

EA - NORTH EAST BOX 5

River Tees

FACT FILE



ENVIRONMENT
AGENCY

KEY FACTS

HEIGHT AT SOURCE

760 metres above sea level

LENGTH FROM SOURCE TO SEA

160km approximately

CATCHMENT DRAINAGE AREA

1930 square kilometres

MAIN TRIBUTARIES OF THE RIVER TEES

River Lune, River Balder, River Leven, River Skerne, Billingham Beck, River Greta

AVERAGE ANNUAL RAINFALL

610mm (eastern coastal areas)
2300mm (Pennines)

WATER QUALITY

Inland River Tees: Good: 283.4km;
Fair: 72.9km; Poor/Bad: 36.3km

Estuarine River Tees: Good: 9.9km,
Fair: 14km; Poor/Bad: 0km

POPULATION

565,400



River Tees

FACT FILE

The River Tees rises high in the Pennine Hills, close to the source of the South Tyne and about 10km from the source of the Wear.

The river then flows in an easterly direction through some of England's wildest countryside over the notable High Force Waterfall near Middleton in Teesdale, to Barnard Castle, then on to Darlington, Yarm, Stockton, Billingham and finally, Middlesbrough. Here, it meets the North Sea, some 160km from its source.

The Tees is a river of contrasts. It embraces isolated moorlands in upland areas, used only for sheep grazing, and industrial Teesside – home of the largest concentration of chemical and petrochemical works in Europe and a major UK port.



Industry on the Tees

A HISTORIC RIVER

The Tees has played a vital role in the history and development of Teesside, being a focal point for trade since the 12th century.

Until the 20th century, the river was clean, healthy and famous for its salmon stocks. During the early 20th century though, the river began to pay the price for attracting industry and a growing population to its banks.

The development of the chemical industry in the late 1920s had a devastating effect on the River Tees. Water quality deteriorated markedly.

By the 1940s, salmon had disappeared altogether and the central stretch of the estuary between Victoria Bridge and the Cargo Fleet, was virtually 'dead'. There was no oxygen present in the water in the central and lower reaches during the summer months.

By the 1970s it was obvious that this destruction of the river could not be allowed to continue and plans were made for a long-term recovery programme to cut pollution loads into the river.

WATER QUALITY

As the river flows through the upland areas, there is sparse population and little industry other than farming. Water quality in these areas is good. However, there are some localised problems with discharges from abandoned mines – a legacy of Teesdale's lead mining history.

In the middle reaches, water quality is affected by the influence of the River Skerne. The upper parts of this major tributary have improved in quality since

RIVER TEES AND ITS
TRIBUTARIES WATER QUALITY CLASSIFICATION TABLE 1995

River Quality Class	Inland Rivers Length of Tees (km)	Estuarine Quality Class	Estuarine Length of Tees (km)
A – GOOD	104.0	A – GOOD	0.0
B – GOOD	179.4	B – FAIR	9.9
C – FAIR	55.0	C – POOR	3.1
D – FAIR	17.9	D – BAD	10.9
E – POOR	34.8		
F – BAD	1.5		

the closure of the Fishburn Coking Works. However, discharges from large sewage treatment works serving Newton Aycliffe and Darlington still affect the water quality sufficiently to cause a class down grade in the main Tees for about 6km.

Generally, the Tees is now a river on the mend. At one time pollution from chemical, petrochemical and steel making industries and domestic sewage caused complete deoxygenation in the central stretch. However, since 1980, various schemes have been undertaken to improve water quality.

All the major dischargers have plans in place to reduce pollution loads in the Tees estuary. Consents and Authorisations to discharge are being reviewed and tightened in order to reflect requirements for effluent improvements. Rehabilitation of the estuary has been planned in parallel with the Tees Barrage, which has led to a

significant improvement in upstream water quality. The freshwater river is now protected from pollution from the estuary which was carried inland on each tide. Efforts are now being concentrated on cleaning up and reducing discharges to the estuary.

Once these improvements are complete early in the next century, it is anticipated that the pollution load to the estuary will be about 10 per cent of that in 1970.

The Agency has a system for classifying the quality of rivers. Class A and B rivers are of a high quality. They are clean enough for salmon and trout to live in and can be used for drinking water. They will also support a variety of invertebrates, including mayflies, stoneflies and most pollution sensitive insects.

Class C and D rivers are of fair quality. Coarse fish such as roach, chub and bream can live in them and possibly

trout in some C waters. These rivers can be used for drinking water if it is treated. A good variety of invertebrate species can be found apart from the most pollution sensitive animals.

Class E rivers are of poor quality. They can still support coarse fish but cannot be used for drinking water.

Class F rivers are badly polluted. Some small animals like worms or midges can live in them, but no fish.



The Agency limits the amount of emissions from industry

INTEGRATED POLLUTION CONTROL

Pollution may harm people and all other parts of the living world. Industrial materials or the by-products of industrial processes constitute many of the worst pollutants – those that can do the most harm if mishandled and which are the hardest to dispose of safely. The role of the Environment Agency is to regulate these processes so that, where possible, pollution is prevented, or minimised and made harmless.

The Agency's authority to regulate industrial discharges stems principally from the Environmental Protection Act of 1990, a key feature of which is the concept of Integrated Pollution Control (IPC). This is being established internationally as the way forward for controlling pollution from industrial sources. As a system, it considers pollution to land, air and water and the way in which it interacts and impacts on the environment as a whole. It also takes a long term view on whether processes are sustainable or make demands on the environment that will rapidly exhaust available resources.

Businesses which want to operate certain industrial processes, those with the greatest pollution potential or those that are particularly complex, must



High Force water falls

ENVIRONMENT AGENCY



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apply to the Environment Agency for permission to operate. Their application must contain all the information required to assess the impact on the environment, including the effects that polluting releases will have in both the short term and long term. Agency inspectors use this and other independent information to assess whether the activity should be permitted. If the decision is to allow the process, an authorisation is then issued which includes limits on the amount of emissions to land, air or water.

Within the Tees catchment, there are a large number of chemical manufacturers, steel processes, incineration operations, a large gas fired power station, a nuclear power station and several smaller power generation units, all of which must have an authorisation to operate. These sites are mainly situated at the lower end of the estuary, below the Tees Barrage. The Agency monitors all authorised processes to ensure that conditions are respected and, if necessary, will use vigorous legal enforcement to protect the environment. The Agency can also order processes to be shut down if there is a serious risk of pollution.

The Environment Agency also has the task of regulating the storage and use of radioactive materials and the accumulation and disposal of radioactive waste. Hospitals, universities and industry are all users of radioactive material and are regulated by the Agency.

IMPROVING FISHERIES

Salmon and sea trout are now beginning to make their way upstream to spawn. This confirms the water quality improvements made to the river.

Each year, increasing numbers of these migratory fish swim upstream as far as High Force Waterfall near Middleton in Teesdale. The headwaters of the river and its tributaries support brown trout populations and the tributaries also provide important spawning and nursery areas.

From Barnard Castle to Darlington the flow in the Tees increases in volume. Trout are then joined by a variety of other species such as grayling and eels. Dace and chub appear in varying numbers and barbel are found at Low Coniscliffe.

The main species in this section of river are dace, chub and roach. Other species include barbel, pike, eels,



Fish survey work on the Tees

gudgeon, minnows, stone loach and brook lamprey.

The Tees Barrage has been built at Blue House Point, Stockton, impounding 22km of the River Tees upstream to protect the river from polluted estuary water. The barrage has made the stretch upstream much cleaner and slower, thereby favouring roach and bream. Fish refuges have also been created to allow smaller fish and fry to seek shelter when the river is in flood.

Since the barrage presents a barrier to migratory salmon and trout, a fish pass has been built to allow them

movement upstream. These fish are expected to return to the river in increasing numbers following the progressive completion by Northumbrian Water Limited of a £140 million effluent treatment centre at Bran Sands and a stocking programme introducing young salmon into the river.

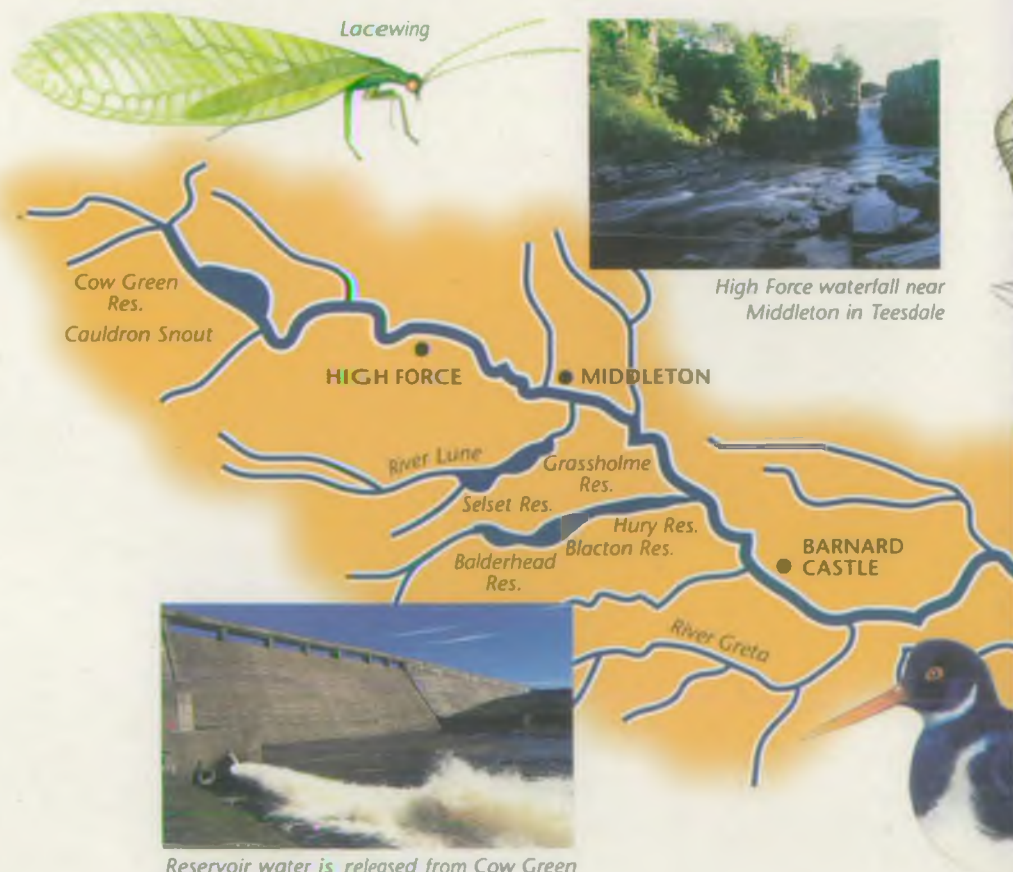
BEATING THE FLOODS

The Tees is a very fast flowing river that rises quickly after heavy rain. It has a long history of flooding with records dating back to the 16th century. Major floods occurred in 1940, 1963, 1967, 1981 and 1995.

The main trouble spots are at Yarm, Croft and Neasham where major floods occurred in 1771, 1881, 1968, 1986 and 1995.

A scheme to protect Yarm was completed in 1992. It successfully prevented over 300 properties from flooding in 1995. The works were designed to blend in naturally with the historic landscape of the town.

Other flood defences in the Tees catchment include works on the River



Reservoir water is released from Cow Green

Oyster Catcher

Leven, which protect the town of Stokesley, and coastal defences in Greatham Creek. Following the flooding of Croft and Neasham in February 1995, engineers are designing improvement works to give Neasham a higher level of protection. Options at Croft will be investigated.

To protect the environment, ecological surveys are undertaken before



Flood defence works on the Tees

carrying out any flood defence works. For areas and properties that cannot be protected, the Environment Agency provides an extensive flood warning system. This consists of predictions based on levels recorded by the 13 gauging stations on the river system.

The Agency is responsible for providing flood defences for a 270km stretch of river on the Tees and its tributaries.

FLOOD WARNING

The Environment Agency operates a sophisticated flood warning service which uses the latest technology to monitor rainfall, river levels, tides and sea conditions 24 hours a day, throughout the year. When there is a flood risk, warnings are issued to the general public, the police, local authorities and the media, so that those most at risk can take action to protect themselves and their property.

There are a number of ways people who live in affected areas can find out about flood warnings.

Those who have agreed to receive flood alerts, will be telephoned by the Environment Agency's Automatic Voice Messaging (AVM) system. This will give details of the flood warning and a contact for further information.

The Environment Agency also provides a 'dial and listen' national



The Agency uses the latest technology to predict possible flooding

telephone service for information on flooding. **Floodcall – 0645 88 11 88** – is a 24 hour recorded information service providing up to date details on warnings in force across England and Wales. It gives details of those places most at risk and information about what to do in a flood.

Local flood alert procedures may also be in place in certain areas. These could include a local warden scheme where a nominated resident passes flood warning information to local households. Warning sirens may also be in place.

The Environment Agency provides local radio stations with up to date information so they can broadcast regular updates. Flood warning information will also be broadcast by AA Roadwatch on many local commercial and BBC stations during their travel bulletins. Weather pages on Teletext (ITV) and weather forecasts on local television and radio may also include flood warning information.

GEOLOGY

The geology of an area influences its character, chemical quality and human uses. The geology of the Tees catchment consists of strata from the Triassic, between 213 and 248 million years old and Carboniferous ages, between 286 and 360 million years old. In the high grounds to the west of the catchment, the oldest rocks are the Middle Limestone Group of the Carboniferous series. At Cauldron Snout and High Force Waterfall a hard igneous, or volcanic, rock called Whin Sill intrudes the Middle Limestone.

The Millstone Grit and Upper Limestone Group form the highlands to the north east and south west of Barnard Castle. They in turn are overlain by Magnesian Limestone from the Permian age – between 248 and 286 million years old. The Magnesian Limestone – a major aquifer – is found between Piercebridge and Darlington. The Sherwood Sandstone, another aquifer, is found along the coastal strip.

The River Tees and its tributaries



Industry on the Tees estuary

The heavily industrialised lower Tees

WATER RESOURCES

The Tees is an important water supply river. The upper reaches are extensively used for public water supply and for industry around Darlington and Teesside.

Aquifers are rocks that absorb, store and transmit water, which can be abstracted from wells, boreholes and springs in useable quantities. The major aquifers in the Tees catchment are the Sherwood Sandstone Group and Magnesian Limestone. Water abstracted from the Sherwood Sandstone is mainly used for industry whilst nearly 98 per cent of water taken from the Magnesian Limestone is used for public water supply.

There are reservoirs at Cow Green on the Tees, Selsel and Grassholme on the River Lune and Blackton, Hury and Balderhead on the River Balder. Releases from the reservoir groups are made to maintain flows in the Tees during dry weather. Flows in the Tees can, if necessary, be maintained by releases from Kielder Reservoir on the Tyne via the River Wear.

Nearly all abstractions from either ground or surface water need to be licensed, although there are some exemptions in the Tees catchment for groundwater and springs. The licence says how much water can be taken and how often. It may not be granted at all if the taking of water would harm the environment or adversely affect other water users.

In total, there are currently 20 licensed groundwater abstractions and

63 surface water abstractions in the Tees catchment.

CONSERVATION

The animal and plant life of the Tees is as varied and rich as its landscape. In the unpopulated upper reaches the river passes through a wilderness of rolling hills and plains before reaching the urban and industrial conurbation of Teesside.

The flora of upper Teesdale is of special significance. The cold climate of the dale and an area of limestone (known locally as 'Sugar Limestone') which has been affected by volcanic heat, has allowed plants present at the end of the last ice age to survive to the present day. Beautiful wildflowers such as the Teesdale Violet, Alpine Forget-Me-Not and Spring Gentian are protected within the Upper Teesdale National Nature Reserve and Site of Special Scientific Interest (SSSI), a vast area of 14,000 hectares.

At first sight, the huge chemical complexes of Teesside appear to be devoid of wildlife, but closer inspection reveals marshes and mudflats of great value to a host of wild animals and plants. The silt deposited by the Tees has formed large areas of salt marsh and inter-tidal mud rich in invertebrates – a vital staging post for migratory and wintering waders and wildfowl. Four SSSIs protect these valuable wetlands, and Teesmouth is also a National Nature Reserve declared in March 1995.

There are over 40 SSSIs within the River Tees catchment covering an area of

more than 30,000 hectares. The vast majority lie in the uplands where an area of the Upper Teesdale SSSI has been designated a National Nature Reserve (NNR) and declared a 'Biosphere Reserve' by the United Nations Educational, Scientific and Cultural Organisation (UNESCO). The SSSI has also been proposed for inclusion in the list of Wetlands of International Importance under the Ramsar Convention. This convention was held in 1971 to designate wetland sites around the world as being of international importance. The estuary at the mouth of the Tees has now been designated as a Ramsar Wetland Site and a Special Protection Area for birds.

WASTE MANAGEMENT

Waste needs to be carefully managed. Hazardous waste may pose a serious threat to the environment and in the worst cases can be dangerous to life.



Waste inspectors at work

Other wastes may cause a problem by their sheer volume or nuisance value such as litter, flies and smell. This means the disposal and recovery of waste must be carefully controlled to ensure that there is no damage to the environment or harm to human health.

It is estimated that the average household produces approximately one tonne of refuse each year. With over 250,000 people living in the catchment area, this adds up to a vast amount of waste which has to be safely disposed of each year.

Landfill remains the prime method for the disposal of household and other forms of solid waste from industry and commerce. Sites suitable for landfill are becoming more difficult to find and, as a consequence, are being located remotely from the urban centres of population.

All facilities where waste is handled, treated or disposed of must be licensed by the Environment Agency. The licence specifies the types and quantities of waste which can be accepted at the site and the precautions which must be



Scrapyards are valuable for recycling metal and other materials

taken by the site operator to protect the environment.

There are over 100 licensed waste sites in Cleveland and Teesside. These include landfills, transfer stations, waste storage facilities, chemical treatment plants, an incinerator, scrapyards, household waste sites, and waste recycling facilities.

When waste is deposited in a landfill site it breaks down to produce a polluting liquid (leachate) and landfill gas (mainly methane). The site operator must line the landfill site with an impermeable barrier to stop leachate polluting groundwater and landfill gas from migrating into property where it might explode. In some cases, landfill gas is extracted from sites and burned to produce heat or generate electricity. Other waste disposal methods include incineration facilities and chemical treatment plants.

However, not all waste is disposed of. Thousands of tonnes of metal and other valuable materials are recycled through a network of scrapyards. Household Waste Sites and other recycling centres take a range of recyclable wastes such as oil, paper, cans, plastic, textiles and even paint. These too are licensed and regulated by the Agency to ensure that they do not harm the environment.



Illegally dumped tyres can cause pollution

Industry and commerce have a Duty of Care to make sure their wastes are only collected by an authorised person and taken to an authorised waste disposal site. Waste carriers also have to be registered with the Agency before they can collect any waste. Illegal dumping (flytipping) of waste at unauthorised sites is always a problem, particularly in urban areas. Those who are caught flytipping are prosecuted.

Wastes which are the most dangerous to people or to the environment are called Special Waste. They include hazardous or toxic waste such as acids, pesticides and asbestos.



The Tees Barrage and canoe slalom

Movement of Special Waste from its place of production to the disposal site must be authorised by the Agency. This provides an opportunity to check that the disposal site is suitable for the waste and that it is deposited safely.

There is a growing acknowledgement, however, that we cannot continue using up natural resources and producing waste the way we do. The government has recently produced a National Waste Strategy in order to try and address these problems. The first priority is to reduce the amount of waste we produce and if we must produce waste then we should try to reuse or recycle it. Only as a last resort should it be disposed of. Everyone has a part to play in this strategy whether at home, at school or in the work place. The Agency issues advice on the safe, efficient disposal of waste and will play a key role in delivering the new national strategy.

● The Agency has a 24 hour emergency hotline – **0800 807060** – for reporting environmental incidents.



Boating on the Tees

Pollution, poaching, fish in distress, risks to wildlife, flytipping, flooding – don't ignore it, report it!

ENJOYING THE TEES

The Tees is a popular haunt for fishermen from all parts of the country, who are attracted by the spectacular countryside and, of course, plentiful coarse fisheries.



Enjoying the River Tees

Of the Teesdale reservoirs, Grassholme, Blackton and Hury are stocked with Rainbow Trout and are open to anglers through a permit system. The reservoirs are also popular for those wishing to picnic, walk or just enjoy the beautiful countryside of Teesdale and the north east Pennines.

Further downstream, the barrage is providing some exciting opportunities for recreation. There is a 280 metre artificial whitewater canoe slalom course. An area of the main river has been set aside for water skiers and a lock on the barrage allows small boats to navigate the river.

NORTH EAST REGION ADDRESSES

REGIONAL OFFICE:
 Environment Agency
 Rivers House
 21 Park Square South
 Leeds LS1 2QC
 Tel: 0113 244 0191
 Fax: 0113 246 1889
 Minicom: 01904 692 297

NORTHUMBRIA AREA
 Environment Agency
 Tyneside House
 Skinnerburn Road
 Newcastle Business Park
 Newcastle upon Tyne NE4 7AR
 Tel: 0191 203 4000
 Fax: 0191 203 4004
 Minicom: 01904 692 297

DALES AREA
 Environment Agency
 Coverdale House
 Amy Johnson Way
 Clifton Moor
 York YO3 4UZ
 Tel: 01904 692 296
 Fax: 01904 693 748
 Minicom: 01904 692 297

RIDINGS AREA
 Environment Agency
 Olympia House
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 Leeds LS12 6DD
 Tel: 0113 244 0191
 Fax: 0113 231 2116
 Minicom: 01904 692 297



Environment Agency
 Information Centre
 About Office
 Class No
 Session No *AXUS*

For general enquiries please call your local Environment Agency office. If you are unsure who to contact, or which is your local office, please call our general enquiry line.

**ENVIRONMENT AGENCY
 GENERAL ENQUIRY LINE
 0645 333 111**

The 24-hour emergency hotline number for reporting all environmental incidents relating to air, land and water.

**ENVIRONMENT AGENCY
 EMERGENCY HOTLINE
 0800 80 70 60**



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