



ENVIRONMENT
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Rivers of the Isle of Wight



ENVIRONMENT AGENCY

Environment Agency - a better environment in England and Wales for present and future generations.

The Environment Agency is one of the world's most powerful environmental watchdogs, regulating air, land and water. As 'guardians of the environment' the Agency has legal duties to protect and improve the environment throughout England and Wales and in doing so contributes towards 'sustainable development' - meeting the needs of today without harming future generations.

Created by the 1995 Environment Act, the Agency started work in 1996. It is officially a 'non-departmental public body', which means that the



organisation works for the public and has specific duties and powers.

Nationally, around 15 million hectares of land are managed by the Agency along with 36,000km of rivers and 5,000km of coastline, including more than 2 million hectares of coastal waters.

There are eight regional offices, which are split into 26 area offices. Southern Region covers the counties of Kent, Sussex, Hampshire and the Isle of Wight.



*Front cover photographs:
Main picture - Eastern Yar
Top inset - Godshill Church
Bottom inset - Sea defences Freshwater Bay*

Rivers of the Isle of Wight



History and Geology

Popular as a holiday destination with an 'abroad feel' to it, the Isle of Wight is the largest Island off the English coast. It is separated from Hampshire by the Solent and bounded by the English Channel on its south side.

Evidence suggests that the first settlers, the New Stone Age communities, arrived on the Island sometime after 4,000 BC. As the population expanded large areas of woodland were cleared for agriculture and by the Middle Ages the Island had become a mixed agricultural landscape.

By Tudor times seven deer parks had been created. Queen Victoria and Prince Albert added their royal seal of approval when they made Osborne House their Island home, causing a large development of Victorian villas and gardens to spring up.

The Island formed part of the mainland until well after the last ice age. Despite its small size – 381 km² (155 square miles) – the Isle of Wight has a varied geology and its rocks and

clay contain Europe's most abundant dinosaur fossil beds.

There are three distinct rock formations, the Tertiary Clays and Sands to the north, the central chalk ridge that once connected The Needles to the chalk of the Isle of Purbeck and the Greensands, Gault and Wealden Clays to the south of the island. These rocks were laid down over a period of time dating back to the Cretaceous (135 million years ago) and the Tertiary (65 million years ago) timescales. The last two million years (Quaternary) complete the geological story of the island.

The Island's topography reflects the geology and forms distinctive areas of the landscape:

- high central ridge of chalk downs and the Southern Chalk Downs
- the Greensand ridge
- northern clay pastures
- intensively managed southern coastal plains, river valleys and dramatic coastline

Main picture: South Wight coast



South Wight coast



Wightlink ferry at Fishbourne

Until well after the last ice age the Isle of Wight was part of the mainland. A major trunk stream, the Solent River, flowed eastwards from the River Frome in Dorset along the line of the Solent and Spithead, to outfall to the sea in the Littlehampton area. Its northern tributaries would have included the Avon, Test and Itchen and its southern tributaries would have been the streams which drained from the northern slopes of Purbeck and the Isle of Wight. The drainage system was

dismembered by the sea breaking into the main channel between Purbeck and the Island.

This breach occurred as a result of a depression of the land, or rise in sea level, which lasted until about 2000 BC and also led to the submergence of the downstream reaches of the North flowing rivers, giving them their well marked estuaries. The Harbours of Yarmouth, Newtown, Cowes and Wootton Creek owe their origins to this movement.



Wootton Creek



Rivers

Apart from a few small brooks on the south coast, all the Island's streams flow northwards. Included among these are the Western Yar, Newtown River (Caul Bourne) and the Palmer's, Blackbridge and Monktonmead Brooks.

There are five main estuary systems – the Eastern Yar, Western Yar, Newtown, Medina and Wootton Creek. All share common features of tidal mudflats and shingle, saltmarsh and varying amounts of fringing

Calbourne Mill

woodlands. The Island's estuaries are the remnants of once large valley systems that carried rivers into the great Solent estuary.

Rivers not fed from the chalk aquifer like the Merstone Stream or Thorley Brook tend to have a 'flashy' response to rainfall and suffer from naturally low flows in the summer. However, rivers fed by springs from the chalk like Lukely Brook do not tend to react rapidly to rainfall except when coupled with urban run off.

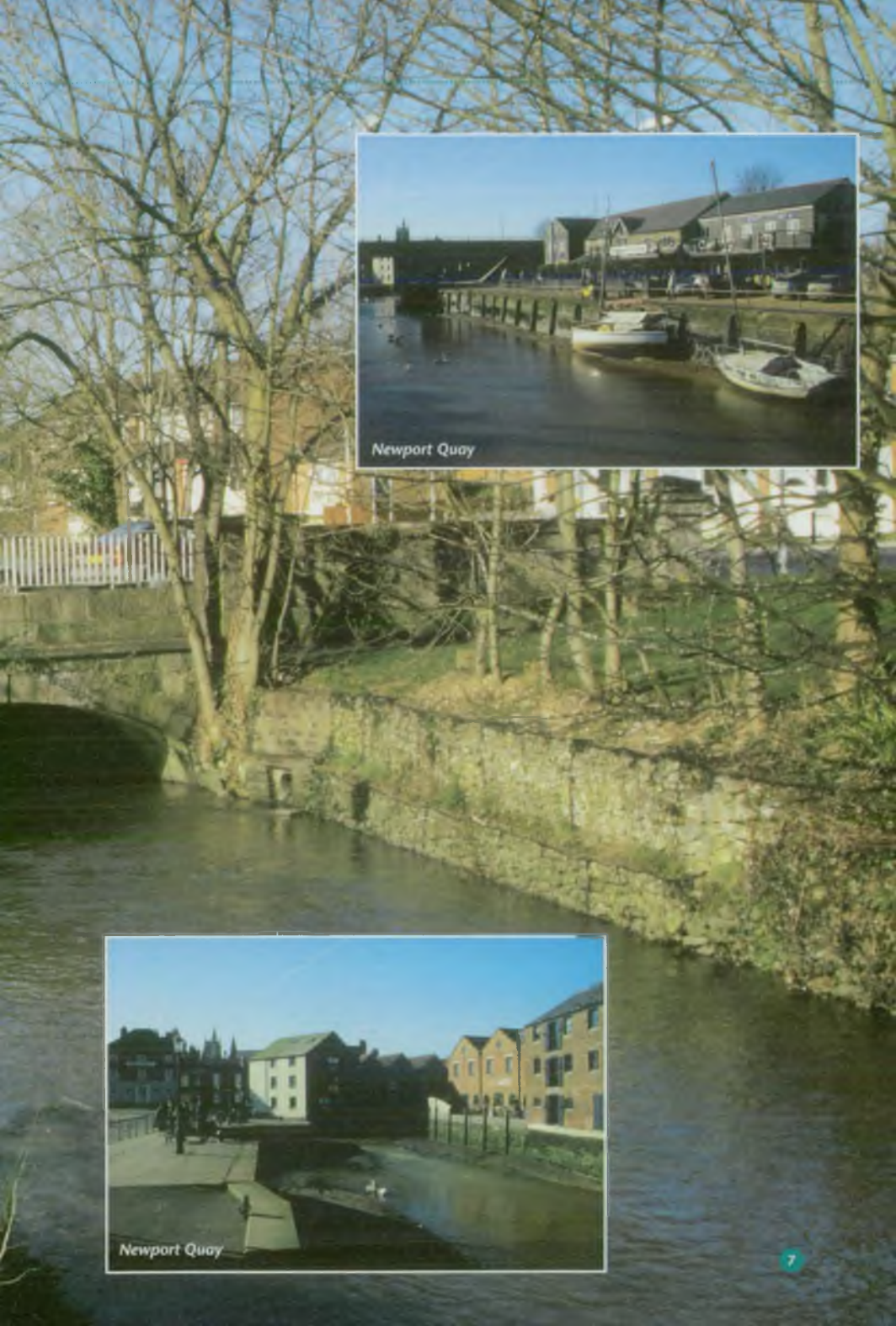
Medina

The Isle of Wight's major rivers are the Medina and the Eastern Yar. The Medina rises as chalk springs from St Catherine's Down on the south side of the Island. Medina is a latinised form of its Saxon name Medene meaning Middle River. The Medina is 17km long, with a catchment area of 71 sq km, and flows due north collecting the Merstone Stream at Blackwater before intersecting the ridge at Shide. It is a linear estuary enclosed by a low valley with plenty of industry and shipping and little marginal vegetation.

The Medina's tributary, the Lukely Brook rises in the Bowcombe Valley and joins the river at the head of the estuary in Newport – the Island's capital. Lukely Brook is also subject to tides and forms the northern boundary of medieval Newport. It cuts through the chalk at Carisbrooke where, to the east of the valley, sits the famous castle.

From Newport to the sea at Cowes the river is tidal.

Lukely Brook at Newport



Newport Quay



Newport Quay

Eastern Yar

The Eastern Yar is 27 km long and flows north east from springs at St Catherine's Down collecting the Wroxall Stream, Scotchell's Brook and a number of small tributaries before cutting through the central chalk ridge at Brading. Until the 16th century the Eastern Yar flowed into the sea at both Sandown and Bembridge. The whole of this saltmarsh has been reclaimed

for agriculture. Bembridge Harbour and the Yar were extensively modified in historic times by the construction of causeways, with land reclamation and drainage above the causeway to St Helen's. The dunes of the Duver are a marked contrast to the seafront and harbour, while the embankment of the Yar upstream provides an unusual and attractive landscape of wet grazing.



Eastern Yar - Longbridge



Yarmouth Mill



Western Yar at Freshwater Nature Reserve



Thorley Brook

Western Yar

The Western Yar was once a river with a well developed system of tributaries, but the erosion of the channel coast has destroyed its upper catchment. Protection works now prevent the sea flowing into the Western Yar at Freshwater Bay - the source of the river. The river must once have been one of the largest on the Island but is now no more than a brook with a disproportionately large estuary. A balanced landscape of fields, saltmarsh and woods all add to the attractiveness

of the river. Afton Marsh reed beds dominate the upper reach.

Creation of the harbour and breakwater in 1843 - seven at Yarmouth did much to change the shape of the lower reaches of the estuary, as did the building of a tide-mill and sluice gates in 1793 across the Thorley Brook - the Western Yar's main tributary. The bridge and harbour dominate the estuary mouth.

Water Resources

The Environment Agency balances carefully demands for water and the needs of the environment through an abstraction licensing system.

Water is abstracted from the Island's rivers and groundwater for a range of uses including public water supply, agriculture and industry. Conditions may be attached to the licence to protect the rights of existing users and ensure that the water environment, such as river flows and wetlands, are not unacceptably affected.

The major aquifers on the Island are the Chalk, the Upper Greensand and the Lower Greensand. Abstractions for public water supply are from the two largest rivers, the Eastern Yar and Medina.

Demand for public supply is the greatest stress on water resources with 86% of all licensed groundwater abstraction for public supply. Nearly 57% of surface water abstraction is also for public supply.

In the past the Isle of Wight suffered water supply problems due to its limited surface water sources and high summer population. New sources of supply were developed including the Cross-Solent Main, which involves pumping water from Testwood Reservoir in Hampshire. The Lower

Greensand Groundwater Scheme and the Medina Yar Transfer Scheme which takes groundwater from the Lower Greensand and transfers it to the Medina.

Water is then transferred from the Medina to the Yar to allow abstraction from the Yar at Sandown.

In 1988 the Island was chosen as the largest pilot scheme area for metering water. Since the installation of water meters at more than 51,000 homes, demand has reduced by 20%.

Water Quality

The Environment Agency has a responsibility for the water quality of all controlled inland waters and coastal waters up to a limit of three nautical miles offshore.

Water quality is assessed by taking samples of water and measuring the



Spray irrigation



Southern Water - Seaclean Wight

concentration of chemical pollutants which they contain. In addition, samples of the creatures which inhabit the bed of the streams are taken to assess the health of the river.

As well as ensuring the suitability of water as a natural habitat, the Agency must also ensure the quality of water and resolve the many conflicting demands made by society for drinking water, agriculture, industry, sewage treatment, fisheries and recreation.

A close working relationship between the Agency and local authorities and organisations is vital to ensure that water quality objectives are consistent and complement one another. Asset Management Plans (AMPs) are strategic investment programmes that

water service companies have agreed to implement over a five year period. The Agency, OFWAT and the Drinking Water Inspectorate all have input into these plans.

The natural quality of the streams is variable. Those arising from chalk springs are well buffered and neutral, whereas those originating from the rich sandstones may be acidic and rusty deposits can be seen on gravel and vegetation. An example of this can be seen between the River Medina and the Merstone Stream where they meet at Blackwater. Iron deposits vividly stain the bed of the Merstone, draining from the Ferruginous Sands of St George's Down.

The Island's rivers are mostly of good water quality, while groundwater is of average quality. Particular stretches of rivers periodically have poor water quality, caused by specific discharges (eg from sewage treatment works). Tidal and estuarine waters are generally of good quality.

There is very little industrial discharge and most water quality problems result from surface water which has been contaminated with oil before being discharged from drains. In particular the Scotchell's Brook at Sandown receives significant diffuse pollution as a result of run-off from urban areas. In rural areas there are occasional pollution incidents from septic tanks or from farm slurry and silage. Other problems that can occur affecting water quality include failure of sewage treatment works (there are 23 on the

Island), leachate leakage from landfill sites, pollution from construction sites and pesticides and nitrates.

The majority of water quality problems occur on the clay soils of the northern half of the Island where domestic septic tanks can cause problems. Most livestock farming is carried out on these less well drained soils and the number of agricultural pollutions occurring in these areas reflects this. The Agency is working in partnership with a number of organisations, including the IOW Council, Island 2000, NFU, English Nature and Southampton University to try and tackle the problem of diffuse pollution on the Eastern Yar. Prompt reporting of pollution incidents by environment conscious Islanders enables the Agency to take early action.

Seaclean Wight



Conservation

The Environment Agency has a duty to promote conservation and often works with other organisations to further this end. It is currently working with the Island's Biodiversity Action Plan Partnership which aims to safeguard key species and habitats. The Island is of great natural interest with important habitats that support a number of rare species.

Key habitats include chalk grassland and coastal areas. Coastal habitats are diverse with several internationally important areas including saltmarshes, estuaries, saline lagoons, sea caves and sandflats.

Parkhurst Forest is a fine example of ancient woodland and there are several extensive areas of natural grasslands particularly on the heavy, poorly draining soils around Newtown Harbour.



South Wight coast



Western Yar marshes

The rivers of the Isle of Wight are small compared with those on the mainland. They may have been modified by river engineering causing a lack of natural features like pool and riffle sequences and meanders. However, in a number of areas the rivers support a diverse aquatic flora – more common species include fool's watercress, water mint, yellow flag and less common species like marsh mallow.

Some wetland species are protected by International nature Conservation Directives and are found around the Island's coast with concentrations in and around the estuaries.

Nationally important mammals to be found are red squirrels and dormice. Twelve out of fifteen British bat species live in the island's woodlands. Dartford warblers nest in the gorse covered downs while the heathland glades attract breeding nightjar, barn owls, wintering waterfowl and waders.

The slumping coastal cliffs support the only persistent population of Glanville butterflies in Britain.

The Island has a large number and area of European designated conservation sites. The Solent and Southampton Water Special Protection Area (SPA), (notified under the EC Directive on Wild Birds), includes several Isle of Wight SSSIs and has also been designated a Ramsar Site. The Island contains four candidate Special Areas of Conservation (SACs), designated under the EC Habitats Directive: the Solent Maritime; South Wight Maritime; the Isle of Wight Lagoons; and the Isle Wight Downs. There are 43 Sites of Special Scientific Interest (SSSI) and 22 of them are water dependent. The Isle of Wight Area of Outstanding Natural Beauty (AONB) covers about half the island (189 sq km), taking in almost all of the south and west. Two stretches of coastline are designated Heritage Coasts and both are in the AONB. They are the Hampstead Heritage Coast around Newtown (length 10.8

km) and the Tennyson Heritage Coast from Totland to Ventnor (length 34.8 km).

Chines are special features of the island's landscape. They are the remains of ancient river valleys, although now are mostly steep gullies leading down to the sea. Rich in geological and ecological interest, the majority of Chines can be found along the Island's south west coast. The Environment Agency in partnership with the Island 2000 Trust won recognition for their enhancement of the Chines.

A section of the Eastern Yar at Langbridge has undergone habitat improvement with advice and help from the Agency. Once a good coarse fishery and haven for kingfishers and watervoles, the water had become badly overrun with small trees causing a decline in the habitat value of the river. A tree management plan to keep the trees in check and maintain varied habitats benefits local bird, fish, mammal and invertebrate populations.

Newtown Upper Reach



Eastern Yar at Longbridge



Lukley Brook

Fisheries

It is a key aim of the Environment Agency to ensure that all waters on the Isle of Wight are capable of sustaining healthy and thriving fish populations.

Potential for coarse fishing is limited because of the small size of the Island's rivers. Carp, roach and dace are the predominant species of coarse fish on the Island. Rudd, perch, bream and tench are found in small numbers, while minor streams are characterised by stone loach, bullhead and eel. Other species to be found include stickleback, gudgeon and brook lamprey. Roach and eel are the most abundant species caught in the Caul Bourne.

Under the EU Freshwater Fisheries Directive the Eastern Yar between Horringford and its mouth and the Medina between Chillerton and Newport are designated as Cyprinid Fisheries. This reinforces the water



Bembridge Harbour

quality standards to which the rivers must be protected.

The Eastern Yar and River Medina both have populations of small wild brown trout, characteristic of chalk stream headwaters. Occasionally, there have been reports of sea trout in the Medina estuary, but these have not extended above Newport.

There are around 30 privately owned stillwater lakes and ponds fished on the island and the majority of these support major coarse fish species.

Recreation

Surrounded by water and geographically placed in one of the sunniest parts of Britain, the Isle of Wight is a Mecca for tourists - attracting 2.3 million visitors a year. It's popularity as a seaside resort goes back to Victorian times when the Island was given the royal seal of approval by Queen Victoria and Prince Albert.



Wootton Creek

The Island attracts national and international attention from the sailing fraternity. Specific events include Cowes Week, the International Power Boat Race and the Round the Island Race. Cowes located at the mouth of the Medina is home to the Royal Yacht Squadron and other yacht clubs. A wide range of moorings, equipment supply and boatyards can be found at Cowes, Bembridge harbour, Wootton Creek and the Medina estuary.

There are no navigable inland waterways on the Island.

Canoeing is also popular and there are four main sites at Newtown Harbour, the River Yar, Yaverland and



Railway bridleway

Dunroamin. Yaverland and Dunroamin beaches are also important windsurfing spots along with Gurnard Bay and the Esplanade at Sandown. Yaverland is also the Island's main water skiing and sub aqua site.

The Island boasts 500 miles of walks - many along rivers and streams and there are also plenty of opportunities for cycling.

Flood defence

The Environment Agency has duties to protect people and property from flooding from rivers and the sea.

There are 114 km of main river on the Isle of Wight for which the Agency has flood defence responsibility. River systems of the island are typically small hill streams rising at the base of the chalk beneath the Downs. Periods of high flow are short lived but peak flows are high.

In the past, the Island's open countryside allowed more rain to soak into the ground slowing down runoff and allowing rivers to rise slowly. Conversion of pasture to arable land has meant water now enters the river more rapidly through furrows. Additionally, river engineering and building in the floodplains have all helped to accelerate the rise in river water levels during heavy rain. The Agency discourages development in the floodplain and actively promotes

sustainable drainage systems which slow down the passage of rain, from the land to the rivers.

The greatest part of the Environment Agency's major flood defence work on the Island is on the tidal reaches of the rivers.

Flood alleviation schemes in the past were carried out at the Schoolgreen area of Freshwater on the Western Yar, a 4 km stretch of the River Medina, Lukely Brook between Towngate Bridge and Westminster Mill, Shalfleet Mill Stream, Thorley Brook and on the Eastern Yar between St Helens and Southford Mill.

Monktonmead Brook at Ryde has a long history of flooding dating back 100 years. In 2001 the Agency announced a £750,000 scheme to more effectively release floodwaters to the sea by extending the concrete outfall and installing two new, high capacity pumps to further relieve the pressure at very high tides

Main picture: River Yar tidal banks



Sandown sea wall



Sandown sea wall



Eastern Yar sluices

River Maintenance

River maintenance plays an important part in reducing the risk of flooding. A programme of annual maintenance is carried out by the Agency's Hampshire and Isle of Wight Direct Works Force. Removal of debris likely to block sluices, culverts and weirs is vital. Also important is the clearance of overgrown bankside vegetation and dredging works to maintain constant flows.

Careful checking and monitoring of man-made flood defences is routinely carried out

Preventing Pollution from Waste

The Environment Agency works with others to ensure that controlled waste – waste produced by offices, businesses, factories, schools and shops amongst others – is handled, transported, treated and disposed of as safely as possible.

Safe disposal of waste costs money and some people try to avoid these costs by dumping their waste illegally. This is known as fly tipping. It is unsightly, but more importantly it can cause significant health problems for rivers, wildlife and the surrounding environment. Anyone caught fly tipping will be prosecuted by the Agency.

Putting waste into landfill sites can generate landfill gas – a greenhouse gas – and liquid leachate, which, if allowed to escape, can contaminate water and harm humans and wildlife.



Amenity site



Landfill operations

Lynnbottom Landfill took the majority of the Island's waste. When that became full a new site was built at Standen Heath not far from the Palmer's Brook. The Agency works with the developers to ensure that the site engineering and environmental monitoring safeguards the watercourse.

There are a number of waste facilities on the Island, some of them near rivers and streams, all carefully monitored by the Agency.



New landfill cell and drainage

Photographs by John Chandler

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