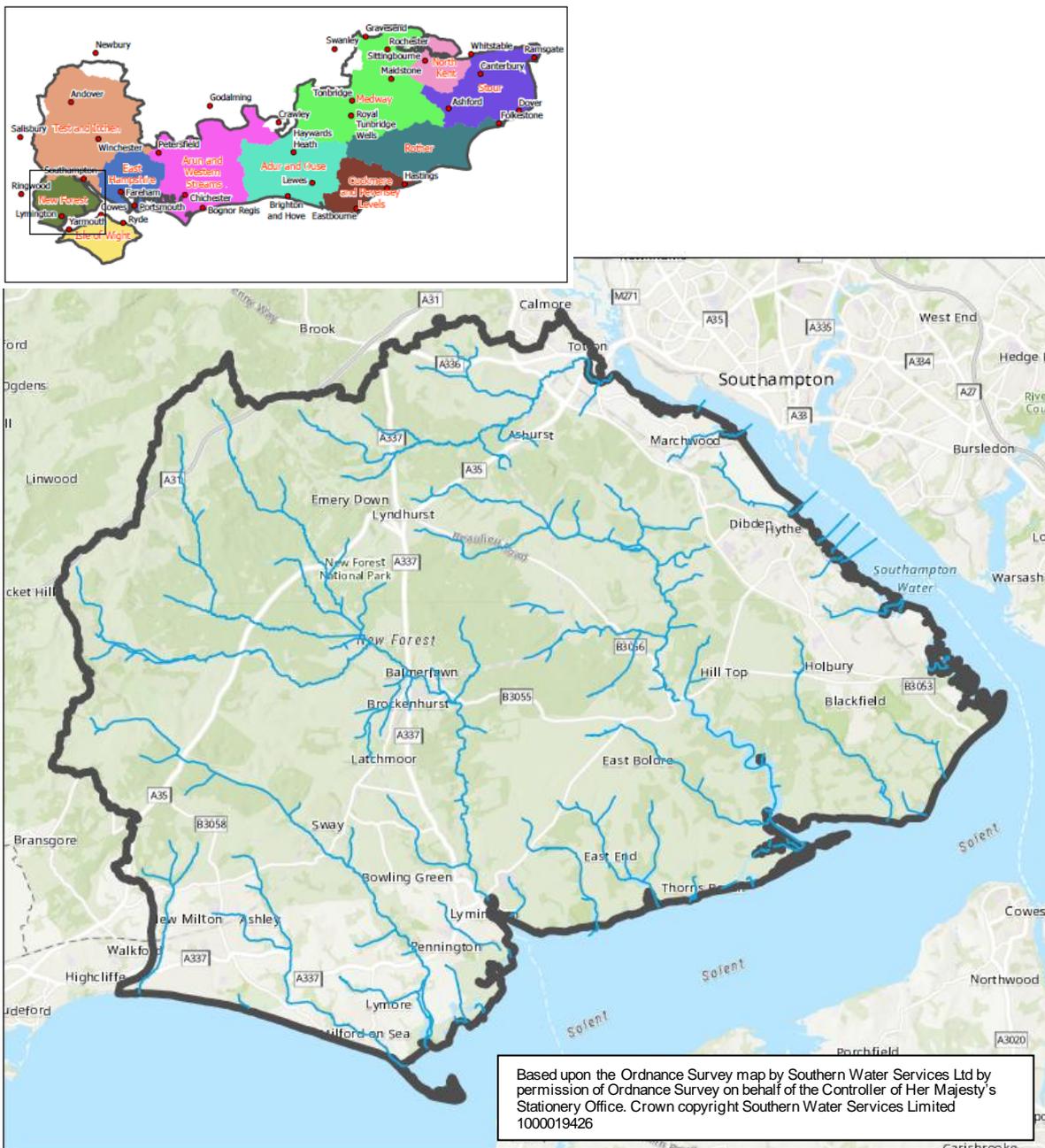


from
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Water** 

Overview of the New Forest River Basin Catchment

The Environment Agency has previously defined the River Basin District catchments in their River Basin Management Plans prepared in response to the European Union’s Water Framework Directive. These river basin catchments are based on the natural configuration of bodies of water (rivers, estuaries, lakes etc.) within a geographical area, and relate to the natural watershed of the main rivers. We are using the same catchment boundaries for our Level 2 DWMPs. A map of the New Forest river basin catchment is shown in figure 1.

Figure 1: The New Forest river basin catchment in Hampshire



The New Forest catchment in Hampshire covers a geographical area of around 300 km², the majority of which is forested common land located within the New Forest National Park boundary. The catchment is essentially rural but there is significant industrial development located to the east, along Southampton Water.

The catchment includes a number of small towns including New Milton, Lyndhurst, Brockenhurst, and Lymington, and four sizeable villages: Ashurst, Brockenhurst, Lyndhurst, and Sway. Outside of The Forest are clusters of larger urban areas including Totton, Marchwood, Dibden, Hythe and Fawley to the east, and New Milton, Milford on Sea, and Lymington to the south-west. Southern Water provides wastewater services to approximately 150,000 people living in the catchment.

Rather than a single river system, the catchment is drained by a dozen or so unconnected streams that rise in the heart of the Forest and drain south and east to Southampton Water and the Solent. There are around a dozen rivers and their tributaries, two lakes, many ponds, two estuaries, three coastal areas, two lagoons, and two groundwater waterbodies, plus a number of urban streams on the periphery of the National Park.

The two largest watercourses in the catchment are the Lymington River and the Beaulieu River. Both flow mainly through forested areas. Other watercourses include the Danes Stream, Avon Water and Bartley Water.

The geology and overlying clay soils of the New Forest are largely impermeable and consist of a combination of clay and sand deposits. These provide only limited groundwater to support the numerous streams and wetlands. Rainfall causes the flow in the streams to rise rapidly and so the rivers are characterised by naturally low summer flows with high winter flows following rainfall. The Danes Stream is the fastest to respond to rainfall in the area.

Land use within the catchment is dominated by farming and the central open areas are used by local people for grazing their livestock. Office, business, and light industrial uses are concentrated in the surrounding urbanised areas and towns. The area has significant value as a recreational area and tourist destination and the coastline is a focus for water sports and sailing activities.

There are many important habitats in the area and along its coast. These are designated both nationally and internationally and are high-value conservation areas. The catchment is exceptionally important for freshwater and marine wildlife. In total, around half of the catchment is protected by designations, including two Ramsar Sites and Special Protection Areas (SPA), three Special Areas of Conservation (SAC), and 14 Sites of Special Scientific Interest (SSSI). The coastline of the New Forest area includes parts of the Solent Maritime SAC, Solent & Southampton Water Ramsar & SPA.

The Danes Stream, Avon Water, Lymington River, Sowley Stream, and Plummers Water drain to the Solent through the Hurst Castle and Lymington River Estuary SSSI. This SSSI spans 9 km of the shoreline and is host to a wide range of coastal habitats including intertidal mud, salt marshes, and saline lagoons important for nationally important breeding birds. The Beaulieu River flows through Beaulieu Pond to its estuary which forms part of the North Solent SSSI. As well as the Beaulieu, which makes up the majority of the SSSI area, it also includes inflow from the Dark Water, Stanswood Stream, and Stone Stream. Several of the other smaller coastal streams along the shoreline of Southampton Water feed the Hythe to Calshot Marshes SSSI.

There are no surface water reservoirs within the catchment and no abstraction for public water supply from the rivers or groundwater.

Drainage and Wastewater Systems

Drainage and wastewater systems are designed to convey water. There are several different drainage systems, including:

- land drains in fields to drain the land to enable it to be used for agricultural purposes
- highway drainage systems to ensure that roads and car parks remain safe and useable during rainfall
- rivers and streams to transport water running off the land to the sea
- surface water drainage systems that take water from roofs and paved areas to local rivers, and
- sewerage systems that take the wastewater away from people's homes and businesses so it can be recycled and released safely back into the environment.

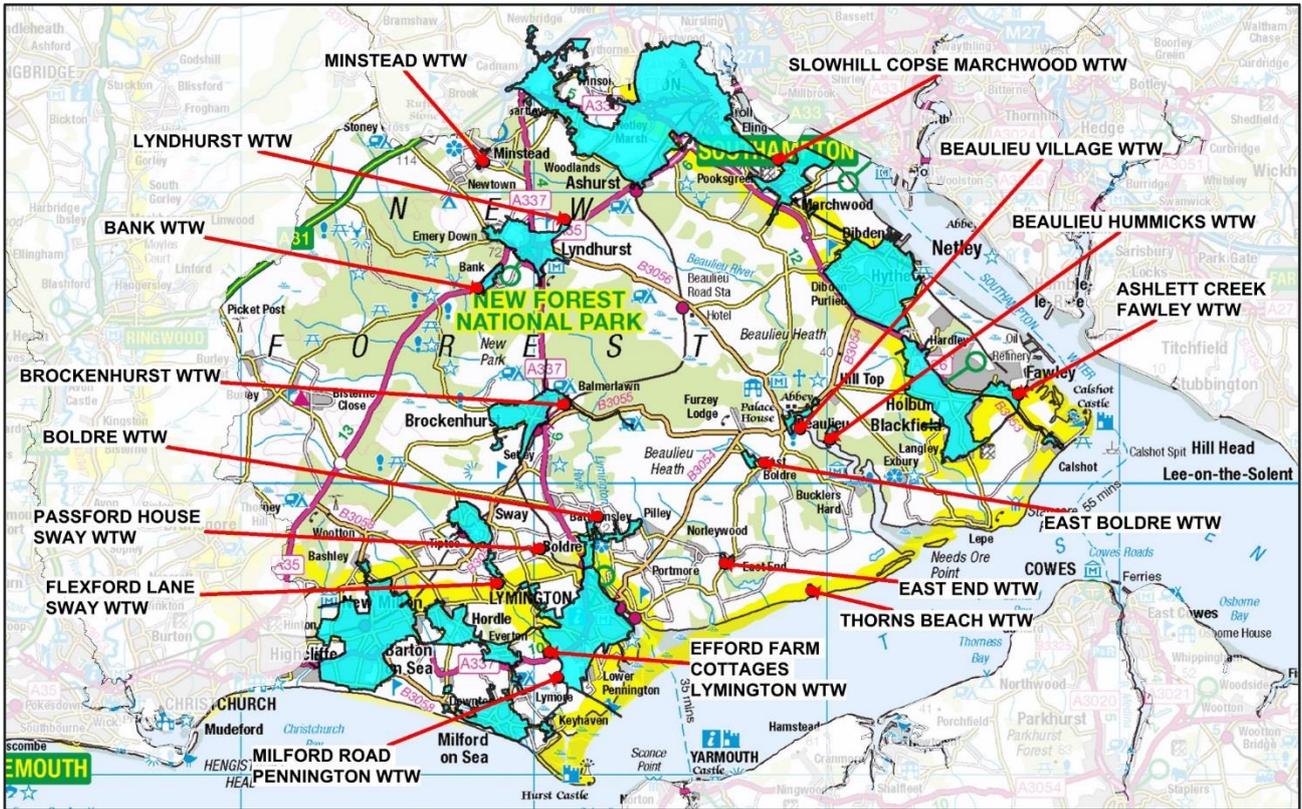
All these systems provide essential services to protect the economy and environment and ensure public health, safety, and hygiene. The links between water use and the management of wastewater are important to protect the wider environment. This excellent independent short film, called "[The Drip](#)", shows how the water cycle links everything together.

In the New Forest river basin catchment, we own and operate 16 separate sewerage systems. Each of these collects wastewater from a geographical area known as a sewer catchment. These areas are shaded blue in Figure 2. Each sewer catchment is drained by a complex sewerage system comprising a network of pipes, wastewater pumping stations (WPS), and wastewater treatment works (WTW). These combine to remove wastewater from homes and businesses and transport it to treatment facilities so that it can be recycled and safely discharged back into the environment.

Our sewer catchments generally cover urban centres and communities. Of the 415km² of land serviced by our sewer catchments in this river basin, only 54km², or 11.4%, of the land is covered by our drainage systems. However, of the 61,250 residential properties and 2,800 businesses within the New Forest catchment, 92% of the homes and 86% of the businesses are connected to our sewerage system.

Remote rural properties are often not connected to sewerage systems and therefore rely upon a septic tank within their property to collect wastewater before it is periodically emptied by tankers and the wastewater is taken to a WTWs to be recycled.

Figure 2: Map of the New Forest Catchment showing locations of the WTWs



More than 1,142 km of wastewater pipes serve the New Forest catchment. The catchment’s network includes 111 wastewater pumping stations (WPSs) pumping sewage to 16 wastewater treatment works (WTWs) for treatment. Table 1 provides a summary of the 16 sewer catchments within the New Forest river basin catchment. It includes the population equivalent that each serves and the approximate length of sewers within the sewer catchment.

Table 1: Sewerage Catchments in the New Forest River Basin Catchment

Sewer Catchment Ref	Sewer Catchment Name	Communities Served	*Population Equivalent	Length of sewers (km)
SLOW	SLOWHILL COPSE MARCHWOOD	Marchwood, Hythe, Totton, Ashurst, Cadnam, Copythorne, Newbridge, Dibden Purlieu	73,836	494
PENN	PENNINGTON	Lymington, New Milton, Barton on Sea, Everton, Hordle, Milford on Sea, Bashley, Bowling Green	50,699	420.8
ASHL	ASHLETT CREEK FAWLEY	Ashlett, Fawley, Calshot, Blackfield, Holbury, Hardley	14,511	94.4
BROC	BROCKENHURST	Brockenhurst	3,762	43.7
LYND	LYNDHURST	Lyndhurst	2,937	37.6

SWAY	FLEXFORD LANE SWAY	Sway	2,528	25.5
BOLD	BOLDRE	Boldre, Pilley	621	9.9
EBOL	EAST BOLDRE	East Boldre	390	3.6
BEAU	BEAULIEU VILLAGE	Beaulieu	188	5.6
EAEN	EAST END	East End	114	0.1
BANK	BANK	Bank	101	2.8
MIND	MINSTEAD	Minstead	83	1.1
BETH	BEAULIEU HUMMICKS	Otterwood, Oxley Copse	51	1.5
EFFC	EFFORD FARM COTTAGES LYMINGTON	Efford Farm Cottages (between Pennington and Everton)	35	0
THBE	THORNS BEACH	Thorns Beach	16	0.8
SWPH	PASSFORD HOUSE SWAY	Passford House, Mount Pleasant	5	0.5

*The population equivalent is a quantity measure used to represent how much sewage that the treatment facility needs to treat. It consists of the calculated equivalent number of people who are likely contribute to the amount of sewage in the catchment.

Of the 16 WTWs in the catchment, three serve more than 4,500 people per day: Ashlett Creek WTW, Milford Road Pennington WTW and Slowhill Copse Marchwood WTW.

Slowhill Copse Marchwood WTW serves a population equivalent of 73,836 and is permitted to recycle 16,317 m³ of wastewater per day during periods of dry weather. The WTW serves the communities on the west bank of River Test Estuary, including Marchwood, Hythe and Totton. The connecting sewage network is a combination of gravity sewers and sewers where the wastewater is pumped (called rising mains). A total of 46 wastewater pumping stations (WPS) are included in the network. Slowhill Copse also serves as a sludge treatment centre (STC) to process and recycle the 'solids' from within the sewage. It receives around 2,000 m³ of liquid sludge per week, delivered to site by tankers, from several other sites in and around the catchment. Slowhill Copse Marchwood WTW discharges the recycled water into the estuarial waters of the Solent.

Milford Road Pennington WTW catchment serves a population equivalent of 50,699. The catchment consists of a number of sub-catchments including Barton-on-Sea, Milford-on-Sea, Everton and Lymington. There are 24 wastewater pumping stations (WPS) in the catchment. These pump wastewater to the WTW for recycling before it is discharged to the Solent. The site has a consented dry weather flow of 17,200 m³ per day.

Ashlett Creek Fawley WTW serves a population equivalent of 14,511. It serves Fawley and surrounding areas. It has a consented discharge of 3,024 m³ per day in dry weather and discharges the recycled water to the estuarial waters of Southampton Water. There are 9 WPS in the catchment. Liquid sludge removed from the wastewater at Ashlett Creek WTW is taken to Slowhill Copse Marchwood WTW for processing.

The popularity of the New Forest a tourist area means that some of the New Forest sites, particularly Brockenhurst, Beaulieu Village and Lyndhurst WTWs, occasionally receive high levels of ammonia at the works during the peak tourist season. Other known issues in the catchment include high levels of infiltration (e.g. the Boldre WTW catchment), saline intrusion (e.g. Beaulieu

Village WTW) and asset deterioration due to age. Milford Road Pennington WTW suffers from overloading due to population growth in Lymington.

The Environment Agency (EA) sets limits on the quality and quantity of recycled water (known as effluent) that can be discharged from WTWs. The EA issues discharge permits to ensure the recycled water released from WTWs complies with three main legal provisions

- (i) The Water Resources Act (WRA) 1991;
- (ii) The Environmental Permitting (England and Wales) Regulations 2010 and
- (iii) The Urban Wastewater Treatment Regulations (UWWTR) 1994.

The permits ensure that the quality of the receiving water (i.e. the river, streams, or sea) is protected and that the discharges do not cause an unacceptable impact on the environment. The flow that may be discharged (released) in dry weather is one of the limits set by permits. Our 16 WTW operate in accordance with their permits and recycle the wastewater to the specifications set out by the EA to ensure it is safe and clean to be released back into the rivers and streams or directly to the sea.

Under heavy storm conditions, rainfall can enter the sewerage systems and significantly increase the flow in the system. The flow of water arriving at the WTW can exceed the recycling capacity of the works, so any excess water is temporarily stored in large storm tanks. If these tanks ever fill to capacity, then they would discharge water into the rivers or sea through storm overflows. Our aim is to prevent any discharge of water that has not been fully recycled to the required standards. Any water released from storm tanks is screened to remove items such as wet wipes and solids. These discharges are permitted by our regulator and monitored carefully. This control mechanism is required to prevent the backing up of water within the sewers and putting homes at risk of flooding.

Wastewater System Performance

We routinely monitor, analyse and report the performance of our wastewater sewerage networks and treatment processes to enable us and our regulators to assess the service provided to our customers and the impact of our activities on the environment.

The current performance on the sewerage systems is a good starting point for the DWMP, and enables current issues to be highlighted so the planning objectives can be identified and defined for use throughout the DWMP. These planning objectives will determine the metrics that we used in the next stage of the DWMP, which is to determine the current and future risks to people, property and the environment of changes in the river basin catchment and in the performance of our sewerage systems.

The current performance, based on the last three years of date, is summarised below.

Sewer blockages

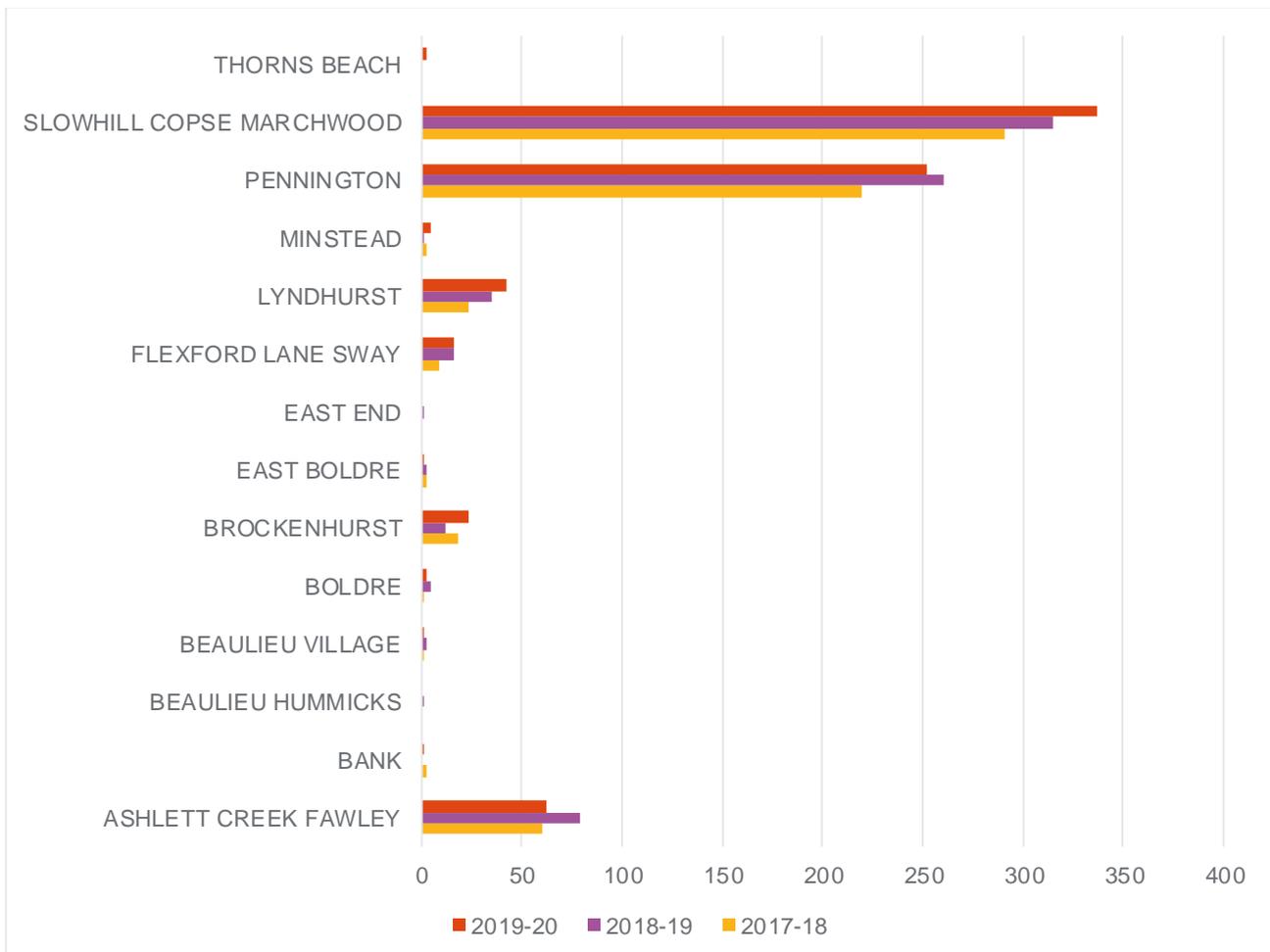
Every year there are thousands of avoidable blockages in our sewers caused by the flushing of wet wipes, cotton buds and other inappropriate items down the toilet, or by pouring fat, oil and grease down the sink. These items cause blockages within the sewer systems, and these blockages can result in flooding to customers' properties or impact upon watercourses or coastal waters.

Figure 3 shows the number of blockages recorded in the New Forest river basin catchment by sewer catchment over the last three years. We have noticed an increasing trend in the number of blockages over the last three years, which we are tackling through our pollution and flooding reduction programmes.

Slowhill Copse had the highest number of blockages, followed by Pennington and Ashlett Creek.

We use high-powered water jets to clear blockages and ensure our sewers are running freely. In 2015, we launched our '[Keep it Clear](#)' campaign which involves teams visiting 'blockage hotspot' areas to educate customers on how to safely dispose of items rather than putting them down their sinks or toilets. We visit almost 20,000 customers a year across the region to promote correct disposal of 'unflushable' items.

Figure 3: Number of blockages in each sewer catchment within the New Forest river basin catchment

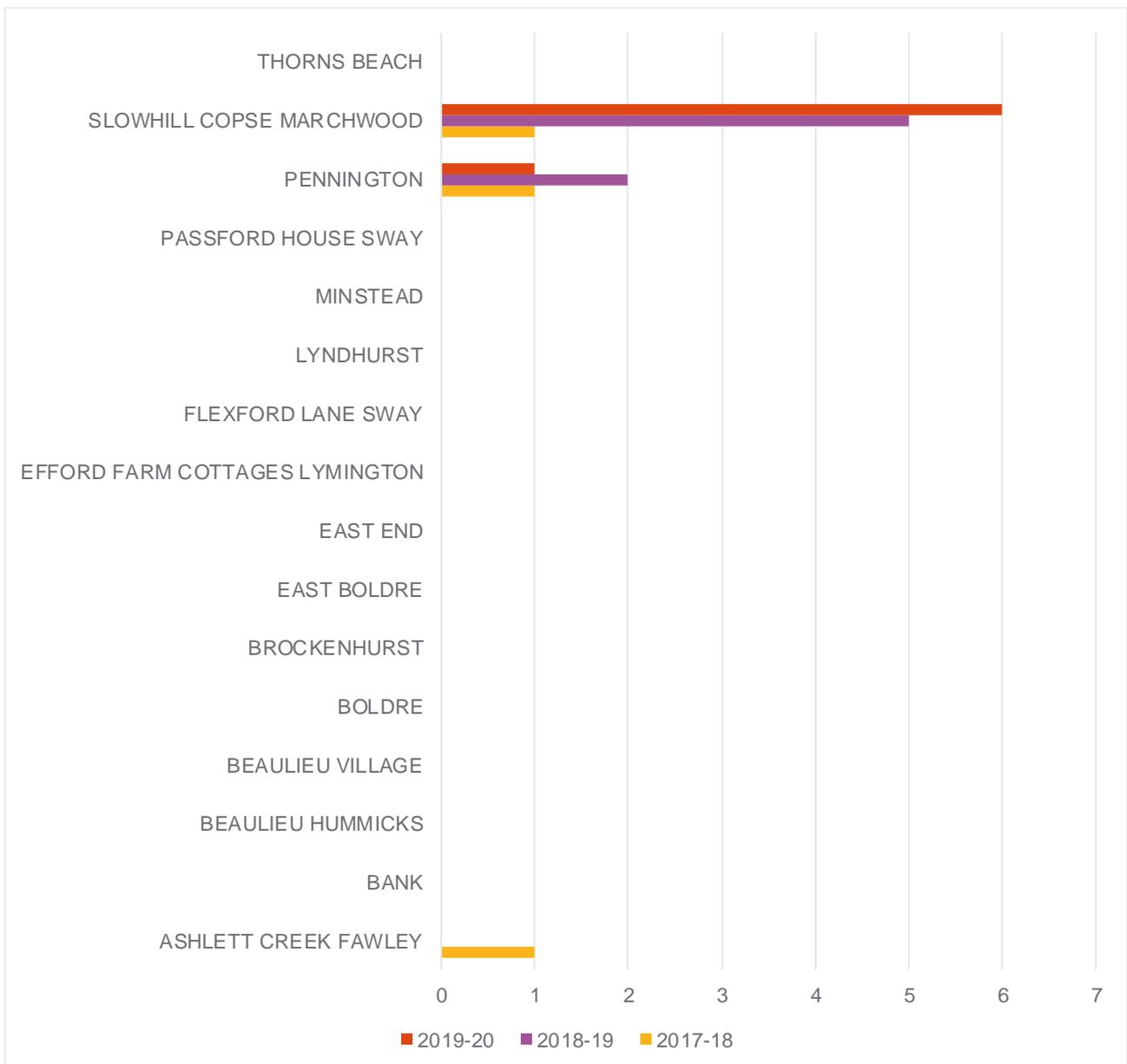


Sewer collapses and rising main bursts

Figure 4 shows the number of sewer collapses and rising main bursts recorded by our Sewer Incident Reporting for public sewers in the New Forest river basin catchment over the last three years. Rising mains contain wastewater that is pumped under pressure from our wastewater pumping stations towards the treatment works.

The majority of these collapses and bursts were in Slowhill Copse Marchwood, Pennington and Ashlett Creek. A collapse or burst can result in a discharge to the environment or flooding. We have an ongoing programme to inspect (by CCTV), replace or refurbish ageing sewers at high risk of collapse or where bursts are likely.

Figure 4: Number of incidents of sewer collapses and rising main bursts in the New Forest River Basin by sewer catchment



Flooding Incidents

The most common cause of flooding is from blockages of debris such as wet wipes. However, flooding can also occur in wet weather when the sewerage system becomes overloaded due to rainwater entering the sewer system.

Within the New Forest river basin catchment, several of our sewer catchment has combined sewer systems to carry wastewater. Combined systems convey both sewage from homes and businesses as well as rain and storm water collected from roofs and hard paved areas. During heavy rainfall, the capacity of combined sewers can be exceeded and lead to localised flooding as a result of the water backing up the system to the closest available escape route: manhole, toilet, sink, basement etc. In some combined sewer systems where flooding of properties could occur in heavy rainfall, there are built in overspill weirs, called storm overflows, which release excess water into rivers to prevent flooding of homes or businesses. Storm overflows (also known as Combined Sewer Overflows) are permitted by the Environment Agency to operate in certain conditions. The majority of storm overflows have equipment installed to record the number of times that water passes through the storm overflow. We monitor these carefully and report this information to the Environment Agency. There are 32 combined sewer overflows in the New Forest catchment.

Figures 5 and 6 show the number of internal and external flooding incidents respectively over the last 3 years in the New Forest catchment. For the purpose of the DWMP, sewer flooding is defined as incidents caused by an escape of water and sewage from a public sewer due to a blockage, sewer collapse, rising main burst, equipment failure or from too much water entering the system (known as hydraulic overload). Importantly, the definition of sewer flooding excludes extreme storms with a probability of occurring of less than once in 20 years (i.e. less likely than a 5% chance in any given year). Internal flooding occurs inside a building or cellar, whilst external flooding occurs within a curtilage (garden) or on a highway or public space.

Of the 61,250 homes connected to the 16 sewer systems within the New Forest river basin, 23 properties experienced some form of internal flooding (including sewage backing up into a bath or shower tray) during the financial year 2019-20. This figure has increased from 8 properties that experienced flooding in 2017-18. The data shows there have been an increase in the number of floods from the sewer network in the Ashlett Creek, Beaulieu Hummicks, Brockenhurst and East End catchments which we are targeting in our flooding reduction programme.

Figure 5: Internal Sewer Flooding within properties by sewer catchment (number of incidents)

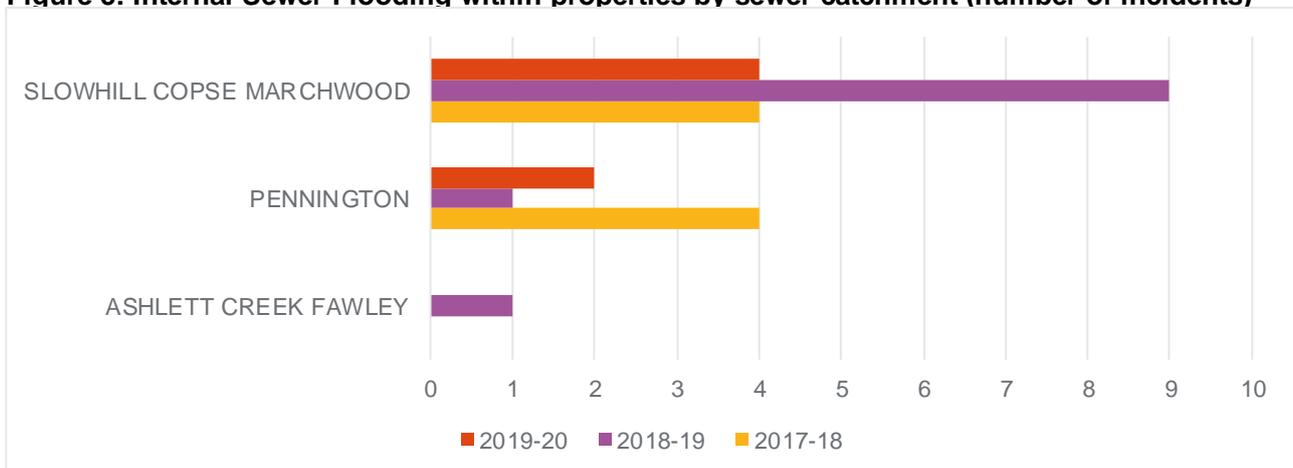
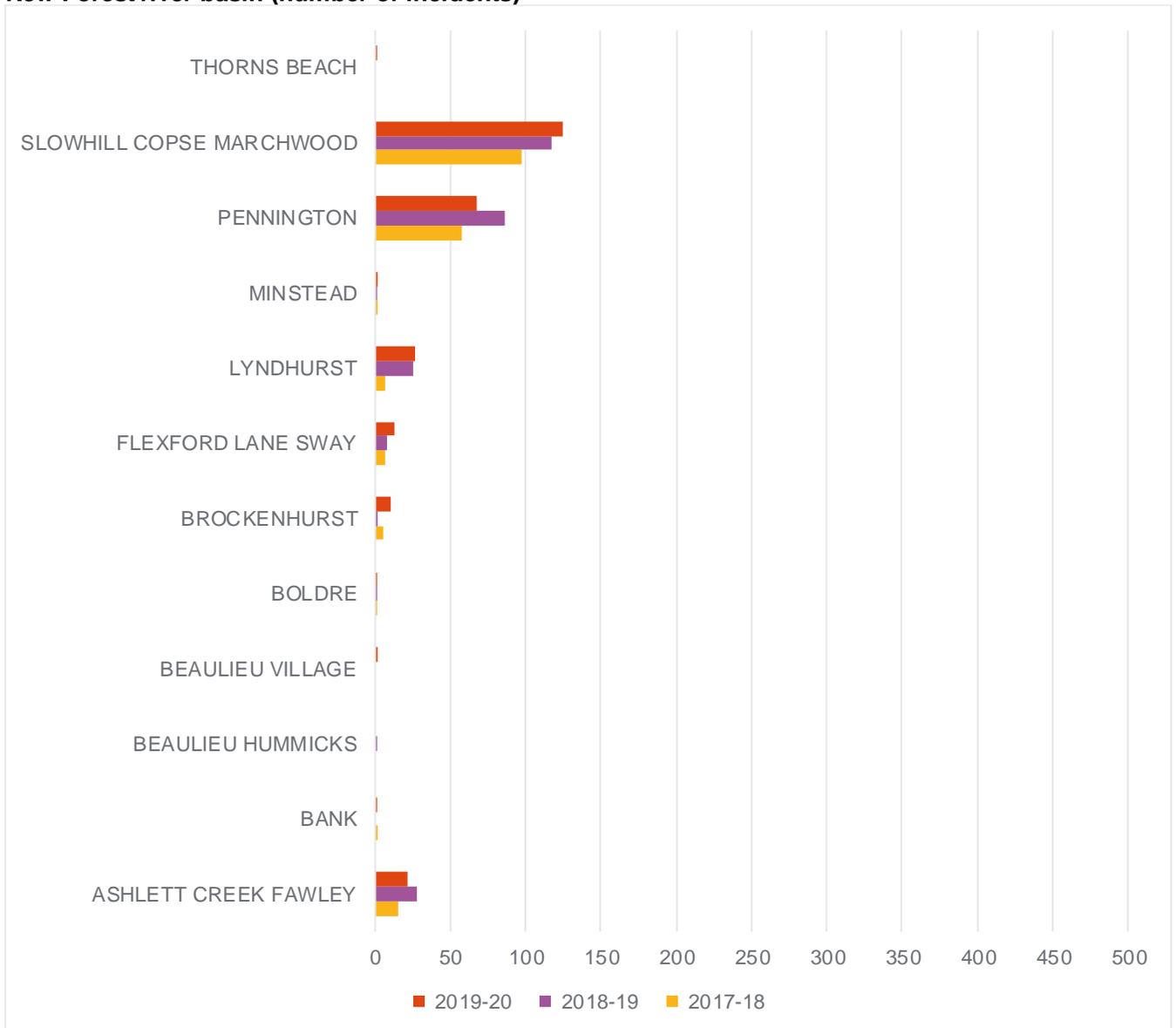


Figure 6: External Flooding within the curtilage of a property (not inside) by sewer catchment in the New Forest river basin (number of incidents)



Pollution Incidents

Reducing the number of pollution incidents is a priority for us, our customers and our stakeholders. We have set the target to reduce the number of pollution incidents across the whole of our operating region to 79 incidents by 2024-25, and our aim by 2040 is to have zero pollution incidents. To achieve this we have created an extensive pollution incident reduction plan with the Environment Agency to significantly reduce pollution over the next five years in line with industry targets.

Pollution incidents connected with our wastewater assets (e.g. blocked sewers, pump failures) are reported to the Environment Agency.

The impact an incident has on the environment is categorised into one of four categories using the Common Incident Classification System (CICS). More information on the classification system can be found on the Ofwat website [here](#). There are four categories for pollution incidents: 1 (major), 2 (significant), 3 (minor) or 4 (no pollution). Only category 1, 2 and 3 pollutions are reportable.

We continue to investigate the root causes of pollution incidents. Our improvements in monitoring of assets and data collection are informing our Pollution Reduction Programme and resulting in more pollutions being prevented. We have also strengthened our incident response team and arrangements to improve our response and reporting of a potential pollution incident.

In addition, our new Environment+ programme looks at all aspects of environmental compliance and performance. Our focus on wastewater treatment works compliance will bring about improved river quality, reduced pollution incidents and flooding, and enhance bathing water quality.

We publish pollution data in our Annual Report and on our website. However, we are not yet at the stage where we can publish that data in greater detail or make further detail publically available. To do so would also require the agreement of the Environment Agency as they provide some of the information. We are currently being investigated by the Environment Agency in relation to pollution events, and the management of some of our wastewater treatment works, so what we can say about these at this time is limited.

Wastewater Treatment Works Compliance with Permits

The Environment Agency sets limits on the quality and quantity of recycled water from WTWs entering rivers or the sea so the water does not cause an unacceptable impact on the environment. The flow that may be discharged in dry weather (known as Dry Weather Flow) is one of these limits. Dry weather flow (DWF) is the average daily flow to a wastewater treatment works during a period without rain. Exceedances of the DWF can be caused by a number of factors, but it can be due to the additional flow from new development in the sewer catchment. To enable further development, we work with planning authorities to understand where future development is planned and include growth schemes in our investment programme so we can increase the capacity of WTWs and continue to comply with our permits in the future.

We must comply with permits issued by the EA. Where we do not meet the permit requirement, we call this a compliance failure.

We are investing in improved operational resilience to maintain wastewater treatment compliance at a high standard by achieving 99.0% as a minimum, but continuing to aim for 100% compliance.

In the New Forest catchment, there have been no water quality compliance failures over the last three years.